

March 27, 2017

Lea Anne S. Atwell, P.G.
Project Manager
New Hampshire Department of Environmental Services
29 Hazen Drive
Concord, NH 03302

Re: MVD Supply Wells 4 and 5 Investigation – Saint-Gobain Performance Plastics Site (DES#199712055-36430)

Dear Ms. Atwell:

On behalf of our client Saint-Gobain, attached to this letter is the report describing the investigation conducted in the vicinity of Merrimack Village District water supply wells MVD-4 and MVD-5 and the Longa Disposal Area in Merrimack, NH.

Please contact me by phone at (952) 832-2691 or email at <u>jgreer@barr.com</u> if you have any questions.

Sincerely,

John C. Greer, P.G. Senior Hydrogeologist

Attachment

 c: Edward Canning, Saint-Gobain Performance Plastics David Edelstein, Archer Law Theresa Miller, Golder Associates Ray Wuolo, Barr Engineering Co.



MVD Supply Wells 4 and 5 Investigation

Merrimack, New Hampshire

Prepared for Saint-Gobain Performance Plastics

March 2017

MVD Supply Wells 4 and 5 Investigation

March 2017

Contents

1.0	Executiv	e Summary	1
2.0		ction	
2.1		MVD-4/5	
		AS in the Wells MVD-4/5 Area	
		urce Water Protection Area	
2.2		a Disposal Area	
	_	AS in Groundwater at the Longa Disposal Area	
2.3		Potential PFAS Sources	
2.4		ose of Work	
2.5	•	e of Work	
3.0	·	ation Methods	
3.1	J	Methods	
3		uifer Profiling	
3		ater sampling	
	3.1.2.1	Groundwater and surface water sampling	
	3.1.2.1.1		
	3.1.2.1.2	Monitoring wells	10
	3.1.2.2	River/stream water grab samples	10
	3.1.2.3	QA/QC sample collection	10
3	3.1.3 Soi	il Sampling	11
	3.1.3.1	Samples for PFAS analysis	11
	3.1.3.2	Samples for grain-size analysis	11
	3.1.3.3	QA/QC sample collection	11
3	3.1.4 Wa	ater-level measurement	11
3	3.1.5 Stre	eam gaging	12
3	3.1.6 Sur	rveying	12
3.2	Labor	ratory Analyses and Quality Assurance/Quality Control Review	12
3.3	Grour	ndwater Modeling Methods	12
3.4	Devia	tions from Work Plan	12

4.0	Investigation Results and Discussion	14
4.1	Site Geology	14
4.2	Hydrogeologic Setting	15
4.2	2.1 MVD/Longa Area Groundwater-Surface Water Interactions	15
4.2	2.2 MVD/Longa Disposal Area Interaction with Bedrock	16
4.3	Groundwater Flow and Capture from the Longa Disposal Area	17
4.4	PFAS Concentrations	17
4.4	4.1 Soil	18
4.4	4.2 Groundwater	18
	4.4.2.1 Wells MVD-4/5 and Longa Disposal Area Vicinity	18
4.4	4.3 Surface Water	20
4.5	Overview of Findings	20
5.0	Summary and Conclusions	22
6.0	References	

List of Tables

- Table 1 Analytical Parameters
- Table 2 Aquifer Profiling Summary
- Table 3 Monitoring Locations
- Table 4 Groundwater and Surface Water Data
- Table 5 QA/QC Blank Sample Data Summary
- Table 6 Soil Data
- Table 7 Hydraulic Conductivity Estimates from Grain Size Distributions
- Table 8 MVD-4 Field Water Quality Measurements
- Table 9 MVD-5 Field Water Quality Measurements
- Table 10 PFAS and TOC Sample Summary

List of Figures

Figure 1	Site Location
Figure 2	PFOA Monitoring Results - NHDES, 3/9/2016-1/2/2017
Figure 3	PFOA+PFOS Monitoring Results - NHDES, 3/9/2016-1/2/2017
Figure 4	Study Locations - Wells MVD-4 and MVD-5
Figure 5	Groundwater Elevations - October 31, 2016
Figure 6	Groundwater Elevations - November 7, 2016
Figure 7	Groundwater Elevations - November 23, 2016
Figure 8	Surficial Geology in the Vicinity of MVD - 4 and MVD-5
Figure 9	Cross Section Locations - Wells MVD-4 and MVD-5
Figure 10	Cross Section A-A' with Geology and Dissolved-Phase PFOA+PFOS
Figure 11	Cross Sections B-B' & C-C' with Geology and Dissolved-Phase PFOA+PFOS
Figure 12	Cross Sections D-D' & E-E' with Geology and Dissolved-Phase PFOA+PFOS
Figure 13	Water Table Elevation Near MVD-4 and MVD-5
Figure 14	Model-Predicted Capture Area for MVD-4/5 Under Summer Pumping Conditions
Figure 15	Long-Term Simulation Result with Historical Pumping Rates for Wells MVD-4/5, Recharge, and
	Extrapolated River Stage Near the Well Field
Figure 16	Profiling Results Along Transect AP01-AP06
Figure 17	Profiling Results Along Transect AP07-AP10
-	PFOA Groundwater Concentrations - Wells MVD-4 and MVD-5
•	PFOS Groundwater Concentrations - Wells MVD-4 and MVD-5
Figure 20	PFOA+PFOS Groundwater Concentrations - Wells MVD-4 and MVD-5
Figure 21	MVD-4 Major Anions and Cations
Figure 22	MVD-5 Major Anions and Cations
-	Select PFAS Measured in MVD-4 During November 2016 Testing
Figure 24	Select PFAS Measured in MVD-5 During November 2016 Testing

List of Appendices

Aquifer Profiling and Sampling Methods
Laboratory Analyses and Quality Assurance/Quality Control Review
Groundwater Flow Modeling
Field Documentation (Well and Stream Sampling Logs, Well Development Logs, Sample
Chains of Custody, Shipping Manifests)
Laboratory Analytical Reports
Boring Logs
Aquifer Profiling and Sampling Data Package

Certification

I hereby certify that this plan, document, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Geologist under the laws of the state of New Hampshire.		
	March 27, 2017	
John C. Greer	Date	
PG #: 00737		

Acronyms

Acronym	Description
CSM Report	Separate report titled: Conceptual Site Model of PFOA Fate and Transport: Merrimack,
	New Hampshire, to be submitted at a later date
LDA	Longa Disposal Area
MVD	Merrimack Village District
MVD-4/5	Merrimack Village District Wells 4 and 5
NHDES	New Hampshire Department of Environmental Services
ng/g	nanogram per gram, typical reporting units for analyses of PFOA in soil, equivalent to ppb
ng/L	nanogram per liter, typical reporting units for analyses of PFOA in water, equivalent to
	ppt for water samples with a density of 1 gram per centiliter (i.e., low total dissolved
	solids)
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PFHxA	Perfluorohexanoic acid
PFHpA	Perfluoroheptanoic acid
PFBA	Perfluorobutanoic acid
PFBS	Perfluorobutane sulfonate
PFPA	Perfluoropentanoic acid
ppb	Parts per billion
ppt	Parts per trillion

1.0 Executive Summary

A groundwater investigation of the Merrimack Valley District (MVD) wells 4 and 5 was conducted to characterize the presence of PFAS compounds in the vicinity of these wells and to better understand groundwater flow paths to the wells under various historical pumping conditions, including whether the Longa Disposal Area is a likely source of the PFAS compounds detected in the wells.

A work plan was developed and executed that included detailed soil profiling and sampling, groundwater sampling from soil probes, sampling of existing wells, groundwater and surface water elevation measurements, and comprehensive groundwater-flow modeling to match historical pumping conditions and recently measured groundwater elevations.

This investigation found the following:

- PFOA flowed to MVD wells 4 and 5 via groundwater from areas west and northwest of the MVD wells. Under non-pumping conditions, the groundwater flow paths from areas to the northwest would likely not have intersected the MVD wells. However, pumping of MVD wells 4 and 5 over time would have changed the groundwater flow directions and "pulled to the southeast" groundwater from this area.
- The Longa Disposal Area is not ruled out as a contributor of PFAS but it is likely not a significant contributor to MVD wells 4 and 5. Groundwater modeling indicates that the total flow of groundwater from underneath the Longa Disposal Area is up to approximately 15 percent of the total volume of water pumped by MVD wells 4 and 5 under summertime (high demand) rates. At lower pumping rates and under non-pumping conditions, groundwater passing underneath the landfill is not predicted to flow to the MVD wells. Volatile organic compounds (compounds that are typically associated with mixed-waste landfills) were found in the landfill's monitoring wells during previous investigations and a few volatile organic compounds were reported at concentrations near or below the reporting limits in two of the Longa Disposal Area monitoring wells sampled for this investigation. Volatile organic compounds were not detected in groundwater samples in monitoring wells or soil probes in the vicinity of MVD wells 4 and 5, except for a few detections at or below the reporting limit, nor were they detected in multiple samples collected from MVD wells 4 and 5 under pumping and non-pumping conditions.
- The water level data, along with the groundwater modeling results and regional studies, indicate that there is not a groundwater migration pathway parallel to the Merrimack River north of the MVD well field area. Direct migration of PFOA from the SGPP facility to MVD wells 4 and 5 is highly unlikely and not supported by the data.
- PFOA and other PFAS compounds were not detected in most of the unsaturated soils that were sampled in the vicinity of MVD wells 4 and 5 as part of this investigation and the few PFAS compounds that were detected were at very low concentrations. These results suggests that there is not an aerially deposited source of PFAS in the vicinity of wells MVD-4 and MVD-5.
- The fraction of Merrimack River water pumped from wells MVD-4/5 is estimated to range from 0 under long-term average pumping conditions to 12 percent under summer pumping conditions

- with normal recharge rates and river stages. The majority of the water pumped by wells MVD-4/5 originates from the west and northwest. The bedrock contributes some water to the wells as it discharges into the alluvial aquifer from the west. Baboosic Brook is also a contributor to flow to the wells and there is a component of flow that reaches the wells from areas west of Baboosic Brook.
- There are many current and historical property uses near wells MVD-4/5 and the Longa Disposal Area that have been identified through review of readily available records as potential sources of PFAS to groundwater. These uses include, but are not limited to: car wash, auto detailing, upholstery cleaning, granite, stone and tile fabrication, and printing. Other sources will likely be identified as more information on PFAS usage becomes available. PFAS from such sources in upgradient portions of the capture area for wells MVD-4/5, including areas to the west of Baboosic Brook, could migrate from the source areas to wells MVD-4/5 wells and may be contributing to the overall concentrations and detections of the various PFAS in wells MVD-4/5.

2.0 Introduction

This report describes the investigation of the presence of poly- and perfluoalkyl substances (PFAS) in the Merrimack Village District's (MVD) water supply wells 4 and 5. The primary PFAS being evaluated is perfluorooctanoic acid (PFOA), although other PFAS compounds such as perfluorooctanesulfonic acid (PFOS), perfluorobutane sulfonate (PFBS), perfluorobutanoic acid (PFBA), and perfluoroheptanoic acid (PFHPA) have been detected in MVD wells 4 and 5 and residential wells in the area. The New Hampshire Ambient Groundwater Quality Standard (NHAGQS) for PFOA+PFOS is 70 ng/L (70 ppt).

Sampling of residential water-supply wells in the Merrimack area by the New Hampshire Department of Environmental Services (NHDES) has found varying levels of PFOA and other PFAS compounds in a general pattern with highest concentrations in the vicinity of the Saint-Gobain Performance Plastics (SGPP) facility (Facility) in Merrimack, New Hampshire. The location of the Facility is shown on Figure 1. SGPP uses dispersions that contain PFAS in the manufacture of films and coated cloths. In the past, the Facility applied coatings to fabrics in which PFOA was an ingredient in the dispersion used during production. PFOA was emitted from the Facility's stacks as part of the process. The primary source of PFOA in the Facility was a component of raw materials purchased from suppliers. These types of materials have been commonly used in a wide range of applications in many industries. Pursuant to the terms of the EPA's Voluntary Stewardship Agreement, from 2006 to 2015, suppliers of raw materials to the Facility undertook the process of phasing out the use of PFOA.

PFOA, PFOS, and other PFAS compounds have been used by many companies in the manufacture of many commercial materials for industrial, commercial, and residential use, including stain-resistant carpeting/furniture, non-stick cookware, food package coatings, aqueous fire-fighting foams (AFFFs), moisture-resistant breathable fabrics, concrete and rock sealants, electrical capacitors, dyes, paints, batteries, and as a vapor suppressor in metal plating processes. They are a ubiquitous presence in most households and are found in municipal waste streams and in most landfills (Busch et al., 2009; MPCA, 2009). They are also found in biosolids (in part from municipal sewer sludge) used as amendments to soil in agricultural and landscaping applications.

The area near the Facility has been identified by the NHDES as one of several areas of interest in southern New Hampshire for the investigation of PFAS impacts to groundwater. NHDES collected water samples from water wells in the area beginning in early 2016 and is ongoing. The results of the NHDES sampling of area water wells, including MVD water supply wells 4 and 5 (MVD-4/5), conducted between March 2016 and early January 2017, for PFOA and PFOA+PFOS are summarized on Figures 2 and 3, respectively.

Some of the PFOA detections and concentration in wells in the Merrimack area generally conforms to airborne deposition and subsequent infiltration/migration through the unsaturated zone to the water table. Detections of PFOS and most other detected PFAS compounds in wells do not conform to this pattern, indicating that there are likely many diverse sources of PFAS compounds to groundwater in the area. The source of the airborne PFOA deposition is likely due, in part, to air emissions from the Facility. Preliminary coupled air and groundwater modeling currently in process by Barr Engineering Co. evaluates this pathway, and provides an explanation for some, but not all, of the PFOA detections in well samples.

The air dispersion pathway does not explain the detections of PFOA or most other PFAS compounds detected in wells. The preliminary modeled annual average air deposition rate around the Facility is also shown on Figures 2 and 3.

The preliminary air dispersion modeling (Barr Engineering Co., 2017) indicates that wells MVD-4/5 are not within the area where air deposition from the Facility would have exceeded levels that would result in groundwater concentrations above 70 ppt. However, wells MVD-4/5 are directly adjacent to a closed landfill – the Longa Disposal Area. Four monitoring wells at the landfill have detections of PFOA, with measured concentrations of up to 130 ppt. The Longa Disposal Area was a suspected source for PFOA and other PFAS compounds detected in wells MVD-4/5, given their close proximity to the edge of the landfill and because landfills are known sources of PFAS contribution to groundwater.

Barr Engineering Co., on behalf of SGPP, proposed a scope of work to evaluate the source of PFAS in the vicinity of wells MVD-4/5 (Barr Engineering Co, 2016a). Following NHDES comments on the draft scope of work (NHDES, 2016), a final scope of work was submitted to NHDES on October 20, 2016, titled: Proposed Investigation Scope of Work: MVD Supply Wells 4 and 5, Merrimack, NH – REVISED (Barr Engineering Co., 2016b). This proposed scope of work included detailed soil and groundwater profiling in the vicinity of the well field and landfill, sampling of existing monitoring and water supply wells, sampling of Baboosic Brook and the Merrimack River, and development of a calibrated groundwater flow model to assist in understanding where wells MVD-4/5 get water when pumping at various reported rates. This report describes the results of the study.

2.1 Wells MVD-4/5

Wells MVD-4/5 are located approximately 800 feet (MVD-5) and 1,100 feet (MVD-4) north-northeast of the Longa Disposal Area (Figure 1). The wells are screened in unconsolidated alluvial deposits consisting mainly of sand and gravel and are within approximately 1,100 feet of the Merrimack River. Well MVD-4 was constructed with a 10-foot long screen in the unconsolidated sediments. The well is screened in the depth interval 43 to 53 feet below ground surface. Well MVD-4 began operation in 1956. Well MVD-5 was constructed with a 15-foot long screen in the unconsolidated sediments. The well is screened in the depth interval 50 to 65 feet below ground surface. Well MVD-5 began operation in 1969. Historically, wells MVD-4/5 have been used to supplement water to the system primarily during the summer months when demand is typically high. Well MVD-4 was taken offline May 21, 2015. Well MVD-5 was taken offline April 26, 2016. Wells MVD-4/5 were deactivated on June 7, 2016 due to detections of PFOA and/or PFOA+PFOS above 70 ppt in the wells.

2.1.1 PFAS in the Wells MVD-4/5 Area

PFAS have been detected in water samples from wells MVD-4/5. The MVD wells were sampled regularly by MVD/NHDES for PFASs between March 2016 and July 2016. Between March and July 2016, analytical results for samples collected from wells MVD-4 and MVD-5 were as follows:

- MVD-4
 - Highest PFOA concentration: 130 ppt on 5/5/2016
 - Lowest PFOA concentration: 11 ppt on 5/19/2016
 - o Highest PFOS concentration: 11 ppt on 5/5/2016
 - o Lowest PFOS concentration: non-detect at 4 ppt on multiple dates
 - Other PFAS detected include: PFBS, PFHpA, PFHxS, and PFHxA,
- MVD-5
 - Highest PFOA concentration: 79 ppt on 5/12/2016
 - Lowest PFOA concentration: 21 ppt on 6/2/2016
 - Highest PFOS concentration: 5.5 ppt on 4/14/2016
 - Lowest PFOS concentration: non-detect at 4 4 ppt on multiple dates
 - o Other PFAS detected include: PFBS, PFHpA, PFHxS, and PFHxA,

In April 2016, four monitoring wells in the vicinity of wells MVD-4/5 were sampled for PFAS on behalf of the NHDES by Sanborn, Head & Associates, Inc. (SHA). Wells sampled included 45-1MW, 45-3A, 45-9, and 45-10 (see Figure 4). The sampling results (SHA, 2016) showed the following:

- The highest PFOA concentration of 140 ppt was reported in the sample from well 45-3a, which is located east-southeast of well MVD-4. Based on the groundwater flow direction inferred by SHA, well 45-3a is located downgradient of well MVD-4.
- The highest PFOS concentration of 11 ppt was reported in the sample from well 45-11, which is located south of well MVD-5 and north of the Longa Disposal Area. Based on the groundwater flow direction inferred by SHA, well 45-11 is located side-gradient to well MVD-5 and the Longa Disposal Area.
- The lowest PFOA concentration of 31 ppt was reported for the sample from well 45-1MW, which
 is located west of MVD-4 and northwest of MVD-5. No PFOS was reported in this sample. Based
 on the groundwater flow direction inferred by SHA, well 45-1MW is upgradient of wells MVD-4/5.
- Other PFAS reported in one or more of the groundwater samples collected from the monitoring wells in the vicinity of well MVD-4/5 include PFPEA, PFBS, PFHxA, PFHPA, and PFHxS.

2.1.2 Source Water Protection Area

A Source Water Protection Area (SWPA) report for well MVD-4/5 was prepared in 2003 by Emery & Garret Groundwater, Inc. (EGGI, 2003). Emery & Garret Groundwater, Inc. delineated the source water protection area (SWPA) for MVD-4 and MVD-5 using water levels and pumping test response data (EGGI, 2003). The SWPA represents an approximate area of groundwater contribution to the wells, based on the requirements for delineating SWPAs. The purpose of SWPAs is to conservatively delineate where a well or wellfield derives its water so that steps can be taken, as necessary, to manage existing or potential contamination sources on the landscape within the SWPA. The SWPA for wells MVD-4/5 encompasses the northern portion of the Longa Disposal Area. When wells MVD-4/5 are pumping they capture groundwater from within the SWPA. When the wells are not pumping, groundwater beneath the northern portion of the Longa Disposal Area likely flows east to the Merrimack River. EGGI (2003) noted that a significant amount of the volume of groundwater that is pumped by wells MVD-4/5 likely comes from the south. This is also where the Longa Disposal Area is located in relation to well MVD4/5. EGGI (2003), in

their delineation report for the SWPA, estimated that 30-35% of the water pumped from wells MVD-4/5 originates from the Merrimack River and Baboosic Brook.

2.2 Longa Disposal Area

The Longa Disposal Area is located to the south-southwest of wells MVD-4 and MVD-5 (Figure 1). Prior to being used as a waste disposal area, the site was used as a borrow pit for sand and gravel and a waste burning pit (HTA, 1989). Waste materials in the disposal area reportedly include mixed municipal solid waste, stumps, demolition waste, and masonry rubble. Waste disposal activities ceased at the site in 1987 (HTA, 1989).

Municipal and mixed solid-waste landfills are known to be sources of PFOA, PFOS, and other PFAS compounds (e.g., Busch et al., 2009; MPCA, 2009) in groundwater. The source of PFAS compounds in landfills is attributed mainly to commercial and consumer materials that contain or were treated with PFAS-containing substances, such as carpeting, furniture, cleaning residues, dyes, and food wrappers.

Currently, portions of the former Longa borrow pit are being reclaimed. According to a recent permit application (Brighter Horizons Environmental, Inc., 2013), reclamation activities involve importing fill consisting of waste-derived products including:

- Urban fill: Soil from urban or developed sites that has the potential to contain residual levels of chemicals
- Street Sweepings and Catch Basin Cleanings: Street sweepings, roadside ditch soils and catch basin cleanings that do not obviously contain wastewater, animal wastes, oil, gasoline or other petroleum product
- Other Impacted Soil: Dredged spoils or soil from known impacted sites with residual levels of chemicals that are acceptable for reuse at the Site. These soils include street sweepings or catch basin cleanings that have obvious or known chemicals.

According to the reclamation plan for the Longa borrow pit (AMEC, 2013), these fill materials will be placed to the south of the existing Longa Disposal Area.

2.2.1 PFAS in Groundwater at the Longa Disposal Area

In April 2016, selected monitoring wells around the Longa Disposal Area and in the vicinity of wells MVD-4/5 were sampled for PFAS for the NHDES by SHA. The sampling results (SHA, 2016) indicated the following:

- Concentrations of PFOA in the Longa Disposal Area monitoring wells ranged from 33 ppt at well LNG-MW-2 to 130 ppt at well LNG-MW-1.
- Concentrations of PFOS in the Longa Disposal Area monitoring wells ranged from non-detect at 4.2 ppt (wells LNG-MW-1 and LNG-MW-2) to 41 ppt at well LNG-MW-4.
- Well LNG-MW-1 is located near the southeastern corner of the disposal area and well LNG-MW-4 is located on the east side of the disposal area (Figure 4). Wells MVD-4/5 were not pumping when the sampling was performed. SHA inferred the groundwater flow direction at the time of the sampling to be to the southeast toward the Merrimack River. The sampling results combined with

- the groundwater flow direction inferred by SHA indicate that the highest PFOA+PFOS concentrations in groundwater were directly downgradient of the Longa Disposal Area.
- Monitoring well LNG-MW-2 is on the west side (upgradient) of the disposal area (Figure 4). The
 reported concentration of PFOA in the groundwater sample from this well was 33 ppt.
- LNG-MW-4, on the east and downgradient side of the disposal area, had the highest PFOS concentration at 41 ppt, as well as a PFOA concentration of 89 ppt. PFOS was not reported above the detection limit on the west side (upgradient) of the disposal area and PFOA was detected at a concentration of 33 ppt. This suggests that the Longa Disposal Area may be a source of PFOA and PFOS.
- Other PFAS reported in one or more of the groundwater samples from the monitoring wells at the Longa Disposal Area include PFBA, PFPEA, PFHxA, PFHPA, and PFHxS

The presence of PFOA, PFOS, and other PFAS compounds in the groundwater samples collected from the Longa Disposal Area monitoring wells and the fact that a portion of the disposal area is within the SWPA for wells MVD-4/5 suggests the likelihood that the disposal area is a source of PFAS detected in the MVD wells.

2.3 Other Potential PFAS Sources

PFOA, PFOS, and PFAS compounds in general, have been used worldwide in the manufacture of many materials for industrial, commercial, and residential use, including stain-resistant carpeting and upholstery, carpet and upholstery cleaners, non-stick cookware, food package coatings, AFFFs, moisture-resistant breathable fabrics, concrete and rock sealants, electrical capacitors, dyes, paints, batteries, and as a vapor suppressor in metal plating processes. They are a ubiquitous presence in most households and, consequently, are found in municipal waste streams and in most landfills (Busch et al., 2009; MPCA, 2009). PFAS are also found in biosolids (e.g., Sepulvado et al, 2011) that are used as amendments to soil in agricultural and landscaping applications including gravel pit reclamation (NEBRA, 2014). They are also used as a sealant for granite, stone and tile (Guo et al., 2009; 3M, 1999) and potentially in the wet saw process associated with cutting granite and stone (NJDEP, 2015).

Due to their use worldwide for many industrial, commercial, and residential uses, there are many potential sources of PFAS impacts to groundwater in developed areas. Near wells MVD-4/5 and the Longa Disposal Area many current and historical property uses have been identified through review of readily available records as potential sources of PFAS to groundwater. These uses include, but are not limited to: car wash, auto detailing, upholstery cleaning, granite, stone and tile fabrication, and printing. Other sources will likely be identified as more information on PFAS usage becomes available.

2.4 Purpose of Work

The goal of the work presented in this report was to assess conditions near wells MVD-4/5. The purpose of this work was to fill data gaps regarding concentrations of PFAS in groundwater and groundwater flow directions near wells MVD-4/5. Wells MVD-4/5 are located approximately 800 feet (MVD-5) to 1,100 feet (MVD-4) north-northeast of the Longa Disposal Area (Figure 1).

2.5 Scope of Work

The investigation scope of work included the following:

- Aguifer profiling and groundwater sampling
- Collection of soil samples for grain size analysis
- Development and sampling of existing wells, including MVD-4, MVD-5, and MVD and Longa Disposal Area monitoring wells
- Surface water sampling
- Surface and groundwater level measurement
- Elevation surveying
- Groundwater flow modeling of the MVD-4/5 well field

This report includes a summary of the water-quality results, measured water levels in wells and the Merrimack River and Baboosic Brook, boring logs, well development records, and relevant hydrogeologic data including hydrogeologic cross sections showing geologic units and the distribution of PFAS in the subsurface, and groundwater impact distribution plan views. Interpretations of groundwater flow under pumping and non-pumping conditions are also presented. Groundwater flow modeling is presented in Appendix C.

3.0 Investigation Methods

3.1 Field Methods

A work plan for the investigation discussed in this report was submitted to the NHDES prior to the start of the investigation. The NHDES provided comments on the initial draft scope of work (NHDES, 2016). These comments were addressed in a final scope of work titled: Proposed Investigation Scope of Work: MVD Supply Wells 4 and 5, Merrimack, NH – REVISED (Barr Engineering Co., 2016b) that was submitted to NHDES on October 20, 2016.

Field data collection was completed during two mobilizations to the site between October 17, 2016 and January 25, 2017. The first mobilization occurred October 17, 2016 through November 15, 2016. The field data collection consisted of aquifer profiling (including groundwater sampling at profiling locations), groundwater sampling at MVD and monitoring wells, stream gaging and sampling, and surveying. The second mobilization occurred January 7, 2017 through January 28, 2017, during which soil samples and the remainder of the profiling location groundwater samples were collected.

3.1.1 Aquifer Profiling

Aquifer profiling using the Waterloo^{APS} characterization method was performed to provide information on hydrostratigraphy and to allow groundwater sampling at multiple discrete depths in a single borehole. This investigative method has been utilized in the evaluation of PFAS in other areas of the Northeast. For the purpose of PFAS studies, potential PFAS-containing components were eliminated from the Waterloo^{APS} system. Hydrologic information provided by the Waterloo^{APS} profiling method includes an approximate measure of hydraulic conductivity (the "index of hydraulic conductivity" which is symbolized as iK) that is estimated from the measured flow rate and pressure of water injected as the probe is advanced through the subsurface. This parameter is calculated in real-time, which enables selection of sampling intervals in relatively permeable zones. Additional background information on this method, including standard operating procedures developed by the aquifer profiling contractor, is provided in Appendix A. Ten aquifer profiling locations (APO1 through AP10) were completed near well MVD-4, along the property line between the Longa Disposal Area and wells MVD-4/5, and along a transect north of the MVD wells. Aquifer profiling locations are shown on Figure 4.

3.1.2 Water sampling

Groundwater samples were collected at aquifer profiling locations, wells MVD-4/5, the MVD monitoring wells, and the Longa Disposal Area monitoring wells. Surface water samples were collected at monitoring locations along Baboosic Brook and the Merrimack River. Samples were collected consistent with the Quality Assurance Project Plan (QAPP) and standard operating procedures (SOPs), with exceptions noted in Section 3.4 below.

3.1.2.1 Groundwater and surface water sampling

The Waterloo^{APS} system was used to collect groundwater samples from selected intervals (at approximately ten foot intervals) during the aquifer profiling work. The Waterloo^{APS} system allows for

sample collection through a 2-inch long sampling head with screened ports using peristaltic or gas-driven (bladder) pumps. At some profiling locations, screens in the aquifer profiling equipment became plugged with fine-grained sediments in some planned sampling intervals. Subsequently, samples were then collected at these intervals using the Geoprobe® Screen Point 16 groundwater sampling system during the second mobilization to the site. This system is described in the SOP included in Appendix A. The groundwater samples were sent to Eurofins Lancaster Laboratories Environmental (ELLE) in Lancaster, PA and analyzed for the parameters shown in Table 1. A summary of groundwater samples and collection method is shown in Table 2. Groundwater sampling logs are included in Appendix D. Analytical results are presented in Table 4; laboratory reports are included in Appendix E.

3.1.2.1.1 Wells MVD-4/5

Wells MVD-4 and MVD-5 were pumped and sampled on November 14, 2016. Prior to sampling, both wells were operated for 30 minutes, as discussed above in Section 2.1. The pumping rate for well MVD-4 ranged from 220 to 225 gallons per minute (gpm). The pumping rate for well MVD-5 was 382 gpm. Four samples of the discharge water were collected from the MVD wells at ten minute intervals (i.e., samples collected at 0 minutes, 10 minutes, 20 minutes and 30 minutes). Water generated from the pumping of wells MVD-4 and MVD-5 was collected in two frac tanks mobilized to the site by Clean Harbors. Upon completion of the tests and receipt of the associated analytical data, the water was transferred to tanker trucks and disposed by Clean Harbors at their disposal facility in South Portland, Maine. Waste disposal manifests can be found in Appendix D.

3.1.2.1.2 Monitoring wells

All monitoring wells within the MVD property (13 wells) and Longa Disposal Area (four wells) were sampled during the first mobilization to the site. Wells not sampled in the June 2016 sampling round (SHA, 2016) were developed prior to sample collection for the investigation discussed in this report. Samples were submitted to ELLE and analyzed for the parameters shown in Table 1. Monitoring well locations are shown on Figure 4 and a summary of monitoring well information is included in Table 3. Sampling and redevelopment logs are included in Appendix D. Analytical results are presented in Table 4.

3.1.2.2 River/stream water grab samples

Grab samples were collected at the river/stream gaging locations shown on Figure 4 on November 7-8, 2016. Samples were collected beginning at downstream sampling locations, and moving upstream.

Surface water samples were collected at three monitoring locations within Baboosic Brook (the downstream, midstream, and upstream sampling locations shown on Figure 4) and the Merrimack River (the downstream and upstream sampling locations shown on Figure 4), Samples were submitted to ELLE and analyzed for the parameters shown in Table 1. Surface water sampling/monitoring locations are shown on Figure 4. Sampling logs are included in Appendix D. Analytical results are presented in Table 4.

3.1.2.3 QA/QC sample collection

Field quality assurance/quality control (QA/QC) samples were collected in accordance with the QAPP and included equipment blanks, field duplicates, matrix spike/matrix spike duplicates (MS/MSD), field blanks,

and laboratory trip blanks. Additional equipment blanks were collected in excess of the QAPP-specified one set of QC samples per 20 media samples at select Waterloo^{APS} profiling locations during groundwater sampling. A summary of groundwater QA/QC samples is shown in Table 5.

3.1.3 Soil Sampling

Soil borings were advanced at four locations using direct-push (Geoprobe®) drilling methods for the purpose of soil classification, and sampling for chemical and physical analysis. Borings were terminated at or below the water table and soils were classified using the modified Burmister Soil Classification System. Boring logs are included in Appendix F. A summary of collected soil samples is presented in Table 2.

3.1.3.1 Samples for PFAS analysis

Unsaturated zone soil samples were collected at the four aquifer profiling locations (AP02, AP05, AP06, and AP09) shown on Figure 4. The samples were collected at nominal five-foot intervals between ground surface and the water table, as indicated by water-level measurements in the Geoprobe® setup. The samples were submitted to ELLE and analyzed for VOCs, PFASs, and total organic carbon (TOC). Analytical data is presented in Table 6.

3.1.3.2 Samples for grain-size analysis

Samples thought to be representative of a range of hydraulic conductivity values were collected and analyzed for grain-size distribution at ELLE. The grain size distributions are shown in Table 6. The sampling depths were selected after review of the iK data profiles generated by the Waterloo^{APS} method, with the objective of assessing consistency in variations between the iK data and hydraulic conductivity estimates from grain-size analyses. Hydraulic conductivity was estimated for each grain-size distribution using the method of Barr (2001). The hydraulic conductivity estimates are shown in Table 7.

3.1.3.3 QA/QC sample collection

QA/QC soil samples (field duplicate and MS/MSD samples) were collected in accordance with the QAPP at one QA/QC sample each per 20 samples. Analytical results for the QA/QC samples are presented in Table 5.

3.1.4 Water-level measurement

Synoptic rounds of water level measurements were performed on October 31, November 7, and November 23, 2016. Transducers were deployed in monitoring wells 45-10 and 45-8 In November 2016. Differences between calculated groundwater elevations at each well between events were used as a basis for identifying outliers in the data. Figures 5, 6, and 7 are contour maps of the groundwater elevation data. Groundwater elevations were estimated at the vertical aquifer profiling locations using the Waterloo^{APS} system. Groundwater elevations at profiling locations AP07 through AP10 were included with the groundwater elevations calculated for wells in the MVD well field and around the Longa Disposal Area.

3.1.5 Stream gaging

Two staff gages were installed on the Merrimack River (Figure 4) and used to measure river elevation during the second and third synoptic water level measurement rounds. The difference in calculated river stage between the two gages was 0.09 feet on November 7 and 0.07 feet on November 23, 2016. The calculated average slope on this reach of the river at that time is 1.6×10^{-5} ft/ft. The river stage information was assumed to represent the water table elevation at the river bank in preparing the groundwater elevation contour maps shown on Figures 5, 6, and 7.

3.1.6 Surveying

The elevations and locations of all monitoring wells and river stage measurement points were surveyed by registered surveyors from CT Male. Ground surface elevations at aquifer profiling and Geoprobe[®] locations were interpolated using LiDAR data obtained through the National Oceanic and Atmospheric Administration (NOAA). A summary of surveyed and interpolated ground surface elevations are shown in Tables 2 and 3.

3.2 Laboratory Analyses and Quality Assurance/Quality Control Review

A QA/QC review was conducted to assess the integrity of the field procedures and the validity of the analytical results for the October 2016 to January 2017 sampling period. The analytical data were evaluated according to the procedures outlined in the Barr Engineering Co. Standard Operating Procedures (SOPs), which are based in part on guidance from the National Function Guidelines as well as QA/QC protocols from approved analytical methods. The QA/QC review concluded that the data are acceptable as presented in the data tables. Details of the review are presented in Appendix B.

3.3 Groundwater Modeling Methods

A local-scale groundwater flow model was developed to simulate flow in the saturated groundwater flow system near wells MVD-4/5. The groundwater flow model was developed to assess hydraulic capture of wells MVD-4/5 from potential PFAS sources by quantifying the water balance for the pumping wells at various historical operational rates. The purpose of the model is to help understand how PFAS compounds may have reached the MVD wells by delineating from where in the unconsolidated aquifer the wells receive water under various pumping conditions. Details of the groundwater model construction are presented in Appendix C.

3.4 Deviations from Work Plan

The work performed for this investigation included several deviations from the Work Plan dated October 20, 2016. As discussed further below, these deviations resulted from difficulties in sample collection using the Waterloo^{APS} method, omission of soil parameters from the Work Plan, and inadvertent collection and analysis of soil samples for VOCs.

The fine sand encountered in the subsurface at some profiling locations led to clogging of the sampling port of the Waterloo^{APS} system. This clogging caused significant delays in sample collection during the

initial field mobilization. As a result, a request was made to collect samples using the Geoprobe® screen point method at the original aquifer profiling locations. This request was submitted to NHDES on January 3, 2017. In the same communication describing changes in groundwater sampling methods, additional soil parameters (total organic carbon, moisture content, and grain-size distribution) were proposed to be measured, having been omitted from the original (October 2016) Work Plan.

Sampling with the Geoprobe® screen point method required some samples to be collected after purging fewer than three riser volumes. A revised sampling approach was adopted in which samples were collected from the Geoprobe® screen point system upon stabilization of water quality parameters. These samples are identified in Table 2.

Soil samples collected across the unsaturated zone for PFAS analysis were also analyzed for VOCs, despite the VOC analysis not being proposed in the Work Plan. The results from these analyses are reported herein.

Two aspects of the Work Plan have not yet been completed, as they require input from NHDES. The permanent monitoring wells proposed to be installed along the AP07-AP10 profiling transect north of the MVD area have not been installed because NHDES has requested that they be included in the decision of where and at what depth the wells are installed. The elevation surveying of the profiling locations is planned to be completed upon installation of any permanent monitoring wells; estimated elevations have been used for this analysis.

4.0 Investigation Results and Discussion

4.1 Site Geology

As shown on Figure 8, the surficial unconsolidated deposits in the vicinity of wells MVD-4/5 and the Facility consists mainly of stream terrace deposits that cut into glacial lake and till deposits and recent alluvial deposits. The stream terraces are composed mainly of sand to gravel with minor amounts of silt. The Merrimack River is incised through terrace deposits and has narrow alluvial deposits on the west (right) bank through much of the reach between the Facility and the MVD well field (Figure 8). The alluvial deposits on the right (west) bank widen in the vicinity of the MVD-4/5 well field as compared to northern reaches including the area of the Facility.

Unconsolidated deposits encountered during the drilling portion of the investigation were classified using a modified version of the Burmister soil classification method at the request of the NHDES. The soils encountered during the investigation included mainly fine sand to gravel with lesser amounts of silt and clay. The iK values provided by the Waterloo^{APS} system range from approximately 0.01 to 5.46. The boring logs and profiling logs are presented in Appendices F and G, respectively.

A comparison of the Burmister soil classifications and the iK values was done for the limited number of depth intervals for which both data were available. There was generally good correlation between the Burmister soil classifications and the iK values for those depth intervals that had an iK less than approximately 1.0 or greater than approximately 3.0. iK values between approximately 1.0 and 3.0 appear to be largely affected by the fines content of the soil, as there is no strong correlation between the observed soils and measured iK for that range.

Data acquired during the investigation were used to create a three-dimensional model of geology using Earth Volumetric StudioTM (EVS) software, developed by C Tech Development Corporation. The EVS model incorporates available site geology data, including geology observed at the MVD well field (EGGI, 2003) and Longa Disposal Area monitoring wells (HTA, 1989).

The indicator kriging method was used to interpolate the geology. Indicator kriging is a geostatistical method for estimating discrete values (e.g., geology type) within a three-dimensional grid; therefore interpolated values are more certain in areas with more data. The indicator geology model is bounded vertically by the ground surface (top) and the top of bedrock (bottom), and bounded horizontally by the extent of site data.

The site unconsolidated lithology was categorized into fourteen lithological/soil types based on the Modified Burmister Soil Classification System. Bedrock was not included in the geologic model and top of bedrock was modeled as a surface, which bounds the bottom of the geologic model. Each unconsolidated interval of a boring log was assigned to one of the lithological/soil types. In this way, the top and bottom elevation of each interval in a boring log, combined with the geographic coordinates of the boring, provided the input data that were interpolated in three dimensions using EVS.

The geologic model was used to develop five cross sections through the investigation area. Cross section locations are shown on Figure 9. The 14 unconsolidated lithological/soil types were simplified for presentation. The cross sections are shown on Figures 10 through 12. As shown on the cross sections, the alluvium in the vicinity of wells MVD-4/5 and the Longa Disposal Area consists mainly of fine sand to gravel with minor silt and/or clay interbeds.

4.2 Hydrogeologic Setting

Merrimack, New Hampshire is located in the Northeastern Appalachians groundwater region (Randall et al., 1988), and the following summary is condensed from that resource unless otherwise indicated. This region is characterized by rolling topography that primarily reflects the weathered bedrock surface with glacial and fluvial landforms mantling the bedrock. The bedrock consists of folded and faulted metamorphosed sedimentary rocks with low primary porosity. Water is conducted in the bedrock through secondary porosity. Recharge from infiltrating precipitation is generally the most important source of water and discharge to surface water is typically the most important groundwater sink. Pumping of high capacity wells is also a groundwater sink. Characterizing recharge and discharge is the key to understanding groundwater flow directions.

Glacial erosion and deposition produced changes in drainage and topography and deposited a nearly continuous layer of unconsolidated till over the bedrock. Stratified drift units, chiefly sand and gravel, follow the larger valleys such as that of the Merrimack River. These stratified drift units are referred to as valley-fill aquifers (Kontis, et al, 2004).

Recharge to the bedrock is controlled by the permeability and thickness of the overlying glacial deposits and overburden. Runoff in upland areas is focused to seasonal streams that typically lose discharge in areas in which they flow over stratified drift at the margins of the larger valleys. Recharge to bedrock wells that are pumped continuously may occur from adjacent stratified drift aquifers. Discharge is primarily from the bedrock to wells and to the stratified drift in the large valleys. Inter-basin flow systems with significant discharge have not been discovered in the bedrock.

In addition to discharge to the stratified drift filling the larger valleys from minor upland streams (Kontis et al., 2004), recharge to these units is from direct infiltration of precipitation, and discharge from bedrock. Recharge from the larger rivers may take place in the case of localized pumping from the stratified drift. Under normal conditions, the main stream in the major valleys consistently gains water from stratified drift aquifers (Kontis, et al, 2004). The Merrimack River acts as a source of groundwater in the aquifer adjacent to the river during periods of rising river stage (a process known as bank storage; Kontis, et al, 2004) and a sink for groundwater during periods of falling and sustained low river stage. Discharge from the stratified drift is via pumping wells, evapotranspiration, and to the larger rivers when their stage is at or below typical levels.

4.2.1 MVD/Longa Area Groundwater-Surface Water Interactions

Aquifer testing performed in 2003 using wells MVD-4/5 (EGGI, 2003) indicated the alluvial materials along the Merrimack River have a strong hydraulic connection with the river. Two temporary piezometers were

installed in the river bank and a river stage monitoring gage was also installed (EGGI, 2003) for the aquifer testing. Hydrographs from the piezometer closest to the river gage and the river show quite similar elevations and variations in elevation during the testing period (EGGI, 2003; see also Appendix C). No measureable drawdown occurred in the temporary piezometers during the aquifer test. Monitoring well 45-5a was the permanent monitoring well closest to the River that was monitored during the testing. Hydrographs for the permanent monitoring wells show that well 45-5a was the only permanent monitoring well in which influence from the river was noted during the aquifer testing period (EGGI, 2003; see also Appendix C).

The relatively high contribution of groundwater to the flow in rivers and streams in the investigation area is supported by an assessment of baseflow. Baseflow is the component of streamflow that is sustained by groundwater discharge to the stream, and the baseflow index (BFI) for a streamflow measurement location is the proportion of total streamflow that is baseflow. A BFI of approximately 0.69 was estimated for the Merrimack River in Lowell, MA (USGS Gage 01100000) (CDM, 2004). This value indicates that approximately 70 percent of the total streamflow measured at the gaging station originates as baseflow.

Some component of down-valley groundwater flow likely takes place in the stratified drift beneath the Merrimack River and in places where a floodplain has developed adjacent to the river. Down-valley groundwater flow is present in areas where the hydraulic gradient parallels and roughly equals the down-valley slope of the floodplain and is referred to as "underflow" (Kontis, et al, 2004). The Merrimack River is incised through terrace deposits and has narrow alluvial deposits on the west (right) bank through much of the reach between the Facility and wells MVD-4/5 (Figure 9). The alluvial deposits on the right bank widen in the vicinity of the MVD well field.

The USGS water table map of the area (Toppin, 1987) indicates no significant zone of down-valley groundwater flow at any appreciable distance from the Merrimack River (Figure 13). Groundwater flow toward the Merrimack River in the vicinity was also shown for a site located at 33 Elm Street (Aries, 1990), which is approximately 1,000 feet northeast of profiling location AP09. Pumping of wells MVD-4/5 created a cone of depression that extended to the river and created radial flow toward the wells and induced some amount of recharge from the river to the valley-fill aquifer near the well field (EGGI, 2003) during the test. Medalie and Moore (1995) refer to this process as induced infiltration. Overall, underflow is likely not a significant factor in the river reach between the Facility and wells MVD-4/5 due primarily to the limited extent of alluvial deposits in that reach.

4.2.2 MVD/Longa Disposal Area Interaction with Bedrock

EGGI (2003) considered contributions from the underlying bedrock aquifer to be negligible; however, their report states that they did not evaluate those contributions in their investigation. Flow of groundwater from the bedrock, through the unconsolidated materials, and discharging to the regional discharge zone (the Merrimack River) is an integral component of the regional conceptual hydrogeologic model (e.g., Randall et al., 1988; Kontis et al., 2004). Available information does not indicate that groundwater flow from the bedrock into the unconsolidated materials should be considered negligible, therefore

groundwater flow from the bedrock to the unconsolidated materials was simulated in the MVD-4/5 groundwater model (Appendix C).

4.3 Groundwater Flow and Capture from the Longa Disposal Area

As discussed above, EGGI (2003) showed that pumping of wells MVD-4/5 created a cone of depression that extended to the river and created roughly radial flow toward the wells during their pumping test. In addition, the SWPA delineated for wells MVD-4/5 indicates that the wells can capture some groundwater from beneath the Longa Disposal Area. The groundwater flow direction in the MVD-4/5 well field/Longa Disposal Area indicated by the water table contours on Figures 5, 6, and 7 shows that, when wells MVD-4/5 are not pumping, groundwater flow in the area is toward the Merrimack River. This non-pumping condition flow pattern is consistent with the groundwater flow indicated by Figure 13 and with that described by Aries (1990). The data collected in this study indicate that under non-pumping conditions groundwater does not flow from the Longa Disposal Area to wells MVD-4 and MVD-5.

The groundwater flow model (described in detail in Appendix C) was used to evaluate groundwater flow to wells MVD-4 and MVD-5 under several different conditions. Simulation of summer pumping conditions (i.e., high demand) was used to evaluate the fraction of water pumped by wells MVD-4/5 that passes beneath the Longa Disposal Area. Summer pumping conditions would be expected to produce an area of capture with the greatest extent within the model domain. The modeled capture area for wells MVD-4/5 within the model domain under summer (i.e., high demand) conditions is shown on Figure 14. The modeled capture area does extend beneath the Longa Disposal Area.

The groundwater model was also used to predict the fraction of water pumped from wells MVD-4/5 that flows beneath the Longa Disposal Area. When making predictions with a groundwater model it is important to account for uncertainty in the model results. Therefore, a predictive uncertainty analysis was performed as part of the assessment of the fraction of pumpage from wells MVD-4/5 passing beneath the Longa Disposal Area. The predictive uncertainty evaluation determined with a 95 percent confidence interval that the percentage of water that wells MVD-4/5 pump which passes beneath the Longa Disposal Area ranges from less than 1.6 percent to approximately 15 percent.

Simulations of conditions from 1989 to 2016, using the calibrated groundwater model parameters, indicate that the long term fraction of pumpage from wells MVD-4/5 passing beneath the Longa Disposal Area ranges from 0 to approximately 3 percent, depending primarily on the pumping rate of wells MVD-4/5 (Figure 15; Appendix C).

4.4 PFAS Concentrations

The results of the NHDES sampling of water wells in the area are shown on Figures 2 and 3. The NHDES sampling included both wells pumping from the unconsolidated materials above bedrock and wells pumping from the bedrock. As shown on Figures 2 and 3, sample locations where the reported PFOA and PFOA+PFOS concentrations are greater than the 70 ppt NHAGQS limit tend to be clustered to the east of the Merrimack River and within the area around the Facility in which annual average air deposition rate of PFOA has been preliminarily modeled to be approximately 200 gm/m²/year*10-6 or higher (Barr

Engineering Co., 2017). There are, however, some locations beyond the preliminarily modeled annual average air deposition area for which PFOA and PFOA+PFOS concentrations exceeded 70 ppt. Wells MVD-4/5 and the Longa Disposal Area are in the area where the preliminarily modeled annual average air deposition rate is less than 100 gm/m²/year*10⁻⁶ (Barr Engineering Co., 2017). This suggests that there may be multiple sources contributing to the observed distribution of PFAS in groundwater in this area.

4.4.1 Soil

A total of 12 unsaturated soil samples were collected at four boring locations (Table 10). Soil samples were collected at varying depths throughout the soil column, spanning from 2 feet below ground surface (bgs) to 21.5 feet bgs. Figures 16 and 17 show the vertical distribution of the soil samples collected along profiling transects AP01-AP06 and AP07-AP10, respectively, along with concentrations of PFOA and total sulfur-containing PFAS compounds reported in the samples.

As shown on Table 6, eight of the 12 unsaturated soil samples did not have a reported detection of PFOA. Of the remaining four unsaturated soil samples, three of the reported detections of PFOA were estimated values below the reporting limit. Eleven of the 12 unsaturated soil samples had no reported detection of PFOS and 10 of the 12 samples had no reported detection of any other PFAS compound (Table 6). Table 6 also shows that six of the 12 unsaturated soil samples did not have a reported detection of total organic carbon. Due to the large number of non-detect results, it was not possible to determine any correlation between PFAS and TOC.

4.4.2 Groundwater

4.4.2.1 Wells MVD-4/5 and Longa Disposal Area Vicinity

Analytical results for groundwater samples collected during the field investigation were combined with data from the NHDES sampling program to evaluate the distribution of PFAS in the groundwater in the area near wells MVD-4/5 and the Longa Disposal Area. Figures 18, 19, and 20 show the areal distribution of PFOA, PFOS, and PFOA+PFOS, respectively, in the groundwater in the vicinity of wells MVD-4/5 and the Longa Disposal Area based on the available sampling results. Also shown on these figures is the modeled capture area within the model domain for wells MVD-4/5 under summer pumping conditions discussed above in Section 4.3 and in Appendix C.

Figure 18 shows that the PFOA concentrations greater than 70 ppt have been detected in groundwater to the north and north-northeast of wells MVD-4/5. In addition, PFOA concentrations greater than 70 ppt have been reported in samples collected from near the southern portion of the Longa Disposal Area. By contrast, Figure 19 shows that PFOS was reported at concentrations greater than 10 ppt at only a few sampling locations in the vicinity of wells MVD-4/5 area. As shown on Figures 18 and 20, areas in which reported PFOA and PFOA+PFOS concentrations exceed 70 ppt are overlapped by the modeled high demand pumping capture area for wells MVD-4 and MVD-5. The distribution of PFOA+PFOS relative to the modeled capture area for wells MVD-4/5 suggests that it is possible that some PFOA and PFOS could have migrated to wells MVD-4/5 after passing beneath the Longa Disposal Area when they were pumping to meet high demand. However, the groundwater modeling predicts that only a small fraction of the water pumped by wells MVD-4/5 is likely to have passed beneath the Longa Disposal Area. The areal

distribution of PFOA+PFOS relative to the model-predicted capture area for wells MVD-4/5 suggests it is more likely that the main source for PFAS in wells MVD-4/5 is from areas to the west and northwest of the wells.

Profiling results along transects AP01-AP06 and AP07-AP10 are shown on Figures 16 and 17, respectively. Inspection of these figures indicates that, in general the highest groundwater concentrations of PFOA and sulfur-containing PFAS are found in the deeper portions of the borings. The exceptions to this are borings AP08 and AP09. At boring AP08 the highest concentration of PFOA+PFOS (285 ppt) was identified in the sample collected just below the water table. Concentrations in subsequent sampling intervals then decreased until the lowermost 25 feet of the boring where the concentrations increased with depth. In boring AP09 the PFOA+PFOS concentrations are greater than 100 ppt in all groundwater samples collected from the boring. The borings were advanced to refusal, which was interpreted to be at or very near the bedrock surface. Note that no PFAS were reported in the soil samples collected from above the water table in boring AP09 (Figure 17, Table 6). The observed PFAS distribution does not appear to be consistent with an on-going infiltration of high-concentrations of PFAS in the vicinity of these transects. The distribution does appear to be consistent with upgradient groundwater flowing into the regional discharge zone at the Merrimack River and bringing with it PFOA and other PFAS compounds.

Very low concentrations (i.e., near or below the reporting limit) of some trihalomethanes were reported in some of the groundwater samples collected from borings AP02 and AP04 and the sample from Longa Disposal Area monitoring well MW-3 (Table 4). Residual concentrations of trihalomethanes can be formed as disinfection byproducts in potable water systems. The source of the trihalomethanes in the samples is not known.

Volatile organic compounds were analyzed for in the groundwater samples collected from monitoring wells and profile borings. No volatile organic compounds were detected, except for one or a few compounds at concentrations near or below the reporting limits in two of the Longa Disposal Area monitoring wells, one monitoring well upgradient of wells MVD-4/5, and four (out of 74) of the profiling samples (Table 4).

Figure 10 shows a north to south cross section view of the PFOA+PFOS concentrations looking from the west toward the Merrimack River. The cross section extends from profiling location AP09 in the north to monitoring well MW-4 on the south end of the Longa Disposal Area. There does not appear to be a close correlation between the variations in the stratigraphy and the vertical distribution of PFAS. The cross section shows that PFOA+PFOS concentrations less than 70 ppt are present in the unconsolidated materials between wells MVD-4/5 and the Longa Disposal Area. Figures 11 and 12 show general west to east cross sections in the vicinity of wells MVD-4/5 and the Longa Disposal Area with the vertical distribution of PFOA+PFOS. As shown on Figure 14, concentrations of PFOA+PFOS greater than 70 ppt were reported for NHDES sampling locations near the modeled high demand pumping capture area for wells MVD-4/5. The presence of PFOA+PFOS in the vicinity of wells MVD-4/5 and the Longa Disposal Area is consistent with transport of these compounds from upgradient areas (west and northwest) toward the Merrimack River (east).

Wells MVD-4/5

The analytical results for the samples collected during the pumping of MVD-4 and MVD-5 are shown in Table 4. Field measurements of pH, temperature, oxidation/reduction potential (ORP), dissolved oxygen, turbidity, and specific conductance were made at the times the analytical samples were collected. These field measurements are summarized in Tables 8 and 9.

The concentrations of the major anions and cations in the samples collected from wells MVD-4/5 during the tests are shown on Figures 21 and 22. A comparison of the chloride and nitrate results in Figures 21 and 22 with historical data presented by EGGI (2003) indicates that the concentrations in the samples collected during the 2016 testing are consistent with the historical ranges of these constituents.

Wells MVD-4/5 had been offline for approximately six months prior to the sampling of these wells during the field investigation. There are not significant differences between the anion and cation concentrations in the samples from wells MVD-4/5 and the samples from the Longa Disposal Area monitoring wells. As such, the anion and cation data is inconclusive relative to showing whether water pumped from wells MVD-4/5 passed beneath the Longa Disposal Area.

Water samples collected from both MVD-4 and MVD-5 during the 30-minute pumping of the wells in November 2016 contained PFAS at detectable concentrations. Table 4 and Figures 23 and 24 show that the predominant PFAS species measured was PFOA. All the samples collected from wells MVD-4/5 had PFOA concentrations below the NHAGQS limit of 70 ppt. The sample collected from MVD-4 at t = 20 minutes had a PFOA+PFOS concentration equal to the NHAGQS limit of 70 ppt (Table 4). The PFOA+PFOS concentrations reported for the remainder of the samples from wells MVD-4/5 were less than 70 ppt. The concentrations of the PFAS-related constituents measured over the course of the 30 minute test at MVD-4 and MVD-5 are shown on Figures 23 and 24, respectively. For comparison, these wells were last sampled by the State of New Hampshire on July 7, 2016, and in that event, MVD-4 had 84 ppt PFOA and no detection of PFOS and MVD-5 had 48 ppt of PFOA and no detection of PFOS (NHDES, 2017). Volatile organic compounds were analyzed for in wells MVD-4/5. No volatile organic compounds were detected.

4.4.3 Surface Water

Surface water samples were collected from three locations on Baboosic Brook and two locations on the Merrimack River (Figure 4) in November 2016. Table 4 shows that PFOA+PFOS was detected in the surface waters but at concentrations below 20 ppt. Table 4 also shows that the individual concentrations of PFOA and PFOS in these samples were estimated values or reported as non-detect. As discussed in Appendix C, the Merrimack River does not appear to be a major source of water to wells MVD-4/5 when they are pumping. Coupled with the low concentrations of PFAS in the samples from the Merrimack River this would indicate that the River was likely not a significant source for PFAS reported in samples from the MVD system when the wells were pumping.

4.5 Overview of Findings

PFAS have been detected in groundwater samples collected by the NHDES in the area. The NHDES sampled wells in both unconsolidated sediments and bedrock. The concentrations of PFOA+PFOS in

many of the samples exceed the NHAGQS level of 70 ppt. Generally higher concentrations in the samples collected by the NHDES tend to be clustered to the east of the Merrimack River and within the area around the Facility in which annual average air deposition rate of PFOA has been preliminarily modeled to be approximately 200 gm/m²/year*10⁻⁶ or higher (Barr Engineering Co., 2017). NHDES sampling results do show PFOA+PFOS concentrations greater than 70 ppt in areas where preliminary modeling indicates lower air deposition rates. This suggests the potential presence of other sources for PFAS in the area.

Wells MVD-4/5 and the Longa Disposal Area sit atop stream terrace deposits elevated approximately 25 feet above the Merrimack River floodplain. Groundwater flowing beneath the Facility is expected to flow to the unnamed drainage south of the Facility and to the Merrimack River. Multiple lines of data indicate that down-valley flow in the unconsolidated aquifer system is not a viable pathway from the Facility to wells MVD-4/5. Available information indicates that the area-wide groundwater flow pattern is toward the Merrimack River, which is the regional groundwater discharge zone. Groundwater flow patterns through the bedrock are controlled by the same natural hydrologic features as the unconsolidated deposits and wells MVD-4/5 do not penetrate bedrock; therefore, flow from the Facility through the bedrock to wells MVD-4/5 is not considered a viable or plausible pathway.

Groundwater modeling simulations and predictive uncertainty evaluation indicates that under high demand pumping conditions that no more than approximately 15 percent of the water pumped by wells MVD-4/5 would pass beneath the Longa Disposal Area. In addition, simulation of conditions from 1989 to 2016 indicates that the long-term fraction of pumpage from wells MVD-4/5 passing beneath the Longa Disposal Area would range over time from 0 to approximately 3 percent. The groundwater flow model was not constructed to recreate the SWPA delineated for wells MVD-4 and MVD-5 that encompasses the northern portion of the Longa Disposal Area (EGGI, 2003) but it is generally consistent with the previous work.

Groundwater sampling in the MVD-4/5 and Longa area indicates that PFAS are present in the groundwater in the area. This sampling included vertical profiling at multiple locations. The highest concentrations identified were in samples collected from profile borings located north-northeast of well MVD-4. The vertical distribution of PFAS in the profile borings generally do not appear to be consistent with a continuing source at or above the water table in the vicinity of the profiling locations.

The simulation of high demand pumping conditions for wells MVD-4/5 indicates that the capture area for the wells extends mainly to the west and northwest of wells MVD-4/5. This is consistent with available information on the regional groundwater flow direction in the area. The results of NHDES sampling of wells in the area shows that wells with PFOA+PFOS concentrations greater than 70 ppt are present in the area to the northwest of wells MVD-4/5. As such, groundwater flow from the area to the northwest of the wells would appear to be a source for PFAS detected in wells MVD-4/5, along with areas to the west. The modeling indicates that there is a component of groundwater flow that passes underneath Baboosic Brook from the west and PFAS could migrate from source areas west of Baboosic Brook to the MVD wells.

5.0 Summary and Conclusions

A groundwater investigation of the area around the Merrimack Valley District (MVD) wells 4 and 5 was conducted to characterize the presence of PFAS compounds in these wells and to better understand where the wells receive groundwater under various historical pumping conditions.

Detailed soil profiling and sampling, sampling of existing wells, and groundwater flow modeling to match historical pumping conditions were completed as part of the investigation. This investigation found:

- PFOA flowed to wells MVD-4/5 via groundwater from areas west and northwest of the MVD wells.
 Under non-pumping conditions, the groundwater flow paths from areas to the northwest would likely not have intersected the MVD wells. However, pumping of MVD wells 4/5 over time would have changed the groundwater flow directions and "pulled to the southeast" groundwater from this area.
- The Longa Disposal Area is not ruled out as a contributor of PFAS but it is likely not a significant contributor to wells MVD-4/5. Groundwater modeling indicates that the total flow of groundwater from underneath the Longa Disposal Area is up to approximately 15 percent of the total volume of water pumped by wells MVD-4/5 under summertime (high demand) rates. At lower pumping rates and under non-pumping conditions, groundwater passing underneath the landfill is not predicted to flow to the MVD wells. Volatile organic compounds (compounds that are typically associated with mixed-waste landfills) were found in the landfill's monitoring wells during previous investigations and a few volatile organic compounds were reported at concentrations near or below the reporting limits in two of the Longa Disposal Area monitoring wells sampled for this investigation. Volatile organic compounds were not detected in groundwater samples in monitoring wells or soil probes in the vicinity of wells MVD-4/5, except for a few instances of detections at or below the reporting limit, nor were they detected in multiple samples collected from MVD-4/5 under pumping and non-pumping conditions.
- The water level data, along with the groundwater modeling results and regional studies, indicate
 that there is not a groundwater migration pathway parallel to the Merrimack River north of the
 MVD-4/5 well field area. Direct migration of PFOA from the SGPP facility to the MVD wells is
 highly unlikely and not supported by the data.
- The fraction of Merrimack River water pumped from wells MVD-4/5 is estimated to range from 0 under long-term average pumping conditions to 12 percent under summer pumping conditions with normal recharge rates and river stages. The majority of the water pumped by wells MVD-4/5 originates from the west and northwest. The bedrock contributes some water to the wells as it discharges into the alluvial aquifer from the west. Baboosic Brook is also a contributor to flow to the wells and there is a component of flow that reaches the wells from areas west of Baboosic Brook.
- PFOA and other PFAS compounds were not detected in most of the unsaturated soils that were sampled in the vicinity of MVD wells 4 and 5 as part of this investigation and the few PFAS

- compounds that were detected were at very low concentrations. These results suggests that there is not an aerially deposited source of PFAS in the vicinity of wells MVD-4 and MVD-5.
- There are many current and historical property uses near wells MVD-4/5 and the Longa Disposal Area that have been identified through review of readily available records as potential sources of PFAS to groundwater. These uses include, but are not limited to: car wash, auto detailing, upholstery cleaning, granite, stone and tile fabrication, and printing. Other sources will likely be identified as more information on PFAS usage becomes available. PFAS from such sources in upgradient portions of the capture area for wells MVD-4/5, including areas to the west of Baboosic Brook, could migrate from the source areas to wells MVD-4/5 wells and may be contributing to the overall concentrations and detections of the various PFAS in wells MVD-4/5.

6.0 References

- 3M, 1999. Fluorochemical Use, Distribution and Release Overview. May 26, 1999.
- AMEC Environment & Infrastructure, Inc. (AMEC), 2013. Gravel Pit Partial Reclamation Operations Plan, prepared for Brighter Horizons Environmental, Inc., May 28, 2013, updated September 27, 2013.
- Barr, D., 2001. Coefficient of Permeability Determined by Measurable Parameters, *Groundwater*, vol. 39, no. 3, p. 356-361.
- Barr Engineering Co., 2016a. Proposed Investigation Scope of Work: MVD Supply Wells 4 and 5, Merrimack, NH. Technical Memorandum dated August 29, 2016.
- Barr Engineering Co., 2016b. Proposed Investigation Scope of Work: MVD Supply Wells 4 and 5, Merrimack, NH REVISED. Technical Memorandum dated October 20, 2016.
- Barr Engineering Co., 2017. Conceptual Site Model of PFOA Fate and Transport: Merrimack, New Hampshire, in preparation for Saint-Gobain Performance Plastics.
- Brighter Horizons Environmental, Inc., 2013. Application to Certify a Waste Derived Product for Distribution & Reuse, application to NHDES for approval of material to be used as fill in the Longa sand pit, September 27, 2013.
- Busch, Jan. Ahrens, Lutz. Strum, Renate. Ebinghaus, Ralf. 2009. Polyfluoroalkyl Compounds in Landfill Leachates, Environmental Pollution. Web. 18 July 2009.
- CDM, 2004. Merrimack River Watershed Assessment Study. Screening Level Model. Prepared for: New England District, U.S. Army Corps of Engineers. March, 2004.
- Emery & Garrett Groundwater, Inc. (EGGI), 2003. Establishment of the Source Water Protection Area, Merrimack Village District Wells MVD-4 and MVD-5, Merrimack, New Hampshire. December, 2003.
- Guo, Z., X. Liu, K.A. Krebs, and N.F. Roache, 2009. Perfluorocarboxylic Acid Content in 116 Articles of Commerce, U.S. Environmental Protection Agency, Washington, D.C., EPA/600/R-09/033.
- Hoyle, Tanner & Associates (HTA), 1989. Public Disposal Site Closure on the J. Longa and Sons Property, Merrimack, New Hampshire. Phase I Hydrogeological Investigation.
- Kontis, A.L., Randall, A.D. and Mazzaferro, D.L., 2004. Regional hydrology and simulation of flow of stratified-drift aquifers in the glaciated northeastern United States. USGS Professional Paper 1415. US Geological Survey. 156 p., 3 plates.
- Koteff, C., 1976. Surficial geologic map of the Nashua North quadrangle, Hillsborough and Rockingham Counties, New Hampshire. U.S. Geological Survey Geologic Quadrangle 1290, color, scale 1:24,000.
- Koteff, C. and Stone, B.D., 2000, Surficial geologic map of the Manchester South quadrangle, Hillsborough and Rockingham Counties, New Hampshire: U.S. Geological Survey, color, scale 1:24,000.

- Medalie, L. and Moore, R.B., 1995. Ground-water resources in New Hampshire; stratified-drift aquifers. US Geological Survey, Water-Resources Investigations Report 95-4100. 31 p.
- Minnesota Pollution Control Agency (MPCA), 2009. Summarized Results of PFC sampling of groundwater and leachate at landfills. Jul. 2009. Web. 20 July 2016.
- North East Biosolids & Residuals Association (NEBRA), 2014. Biosolids: The Other Recyclable "Food" Waste, June 10, 2014.
- New Hampshire Department of Environmental Services (NHDES), 2016. Letter with feedback on work plan. Dated September 21, 2016.
- New Hampshire Department of Environmental Services (NHDES), 2017. PFOA/PFOS Sampling Results for Merrimack Village District Water Works, updated February 9, 2017. Accessed on-line, March 6, 2017 at https://www.des.nh.gov/organization/commissioner/documents/pfoa-mvd-public-water-results-20170209.pdf.
- New Jersey Department of Environmental Protection (NJDEP), 2015. Identification of Perfluoroalkyl Compounds (PFCs) in the Metedeconk River Watershed Final Report, NJDEP Grant Contract No. SR11-016, April 2015.
- Randall, A.D., Francis, R.M., Frimpter, M.H. and Emery, J.M., 1988. Region 19, Northeastern Appalachians. Hydrogeology. Chapter 22 in *The Geology of North America*, vol. O-2, Hydrogeology, The Geological Society of North America, Boulder Colorado. 1988. p 177-187. 7 fig, 1 tab, 70 ref.
- Sanborn, Head & Associates, Inc. (SHA), 2016. Groundwater Analytical Data Transmittal, Longa Disposal Area Site, NHDES Site #198403080, Prepared for NHDES. June 8, 2016.
- Sepulvado, J.G., A.C. Blaine, L.S. Hundal, and C.P. Higgins, 2011. Occurrence and Fate of Perfluorochemicals in Soil Following the Land Application of Municipal Biosolids, Environmental Science and Technology, 45(19), pp. 8106-8112.
- Toppin, K.W., 1987. Hydrogeology of stratified-drift aquifers and water quality in the Nashua Regional Planning Commission area, south-central New Hampshire. US Geological Survey Water-Resources Investigations Report 86-4358. Converted to GIS coverages by CSRC, UNH, 2000.

Tables

Table 1 Analytical Parameters MVD-4/5 Investigation

Parameters	Analytical Method Number
Carbon, total organic	9060
Alkalinity, bicarbonate, as CaCO3	2320B
Alkalinity, carbonate, as CaCO3	2320B
Alkalinity, total, as CaCO3	2320B
Chloride	E300.0
Sulfate, as SO4	E300.0 E353.2
Nitrogen, Nitrate + Nitrite, as N	
Moisture	SM2540 G
Calcium	6010C
Magnesium	6010C
Potassium	6010C
Sodium	6010C
1,1,1-Trichloroethane	8260C
1,1,2,2-Tetrachloroethane	8260C
1,1,2-Trichloroethane	8260C
1,1-Dichloroethane	8260C
1,1-Dichloroethylene	8260C
1,2,3-Trichlorobenzene	8260C
1,2,4-Trichlorobenzene	8260C
1,2-Dibromo-3-chloropropane (DBCP)	8260C
1,2-Dibromoethane (EDB)	8260C
1,2-Dichlorobenzene	8260C
1,2-Dichloroethane	8260C
1,2-Dichloroethylene, cis	8260C
1,2-Dichloroethylene, trans	8260C
1,2-Dichloropropane	8260C
1,3-Dichloro-1-propene, cis	8260C
1,3-Dichloro-1-propene, trans	8260C
1,3-Dichlorobenzene	8260C
1,4-Dichlorobenzene	8260C
2-Hexanone	8260C
Acetone	8260C
Benzene	8260C
Bromochloromethane	8260C
Bromodichloromethane	8260C
Bromoform	8260C
Bromomethane	8260C
Carbon disulfide	8260C
Carbon tetrachloride	8260C
Chlorobenzene	8260C
Chlorodibromomethane	8260C
Chloroethane	8260C
Chloroform	8260C
Chloromethane	8260C
Cumene (isopropyl benzene)	8260C
Cyclohexane	8260C 8260C
Dichlorodifluoromethane (CFC-12)	8260C
` '	
Ethyl benzene	8260C

Table 1 Analytical Parameters MVD-4/5 Investigation

Parameters	Analytical Method Number
Methyl acetate	8260C
Methyl ethyl ketone (2-butanone)	8260C
Methyl isobutyl ketone (MIBK)	8260C
Methyl tertiary butyl ether (MTBE)	8260C
Methylcyclohexane	8260C
Methylene chloride	8260C
Octamethylcyclotetrasiloxane	8260C
Styrene	8260C
Tentatively Identified Compounds	8260C
Tetrachloroethylene	8260C
Toluene	8260C
Trichloroethylene	8260C
Trichlorofluoromethane (CFC-11)	8260C
Trichlorotrifluoroethane (Freon 113)	8260C
Vinyl chloride	8260C
Xylene, m & p	8260C
Xylene, o	8260C
Hydrometer Diameter (0.001 mm)	D422
Hydrometer Diameter (0.002 mm)	D422
Hydrometer Diameter (0.005 mm)	D422
Hydrometer Diameter (0.02 mm)	D422
Hydrometer Diameter (0.05 mm)	D422
Hydrometer Diameter (0.064 mm)	D422
Hydrometer Diameter (0.075 mm)	D422
Hydrometer Diameter (0.075 mm)	D422
Hydrometer Diameter (0.3 mm)	D422
Hydrometer Diameter (0.6 mm)	D422
Hydrometer Diameter (0.0 mm)	D422
Hydrometer Diameter (1.10 mm)	D422
Hydrometer Diameter (2.36 mm)	D422
Hydrometer Diameter (2.35 mm)	D422
Hydrometer Diameter (3.55 mm)	D422
, , ,	D422
Hydrometer Diameter (4.75 mm) Hydrometer Diameter (75 mm)	D422
` ` ` `	
N-Ethyl perfluorooctanesulfonamidoacetic acid	E537
N-Methyl perfluorooctanesulfonamidoacetic acid (MeFOSAA)	E537
Perfluorobutane sulfonate (PFBS)	E537
Perfluorobutanoic acid (PFBA)	E537
Perfluorodecanoic acid (PFDA)	E537
Perfluorododecanoic acid (PFDoA)	E537
Perfluoroheptanoic acid (PFHpA)	E537
Perfluorohexane sulfonate (PFHxS)	E537
Perfluorohexanoic acid (PFHxA)	E537
Perfluorononanoic acid (PFNA)	E537
Perfluoroctane sulfonate (PFOS)	E537
Perfluorooctanoic acid (PFOA)	E537
Perfluoropentanoic acid (PFPeA)	E537
Perfluorotetradecanoic acid (PFTA / PFTeDA)	E537

Table 1 **Analytical Parameters MVD-4/5 Investigation**

Parameters	Analytical Method Number
Perfluorotridecanoic acid (PFTrDA)	E537
Perfluoroundecanoic acid (PFUnA)	E537

Table 2 Aquifer Profiling Summary MVD-4/5 Investigation

					MVD-4/5 Inv	estigation					
Location	Easting (UTM19N)	Northing (UTM19N)	Ground Elevation ¹ (ft NAVD88)	Depth to Water During Waterloo ^{APS} Event (ft bgs)	Depth to Water During Geoprobe Event (ft bgs)	Sample Type	Sample Top Depth (ft bgs)	Sample Bottom Depth (ft bgs)	Sample Top Elevation (ft NAVD88)	Sample Bottom Elevation (ft NAVD88)	Sample Collection Method
				_	_		45	46	91.1	90.1	
							55	56	81.1	80.1	
AP01	296973.1	4749447.4	136.1	23.3	36.6	Groundwater	65	66	71.1	70.1	Geoprobe
							75	76	61.1	60.1	
							79	80	57.1	56.1	
							3	5	116.1	114.1	
						Soil	7	8	112.1	111.1	
						Chemistry	12 17	13	107.1	106.1	
							20	18 21.5	102.1 99.1	101.1 97.6	
						Soil	25.7	26.5	93.4	92.6	
AP02	297047.6	4749425.9	119.1	23.0	23.0	Grain Size	27	28.4	92.1	90.7	Geoprobe
						Gruin Size	24	25	95.1	94.1	
							34	35	85.1	84.1	
						Groundwater	44	45	75.1	74.1	
							54	55	65.1	64.1	
							64	65	55.1	54.1	
							25	25	94.9	94.9	
							35	35	84.9	84.9	
	P03 297102.7						35	35	84.9	84.9	Waterloo ^{APS}
AP03		4749368.5	119.9	21.0	24.0	Groundwater	55	55	64.9	64.9	
							65	65	54.9	54.9	
							68	69	51.9	50.9	Geoprobe
							27	28	92.6	91.6	Сеоргове
							34	35	85.6	84.6	
							44	45	75.6	74.6	
AP04	297056.9	4749261.4	119.6	22.0	23.1	Groundwater	54	55	65.6	64.6	Geoprobe
							64	65	55.6	54.6	
							74	75	45.6	44.6	
							83.5	84.5	36.1	35.1	
						Soil	2	3	114.0	113.0	
						Chemistry	7	8	109.0	108.0	Geoprobe
						·	11.5	14.5	104.5	101.5	·
						Soil Grain Size	27.6	29.8	88.4	86.2	
AP05	297163.9	4749628.6	116.0	18.3	16.0		21	21	95.0	95.0	
711 03	237103.3	17 13020.0	110.0	10.5	10.0		31	31	85.0	85.0	
						Groundwater	41	41	75.0	75.0	Waterloo ^{APS}
							51	51	65.0	65.0	
							61	61	55.0	55.0	
							69	69	47.0	47.0	
						Soil	2.5	4.5	113.7	111.7	Geoprobe
						3011	6	8	110.2	108.2	асорговс
							19	19	97.2	97.2	
							29	29	87.2	87.2	
AP06	297140.6	4749674.6	116.2	17.6	10.8		39	39	77.2	77.2	
						Groundwater	49	49	67.2	67.2	Waterloo ^{APS}
							59	59	57.2	57.2	
							68	68	48.2	48.2	
							73	73	43.2	43.2	
	l	l			l		/3	/3	43.2	43.2	

Table 2 Aquifer Profiling Summary MVD-4/5 Investigation

					MVD-4/5 Inv	estigation					
Location	Easting (UTM19N)	Northing (UTM19N)	Ground Elevation ¹ (ft NAVD88)	Depth to Water During Waterloo ^{APS} Event (ft bgs)	Depth to Water During Geoprobe Event (ft bgs)	Sample Type	Sample Top Depth (ft bgs)	Sample Bottom Depth (ft bgs)	Sample Top Elevation (ft NAVD88)	Sample Bottom Elevation (ft NAVD88)	Sample Collection Method
				_			28	28	136.2	136.2	
							38	38	126.2	126.2	
							48	48	116.2	116.2	
AP07	297182.1	4750227.9	164.2	25.6	NM	Groundwater	58	58	106.2	106.2	Waterloo ^{APS}
							68	68	96.2	96.2	
							78	78	86.2	86.2	
							85	85	79.2	79.2	
							18	18	127.7	127.7	
							28	28	117.7	117.7	Waterloo ^{APS}
			.2 145.7 15.				38	38	107.7	107.7	
AP08	297264.8	4750145.2	145.7	15.5	14.9	Groundwater	48 57	48	97.7	97.7	
								58 68	88.7 79.7	87.7 77.7	
							67 77	68 78	78.7 68.7	67.7	Geoprobe
							81	82	64.7	63.7	
						Soil	2.5	3	135.1	134.6	
						Chemistry	6	8	131.6	129.6	
						Soil	14.1	17	123.5	120.6	Caammaha
						Grain Size	34	35	103.6	102.6	Geoprobe
							11	12	126.6	125.6	
AP09	297336.9	4750058.2	137.6	10.5	10.3		17	18	120.6	119.6	
7 11 03	237330.3	., 50050.2	237.0	20.5	20.5		28	28	109.6	109.6	Waterloo ^{APS}
						Groundwater	35	36	102.6	101.6	
							47	48	90.6	89.6	
							56	57	81.6	80.6	Geoprobe
							65	66	72.6	71.6	
							70	71	67.6	66.6	
							20	20	105.6	105.6	
							30	30	95.6	95.6	
							40	40	85.6	85.6	
AP10	297376.9	4749936.4	125.6	15.2	NM	Groundwater	50	50	75.6	75.6	Waterloo ^{APS}
							60	60	65.6	65.6	
							70	70	55.6	55.6	
							80	80	45.6	45.6	
							84.5	84.5	41.1	41.1	

Ground surface elevation at aquifer profiling locations was interpolated using LiDAR data obtained from National Oceanic and Atmospheric Administration (NOAA)

UTM19N Universal Transverse Mercator Zone 19 North NAVD88 North American Vertical Datum of 1988

ft feet

bgs below ground surface NM not measured

Table 3
Monitoring Locations
MVD-4/5 Investigation

				Ground		Top of	Bottom	Top of Well	Bottom of	Total Depth						
Monitoring				Surface	Reference	Well	of Well	Screen	Well Screen	(ft below						
Location		Easting	Northing	Elevation ¹	Elevation ¹	Screen	Screen	Elevation	Elevation	Reference)	Deptl	h To Water (f	t bgs)	Water Tabl	e Elevation (f	t NAVD88)
Туре	Location	(UTM19N)	(UTM19N)	(ft NAVD88)	(ft NAVD88)	(ft bgs)	(ft bgs)	(ft NAVD88)	(ft NAVD88)	Nov 2016	10/31/2016	11/7/2016	11/23/2016	10/31/2016	11/7/2016	11/23/2016
Lange	LNG-MW-1	296849.90	4748915.88	113.87	115.64	18.5	38.5	95.37	75.37	31.57	22.28	22.15	22.19	93.36	93.49	93.45
Longa	LNG-MW-2	296824.85	4749230.07	122.21	122.87	24	39	98.21	83.21	40.85	28.45	28.18	28.09	94.42	94.69	94.78
Monitoring Well	LNG-MW-3	297041.27	4749332.60	120.10	122.09	17.5	37.5	102.60	82.60	40.46	27.46	27.29	27.35	94.63	94.80	94.74
weii	LNG-MW-4	297012.43	4749158.95	118.11	118.37	19.5	39.5	98.61	78.61	40.03	25.07	25.03	25.18	93.30	93.34	93.19
MVD Pumping	MVD-4	297129.52	4749648.93	115.9 ²		43	53	72.9	62.9							
Well	MVD-5	297064.53	4749582.18	120.3 ²		50	65	70.3	55.3							
	45-1MW	297016.73	4749662.23	142.11	144.39	67.5	72.5	74.61	69.61	45.35	45.62	45.4	45.34	98.77	98.99	99.05
	45-1A	297014.49	4749661.60	142.08	144.25	45	50	97.08	92.08	NM	45.49	45.66	42.1	98.76	98.59	102.15
	45-2A	296977.67	4749596.40	143.59	144.43	52	57	91.59	86.59	51.78	44.8	45.74	45.69	99.63	98.69	98.74
	45-3A	297200.24	4749614.63	119.39	121.15	67	72	52.39	47.39	48.48 ³	22.89	22.66	22.67	98.26	98.49	98.48
	45-4A	297099.59	4749495.08	117.98	119.42	39.3	44.8	78.68	73.18	44.80	23.07	22.84	22.85	96.35	96.58	96.57
MVD	45-5A	297083.56	4749364.07	119.73	121.24	49.75	55.25	69.98	64.48	52.98	26.22	26.07	26.12	95.02	95.17	95.12
Monitoring	45-6	297062.28	4749583.36	120.94	123.52	50	70	70.94	50.94	71.92	25.28	25.07	25.01	98.24	98.45	98.51
Well	45-7	297131.39	4749645.68	116.17	118.69	55.5	75.5	60.67	40.67	76.25	19.98	19.77	19.74	98.71	98.92	98.95
	45-8	297075.19	4749598.59	120.15	122.38	46	66	74.15	54.15	68.67	24.07	23.86	23.8	98.31	98.52	98.58
	45-9	297163.18	4749757.79	120.77	123.05	60	80	60.77	40.77	82.90	21.38	21.19	21.2	101.67	101.86	101.85
	45-10	296971.07	4749482.74	115.02	116.56	35.5	55.5	79.52	59.52	58.49	18.98	18.75	18.7	97.58	97.81	97.86
	45-11	297014.10	4749427.13	126.22	128.94	59.5	64.5	66.72	61.72	64.62	33.11	32.88	32.86	95.83	96.06	96.08
	45-28	297099.90	4749620.45	117.37	118.89	46	51	71.37	66.37	52.46	20.5	20.27	19.96	98.39	98.62	98.93
	SWUp_Baboosic	296319.62	4750036.64		160.94						ND	ND	ND	ND	ND	ND
Curfo co Motor	SWMid_Baboosic	296672.74	4749144.22		102.47						ND	ND	ND	ND	ND	ND
Surface Water	SWDn_Baboosic	296504.18	4748647.67		92.45						ND	0.19	ND	ND	92.26	ND
Location	SWUp_Merrimack	297464.56	4749943.92		92.81		-				ND	0.97	0.47	ND	91.84	92.34
	SWDn_Merrimack	296805.94	4748539.21		94.53						ND	2.78	2.23	ND	91.75	92.27

¹ Ground surface and reference elevations surveyed by CT MALE.

UTM19N Universal Transverse Mercator Zone 19 North

NAVD88 North American Vertical Datum of 1988

ft feet

bgs below ground surface

NM not measured

ND no data available

² Ground surface elevation interpolated using available data obtained from the National Oceanic and Atmospheric Administration (NOAA).

Water level tape stopped at 48.48 feet bgs. Potential blockage at this depth, as well as at 31.95 feet bgs.

		Location	AP01	AP01	AP01	AP01	AP01	AP02	AP02	AP02	AP02	AP02	AP03	AP03	AP03	AP03	AP03	AP03	AP03	AP04	AP04	AP04	AP04	AP04	AP04
							-		-															-	
		Date	1/10/2017	1/10/2017	1/11/2017	1/11/2017	1/11/2017	1/12/2017	1/12/2017	1/12/2017	1/13/2017	1/13/2017	10/28/2016	10/28/2016	10/31/2016	10/31/2016	10/31/2016	1/16/2017	1/16/2017		1/17/2017	1/17/2017	1/17/2017	1/17/2017	1/17/2017
		Depth	45 - 46 ft	55 - 56 ft	65 - 66 ft	75 - 76 ft	79 - 80 ft	24 - 25 ft	34 - 35 ft	44 - 45 ft	54 - 55 ft	64 - 65 ft	25 ft	35 ft 35 ft	45 ft	55 ft	65 ft	68 - 69 ft	68 - 69 ft	27 - 28 ft	34 - 35 ft	34 - 35 ft	44 - 45 ft	54 - 55 ft	54 - 55 ft
		Sample Type	N	N	N	N	N	N	N	N	N	N	N	N FD	N	N	N	N	N	N	N	N FD	N	N	N
	Total or	Comparison																							
Parameter	Dissolved Units																								
Exceedance Key		Bold																							
General Parameters																									
Alkalinity, bicarbonate, as CaCO3	NA mg/l												< 5.0	17.0 22.2	20.4	24.1	22.1		32.8	10.7		43.6 47.5	36.6		20.1
Alkalinity, total, as CaCO3	NA mg/l		37.8				34.8						< 5.0	17.0 22.2	20.4	24.1	22.1		32.8	10.7		43.6 47.5	36.6		20.1
Chloride	NA mg/l		3.3	162	215	222	231	36.8	217	215	212	281	1.1 j	131 124	148	109	121		109	3.3		65.6 62.4	149		330
Nitrogen, Nitrate + Nitrite, as N	NA mg/l		0.98	2.0	2.0	1.9	1.7	0.38	7.6	1.6	1.7	1.5	< 0.10	2.6 3.0	2.0	3.6 *	3.7		4.4	0.38		0.99 0.99	1.5		1.6
Sulfate, as SO4	NA mg/l		6.8	8.8	11.3	12.6	12.6	4.4 j	13.4	14.2	13.1	13.9	18.7	12.3 13.7	9.9	11.4	15.1		14.3	9.9		25.3 23.8	19.8		20.6
Metals																									
Calcium	Dissolved mg/l		4.10	21.3	24.3	17.7	20.7					49.3													-
Magnesium	Dissolved mg/l		0.740	4.95	5.48	4.30	5.19					12.7													
Potassium	Dissolved mg/l		3.38	4.46	3.03	3.69	4.13					6.36												-	-
Sodium	Dissolved mg/l		7.67	81.9	116	127	125					104												-	1
Calcium	Total mg/l		46.6	35.0	26.2	29.0	37.0	11.9	26.0	24.4	25.7	55.8	8.42	24.7 24.6	19.6	20.2	37.7	30.1	35.3	5.95	20.0	20.8 21.0	30.5	85.3	84.8
Magnesium	Total mg/l		21.1	15.7	10.1	14.9	29.8	1.91	5.84	5.54	6.22	22.1	0.875	4.68 4.68	4.12	4.27	9.48	6.67	9.88	0.939	4.17	4.87 4.98	7.06	19.8	20.2
Potassium	Total mg/l		25.7	19.1	7.12	16.6	26.0	1.07	3.40	3.33	4.08	16.9	0.954 j	2.42 2.37	2.96	3.21	3.53	4.21	8.09	0.850 j	1.94	3.07 3.32	4.94	4.02	5.90
Sodium	Total mg/l		20.9	87.6	114	131	118	11.8	111	110	108	108	4.17	53.1 52.5	55.1	56.7	42.1	48.9	49.5	2.51	37.9	38.7 38.8	70.2	50.8	51.1
VOCs																									
1,1-Dichloroethane	NA ug/l		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 1 < 1	< 1	< 1	< 1		< 1	< 1		< 1 < 1	< 1		< 1
1,1-Dichloroethylene	NA ug/l		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 1 < 1	< 1	< 1	< 1		< 1	< 1		< 1 < 1	< 1		< 1
Acetone	NA ug/l		9 j	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 20	< 20 < 20	< 20	< 20	< 20		< 20	< 20		< 20 < 20	< 20		< 20
Bromodichloromethane	NA ug/l		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.7 j	< 1	<1 <1	< 1	< 1	< 1		< 1	< 1		<1 <1	< 1		1
Carbon disulfide	NA ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5	< 5 < 5	< 5	< 5	< 5		< 5	< 5		< 5 < 5	< 5		< 5
Chlorodibromomethane	NA ug/l		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	<1 <1	< 1	< 1	< 1		< 1	< 1		<1 <1	< 1		1
Chloroform	NA ug/l		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.8 j	0.7 j	0.6 j	1	< 1	<1 <1	< 1	< 1	< 1		< 1	< 1		< 1 < 1	< 1		2
Methyl tertiary butyl ether (MTBE)	NA ug/l		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	<1 <1	< 1	< 1	< 1		< 1	< 1		< 1 < 1	< 1		< 1
Tentatively Identified Compounds	NA ug/l												0 TIC	0 TIC 0 TIC	0 TIC	0 TIC	0 TIC		0 TIC	0 TIC		0 TIC 0 TIC			0 TIC
Tetrachloroethylene	NA ug/l		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	<1 <1	< 1	< 1	< 1		< 1	< 1		<1 <1	0.7 j		< 1
Trichloroethylene	NA ug/l		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	<1 <1	< 1	< 1	< 1		< 1	< 1		<1 <1	< 1		< 1
Perfluorinated Compounds																									
Perfluorooctane sulfonate (PFOS)	NA ng/l		< 2	< 2	< 2	< 2 *	< 2 *	< 2 *	< 2	< 2	< 2	< 2	< 6	< 6 < 6	< 10	< 10	< 10		< 6	< 6		3 j 2 j	3 j		4 j
Perfluorooctanoic acid (PFOA)	NA ng/l		59	30 *	25	30	6 *	6	45	32	35	37	3	45 52	44	54	77		95	0.5 j		29 28	44		42
PFOS + PFOA, Calculated	NA ng/l	70	59	30 a	25	30 a	6 a	6 a	45	32	35	37	3	45 52	44	54	77		95	0.5 a		32 a 30 a	47 a		46 a
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA ng/l		< 1	< 1	< 1 *	< 1	< 1 *	< 1	< 1	< 1	< 1	< 1	< 3	< 3 * < 3	< 8	< 8	< 8		< 3	< 3		< 3 < 3	< 3		< 3
Perfluorobutane sulfonate (PFBS)	NA ng/l		1 j	2	3	4	2 *	2 j*	6	5	6	6	< 2	3 3	< 10	< 10	< 10		3	< 2		1j 1j	4		5
Perfluorobutanoic acid (PFBA)	NA ng/l		11	5 j	3 j	4 j*	< 3 *	< 3 *	10	5 j	5 j	5 j	< 10	4 jb 4 jb	4 j	< 10	3 j		4 j	< 10		< 10 < 10			5 j
Perfluorodecanoic acid (PFDA)	NA ng/l		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5 *	< 0.5 *	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 2 < 2	< 2	< 2	< 2		< 2	< 2		< 2 < 2	< 2		< 2
Perfluorododecanoic acid (PFDoA)	NA ng/l		< 0.5 *	< 0.5 *	< 0.5	< 0.5	< 0.5 *	< 0.5 *	< 0.5	< 0.5	< 0.5 *	< 0.5	< 2	< 2 < 2	< 5	< 5	< 5		< 2	< 2		< 2 < 2 *	< 2		< 2 *
Perfluoroheptanoic acid (PFHpA)	NA ng/l		9	6 *	4	5 *	1 j	1 j	7	6	7	6	0.6 j	8 8	6	7	10		10	< 2		5 5	7		7
Perfluorohexane sulfonate (PFHxS)	NA ng/l		1 j	1 j*	1 j	2 j*	< 1 *	< 1 *	3 j	2 j	2 j	2 j	< 3	3 j 2 j	< 10	< 10	4 j		5	< 3		1 j 2 j	2 j		2 j
Perfluorohexanoic acid (PFHxA)	NA ng/l		16	8 *	5 b	7 *	3 b	3 b*	12	9	9	10	0.7 j	9 8	8	7	9		11	< 2		4 4	9		10
Perfluorononanoic acid (PFNA)	NA ng/l		< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6 *	1 j	< 0.6	< 0.6	< 0.6	< 2	< 2 < 2	< 2	< 2	< 2		< 2	< 2		< 2 < 2	< 2	-	0.8 j
Perfluoropentanoic acid (PFPeA)	NA ng/l		12	7	5	6 *	8	9	9	7	8	7	0.6 j	8 7	6 *	5	5		7	< 2		3 4	8	-	10
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA ng/l		< 0.5 *	< 0.5 *	< 0.5	< 0.5 *	< 0.5 *	< 0.5 *	< 0.5	< 0.5 *	< 0.5 *	< 0.5	< 2	< 2 < 2	< 5	< 5	< 5		< 2	< 2		<2 <2 *	< 2		< 2 *
Perfluorotridecanoic acid (PFTrDA)	NA ng/l		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 2 < 2	< 4	< 4	< 4		< 2	< 2		< 2 < 2	< 2		< 2
Perfluoroundecanoic acid (PFUnA)	NA ng/l		< 1 *	< 1	< 1	< 1	< 1 *	< 1 *	< 1	< 1	< 1 *	< 1	< 3	< 3 < 3	< 4	< 4	< 4		< 3	< 3		< 3 < 3	< 3		< 3

						150/								1		1544								1707
			Location	AP04	AP04	AP04	AP04	AP05	AP05	AP05	AP05	AP05	AP05	AP06	AP07	AP07	AP07	AP07						
			Date	1/17/2017	1/18/2017	1/18/2017	1/18/2017	10/24/2016	10/24/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/26/2016	10/26/2016	10/26/2016	10/26/2016	10/27/2016	10/27/2016	10/27/2016	10/20/2016	10/20/2016	10/20/2016	10/20/2016
			Depth	64 - 65 ft	75 ft	83.5 - 84.5 ft	83.5 - 84.5 ft	21 ft	31 ft	41 ft	51 ft	61 ft	69 ft	19 ft	29 ft	39 ft	49 ft	59 ft	68 ft	73 ft	28 ft	38 ft	48 ft	58 ft
			Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Total or	l	Comparison																					
Parameter	Dissolved	Units	Criteria																					
Exceedance Key		ļ	Bold																					
General Parameters		,		20.0	05.5		40.0	20.0	04.4	04.7	00.0	00.0	05.0	00.0	45.7	40.0	20.0	45.41	04.51	0471	07.4	00.4	20.0	
Alkalinity, bicarbonate, as CaCO3	NA	mg/l		23.6	25.5		42.3	22.0	21.4	21.7	22.3	32.0	35.6	20.8	15.7	16.6	23.0	15.1 b	21.5 b	24.7 b	27.1	29.1	23.3	23.8
Alkalinity, total, as CaCO3	NA NA	mg/l		23.6	25.5		42.3	22.0	21.4	21.7	22.3	32.0	35.6	20.8	15.7	16.6	23.0	15.1 b	21.5 b	24.7 b	27.1	29.1	23.3	23.8
Chloride	NA NA	mg/l		319	316		145	108	80.8	96.4	94.2	95.1	87.1	109	73.7	90.6	81.8	76.5 b	77.8 b	75.7 b	185	194	47.8	18.3
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l		1.7	1.5		1.2	2.4	4.6	4.8	4.4	4.6	3.2	2.3	3.0	4.0	3.6	3.5	3.7	3.6	1.8	0.063 j	0.097 j	0.20
Sulfate, as SO4 Metals	NA	mg/l		20.0	22.6		45.5	10.8	11.2	11.5	11.0	12.4	18.7	11.3	15.2	13.5	13.8	12.9 b	12.8 b	12.8 b	4.7 j	13.2	10.1	9.0
Calcium	Dissolved	ma/l																						
	Dissolved Dissolved	mg/l																						
Magnesium Potassium		mg/l																						
Sodium	Dissolved Dissolved	mg/l																						
Calcium	Total	mg/l		86.6	85.3	35.6	42.4	16.7	15.7	17.9	12.8	14.4	18.7	15.0	14.6	17.5	16.0	15.6 b	15.2 b	16.3 b	15.7	35.5	11.5	10.5
	_	mg/l		21.6	21.3	10.1	13.9	2.98	2.88	3.02	2.15	2.66	6.51	2.64	2.95	3.46	3.07	3.03 b	3.19 b	3.80 b	3.78	9.16	2.74	2.65
Magnesium Potassium	Total Total	mg/l		5.87	3.88	4.22	11.2	2.90	2.00	3.02	2.13	2.84	4.13	2.04	2.95	2.49	2.54	2.82 b	2.28 b	2.62 b	3.76	4.98	2.74	3.19
		mg/l		54.6	45.9	64.3	67.1	64.9	49.4		60.0				47.0		47.9	48.7 b		48.0 b			28.1	31.8
Sodium	Total	mg/l		34.6	45.9	64.3	07.1	64.9	49.4	59.3	60.0	62.9	49.5	64.3	47.0	52.8	47.9	40.7 D	47.3 b	40.0 D	104	72.3	20.1	31.0
1,1-Dichloroethane	NA	ua/l		< 1	< 1		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,1-Dichloroethylene	NA NA	ug/l ug/l		< 1	< 1		< 1	<1	<1	<1	<1	< 1	<1	< 1	<1	<1	< 1	<1	<1	<1	<1	<1	<1	< 1
Acetone	NA NA	ug/I		< 20	< 20		< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Bromodichloromethane	NA NA	ug/l		1	1		< 1	<1	< 1	< 1	<1	< 1	< 1	< 1	<1	< 1	<1	<1	< 1	< 1	<1	< 1	< 1	< 1
Carbon disulfide	NA NA	ug/l		< 5	< 5		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodibromomethane	NA NA	ug/l		1	1		< 1	< 1	< 1	< 1	<1	<1	<1	<1	<1	<1	<1	<1	<1	< 1	<1	< 1	<1	< 1
Chloroform	NA NA	ug/l		1	1		< 1	<1	< 1	< 1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	< 1
Methyl tertiary butyl ether (MTBE)	NA NA	ug/l		< 1	< 1		< 1	<1	< 1	< 1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	< 1	<1	< 1
Tentatively Identified Compounds	NA.	ug/l		0 TIC	0 TIC		0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC
Tetrachloroethylene	NA	ug/l		< 1	< 1		< 1	< 1	< 1	< 1	<1	< 1	<1	< 1	< 1	< 1	<1	< 1	< 1	< 1	<1	< 1	< 1	< 1
Trichloroethylene	NA	ug/l		< 1	<1		< 1	< 1	<1	< 1	<1	< 1	<1	<1	<1	<1	<1	<1	<1	<1	<1	< 1	<1	< 1
Perfluorinated Compounds		ug,.		` '	- ` '					1	` '	` '		1	- ' '			` '						
Perfluorooctane sulfonate (PFOS)	NA	ng/l		4 i	3 j		< 6	2 j	5 j	10	10 *	9	6	< 10	12	7 j	7 j	6 i	< 10	< 10	< 6	< 6	< 6	
Perfluorooctanoic acid (PFOA)	NA	ng/l		44	45		27	39	100 *	140 *	120 *	120 *	130 *	41	54	97	65	62	63	63	7 b	5 b*	11 b*	
PFOS + PFOA, Calculated	NA	ng/l	70	48 a	48 a		27	41 a	105 a	150 a	130 a	129 a	136 a	41	66	104 a	72 a	68 a	63	63	7 a	5 a	11 a	
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l		< 3	< 3		2 j	< 3 *	< 3 *	< 3	< 3 *	< 3 *	< 3	< 8	< 8	< 8	< 8	< 8	< 8	< 8 *	< 3	< 3 *	< 3 *	
Perfluorobutane sulfonate (PFBS)	NA	ng/l		6	5		2 j	3	6	7	7	6	6	< 10	< 10	5 j	5 j	4 j	< 10	4 j	< 2	1 jb	1 jb	
Perfluorobutanoic acid (PFBA)	NA	ng/l		5 i	5 j		3 j	8 jb*	7 jb*	9 jb*	8 jb*	6 jb*	7 jb*	4 j	4 i	5 j	4 j	4 i	4 i	4 j	5 jb*	9 jb*	8 jb*	
Perfluorodecanoic acid (PFDA)	NA	ng/l		< 2	< 2		< 2	< 2 *	< 2 *	< 2 *	0.8 j*	< 2 *	< 2 *	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2 *	< 2 *	< 2 *	
Perfluorododecanoic acid (PFDoA)	NA	ng/l		< 2	< 2		< 2	< 2 *	< 2 *	< 2 *	< 2 *	< 2 *	< 2 *	< 5	< 5	< 5	< 5	< 5	< 5	< 5 *	< 2 *	< 2 *	< 2 *	
Perfluoroheptanoic acid (PFHpA)	NA	ng/l		8	8		6	8	15 *	19 *	18 *	18 *	16	7	8	13	10	9	9	9	1 jb	0.6 jb*	2 ib*	
Perfluorohexane sulfonate (PFHxS)	NA	ng/l		2 j	3 i		2 j	2 j	4	4	4	4	5	< 10	< 10	< 10	< 10	< 10	< 10	< 10 *	< 3	3 jb	2 jb	
Perfluorohexanoic acid (PFHxA)	NA	ng/l		9	9		6	12	15 *	19	19 *	22 *	16 *	10	9	15	12	12	11	11	2 jb*	0.9 ib*	4 b*	
Perfluorononanoic acid (PFNA)	NA	ng/l		0.6 j	< 2		< 2	< 2 *	0.9 j*	1 i*	1 i*	0.8 j*	1 i	< 2	1 i	1 i	< 2	< 2	< 2	< 2	< 2	< 2 *	< 2 *	
Perfluoropentanoic acid (PFPeA)	NA.	ng/l		11	10		5	9 *	11 *	12 *	12 *	13 *	11 *	8	6	10	8	8	7	7	2 jb*	0.7 ib*	2	
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l		< 2	< 2		< 2	< 2 *	< 2 *	< 2 *	< 2 *	< 2 *	< 2	< 5	< 5	< 5	< 5	< 5	< 5	< 5 *	< 2 *	0.5 jb*	< 2 *	
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l		< 2	< 2		< 2	< 2 *	< 2 *	< 2 *	< 2 *	< 2 *	< 2 *	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 2 *	< 2 *	< 2 *	
Perfluoroundecanoic acid (PFUnA)	NA	ng/l		< 3	< 3		< 3	< 3 *	< 3 *	< 3 *	< 3 *	< 3 *	< 3 *	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 3 *	< 3 *	< 3 *	
. S as . ca as oar lole as a (1 1 5 11/1)	1 1771	119/1		``	``		_ ``	``	``	``	``	``	``	` '	` '	` '	` '	` '	` '	` '	``	``		

			Logotion	AP07	AP07	A DO7	AP07	4 D00	AP08	AP08	AP08	AP08	AP08	A D00	AP08	A D00	AP09	A D00	A D00	A D00	A D00	A D00	AP09	AP09	AP09
			Location			AP07		AP08						AP08		AP08		AP09	AP09	AP09	AP09	AP09			
			Date	10/21/2016	10/21/2016	10/21/2016	10/24/2016	10/17/2016	10/18/201	6 10/18/20 ⁻	6 10/18/2016	1/19/2017	1/19/2017	1/19/2017	1/19/2017	1/20/2017	1/20/2017	1/20/2017	1/23/2017	11/04/2016	1/23/2017	1/23/2017	1/23/2017	1/23/2017	1/25/2017
			Depth	58 ft	68 ft	78 ft	85 ft	18 ft	28 ft	38 ft	48 ft	57 - 58 ft	67 - 68 ft	77 - 78 ft	81 - 82 ft	81 - 82 ft	11 - 12 ft	11 - 12 ft	17 - 18 ft	28 ft	35 - 36 ft	47 - 48 ft	56 - 57 ft	65 - 66 ft	70 - 71 ft
			Sample Type	N	N	N	N	N	N F	D N	N	N	N FD	N	N	N	N	N	N	N	N	N	N	N	N
5 .	Total or		Comparison																						
Parameter Exceedance Key	Dissolved	Units	Criteria Bold																						\vdash
General Parameters	_		Боіц																					\vdash	+
Alkalinity, bicarbonate, as CaCO3	NA	ma/l			26.9	30.8	28.1	22.1	17.8 b 15	0 b 13.3 b	13.7	16.8	27.6 30.0	23.9	37.1 *			20.9		27.5					
Alkalinity, total, as CaCO3	NA NA	mg/l mg/l			26.9	30.8	28.1	22.1	17.8 b 15		13.7	16.8	27.6 30.0	23.9	37.1 *			20.9	58.4	27.5					28.9
Chloride	NA	mg/l			43.8	21.0	57.2	84.5	78.6 8		73.9	94.6	116 107	118	133			80.5	102	104	93.2	95.6	92.9	175	186
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l			0.049 j	0.10	2.2	4.2	4.1 4		0.83	4.7	5.5 5.5	5.4	5.5		-	2.4	4.4 *	5.1	5.1	4.9	5.0	5.7	5.3
Sulfate, as SO4	NA	mg/l			17.4	17.9	15.8	14.1	11.9 b 11		11.2	12.7	12.9 13.1	14.2	14.4		-	13.3	15.1 *	14.2	15.6	12.0	13.6	16.0	18.4
Metals		Ŭ																							
Calcium	Dissolved	mg/l															-								15.7
Magnesium	Dissolved	mg/l															-								3.45
Potassium	Dissolved	mg/l					-										1								4.58
Sodium	Dissolved	mg/l																							117
Calcium	Total	mg/l			15.7	10.8	14.3	15.7	16.0 b 15		13.9 b	17.0	18.2 18.1	16.4	14.7	14.1	12.3	16.9	24.9	15.8	15.2	16.2	16.9	15.4	17.8
Magnesium	Total	mg/l			3.22	2.92	2.99	3.03	5.31 4.2		2.31 b	3.55	3.80 3.80	3.55	2.72	2.29	1.87	5.80	6.92	2.77	2.77	2.80	2.85	2.70	4.32
Potassium	Total	mg/l			2.32	4.07	4.45	2.60	5.19 4.		2.46 b	3.79	4.18 4.17	3.96	3.76	2.97	2.61	6.47	5.42	2.74	3.56	3.15	3.25	2.98	5.26
Sodium	Total	mg/l			20.3	17.4	35.3	49.2	44.2 43	3.9 44.9	44.0	52.5	67.3 67.1	72.4	85.9	84.4	49.4	52.1	59.2	62.6	60.7	50.2	51.9	108	122
VOCs	NIA	/1			< 1	< 1	. 1	. 4	. 1	1 <1	< 1	< 1	<1 <1	< 1	< 1		-	< 1	.0.5	< 1	.0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethane 1,1-Dichloroethylene	NA NA	ug/l			<1	<1	< 1 < 1	< 1 < 1	<1 <		<1	< 1	<1 <1	< 1	< 1			< 1	< 0.5 < 0.5	<1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acetone	NA NA	ug/l ug/l			< 20	< 20	< 20	< 20		20 < 20	< 20	< 20	< 20 < 20		< 20			< 20	< 6	< 20	< 0.5 < 6	< 6	< 6	< 6	< 6
Bromodichloromethane	NA.	ug/l			< 1	< 1	<1	<1	<1 <		< 1	<1	<1 <1	< 1	< 1		-	< 1	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carbon disulfide	NA NA	ug/l			< 5	< 5	< 5	2 jb		5 < 5	< 5	< 5	<5 <5	< 5	< 5		-	< 5	< 1	< 5	< 1	< 1	< 1	< 1	< 1
Chlorodibromomethane	NA	ug/l			< 1	< 1	< 1	< 1		1 <1	< 1	< 1	<1 <1	< 1	< 1		-	< 1	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	NA	ug/l			< 1	< 1	< 1	< 1	<1 <	1 < 1	< 1	< 1	< 1 < 1	< 1	< 1			< 1	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Methyl tertiary butyl ether (MTBE)	NA	ug/l			< 1	< 1	< 1	< 1	<1 <	1 < 1	< 1	< 1	< 1 < 1	< 1	< 1			< 1	< 0.5	< 1	0.5 j	< 0.5	< 0.5	< 0.5	< 0.5
Tentatively Identified Compounds	NA	ug/l			0 TIC	0 TIC	0 TIC	0 TIC	0 TIC 0	TIC 0 TIC	0 TIC	0 TIC	0 TIC 0 TIC	0 TIC	0 TIC		-	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC
Tetrachloroethylene	NA	ug/l			< 1	< 1	< 1	< 1	<1 <	1 < 1	< 1	< 1	< 1 < 1	< 1	< 1		-	< 1	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	NA	ug/l			< 1	< 1	< 1	< 1	<1 <	1 < 1	< 1	< 1	< 1 < 1	< 1	< 1			< 1	< 0.5	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorinated Compounds																									
Perfluorooctane sulfonate (PFOS)	NA	ng/l		5 jb	< 6	< 6	3 j	75 *	< 6 * <		3 j*	6 j	9 11	9	12			6	5 j	11	11	6 j	6	13	15
Perfluorooctanoic acid (PFOA)	NA	ng/l		5 b*	3 b*	4 b	41	210 *	71 * 7		46 *	92	130 120	140	120			25	140	150	120	100	110	140	150
PFOS + PFOA, Calculated	NA	ng/l	70	10 a	3 a	4 a	44 a	285 a	71 a 7		49 a	98 a	139 131	149	132		-	31	145 a	161	131	106 a	116	153	165
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA NA	ng/l		< 3	< 3 *	< 3	< 3	< 3 * 7		3 < 3 *	< 3 * 3 *	< 3	< 3 < 3 9 8	< 3	< 3 9		-	6	< 1	< 3	< 1	< 1 10	< 1 9	< 1 8	< 1 8
Perfluorobutane sulfonate (PFBS) Perfluorobutanoic acid (PFBA)	NA NA	ng/l		< 2 6 jb*	1 jb 9 jb*	1 jb 9 ib*	3 9 jb*	12 *	11 b* 9		7 ib*	6 i	8 i 7 i	10 8 j	10			5 i	5 5 j	6 i	10 7 i	6 i	6 i	8 i	8 j
Perfluorodecanoic acid (PFDA)	NA NA	ng/l ng/l		< 2	< 2 *	9 JD < 2	9 Jb 0.6 i*	< 2 *	0.6 jb* <		0.6 jb*	< 2	0.7 j 0.6 j	0.6 i	0.8 j			2	< 0.5	< 2	0.6 j	0.5 j	0.6 i	0.8 i	1 j
Perfluorododecanoic acid (PFDA)	NA NA	ng/l		0.7 ib*	< 2 *	< 2 *	< 2 *	< 2 *	< 2 * <		0.7 jb*	< 2 *	<2 <2	< 2	< 2			< 2 *	< 0.5 *	< 2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroheptanoic acid (PFHpA)	NA NA	ng/l		2 jb	2	1 jb	6	28 *	14 * 1		8 *	11	16 16	16	17		-	5	15	17	14	16	16	20	20
Perfluorohexane sulfonate (PFHxS)	NA.	ng/l		2 jb	1 jb	< 3	2 j	5	3 * 3		3 *	3	3 3	4	3		-	1 i	4	4	3	2 j	3 j	4	3
Perfluorohexanoic acid (PFHxA)	NA	ng/l		2 jb	6 b	4 b	8	21 *	17 * 1	,	9 *	14	19 22	19	25		-	7	15	20	17	18	17	23	22
Perfluorononanoic acid (PFNA)	NA	ng/l		0.7 jb*	< 2 *	< 2	0.7 j*	9	0.8 jb* <		1 jb*	0.8 j	1j 1j	1 j	1 j			2 j	1 j	1 j	1 j	0.7 j	1 j	1 j	1 j
Perfluoropentanoic acid (PFPeA)	NA	ng/l		2 jb*	3 *	2	4 b*	14 b*	10 * 1		7 *	10	15 14	14	17			5	8	13	12	10	12	18	16
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l		2 jb*	< 2 *	< 2 *	< 2 *	0.5 j*	1 jb* 2	b* 0.6 jb*	2 jb*	< 2 *	<2 <2	< 2	< 2 *			< 2 *	< 0.5 *	< 2	< 0.5 *	< 0.5 *	< 0.5	< 0.5 *	< 0.5 *
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l		0.9 jb*	< 2 *	< 2 *	< 2 *	< 2 *	0.9 jb* <	2 * < 2 *	< 2 *	< 2	<2 <2	< 2	< 2		-	< 2	< 0.5	< 2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroundecanoic acid (PFUnA)	NA	ng/l		< 3	< 3 *	< 3	< 3 *	< 3 *	< 3 * <	3 * < 3 *	< 3 *	< 3	< 3 < 3	< 3	< 3		-	< 3	< 1	< 3	< 1	< 1	< 1	< 1	< 1

			Lasation	A D40	AD40	A D40	AD40	A D40	A D40	A D40	A D40	MVD4	841/0	N I	MVD4	MVD4	MVDE	MVD5	MVDC	MVDC	LNOWWA	LNOWN	LNOWN	LNOWN	4888/
			Location	AP10	MVD4	MVD		MVD4	MVD4	MVD5	MVD5	MVD5	MVD5	LNGMW-1	LNGMW-2	LNGMW-3	LNGMW-4	1MW							
			Date	11/02/2016	11/02/2016	11/02/2016	11/03/2016	11/03/2016	11/03/2016	11/03/2016	11/03/2016	11/14/2016	11/14/2	2016 1	11/14/2016	11/14/2016	11/14/2016	11/14/2016	11/14/2016	11/14/2016	11/10/2016	11/11/2016	11/10/2016	11/09/2016	11/09/2016
			Depth	20 ft	30 ft	40 ft	50 ft	60 ft	70 ft	80 ft	84.5 ft	0 min	10 m	nin	20 min	30 min	0 min	10 min	20 min	30 min					
			Sample Type	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N
	Total or		Comparison																						
Parameter Exceedance Key	Dissolved	Units	Criteria Bold																						
General Parameters	+	ł	Вош																						
Alkalinity, bicarbonate, as CaCO3	NA	mg/l		11.8 b	< 5.0	20.9	16.6	20.5	23.1	23.1	21.8	21.6	20.1	20.2	20.4	20.3	21.7	18.1	28.9	17.6	96.0	41.3	22.6	55.7	13.6
Alkalinity, bicarbonate, as cacos Alkalinity, total, as CaCO3	NA NA	mg/l		11.8 b	< 5.0	20.9	16.6	20.5	23.1	23.1	21.8	21.6		20.2	20.4	20.3	21.7	18.1	28.9	17.6	96.0	41.3	22.6	55.7	13.6
Chloride	NA NA	mg/l		17.9	439	225	89.0	85.9	116	125	128	90.5		86.8	87.3	87.6	117	10.1	109	112	4.5	13.2	122	42.2	293
Nitrogen, Nitrate + Nitrite, as N	NA NA	mg/l		< 0.10	1.6	1.2	4.3	4.3	4.9	4.8	4.4	2.8		2.9	2.7	2.8	2.2	2.3	2.3	2.2 *	3.1	1.4	1.2	< 0.10	0.33
Sulfate, as SO4	NA NA	mg/l		4.3 i	12.7	10.5	12.8	13.1	13.1	14.0	13.2	14.7		14.7	14.2	14.1	13.6	13.8	14.2	14.0	31.0	22.5	10.9	48.2	22.8
Metals	INA	mg/i		4.0]	12.1	10.5	12.0	13.1	13.1	14.0	13.2	14.7	14.5	14.7	14.2	14.1	13.0	13.0	14.2	14.0	31.0	22.5	10.9	40.2	22.0
Calcium	Dissolved	mg/l																							
Magnesium	Dissolved	mg/l																							
Potassium	Dissolved	mg/l																							
Sodium	Dissolved	mg/l									-														
Calcium	Total	mg/l		1.15	19.6	13.2	14.6	15.0	16.4	16.1	14.5	16.0		16.8	15.7	16.5	18.3	18.0	18.3	19.0	42.6	17.7	31.3	29.1	39.0
Magnesium	Total	mg/l		0.323	3.15	2.33	2.46	2.48	2.71	2.84	2.65	2.97		3.14	2.92	3.08	3.26	3.21	3.27	3.37	2.64	3.17	6.01	11.5	7.40
Potassium	Total	mg/l		0.768 j	3.95	3.07	2.98	2.79	3.27	3.39	3.56	2.07		2.31	1.99	2.14	2.45	2.39	2.43	2.57	1.78	1.18	2.38	2.97	5.10
Sodium	Total	mg/l		25.2	256	134	47.7	47.9	66.8	77.2	77.2	48.8		53.0	49.7	52.4	58.1	58.9	61.4	64.4	6.65	10.9	41.9	12.3	140
VOCs	rotai	mg/i		20.2	200	101		17.0	00.0	77.2	77.2	10.0	00.0	00.0	10.7	02.1	00.1	00.0	01.1	0 1. 1	0.00	10.0	11.0	12.0	110
1,1-Dichloroethane	NA	ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.7 j	< 1
1,1-Dichloroethylene	NA	ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.8 j	< 1
Acetone	NA	ug/l		< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20		< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	20
Bromodichloromethane	NA	ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.6 j	< 1	< 1
Carbon disulfide	NA	ug/l		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorodibromomethane	NA	ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.6 j	< 1	< 1
Chloroform	NA	ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl tertiary butyl ether (MTBE)	NA	ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tentatively Identified Compounds	NA	ug/l		0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC								
Tetrachloroethylene	NA	ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	0.5 j	3	< 1
Trichloroethylene	NA	ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	4	< 1
Perfluorinated Compounds																									
Perfluorooctane sulfonate (PFOS)	NA	ng/l		15	37	19	6 j	7	10	11	10	5 j	< 10	< 10	5 j*	< 10	< 10	< 10	< 10	< 10	4 j*	< 10 *	3 ј	3 j*	< 6 *
Perfluorooctanoic acid (PFOA)	NA	ng/l		30	66	45	86	76	130	110	110	60	60	60	65 *	65	45	48 *	47 *	45	110 *	75 *	56 *	12 *	23 *
PFOS + PFOA, Calculated	NA	ng/l	70	45	103	64	92 a	83	140	121	120	65 a	60	60	70 a	65	45	48 a	47 a	45	114 a	75 a	59 a	15 a	23 a
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l		< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 8	< 8	< 8	< 8 *	< 8	< 8 *	< 8	< 8	< 8					
Perfluorobutane sulfonate (PFBS)	NA	ng/l		20	10	9	7	7	7 *	7	6 *	4 j	4 j	4 j	< 10	< 10	< 10	< 10	< 10	< 10	1 j	< 10 *	2 j	4	5 *
Perfluorobutanoic acid (PFBA)	NA	ng/l		4 j	7 j	5 j	4 j	4 j	6 j	6 j	5 j	5 j	5 j	4 j	5 j*	5 j	5 j*	5 j*	5 j	5 j	11 *	8 j*	6 j*	11 *	4 j*
Perfluorodecanoic acid (PFDA)	NA	ng/l		3	5	0.7 j	< 2	< 2	0.7 j	0.7 j	0.6 j	< 2	< 2	< 2	< 2 *	< 2	< 2 *	< 2 *	< 2 *	< 2	< 2 *	< 2	1 j*	0.7 j	< 2 *
Perfluorododecanoic acid (PFDoA)	NA	ng/l		< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 5 *	< 5 *	< 5 *	< 5 *	< 5	< 5 *	< 5 *	< 5 *	< 5	< 2 *	< 5 *	2 j*	< 2 *	< 2 *
Perfluoroheptanoic acid (PFHpA)	NA	ng/l		10	23	11	13	13	16	20	18	10	9	9	9 *	8	8 *	7 *	8	8	16 *	10	10 *	14 *	7 *
Perfluorohexane sulfonate (PFHxS)	NA	ng/l		6	9	6	2 jb	3 jb	4	4 b	3	< 10		< 10 *	< 10 *	< 10	< 10 *	< 10 *	< 10 *	< 10	3 j*	< 10 *	2 j*	7 *	1 j*
Perfluorohexanoic acid (PFHxA)	NA	ng/l		26	48	18	13 b	15	20	21	19	11	-	10 *	10 *	12	10 *	10 *	10 *	10	23	15 *	10 *	17	8 *
Perfluorononanoic acid (PFNA)	NA	ng/l		7	3	3	0.9 j	0.9 j	1 j	1 j	1 j	< 2	< 2	< 2	< 2 *	< 2	< 2	< 2 *	< 2 *	< 2	0.7 j*	< 2	0.8 j	0.7 j*	< 2 *
Perfluoropentanoic acid (PFPeA)	NA	ng/l		9	17	7	9	9	12	12 *	11 *	7	7	7	7	8	8	7 *	7	7	14	10 *	11	24	8 *
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l		< 2	< 2	0.9 j*	< 2 *	< 2 *	< 2	< 2	< 2	< 5	< 5 *	< 5 *	< 5 *	< 5	< 5 *	< 5 *	< 5 *	< 5	< 2 *	< 5 *	1 j	0.6 j*	< 2 *
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l		< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 4	< 4	< 4	< 4 *	< 4	< 4	< 4 *	< 4	< 4	< 2 *	< 4	2 j*	< 2	< 2 *
Perfluoroundecanoic acid (PFUnA)	NA	ng/l		< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 4	< 4	< 4 *	< 4 *	< 4	< 4 *	< 4 *	< 4 *	< 4	< 3 *	< 4 *	2 j*	< 3 *	< 3 *

			Location	45-10	AE 44	45-1A	45-28	45-2A	45.24	4E 4A	45-5	- Λ	45-6	45-7	45-8	45.0	CWD=Dab	CWD	SWMidBa	h CWIInDah	CWILITA
					45-11			-	45-3A	45-4A				-		45-9	SWDnBab	SWDnr			•
			Date	11/10/2016	11/11/2016	11/10/2016	11/09/2016	11/10/2016	11/09/2016	11/08/2016	11/09/	2016	11/08/2016	11/08/2016	11/08/2016	11/08/2016	11/07/2016	11/07/2016	11/07/201	6 11/08/2016	11/08/2016
			Depth																		4
			Sample Type	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N FI	N	N
	Total or	T T	Comparison																		4
Parameter	Dissolved	Units	Criteria																		
Exceedance Key			Bold																		+
General Parameters																					+
Alkalinity, bicarbonate, as CaCO3	NA	mg/l		16.7	20.4	10.3	2.7 j	21.9	34.4	24.6	28.8	26.9	21.0	20.4	21.8	17.1	12.7	8.7	12.7 11	6 11.8 *	5.4
Alkalinity, total, as CaCO3	NA	mg/l		16.7	20.4	10.3	2.7 j	21.9	34.4	24.6	28.8		21.0	20.4	21.8	17.1	12.7	8.7	12.7 11		5.4
Chloride	NA	mg/l		155	303	319	138	285	99.4	91.1		119	114	96.0	113	79.3	80.8	14.3 *	79.2 83	8 84.2	18.6
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l		1.0	1.2	0.91	0.53	0.98	0.39	3.5		1.9	2.2	3.0 *	2.3	3.6	0.17	0.20	0.19 0.1		0.20
Sulfate, as SO4	NA	mg/l		10.3	9.9	10.7	6.1	11.6	12.0	13.2	11.3		13.6	11.4	13.9	12.9	29.5	5.2 *	30.4 29	8 30.7	6.4
Metals		Ŭ																			
Calcium	Dissolved	mg/l																			
Magnesium	Dissolved	mg/l																			
Potassium	Dissolved	mg/l																			
Sodium	Dissolved	mg/l								-											
Calcium	Total	mg/l		21.0	40.9	30.4	18.0	15.0	14.8	12.4	25.9	25.2	15.9	16.6	16.2	13.8	15.3	4.39	14.8 15	0 14.9	3.90
Magnesium	Total	mg/l		3.69	9.79	6.44	3.17	2.50	3.10	2.30	5.56	5.40	2.87	3.23	2.87	2.41	3.52	0.957	3.42 3.4	5 3.45	0.842
Potassium	Total	mg/l		1.93	3.63	5.80	2.23	2.51	2.49	1.86	2.73	2.62	2.19	2.37	1.98	2.16	2.99	1.19	2.92 2.9	6 2.83	1.08
Sodium	Total	mg/l		74.7	134	159	50.3	158	61.2	55.3	56.9	55.0	61.4	52.7	55.6	49.9	46.7	12.5	44.7 45	3 44.4	11.7
VOCs																					
1,1-Dichloroethane	NA	ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	<1 <	< 1	< 1
1,1-Dichloroethylene	NA	ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	<1 <	l <1	< 1
Acetone	NA	ug/l		< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20 < 2	0 < 20	< 20
Bromodichloromethane	NA	ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	<1 <	< 1	< 1
Carbon disulfide	NA	ug/l		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5 <	5 < 5	< 5
Chlorodibromomethane	NA	ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	<1 <	l <1	< 1
Chloroform	NA	ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	<1 <	l < 1	< 1
Methyl tertiary butyl ether (MTBE)	NA	ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	<1 <	l <1	< 1
Tentatively Identified Compounds	NA	ug/l		0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC	0 TIC 0 T	C 0 TIC	0 TIC						
Tetrachloroethylene	NA	ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	<1 <		< 1
Trichloroethylene	NA	ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	<1 <	l <1	< 1
Perfluorinated Compounds																					
Perfluorooctane sulfonate (PFOS)	NA	ng/l		< 6 *	< 10	< 6 *	3 j*	16 *	9 *	4 j*	,	2 j*	3 j*	4 j	3 j*	8 *	4 j	< 6	4 j* 5		< 6 *
Perfluorooctanoic acid (PFOA)	NA	ng/l		17 *	32	26 *	59 *	26 *	140 *	82 *		59 *	49 *	58	52 *	93 *	13 *	3 b	12 * 11		3 b*
PFOS + PFOA, Calculated	NA	ng/l	70	17 a	32	26 a	62 a	42 a	149 a	86 a	65 a	61 a	52 a	62 a	55 a	101 a	17 a	3 a	16 a 16		3 a
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l																			
Perfluorobutane sulfonate (PFBS)	NA	ng/l		1 j*	< 10	6 *	4 *	4 *	7 *	6		3 *	3 *	4	4 *	6	3	< 2	3 2		1 j
Perfluorobutanoic acid (PFBA)	NA	ng/l		< 10 *	5 j	5 j*	5 j*	6 j*	7 j*	5 j*	,	5 j*	4 j*	5 j	5 j*	6 j*	7 j	< 10	7 j* 6		< 10 *
Perfluorodecanoic acid (PFDA)	NA	ng/l		< 2 *	< 2	< 2 *	< 2 *	0.6 j*	< 2 *	< 2 *		< 2 *	< 2 *	< 2	< 2 *	< 2 *	< 2 *	< 2	< 2 * < 2		< 2 *
Perfluorododecanoic acid (PFDoA)	NA	ng/l		< 2 *	< 5	< 2 *	< 2 *	< 2 *	< 2 *	< 2 *		< 2 *	< 2 *	< 2	< 2 *	< 2 *	< 2 *	< 2	< 2 * < 2		< 2 *
Perfluoroheptanoic acid (PFHpA)	NA	ng/l		3 *	8	7 *	10 *	9 *	22 *	15 *	10 *	9 *	9 *	11	11 *	15 *	4 b*	1 jb	3 b* 4 l		2 b*
Perfluorohexane sulfonate (PFHxS)	NA	ng/l		1 j*	< 10	1 j*	3 *	1 j*	4	4 b		3 j*	2 j	3 b	3 b*	6 b*	2 jb	< 3	2 jb* 2 j		< 3 *
Perfluorohexanoic acid (PFHxA)	NA	ng/l		4 *	11	10 *	12 *	12 *	19 *	14 b*		11 *	9 b*	13 b*	11 b*	19 b*	5 b*	2 jb	5 b* 5 l		2 jb*
Perfluorononanoic acid (PFNA)	NA	ng/l		< 2 *	< 2	< 2 *	< 2	2 *	1 j*	0.6 j*		< 2 *	< 2 *	0.7 j	< 2 *	0.8 j*	< 2	< 2	0.8 j* < 2		< 2 *
Perfluoropentanoic acid (PFPeA)	NA	ng/l		4	10	8 *	9	13 *	12 *	9		8 *	7 *	8	8 *	10	3 b	2 jb	4 b 5		2 jb
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l		< 2 *	< 5	< 2 *	0.9 j*	< 2 *	< 2 *	< 2 *		< 2 *	< 2 *	< 2	< 2 *	< 2 *	< 2 *	< 2 *	< 2 * < 2		< 2 *
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l		< 2 *	< 4	< 2 *	< 2	< 2 *	< 2 *	< 2 *		< 2 *	< 2 *	< 2	< 2 *	< 2 *	< 2	< 2	< 2 * < 2		< 2 *
Perfluoroundecanoic acid (PFUnA)	NA	ng/l		< 3 *	< 4 *	< 3 *	< 3 *	< 3 *	< 3 *	< 3 *	< 3 *	< 3 *	< 3 *	< 3	< 3 *	< 3 *	< 3 *	< 3	< 3 * < 3	* < 3 *	< 3 *

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

	Not analyzed/Not available.
N	Sample Type: Normal
FD	Sample Type: Field Duplicate
ND	Not detected.
TIC	Tentatively identified compound.
*	Estimated value, QA/QC criteria not met.
а	Estimated value, calculated using some or all values that are estimates.
b	Potential false positive value based on blank data validation procedures. Concentrations identified as potential false positive are excluded from calculations.
j	Estimated detected value. The reported value is less than the stated laboratory quantitation limit but greater than the laboratory method detection limit.

	L	Location	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
		Date	10/17/2016	10/17/2016	10/18/2016	10/18/2016	10/20/2016	10/20/2016	10/20/2016	10/20/2016	10/21/2016	10/21/2016	10/24/2016	10/24/2016	10/24/2016
	Samı	ple Type	Rinsate Blank	Equipment Blank	Trip Blank	Trip Blank	Trip Blank	Equipment Blank	Lab Blank	Trip Blank	Rinsate Blank	Rinsate Blank	Trip Blank	Equipment Blank	Trip Blank
	Total or														
Parameter	Dissolved	Units													
General Parameters															
Alkalinity, bicarbonate, as CaCO3	NA	mg/l		15.9											
Alkalinity, total, as CaCO3	NA	mg/l mg/l mg/l mg/l		15.9											
Chloride	NA	mg/l		2.0					< 0.20						
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l		0.56											
Sulfate, as SO4	NA	mg/l		3.3					< 0.30						
Metals															
Calcium	Total	mg/l		4.59											
Magnesium	Total	mg/l		1.05											
Potassium	Total	mg/l		0.572 j											
Sodium	Total	mg/l		2.36											
VOCs															
Carbon disulfide	NA	ug/l		12	< 1		< 1						< 1		
Chloromethane	NA	ug/l		< 0.5	< 0.5		< 0.5						< 0.5		
Tentatively Identified Compounds	NA	ug/l		< 0 TIC	< 0 TIC		< 0 TIC						< 0 TIC		
Perfluorinated Compounds															
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l	< 1 *	< 1 *	< 1 *	< 1	< 1	< 1 b*		< 1	< 1	< 1	< 1	< 1	< 1
Perfluorobutane sulfonate (PFBS)	NA	ng/l	< 0.7 *	< 0.7 *	< 0.7 *	< 0.7 *	1 jb	< 0.7 b		< 0.7 b	1 jb	1 jb*	< 0.7	< 0.7	< 0.7
Perfluorobutanoic acid (PFBA)	NA	ng/l	4 jb*	6 jb*	7 jb*	6 jb*	8 jb	4 jb*		4 jb	5 jb	4 jb*	5 jb	3 jb	3 jb
Perfluorodecanoic acid (PFDA)	NA	ng/l	< 0.5 *	< 0.5 *	0.9 j*	< 0.5 *	3 b	< 0.5 b*		< 0.5 b	< 0.5 b	< 0.5 b*	< 0.5	< 0.5	< 0.5
Perfluorododecanoic acid (PFDoA)	NA	ng/l	< 0.5 *	< 0.5 *	2 j*	0.5 j*	< 0.5 b	< 0.5 b*		< 0.5 b	< 0.5 b	< 0.5 b*	< 0.5	< 0.5	3
Perfluoroheptanoic acid (PFHpA)	NA	ng/l	< 0.5 *	0.6 jb*	0.7 j*	< 0.5 *	7 b	1 jb		0.7 jb	1 jb	0.9 jb*	< 0.5	< 0.5	1 j
Perfluorohexane sulfonate (PFHxS)	NA	ng/l	< 1 *	< 1 *	< 1 *	< 1 *	19 b	< 1 b		< 1 b	2 jb	1 jb	< 1	< 1	< 1
Perfluorohexanoic acid (PFHxA)	NA	ng/l	0.7 j*	0.9 jb*	0.7 j*	0.6 j*	6 b	1 jb		0.5 jb	1 jb	2 jb*	< 0.5	0.8 jb	0.5 jb
Perfluorononanoic acid (PFNA)	NA	ng/l	< 0.6 *	< 0.6 *	4 *	< 0.6 *	< 0.6 b	< 0.6 b*		< 0.6 b	< 0.6 b	< 0.6 b*	< 0.6	< 0.6	< 0.6
Perfluorooctane sulfonate (PFOS)	NA	ng/l ng/l ng/l	< 2 *	< 2 *	5 j*	< 2 *	89 b	< 2 b		< 2 b	2 jb	< 2 b	< 2	< 2	< 2
Perfluorooctanoic acid (PFOA)	NA	ng/l	3 b*	3 b*	2 jb*	2 jb*	150 b	3 b		3 b	12 b	2 b*	1 jb	2 b	3 b
Perfluoropentanoic acid (PFPeA)	NA	ng/l	1 jb*	1 jb*	0.8 jb*	0.7 jb*	0.8 jb	0.7 jb*		< 0.5 b	0.8 jb	0.7 jb*	0.6 jb	0.7 jb	1 jb
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l	3 *	1 jb*	3 *	2 j*	25 b	0.8 jb*		11 b	0.8 jb	0.9 jb*	< 0.5	< 0.5	12 b
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l	< 0.5 *	< 0.5 *	2 j*	< 0.5 *	< 0.5 b	< 0.5 b*		< 0.5 b	< 0.5 b	< 0.5 b*	2 j	< 0.5	8
Perfluoroundecanoic acid (PFUnA)	NA	ng/l	< 1 *	<1*	< 1 *	< 1 *	6 b	< 1 b*		< 1 b	< 1 b	< 1 b*	<1	<1	1 j

	L	ocation	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
		Date	10/26/2016	10/27/2016	10/27/2016	10/27/2016	10/27/2016	10/27/2016	10/27/2016	10/28/2016	10/28/2016	10/28/2016	10/30/2016	10/30/2016	10/31/2016
	Samp	le Type	Equipment Blank	Trip Blank	Lab Blank	Lab Blank	Trip Blank	Equipment Blank	Lab Blank	Trip Blank	Trip Blank	Lab Blank	Lab Blank	Lab Blank	Trip Blank
Parameter	Total or Dissolved	Units													
General Parameters															
Alkalinity, bicarbonate, as CaCO3	NA	mg/l						26.9							
Alkalinity, total, as CaCO3	NA	mg/l						26.9				< 1.7		-	
Chloride	NA	mg/l mg/l						23.2							
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l			< 0.040			0.20						< 0.040	
Sulfate, as SO4	NA	mg/l						5.3							
Metals															
Calcium	Total	mg/l						7.83	< 0.0382						
Magnesium	Total	mg/l						1.49	< 0.0190						
Potassium	Total	mg/l						0.829 j	< 0.160						
Sodium	Total	mg/l						19.3	< 0.173						
VOCs															
Carbon disulfide	NA	ug/l		< 1		< 1		< 1		< 1			< 1		< 1
Chloromethane	NA	ug/l		< 0.5		< 0.5		< 0.5		< 0.5			< 0.5		< 0.5
Tentatively Identified Compounds	NA	ug/l		< 0 TIC				< 0 TIC		< 0 TIC				-	< 0 TIC
Perfluorinated Compounds															
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l	< 5 *	< 5			< 5	< 5 *		< 1	< 1 *			-	< 5
Perfluorobutane sulfonate (PFBS)	NA	ng/l	< 4	< 4			< 4	< 4		< 0.7	< 0.7			1	< 4
Perfluorobutanoic acid (PFBA)	NA	ng/l ng/l ng/l	< 3	< 3			< 3	< 3		< 3	< 3				< 3
Perfluorodecanoic acid (PFDA)	NA	ng/l	< 1	< 1			< 1	< 1		< 0.5	< 0.5			1	< 1
Perfluorododecanoic acid (PFDoA)	NA	ng/l	< 3 *	< 3			< 3	< 3 *		< 0.5	< 0.5			1	< 3
Perfluoroheptanoic acid (PFHpA)	NA	ng/l	< 1	< 1			< 1	< 1		< 0.5	< 0.5			1	< 1
Perfluorohexane sulfonate (PFHxS)	NA	ng/l	< 4	< 4			< 4	< 4		< 1	< 1			1	< 4
Perfluorohexanoic acid (PFHxA)	NA	ng/l	< 1	< 1			< 1	< 1		< 0.5	< 0.5			1	< 1
Perfluorononanoic acid (PFNA)	NA	ng/l	< 1	< 1			< 1	< 1		< 0.6	< 0.6				< 1
Perfluorooctane sulfonate (PFOS)	NA	ng/l ng/l ng/l ng/l	< 5	< 5			< 5	< 5		< 2	< 2			-	< 5
Perfluorooctanoic acid (PFOA)	NA	ng/l	< 1	< 1			< 1	< 1		< 0.5	< 0.5			-	< 1
Perfluoropentanoic acid (PFPeA)	NA	ng/l	< 1	< 1			< 1	< 1		< 0.5	< 0.5				< 1
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l ng/l ng/l	< 3 *	< 3			< 3	< 3 *		< 0.5	< 0.5 *			-	< 3
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l ng/l	< 2	< 2			< 2	< 2		< 0.5	< 0.5			-	< 2
Perfluoroundecanoic acid (PFUnA)	NA	ng/l	< 2 *	< 2			< 2	< 2 *		< 1	< 1				< 2

			22	22	20	22	22	1 00 1	22				20	22	22
	L	ocation.	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
		Date	10/31/2016	10/31/2016	10/31/2016	11/01/2016	11/01/2016	11/01/2016	11/01/2016	11/01/2016	11/01/2016	11/01/2016	11/02/2016	11/02/2016	11/03/2016
	Samp	ole Type	Lab Blank	Trip Blank	Lab Blank	Lab Blank	Lab Blank	Rinsate Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Trip Blank
	Total or														
Parameter	Dissolved	Units													
General Parameters															
Alkalinity, bicarbonate, as CaCO3	NA	mg/l													
Alkalinity, total, as CaCO3	NA	mg/l				1.8 j	1.8 j					< 1.7	2.8 j		
Chloride	NA	mg/l													
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l													
Sulfate, as SO4	NA	mg/l													
Metals															
Calcium	Total	mg/l			< 0.0382										
Magnesium	Total	mg/l			< 0.0190										
Potassium	Total	mg/l			< 0.160										
Sodium	Total	mg/l			< 0.173										
VOCs															
Carbon disulfide	NA	ug/l									< 1			< 1	< 1
Chloromethane	NA	ug/l									< 0.5			0.8 j	< 0.5
Tentatively Identified Compounds	NA	ug/l													< 0 TIC
Perfluorinated Compounds															
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l	< 1 *	< 5				< 5	< 1	< 1					< 1
Perfluorobutane sulfonate (PFBS)	NA	ng/l	< 0.7 *	< 4				< 4	< 0.7 b	< 0.7					< 0.7
Perfluorobutanoic acid (PFBA)	NA	ng/l	5 j*	< 3				< 3	6 jb	4 j					< 3
Perfluorodecanoic acid (PFDA)	NA	ng/l	< 0.5 *	< 1				< 1	< 0.5 b	< 0.5					< 0.5
Perfluorododecanoic acid (PFDoA)	NA	ng/l	< 0.5 *	< 3				< 3	< 0.5 b	< 0.5					< 0.5
Perfluoroheptanoic acid (PFHpA)	NA	ng/l	< 0.5 *	< 1				< 1	< 0.5 b	< 0.5					< 0.5
Perfluorohexane sulfonate (PFHxS)	NA	ng/l	< 1 *	< 4				< 4	< 1 b	< 1					< 1
Perfluorohexanoic acid (PFHxA)	NA	ng/l	< 0.5 *	< 1				< 1	0.5 jb	0.6 j					< 0.5
Perfluorononanoic acid (PFNA)	NA	ng/l	< 0.6 *	< 1				< 1	< 0.6 b	< 0.6					< 0.6
Perfluorooctane sulfonate (PFOS)	NA	ng/l	< 2 *	< 5				< 5	< 2 b	< 2					< 2
Perfluorooctanoic acid (PFOA)	NA	ng/l	1 j*	< 1				2 j	1 jb	1 j					< 0.5
Perfluoropentanoic acid (PFPeA)	NA	ng/l	0.5 j*	< 1				< 1	< 0.5 b	0.5 j					< 0.5
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l	< 0.5 *	< 3				< 3	< 0.5 b	< 0.5					< 0.5
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l	< 0.5 *	< 2				< 2	< 0.5 b	< 0.5					< 0.5
Perfluoroundecanoic acid (PFUnA)	NA	ng/l	< 1 *	< 2				< 2	< 1 b	< 1					< 1

				20		1 00	22		1 00		1 00	1 00		22	1 00 D 1 1D:
	L	ocation.	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC-PolandDis
		Date	11/03/2016	11/03/2016	11/04/2016	11/04/2016	11/04/2016	11/04/2016	11/05/2016	11/05/2016	11/05/2016	11/07/2016	11/07/2016	11/07/2016	11/08/2016
	Samp	ole Type	Trip Blank	Lab Blank	Lab Blank	Rinsate Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Blank
Parameter	Total or Dissolved	Units													
General Parameters															
Alkalinity, bicarbonate, as CaCO3	NA	mg/l													
Alkalinity, total, as CaCO3	NA	mg/l					< 1.7	< 1.7	1.7 j				2.9 j	2.8 j	
Chloride	NA	mg/l mg/l mg/l										< 0.20			
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l		< 0.040											
Sulfate, as SO4	NA	mg/l										< 0.30			
Metals															
Calcium	Total	mg/l			< 0.0382					0.0383 j					
Magnesium	Total	mg/l			< 0.0190					0.0334 j					
Potassium	Total	mg/l			< 0.160					< 0.160					
Sodium	Total	mg/l			< 0.173					0.291 j					
VOCs															
Carbon disulfide	NA	ug/l									< 1				
Chloromethane	NA	ug/l									< 0.5				
Tentatively Identified Compounds	NA	ug/l													
Perfluorinated Compounds															
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l	< 1			< 1 *									
Perfluorobutane sulfonate (PFBS)	NA	ng/l	< 0.7			< 0.7 *									< 2 *
Perfluorobutanoic acid (PFBA)	NA	ng/l ng/l ng/l	< 3			< 3									< 10 *
Perfluorodecanoic acid (PFDA)	NA	ng/l	< 0.5			< 0.5									< 2 *
Perfluorododecanoic acid (PFDoA)	NA	ng/l	< 0.5			< 0.5 *									< 2 *
Perfluoroheptanoic acid (PFHpA)	NA	ng/l	1 j			1 j									2 j*
Perfluorohexane sulfonate (PFHxS)	NA	ng/l	< 1			2 j									2 j*
Perfluorohexanoic acid (PFHxA)	NA	ng/l	3			2									4 b*
Perfluorononanoic acid (PFNA)	NA	ng/l	< 0.6			< 0.6 *									< 2 *
Perfluorooctane sulfonate (PFOS)	NA	ng/l	< 2			< 2									< 6 *
Perfluorooctanoic acid (PFOA)	NA	ng/l	0.9 j			3									2 *
Perfluoropentanoic acid (PFPeA)	NA	ng/l	0.6 j			0.7 j									1 j*
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l ng/l ng/l ng/l ng/l ng/l ng/l ng/l	< 0.5			< 0.5 *									< 2 *
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l	< 0.5			< 0.5									< 2 *
Perfluoroundecanoic acid (PFUnA)	NA	ng/l	< 1			< 1 *									< 3 *

		ocation	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
	_						• •								
		Date	11/08/2016	11/08/2016	11/08/2016	11/08/2016	11/08/2016	11/08/2016	11/08/2016	11/09/2016	11/09/2016	11/09/2016	11/09/2016	11/09/2016	11/09/2016
	Samp	ole Type	Trip Blank	Lab Blank	Lab Blank	Rinsate Blank	Trip Blank	Rinsate Blank	Equipment Blank	Trip Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Equipment Blank
Parameter	Total or Dissolved	Units													
General Parameters															
Alkalinity, bicarbonate, as CaCO3	NA	mg/l							< 1.7						< 1.7
Alkalinity, total, as CaCO3	NA	mg/l mg/l mg/l mg/l							< 1.7						< 1.7
Chloride	NA	mg/l		< 0.20	< 0.20				< 0.20						< 0.20
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l							< 0.040		< 0.040	< 0.040	< 0.040	< 0.040	0.056 j
Sulfate, as SO4	NA	mg/l		< 0.30	< 0.30				< 0.30						< 0.30
Metals															
Calcium	Total	mg/l							0.0896 j						< 0.0382
Magnesium	Total	mg/l							< 0.0190						< 0.0190
Potassium	Total	mg/l							< 0.160						< 0.160
Sodium	Total	mg/l							0.229 j						< 0.173
VOCs															
Carbon disulfide	NA	ug/l	< 1						< 1	< 1					< 1
Chloromethane	NA	ug/l	< 0.5						< 0.5	< 0.5					< 0.5
Tentatively Identified Compounds	NA	ug/l	0 TIC						0 TIC	< 0 TIC					< 0 TIC
Perfluorinated Compounds															
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l													
Perfluorobutane sulfonate (PFBS)	NA	ng/l ng/l	< 0.7			< 0.7 *	< 0.7 *	< 0.7	< 0.7 *	< 0.7 *					< 0.7 *
Perfluorobutanoic acid (PFBA)	NA	ng/l	< 3			< 3 *	< 3 *	< 3	< 3 *	< 3					< 3 *
Perfluorodecanoic acid (PFDA)	NA	ng/l	< 0.5			< 0.5 *	< 0.5 *	< 0.5	< 0.5 *	< 0.5 *					< 0.5 *
Perfluorododecanoic acid (PFDoA)	NA	ng/l	< 0.5			< 0.5 *	< 0.5 *	< 0.5 *	< 0.5 *	< 0.5 *					< 0.5 *
Perfluoroheptanoic acid (PFHpA)	NA	ng/l	< 0.5			< 0.5 *	< 0.5 *	< 0.5	< 0.5 *	< 0.5					< 0.5
Perfluorohexane sulfonate (PFHxS)	NA	ng/l	< 1			< 1 *	< 1 *	< 1	< 1 *	< 1					< 1
Perfluorohexanoic acid (PFHxA)	NA	ng/l	< 0.5			0.6 jb*	< 0.5 b*	< 0.5 b*	< 0.5 b	< 0.5					< 0.5
Perfluorononanoic acid (PFNA)	NA	ng/l	< 0.6			< 0.6 *	< 0.6 *	< 0.6	< 0.6 *	< 0.6					< 0.6 *
Perfluorooctane sulfonate (PFOS)	NA	ng/l	< 2			< 2 *	< 2 *	< 2	< 2 *	< 2					< 2 *
Perfluorooctanoic acid (PFOA)	NA	ng/l	< 0.5			< 0.5 *	< 0.5 *	< 0.5	< 0.5 *	< 0.5					< 0.5
Perfluoropentanoic acid (PFPeA)	NA	ng/l	< 0.5			< 0.5 *	< 0.5 *	< 0.5	< 0.5 *	< 0.5					< 0.5 *
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l	< 0.5			< 0.5 *	< 0.5 *	< 0.5 *	< 0.5 *	< 0.5 *					< 0.5 *
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l	< 0.5			< 0.5 *	< 0.5 *	< 0.5	< 0.5 *	< 0.5					< 0.5
Perfluoroundecanoic acid (PFUnA)	NA	ng/l	< 1			< 1 *	< 1 *	< 1	< 1 *	< 1 *					< 1 *

											••				
	L	ocation	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
		Date	11/09/2016	11/09/2016	11/09/2016	11/09/2016	11/10/2016	11/10/2016	11/10/2016	11/10/2016	11/10/2016	11/10/2016	11/11/2016	11/11/2016	11/11/2016
	Samı	ole Type	Trip Blank	Lab Blank	Lab Blank	Lab Blank	Trip Blank	Rinsate Blank	Trip Blank	Lab Blank	Lab Blank	Rinsate Blank	Trip Blank	Trip Blank	Lab Blank
	Total or														
Parameter	Dissolved	Units													
General Parameters															
Alkalinity, bicarbonate, as CaCO3	NA	mg/l mg/l mg/l					-								
Alkalinity, total, as CaCO3	NA	mg/l													
Chloride	NA	mg/l					-			< 0.20	< 0.20		-		
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l mg/l					-								
Sulfate, as SO4	NA	mg/l								< 0.30	< 0.30				
Metals															
Calcium	Total	mg/l				< 0.0382	-								
Magnesium	Total	mg/l				< 0.0190	-								
Potassium	Total	mg/l				< 0.160									
Sodium	Total	mg/l				< 0.173									
VOCs															
Carbon disulfide	NA	ug/l		< 1			< 1						< 1		< 1
Chloromethane	NA	ug/l		< 0.5			< 0.5						< 0.5		< 0.5
Tentatively Identified Compounds	NA	ug/l					< 0 TIC						< 0 TIC		
Perfluorinated Compounds															
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l			< 5		-								
Perfluorobutane sulfonate (PFBS)	NA	ng/l	< 0.7 *		< 4		< 0.7 *	< 0.7 *	< 0.7 *			< 0.7 *	< 4 *	< 4 *	
Perfluorobutanoic acid (PFBA)	NA	ng/l	< 3 *		< 3		< 3	< 3	< 3 *			< 3 *	< 3 *	< 3	
Perfluorodecanoic acid (PFDA)	NA	ng/l	< 0.5 *		< 1		< 0.5	< 0.5 *	< 0.5			< 0.5 *	< 1	< 1	
Perfluorododecanoic acid (PFDoA)	NA	ng/l ng/l ng/l	< 0.5 *		< 3		< 0.5	< 0.5 *	< 0.5 *			< 0.5 *	< 3 *	< 3 *	
Perfluoroheptanoic acid (PFHpA)	NA	ng/l	< 0.5 *		< 1		< 0.5	< 0.5	< 0.5 *			< 0.5 *	< 1	< 1	
Perfluorohexane sulfonate (PFHxS)	NA	ng/l	< 1 *		< 4 *		< 1	< 1	< 1 *			< 1 *	< 4 *	< 4 *	
Perfluorohexanoic acid (PFHxA)	NA	ng/l	< 0.5 *		< 1		< 0.5	< 0.5	< 0.5 *			< 0.5 *	< 1	< 1 *	
Perfluorononanoic acid (PFNA)	NA	ng/l ng/l ng/l ng/l ng/l ng/l	< 0.6 *		< 1		< 0.6	< 0.6	< 0.6			< 0.6 *	< 1	< 1	
Perfluorooctane sulfonate (PFOS)	NA	ng/l	< 2 *		< 5		< 2	< 2	< 2 *			< 2 *	< 5	< 5	
Perfluorooctanoic acid (PFOA)	NA	ng/l	< 0.5 *		< 1		< 0.5	< 0.5	< 0.5 *			< 0.5 *	< 1 *	< 1	
Perfluoropentanoic acid (PFPeA)	NA	ng/l	< 0.5 *		< 1		< 0.5	< 0.5	< 0.5 *			< 0.5 *	< 1 *	< 1 *	
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l	< 0.5 *		< 3		< 0.5 *	< 0.5 *	< 0.5 *			< 0.5 *	< 3 *	< 3 *	
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l	< 0.5 *		< 2		< 0.5	< 0.5	< 0.5 *			< 0.5 *	< 2	< 2	
Perfluoroundecanoic acid (PFUnA)	NA	ng/l	< 1 *		< 2		< 1	< 1 *	< 1 *			< 1 *	< 2 *	< 2 *	

								1	1 22					22
	L	ocation.	QC											
		Date	11/11/2016	11/11/2016	11/12/2016	11/12/2016	11/12/2016	11/14/2016	11/14/2016	11/14/2016	11/14/2016	11/14/2016	11/14/2016	11/16/2016
	Samp	ole Type	Lab Blank	Trip Blank	Lab Blank	Trip Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank				
	Total or													
Parameter	Dissolved	Units												
General Parameters														
Alkalinity, bicarbonate, as CaCO3	NA	mg/l												
Alkalinity, total, as CaCO3	NA	mg/l			3.1 j	3.2 j	3.2 j					< 1.7	< 1.7	
Chloride	NA	mg/l		< 0.20									-	
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l							< 0.040					< 0.040
Sulfate, as SO4	NA	mg/l		< 0.30									-	
Metals														
Calcium	Total	mg/l												
Magnesium	Total	mg/l												
Potassium	Total	mg/l												
Sodium	Total	mg/l												
VOCs														
Carbon disulfide	NA	ug/l						< 1						
Chloromethane	NA	ug/l						< 0.5						
Tentatively Identified Compounds	NA	ug/l						< 0 TIC						
Perfluorinated Compounds														
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l	< 1					< 5		< 5	< 5			
Perfluorobutane sulfonate (PFBS)	NA	ng/l	< 0.7					< 4		< 4 *	< 4			
Perfluorobutanoic acid (PFBA)	NA	ng/l	4 j					< 3		< 3	< 3			
Perfluorodecanoic acid (PFDA)	NA	ng/l	< 0.5					< 1		< 1	< 1			
Perfluorododecanoic acid (PFDoA)	NA	ng/l	< 0.5					< 3		< 3 *	< 3			
Perfluoroheptanoic acid (PFHpA)	NA	ng/l	< 0.5					< 1		< 1	< 1			
Perfluorohexane sulfonate (PFHxS)	NA	ng/l	< 1					< 4		< 4 *	< 4			
Perfluorohexanoic acid (PFHxA)	NA	ng/l	< 0.5					< 1		< 1 *	< 1			
Perfluorononanoic acid (PFNA)	NA	ng/l	< 0.6					< 1		< 1	< 1			
Perfluorooctane sulfonate (PFOS)	NA	ng/l	< 2					< 5		< 5	< 5			
Perfluorooctanoic acid (PFOA)	NA	ng/l	< 0.5					< 1		< 1 *	< 1			
Perfluoropentanoic acid (PFPeA)	NA	ng/l	< 0.5					< 1		< 1	< 1			
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l	< 0.5					< 3 *		< 3 *	< 3			
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l	< 0.5					< 2		< 2	< 2			
Perfluoroundecanoic acid (PFUnA)	NA	ng/l	< 1					< 2		< 2	< 2			

		ocation	00	1 00	00	00	00	00	00	00	00	00	00	00
	_		QC											
		Date	11/16/2016	11/16/2016	11/16/2016	11/16/2016	11/16/2016	11/16/2016	11/17/2016	11/17/2016	11/17/2016	11/17/2016	11/18/2016	11/18/2016
	Samp	le Type	Lab Blank											
	Total or													
Parameter	Dissolved	Units												
General Parameters														
Alkalinity, bicarbonate, as CaCO3	NA	mg/l												
Alkalinity, total, as CaCO3	NA	mg/l					< 1.7	< 1.7	< 1.7	2.8 j	< 1.7		1	
Chloride	NA	mg/l				< 0.20							1	< 0.20
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l	< 0.040										< 0.040	
Sulfate, as SO4	NA	mg/l				< 0.30								< 0.30
Metals														
Calcium	Total	mg/l										< 0.0382	-	
Magnesium	Total	mg/l										< 0.0190	-	
Potassium	Total	mg/l										< 0.160		
Sodium	Total	mg/l										< 0.173		
VOCs														
Carbon disulfide	NA	ug/l												
Chloromethane	NA	ug/l												
Tentatively Identified Compounds	NA	ug/l												
Perfluorinated Compounds														
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l		< 1	<1		-						-	
Perfluorobutane sulfonate (PFBS)	NA	ng/l		< 0.7	< 0.7		-						-	
Perfluorobutanoic acid (PFBA)	NA	ng/l		< 3	< 3									
Perfluorodecanoic acid (PFDA)	NA	ng/l		< 0.5	< 0.5		-						-	
Perfluorododecanoic acid (PFDoA)	NA	ng/l		< 0.5	< 0.5								-	
Perfluoroheptanoic acid (PFHpA)	NA	ng/l		< 0.5	< 0.5								-	
Perfluorohexane sulfonate (PFHxS)	NA	ng/l		< 1	< 1		-						-	
Perfluorohexanoic acid (PFHxA)	NA	ng/l		< 0.5	< 0.5		-						-	
Perfluorononanoic acid (PFNA)	NA	ng/l		< 0.6	< 0.6								-	
Perfluorooctane sulfonate (PFOS)	NA	ng/l		< 2	< 2									
Perfluorooctanoic acid (PFOA)	NA	ng/l		< 0.5	< 0.5									
Perfluoropentanoic acid (PFPeA)	NA	ng/l		< 0.5	< 0.5									
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l		< 0.5	< 0.5								-	
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l		< 0.5	< 0.5									
Perfluoroundecanoic acid (PFUnA)	NA	ng/l		< 1	< 1								-	

										1	22			
	L	ocation	QC											
		Date	11/18/2016	11/19/2016	11/20/2016	11/20/2016	11/20/2016	11/20/2016	11/20/2016	11/21/2016	11/21/2016	11/21/2016	11/21/2016	11/21/2016
	Samp	le Type	Lab Blank											
	Total or													
Parameter	Dissolved	Units												
General Parameters														
Alkalinity, bicarbonate, as CaCO3	NA	mg/l												
Alkalinity, total, as CaCO3	NA	mg/l		< 1.7	2.4 j							< 1.7		
Chloride	NA	mg/l								< 0.20				< 0.20
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l						< 0.040	< 0.040					
Sulfate, as SO4	NA	mg/l					-			< 0.30				< 0.30
Metals														
Calcium	Total	mg/l					-				0.0508 j			
Magnesium	Total	mg/l									< 0.0190			
Potassium	Total	mg/l					-				< 0.160			
Sodium	Total	mg/l					-				< 0.173			
VOCs														
Carbon disulfide	NA	ug/l	< 1				-						< 1	
Chloromethane	NA	ug/l	< 0.5				-						< 0.5	
Tentatively Identified Compounds	NA	ug/l					-							
Perfluorinated Compounds														
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l					-							
Perfluorobutane sulfonate (PFBS)	NA	ng/l				< 0.7	< 0.7 *							
Perfluorobutanoic acid (PFBA)	NA	ng/l				< 3	< 3							
Perfluorodecanoic acid (PFDA)	NA	ng/l				< 0.5	< 0.5							
Perfluorododecanoic acid (PFDoA)	NA	ng/l				< 0.5	< 0.5							
Perfluoroheptanoic acid (PFHpA)	NA	ng/l				< 0.5	< 0.5							
Perfluorohexane sulfonate (PFHxS)	NA	ng/l				< 1	< 1							
Perfluorohexanoic acid (PFHxA)	NA	ng/l				< 0.5 b	< 0.5							
Perfluorononanoic acid (PFNA)	NA	ng/l				< 0.6	< 0.6							
Perfluorooctane sulfonate (PFOS)	NA	ng/l				< 2	< 2							
Perfluorooctanoic acid (PFOA)	NA	ng/l				< 0.5	< 0.5							
Perfluoropentanoic acid (PFPeA)	NA	ng/l				< 0.5	< 0.5							
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l				< 0.5	< 0.5 *							
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l				< 0.5	< 0.5							
Perfluoroundecanoic acid (PFUnA)	NA	ng/l				<1	<1*							

		Location	QC	QC	QC										
						• •									
		Date	11/21/2016	11/22/2016	11/23/2016	11/24/2016	11/25/2016	11/25/2016	11/25/2016	11/26/2016	1/10/2017	1/10/2017	1/12/2017	1/13/2017	1/13/2017
	Sam	ple Type	Lab Blank	Trip Blank	Trip Blank	Field Blank	Equipment Blank	Equipment Blank							
Parameter	Total or Dissolved	Units													
General Parameters	Dissolved	Ullits													
Alkalinity, bicarbonate, as CaCO3	NA	ma/l													
Alkalinity, total, as CaCO3	NA NA	mg/l	< 1.7												
Chloride	NA NA	mg/l mg/l mg/l mg/l				< 0.20			< 0.20	< 0.20					
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l													
Sulfate, as SO4	NA	mg/l				< 0.30			< 0.30	< 0.30					
Metals	107	mg/i				V 0.00			1 0.00	1 0.00					
Calcium	Total	mg/l					0.0472 j								
Magnesium	Total	mg/l					< 0.0190								
Potassium	Total	ma/l					< 0.160								
Sodium	Total	mg/l					< 0.173								
VOCs															
Carbon disulfide	NA	ug/l		< 1	< 1							< 1			
Chloromethane	NA	ug/l		< 0.5	< 0.5							< 0.5			
Tentatively Identified Compounds	NA	ug/l				-						-	-		
Perfluorinated Compounds															
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l						< 5			< 1	-	< 1 *	< 1	< 1 *
Perfluorobutane sulfonate (PFBS)	NA	ng/l						< 4			< 0.8		< 0.8 *	< 0.8 *	< 0.8
Perfluorobutanoic acid (PFBA)	NA	ng/l						< 3			< 3		< 3	< 3	< 3
Perfluorodecanoic acid (PFDA)	NA	ng/l						< 1			< 0.5		< 0.5	< 0.5	< 0.5
Perfluorododecanoic acid (PFDoA)	NA	ng/l	-					< 3 *			< 0.5 *	1	< 0.5 *	< 0.5	< 0.5 *
Perfluoroheptanoic acid (PFHpA)	NA	ng/l						< 1			< 0.5	-	< 0.5	< 0.5	< 0.5 *
Perfluorohexane sulfonate (PFHxS)	NA	ng/l						< 4			< 1 *		< 1	< 1	< 1 *
Perfluorohexanoic acid (PFHxA)	NA	ng/l						< 1			1 j*		< 0.5	0.6 j	1 j*
Perfluorononanoic acid (PFNA)	NA	ng/l						< 1			< 0.6		< 0.6	< 0.6 *	< 0.6
Perfluorooctane sulfonate (PFOS)	NA	ng/l						< 5			< 2		< 2	< 2	< 2 *
Perfluorooctanoic acid (PFOA)	NA	ng/l						< 1			< 0.5		0.7 j	< 0.5	< 0.5
Perfluoropentanoic acid (PFPeA)	NA	ng/l						< 1			< 0.5		< 0.5 *	< 0.5 *	< 0.5
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l						< 3 *			< 0.5 *		< 0.5 *	< 0.5	< 0.5 *
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l						< 2			< 0.5	-	< 0.5	< 0.5	< 0.5
Perfluoroundecanoic acid (PFUnA)	NA	ng/l						< 2 *			< 1		< 1 *	< 1	< 1 *

Dee 1/12/017 1/17/2017																
Description Description		L	ocation.	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
Parameter			Date	1/13/2017	1/17/2017	1/17/2017	1/17/2017	1/18/2017	1/18/2017	1/18/2017	1/18/2017	1/18/2017	1/18/2017	1/18/2017	1/19/2017	1/19/2017
Parameter Dissolver Units		Samp	ole Type	Rinsate Blank	Trip Blank	Lab Blank	Lab Blank	Trip Blank	Trip Blank	Field Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Trip Blank	Lab Blank
General Parameters	_															
Akalani, biantonnie, as CaCO3		Dissolved	Units													
Akademy, total, as CaCO3																
Chloride NA mgt																
Chloride NA mgt			mg/l			< 1.7	< 1.7									
Nitrogen, Nitrate in Nitrite, as N N mg/l			mg/l										< 0.20	< 0.20		
Magnesium	0 ,		mg/l													< 0.040
Calcium Total mgl		NA	mg/l		-								< 0.30	< 0.30		
Magnesium Total mgl	Metals															
Potessium Total mg/l	Calcium	Total	mg/l													
Sodium	Magnesium	Total	mg/l													
VOCs	Potassium	Total	mg/l													
Cation disulfide	Sodium	Total	mg/l													
Chloromethane	VOCs															
Chloromethane	Carbon disulfide	NA	ug/l		< 1				< 1							
Tentalvely Identified Compounds	Chloromethane	NA	ug/l		< 0.5				< 0.5							
N-Ethyl perfluorooctanesulfonamidoacetic acid NA ng/l < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 < 1 <	Tentatively Identified Compounds	NA			< 0 TIC				< 0 TIC							
Perfluorobutane sulfonate (PFBS)	Perfluorinated Compounds															
Perfluorobutane sulfonate (PFBS)	N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l	< 1	-			< 1		< 1		< 1			< 1	
Perfluorobutanoic acid (PFBA)	Perfluorobutane sulfonate (PFBS)	NA	ng/l	< 0.7	-			< 0.7		< 0.7		< 0.7			< 0.7	
Perfluoronexanoic acid (PFNA)	Perfluorobutanoic acid (PFBA)	NA	ng/l	< 3 *				< 3		< 3		< 3			< 3	
Perfluoronexanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	NA	ng/l	< 0.5	-			< 0.5		< 0.5		< 0.5			< 0.5	
Perfluoronexanoic acid (PFNA)	Perfluorododecanoic acid (PFDoA)	NA	ng/l	< 0.5 *	-			< 0.5		< 0.5 *		< 0.5 *			< 0.5	
Perfluoronexanoic acid (PFNA)	Perfluoroheptanoic acid (PFHpA)	NA	ng/l	< 0.5 *	-			< 0.5		< 0.5		< 0.5			< 0.5	
Perfluoronexanoic acid (PFNA)	Perfluorohexane sulfonate (PFHxS)	NA	ng/l	< 1 *				< 1		< 1		< 1			< 1	
Perfluoronanoic acid (PFNA)	Perfluorohexanoic acid (PFHxA)	NA	ng/l	< 0.5 *				< 0.5		< 0.5		< 0.5			< 0.5	
Perfluoroctane sulfonate (PFOS)	Perfluorononanoic acid (PFNA)	NA	ng/l	< 0.6				< 0.6		< 0.6		< 0.6			< 0.6	
Perfluoroctanoic acid (PFOA)	Perfluorooctane sulfonate (PFOS)	NA	ng/l					< 2							< 2	
Perfluoropentanoic acid (PFPeA) NA ng/l < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 <	, ,		ng/l													
Perfluorotetradecanoic acid (PFTA / PFTeDA) NA ng/l 5* < 0.5* < 0.5* < 0.5* < 0.5* < 0.5* < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 <td>\</td> <td></td> <td>ng/l</td> <td></td>	\		ng/l													
Perfluorotridecanoic acid (PFTrDA) NA ng/l < 0.5 < 0.5 < 0.5			ng/l													
	Perfluorotridecanoic acid (PFTrDA)		ng/l													
Perfluoroundecanoic acid (PFUnA)	Perfluoroundecanoic acid (PFUnA)	NA	ng/l	< 1 *				<1		< 1		< 1 *			< 1	

	L	ocation	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
		Date	1/19/2017	1/19/2017	1/20/2017	1/20/2017	1/20/2017	1/23/2017	1/23/2017	1/23/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017	1/24/2017
	Samı	ole Type	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Field Blank	Trip Blank	Trip Blank	Lab Blank	Field Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank
	Total or														
Parameter	Dissolved	Units													
General Parameters															
Alkalinity, bicarbonate, as CaCO3	NA	mg/l	-					-							
Alkalinity, total, as CaCO3	NA	mg/l mg/l mg/l mg/l	-					-							
Chloride	NA	mg/l													
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l	< 0.040	< 0.040											
Sulfate, as SO4	NA	mg/l													
Metals															
Calcium	Total	mg/l			0.0448 j										
Magnesium	Total	mg/l mg/l			< 0.0190										
Potassium	Total	mg/l		-	< 0.160										
Sodium	Total	mg/l		-	< 0.173										
VOCs															
Carbon disulfide	NA	ug/l		-					< 1	< 1					
Chloromethane	NA	ug/l	-	-				-	< 0.5	< 0.5					
Tentatively Identified Compounds	NA	ug/l							0 TIC						
Perfluorinated Compounds															
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l		-			< 1	< 1			< 1	< 1	< 1	< 1	1 j
Perfluorobutane sulfonate (PFBS)	NA	ng/l	-	-			< 0.7	< 0.7			< 0.7	< 0.7	1 j	< 0.7	0.8 j
Perfluorobutanoic acid (PFBA)	NA	ng/l					< 3	< 3			< 3	< 3	< 3	< 3	< 3
Perfluorodecanoic acid (PFDA)	NA						< 0.5	< 0.5			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorododecanoic acid (PFDoA)	NA	ng/l ng/l ng/l ng/l ng/l ng/l ng/l					< 0.5	< 0.5 *			< 0.5	< 0.5	< 0.5	< 0.5 *	< 0.5 *
Perfluoroheptanoic acid (PFHpA)	NA	ng/l					< 0.5	< 0.5			< 0.5	< 0.5	2	< 0.5	< 0.5
Perfluorohexane sulfonate (PFHxS)	NA	ng/l		-			< 1	< 1 b			< 1 b	< 1	2 j	< 1	< 1
Perfluorohexanoic acid (PFHxA)	NA	ng/l					< 0.5	< 0.5			< 0.5	< 0.5	1 j	< 0.5	0.9 j
Perfluorononanoic acid (PFNA)	NA	ng/l					< 0.6	< 0.6			< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Perfluorooctane sulfonate (PFOS)	NA	ng/l		-			< 2	< 2			< 2	< 2	< 2	< 2	< 2
Perfluorooctanoic acid (PFOA)	NA	ng/l					< 0.5	< 0.5			< 0.5	< 0.5	5	< 0.5	1 j
Perfluoropentanoic acid (PFPeA)	NA	ng/l		-			< 0.5	< 0.5			< 0.5	< 0.5	1 j	< 0.5	< 0.5
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l					< 0.5	< 0.5			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l		-			< 0.5	< 0.5			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroundecanoic acid (PFUnA)	NA	ng/l		-			< 1	< 1			< 1	< 1	< 1	< 1	< 1

	Locat	on QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
	D	ate 1/24/2017	1/24/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/27/2017	1/27/2017	1/27/2017	1/27/2017
	Sample Ty	pe Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank
	Total or												
Parameter	Dissolved Un	ts											
General Parameters													
Alkalinity, bicarbonate, as CaCO3	NA mọ	y/I											
Alkalinity, total, as CaCO3	NA mg	ı/l		3.5 j	3.3 j	3.3 j				2.6 j			
Chloride	NA mg	y/l < 0.20	< 0.20				< 0.20						< 0.20
Nitrogen, Nitrate + Nitrite, as N	NA mọ	ı/l											
Sulfate, as SO4	NA mg	/l < 0.30	< 0.30				< 0.30						< 0.30
Metals													
Calcium	Total mo	ı/l						0.0495 j	< 0.0382				
Magnesium	Total mo	ı/l						0.0460 j	< 0.0190				
Potassium	Total mg	y/I						< 0.160	< 0.160				
Sodium	Total mg	y/I						< 0.173	< 0.173				
VOCs													
Carbon disulfide	NA ug	/I									< 1	< 1	
Chloromethane	NA ug	/I									< 0.5	< 0.5	
Tentatively Identified Compounds	NA ug												
Perfluorinated Compounds													
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA ng	/I											
Perfluorobutane sulfonate (PFBS)	NA ng	/I											
Perfluorobutanoic acid (PFBA)	NA ng												
Perfluorodecanoic acid (PFDA)	NA ng												
Perfluorododecanoic acid (PFDoA)	NA ng												
Perfluoroheptanoic acid (PFHpA)	NA ng												
Perfluorohexane sulfonate (PFHxS)	NA ng	/											
Perfluorohexanoic acid (PFHxA)	NA ng												
Perfluorononanoic acid (PFNA)	NA no												
Perfluorooctane sulfonate (PFOS)	NA ng												
Perfluorooctanoic acid (PFOA)	NA ng												
Perfluoropentanoic acid (PFPeA)	NA ng	/I											
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA ng												
Perfluorotridecanoic acid (PFTrDA)	NA ng												
Perfluoroundecanoic acid (PFUnA)	NA ng												

	L	ocation	QC	SG2-APRB01	SG2-RB01										
		Date	1/29/2017	1/29/2017	1/29/2017	1/30/2017	1/30/2017	1/31/2017	1/31/2017	1/31/2017	2/01/2017	2/02/2017	2/03/2017	11/01/2016	11/02/2016
	Samı	ole Type	Lab Blank	Rinsate Blank	Rinsate Blank										
	Total or	T "													
Parameter	Dissolved	Units													
General Parameters															
Alkalinity, bicarbonate, as CaCO3	NA	mg/l													
Alkalinity, total, as CaCO3	NA	mg/l						2.1 j							
Chloride	NA	mg/l													
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l	< 0.040	< 0.040									< 0.040		
Sulfate, as SO4	NA	mg/l													
Metals															
Calcium	Total	mg/l			< 0.0382				0.0388 j						
Magnesium	Total	mg/l			< 0.0190							< 0.0190			
Potassium	Total	mg/l			< 0.160							< 0.160			
Sodium	Total	mg/l			< 0.173							< 0.173			
VOCs															
Carbon disulfide	NA	ug/l									< 1				
Chloromethane	NA	ug/l									< 0.5				
Tentatively Identified Compounds	NA	ug/l													
Perfluorinated Compounds															
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l				< 1	< 1			< 1				< 8	< 3
Perfluorobutane sulfonate (PFBS)	NA	ng/l				< 0.7	< 0.7 *			< 0.7				< 10 *	< 2
Perfluorobutanoic acid (PFBA)	NA	ng/l				< 3	< 3 *			< 3				< 10	< 10
Perfluorodecanoic acid (PFDA)	NA	ng/l				< 0.5	< 0.5 *			< 0.5				< 2 *	< 2
Perfluorododecanoic acid (PFDoA)	NA	ng/l				< 0.5	< 0.5			< 0.5				< 5 *	< 2
Perfluoroheptanoic acid (PFHpA)	NA	ng/l				< 0.5	< 0.5 *			< 0.5				< 2	< 2
Perfluorohexane sulfonate (PFHxS)	NA	ng/l				< 1	< 1			< 1				< 10	< 3
Perfluorohexanoic acid (PFHxA)	NA	ng/l				< 0.5	< 0.5 *			< 0.5				< 2	< 2
Perfluorononanoic acid (PFNA)	NA	ng/l				< 0.6	< 0.6			< 0.6				< 2	< 2
Perfluorooctane sulfonate (PFOS)	NA	ng/l				< 2	< 2			< 2				< 10	< 6
Perfluorooctanoic acid (PFOA)	NA	ng/l				< 0.5	< 0.5 *			< 0.5				2 j	< 2
Perfluoropentanoic acid (PFPeA)	NA	ng/l				< 0.5	< 0.5 *			< 0.5				< 3	< 2
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l				< 0.5 *	< 0.5 *			< 0.5				< 5 *	< 2
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l				< 0.5	< 0.5			< 0.5				< 4	< 2
Perfluoroundecanoic acid (PFUnA)	NA	ng/l				< 1	< 1 *			< 1				< 4 *	< 3

	L	ocation	SG2-RB02	SG2-RB03	SG2-RB04	SG2-RB05	SG2-RB06
	_	Date	11/02/2016	11/02/2016	11/02/2016	11/02/2016	11/02/2016
	·	le Type	Rinsate Blank				
Parameter	Total or Dissolved	Units					
General Parameters							
Alkalinity, bicarbonate, as CaCO3	NA	mg/l					
Alkalinity, total, as CaCO3	NA	mg/l					
Chloride	NA	mg/l					
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l					
Sulfate, as SO4	NA	mg/l					
Metals							
Calcium	Total	mg/l					
Magnesium	Total	mg/l					
Potassium	Total	mg/l					
Sodium	Total	mg/l					
VOCs							
Carbon disulfide	NA	ug/l					
Chloromethane	NA	ug/l					
Tentatively Identified Compounds	NA	ug/l					
Perfluorinated Compounds							
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l	< 3	< 3	< 3	< 3	< 3
Perfluorobutane sulfonate (PFBS)	NA	ng/l	< 2	< 2	1 j	1 j	4
Perfluorobutanoic acid (PFBA)	NA	ng/l	< 10	< 10	< 10	< 10	< 10
Perfluorodecanoic acid (PFDA)	NA	ng/l	< 2	< 2	< 2	< 2	< 2
Perfluorododecanoic acid (PFDoA)	NA	ng/l	< 2	< 2 *	< 2	< 2	< 2
Perfluoroheptanoic acid (PFHpA)	NA	ng/l	< 2	2 j*	8	11	25
Perfluorohexane sulfonate (PFHxS)	NA	ng/l	< 3	1 j*	6	9	21
Perfluorohexanoic acid (PFHxA)	NA	ng/l	< 2	5 *	28	34	84
Perfluorononanoic acid (PFNA)	NA	ng/l	< 2 *	< 2	< 2	< 2	< 2
Perfluorooctane sulfonate (PFOS)	NA	ng/l	< 6	< 6	2 j	3 ј	6
Perfluorooctanoic acid (PFOA)	NA	ng/l	< 2	2 j*	9	9	23
Perfluoropentanoic acid (PFPeA)	NA	ng/l	< 2	0.6 j*	3	3	7
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l	< 2	< 2 *	4 *	< 2	< 2
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l	< 2	< 2	< 2	< 2	< 2
Perfluoroundecanoic acid (PFUnA)	NA	ng/l	< 3	< 3	< 3 *	< 3	< 3

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

	Not analyzed/Not available.
TIC	Tentatively identified compound.
*	Estimated value, QA/QC criteria not met.
b	Potential false positive value based on blank data validation procedures. Concentrations identified as potential false positive are excluded from calculations.
j	Estimated detected value. The reported value is less than the stated laboratory quantitation limit but greater than the laboratory method detection limit.

Table 6 Soil Data Wells MVD-4/5 Investigation

																		•	
	Location	SG2-AP02	SG2-AP02	SG2-AP02	SG2-AP02	SG2-AP02	SG2-AP02	SG2-AP02	SG2-AP05	SG2-AP05	SG2-A	P05	SG2-AP05-SWS	SG2-AP06	SG2-AP06	SG2-AP09	SG2-AP09	SG2-AP09-FS	SG2-AP09
	Date	1/16/2017	1/16/2017	1/16/2017	1/16/2017	1/16/2017	1/16/2017	1/16/2017	1/18/2017	1/18/2017	1/18/2	017	1/18/2017	1/18/2017	1/18/2017	1/20/2017	1/20/2017	1/20/2017	1/23/2017
	Depth	3 - 5 ft	7 - 8 ft	12 - 13 ft	17 - 18 ft	20 - 21.5 ft	25.7 - 26.5 ft	27 - 28.4 ft	2 - 3 ft	7 - 8 ft	11.5 - 1	4.5 ft	27.6 - 29.8 ft	2.5 - 4.5 ft	6 - 8 ft	2.5 - 3 ft	6 - 8 ft	14.1 - 17 ft	34 - 35 ft
	Sample Type	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N
Parameter	Units																		
General Parameters																			
Carbon, total organic	mg/kg	1350	< 584	< 651	< 592	< 659			11800	1160 *	755	860		8230	< 727	213 j	< 486		
Hydrometer Diameter (0.005 mm)	% Passing						< 0.50	< 0.50					< 0.50					2.0	< 0.50
Hydrometer Diameter (0.02 mm)	% Passing						< 0.50	< 0.50					< 0.50					20.0	< 0.50
Hydrometer Diameter (0.05 mm)	% Passing						9.0	< 0.50					9.0					57.5	5.5
Hydrometer Diameter (0.064 mm)	% Passing						19.0	2.0					18.5					77.0	13.0
Hydrometer Diameter (0.075 mm)	% Passing						25.4	2.7					24.6					83.0	17.1
Hydrometer Diameter (0.15 mm)	% Passing						66.1	9.3					58.5					90.5	41.0
Hydrometer Diameter (0.3 mm)	% Passing						94.3	31.7					93.3					96.7	83.6
Hydrometer Diameter (0.6 mm)	% Passing						96.8	55.8					98.0					99.1	98.5
Hydrometer Diameter (1.18 mm)	% Passing						98.5	83.5					99.5					99.3	99.6
Hydrometer Diameter (19 mm)	% Passing						100	100					100					100	100
Hydrometer Diameter (2.36 mm)	% Passing						99.5	96.4					99.7					99.3	99.7
Hydrometer Diameter (3.35 mm)	% Passing				-		99.7	98.1					99.8					99.5	99.8
Hydrometer Diameter (37.5 mm)	% Passing						100	100					100					100	100
Hydrometer Diameter (4.75 mm)	% Passing						100	98.9					100					99.8	99.9
Hydrometer Diameter (75 mm)	% Passing						100	100					100					100	100
Moisture	%	8.5	11.1	4.6	7.3	13.1			22.9	16.0	24.4	24.2		24.2	8.0	6.9	2.5		
VOCs																			
Acetone	mg/kg	0.021 j	0.010 j	< 0.021	< 0.021	0.009 j			0.13	0.037	< 0.026	< 0.026		0.036	< 0.022	0.012 j	0.024		
Methyl acetate	mg/kg	< 0.006	< 0.006	< 0.005	< 0.005	< 0.006			< 0.006	< 0.006	< 0.007	< 0.007		< 0.007	< 0.005	< 0.004	0.060		
Methyl ethyl ketone (2-butanone)	mg/kg	< 0.011	< 0.012	< 0.010	< 0.011	< 0.012			0.008 j	< 0.012	< 0.013	< 0.013		< 0.014	< 0.011	< 0.009	< 0.009		
Octamethylcyclotetrasiloxane	mg/kg	0.012 j	0.007 j	0.007 j	0.008 j	0.008 j			0.013 j	0.015 j						0.006 j	0.006 j		
Tentatively Identified Compounds	mg/kg	0.02 j TIC	0.007 j TIC	0.007 j TIC	0.008 j TIC	0.008 j TIC			0.046 j TIC	0.015 j TIC	0.009 j TIC	0 TIC		0.037 j TIC	0.008 j TIC	0.006 j TIC	0.006 j TIC		
Xylene, m & p	mg/kg	< 0.006	< 0.006	< 0.005	< 0.005	< 0.006			< 0.006	< 0.006	< 0.007	< 0.007		< 0.007	< 0.005	< 0.004	0.001 j		
Perfluorinated Compounds																			
Perfluorodecanoic acid (PFDA)	ng/g	< 0.64	< 0.66	< 0.58	< 0.60	< 0.67			0.30 j*	< 0.68	< 0.73	< 0.75		< 0.72	< 0.61	< 0.60	< 0.61		
Perfluoroheptanoic acid (PFHpA)	ng/g	< 0.64	< 0.66	< 0.58	< 0.60	< 0.67			0.73	< 0.68	< 0.73	< 0.75		< 0.72	< 0.61	< 0.60	< 0.61		
Perfluorohexanoic acid (PFHxA)	ng/g	0.11 j	< 0.44	< 0.39	< 0.40	< 0.45			1.4	< 0.45 *	< 0.49	< 0.50 *		< 0.48	< 0.41	< 0.40	< 0.41		
Perfluorononanoic acid (PFNA)	ng/g	< 0.43	< 0.44	< 0.39	< 0.40	< 0.45			0.62	< 0.45	< 0.49	< 0.50 *		< 0.48	< 0.41	< 0.40	< 0.41		
Perfluorooctane sulfonate (PFOS)	ng/g	< 0.96	< 0.98 *	< 0.88	< 0.90	< 1.0			1.4	< 1.0	< 1.1	< 1.1 *		< 1.1 *	< 0.92	< 0.90	< 0.91 *		
Perfluorooctanoic acid (PFOA)	ng/g	0.35 j	0.27 j	0.29 j	< 0.60	< 0.67			5.2	< 0.68	< 0.73	< 0.75		< 0.72	< 0.61	< 0.60	< 0.61		

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

	Not analyzed/Not available.
N	Sample Type: Normal
FD	Sample Type: Field Duplicate
TIC	Tentatively identified compound.
*	Estimated value, QA/QC criteria not met.
j	Estimated detected value. The reported value is less than the stated laboratory quantitation limit but greater than the laboratory method detection limit.

Table 7

Hydraulic Conductivity Estimates from Grain Size Distributions

Wells MVD-4/5 Investigation

Sample Name	Aquifer Profiling Location	Sample Depth Interval, feet below ground surface	Hydraulic Conductivity (meters/day)	Hydraulic Conductivity (feet/day)
SG2-AP02-25.7-26.5-170116	AP02	25.7-26.5	1.2	3.9
SG2-AP02-27-28.4-170116	AP02	27.0-28.4	11	36
SG2-AP05-SWS-27.6-29.8-170118	AP05	27.6-29.8	1.4	4.6
SG2-AP09-FS-14.1-17-170120	AP09	14.1-17.0	0.12	0.39
SG2-AP09-34-35-170123	AP09	34.0-35.0	1.9	6.2

Table 8

MVD-4 Field Water Quality Measurements
Wells MVD-4/5 Investigation

Parameter	t = 0 min	t = 10 min	t = 20 min	t = 30 min
рН	5.75	5.62	5.58	5.64
Temperature (°C)	10.7	10.6	10.5	10.5
Oxidation Reduction Potential (mV)	173.1	173.7	182.0	184.0
Dissolved oxygen (mg/L)	4.23	5.15	5.12	4.77
Turbidity (NTU)	1.92	1.90	0.87	0.43
Specific conductance (µS/cm)	561.5	566.2	565.7	564.7

Table 9

MVD-5 Field Water Quality Measurements
Wells MVD-4/5 Investigation

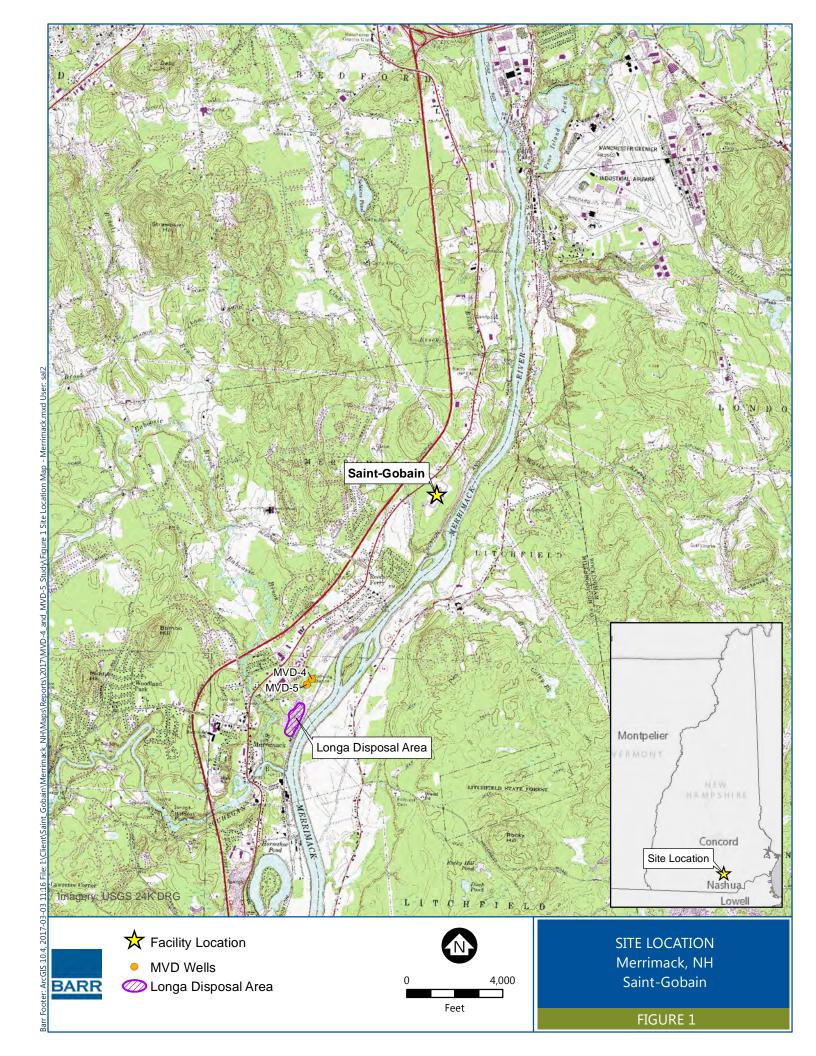
Parameter	t = 0 min	t = 10 min	t = 20 min	t = 30 min
рН	5.78	5.69	5.74	5.66
Temperature (°C)	10.7	10.7	10.8	10.9
Oxidation Reduction Potential (mV)	180.2	168.2	172.8	177.2
Dissolved oxygen (mg/L)	6.36	5.51	5.43	4.83
Turbidity (NTU)	10.15	1.48	0.23	0.19
Specific conductance (µS/cm)	628.8	562.1	630.7	630.1

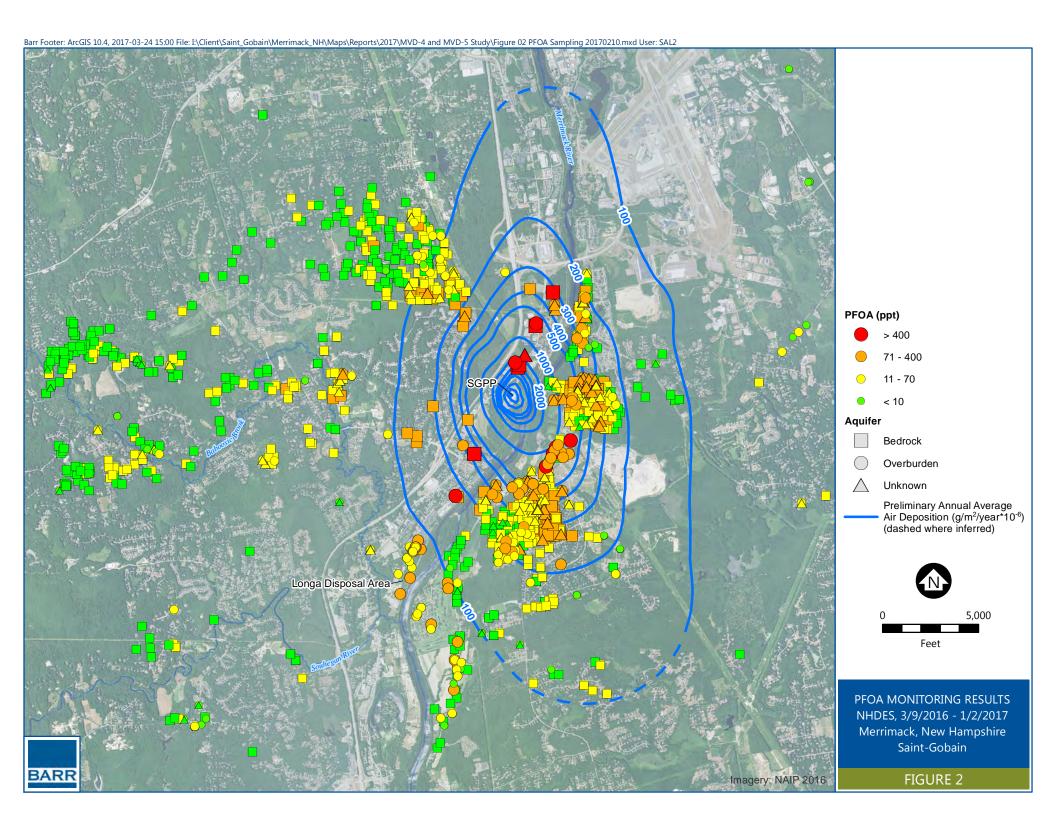
Table 10

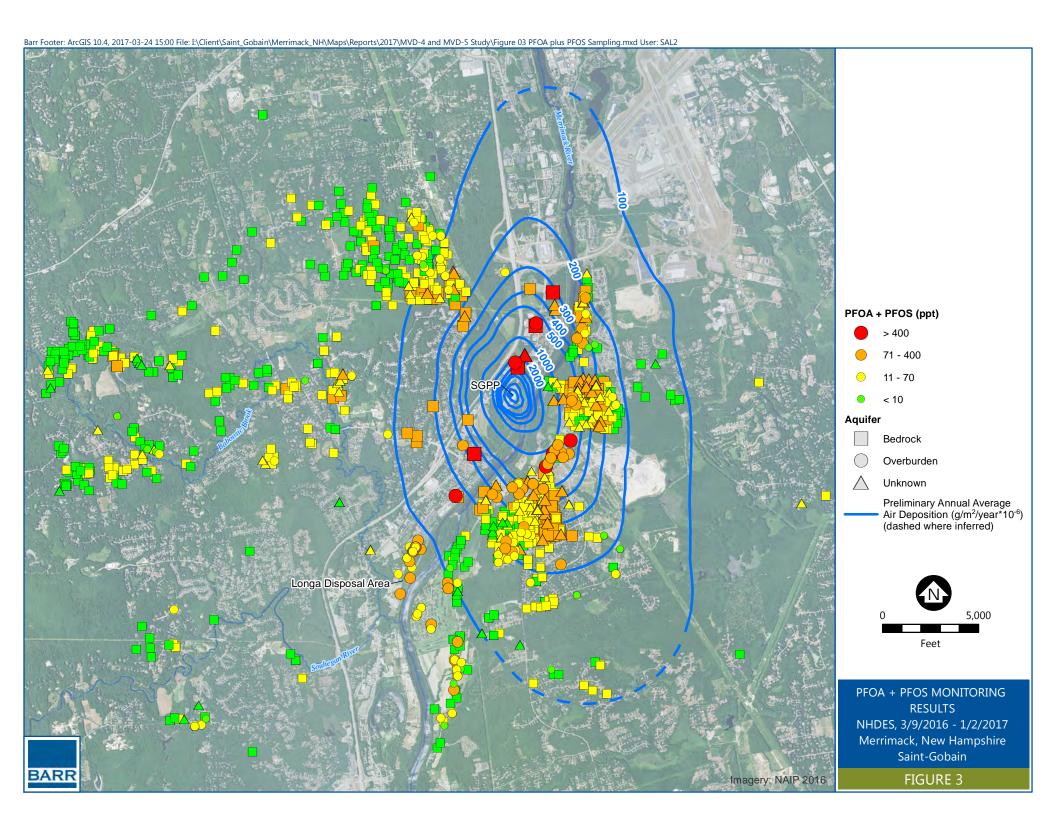
PFAS and TOC Sample Summary
Wells MVD-4/5 Investigation

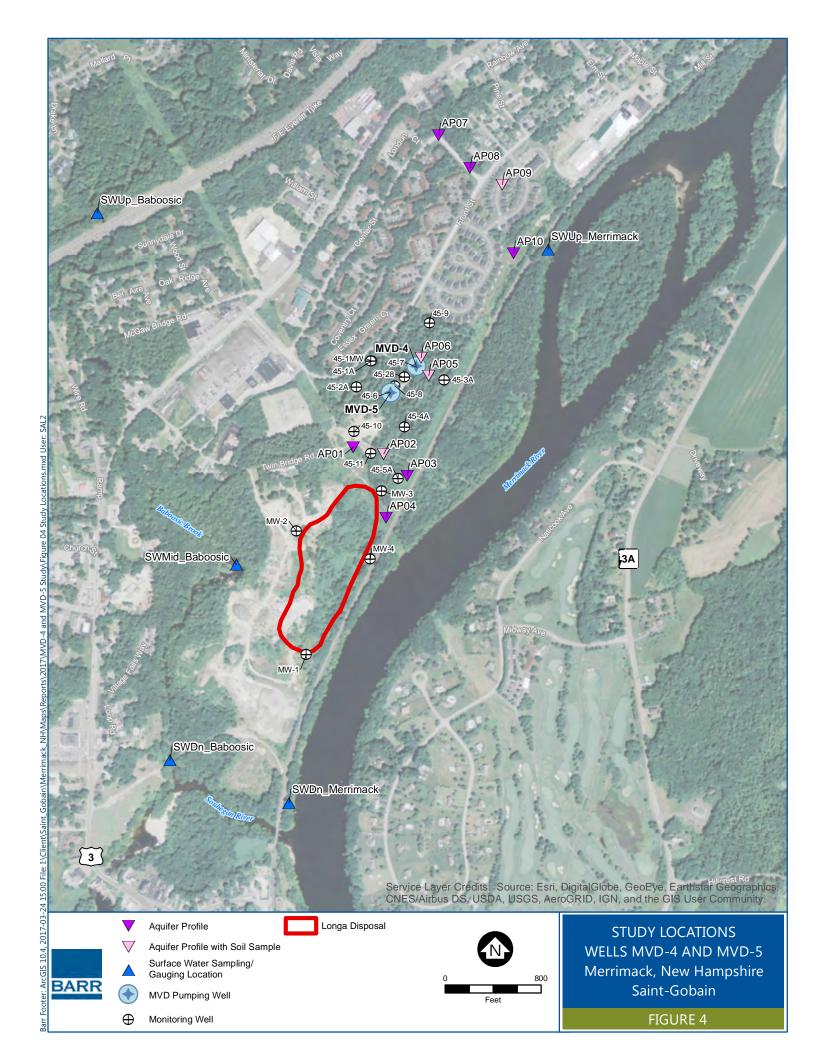
Sample Boring	Number of Samples		Sar	nple Depths (b	gs)	
AP02	5	3-5 ft	7-8 ft	12-13 ft	17-18 ft	20-21.5 ft
AP05	3	2-3 ft	7-8 ft	11.5-14.5 ft		
AP06	2	2.5-4.5 ft	6-8 ft			
AP09	2	2.5-3 ft	6-8 ft			

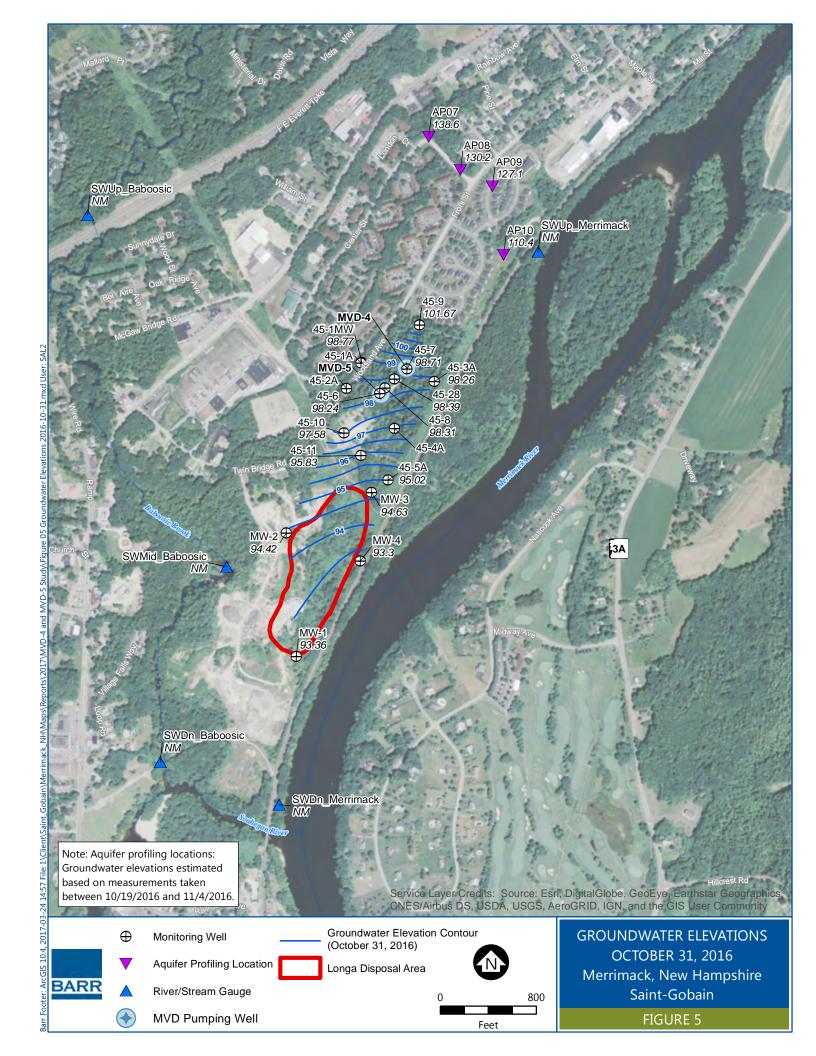
Figures

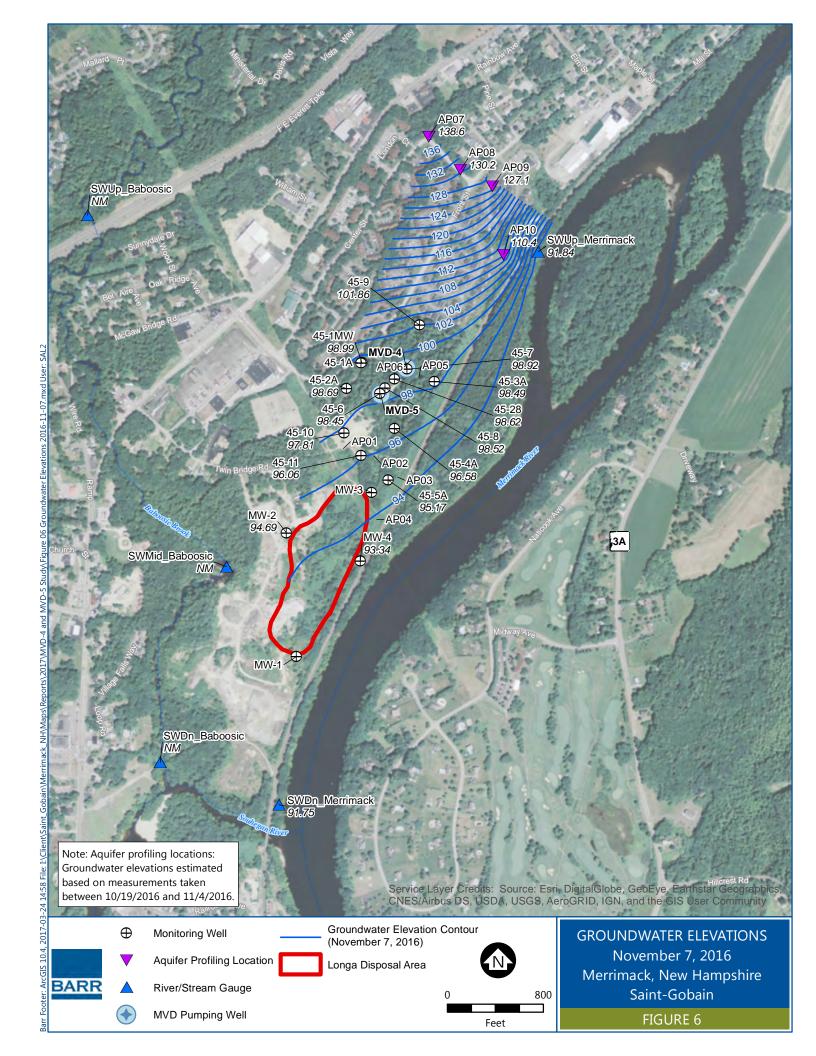


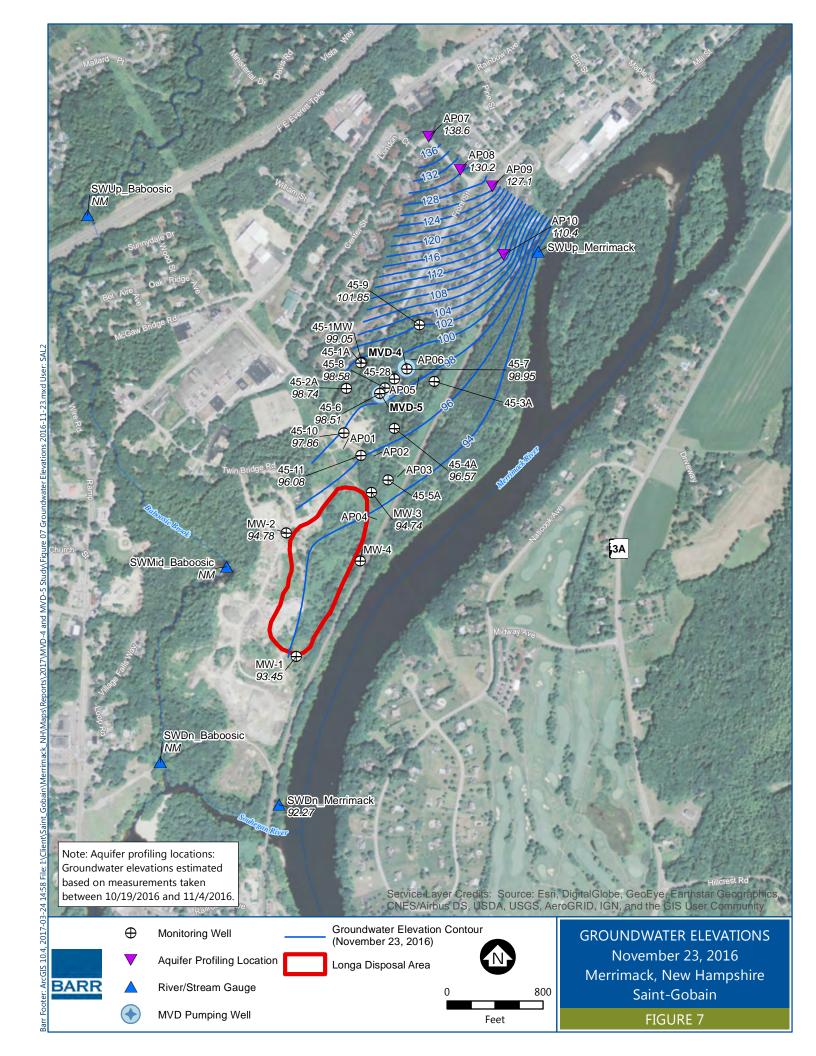


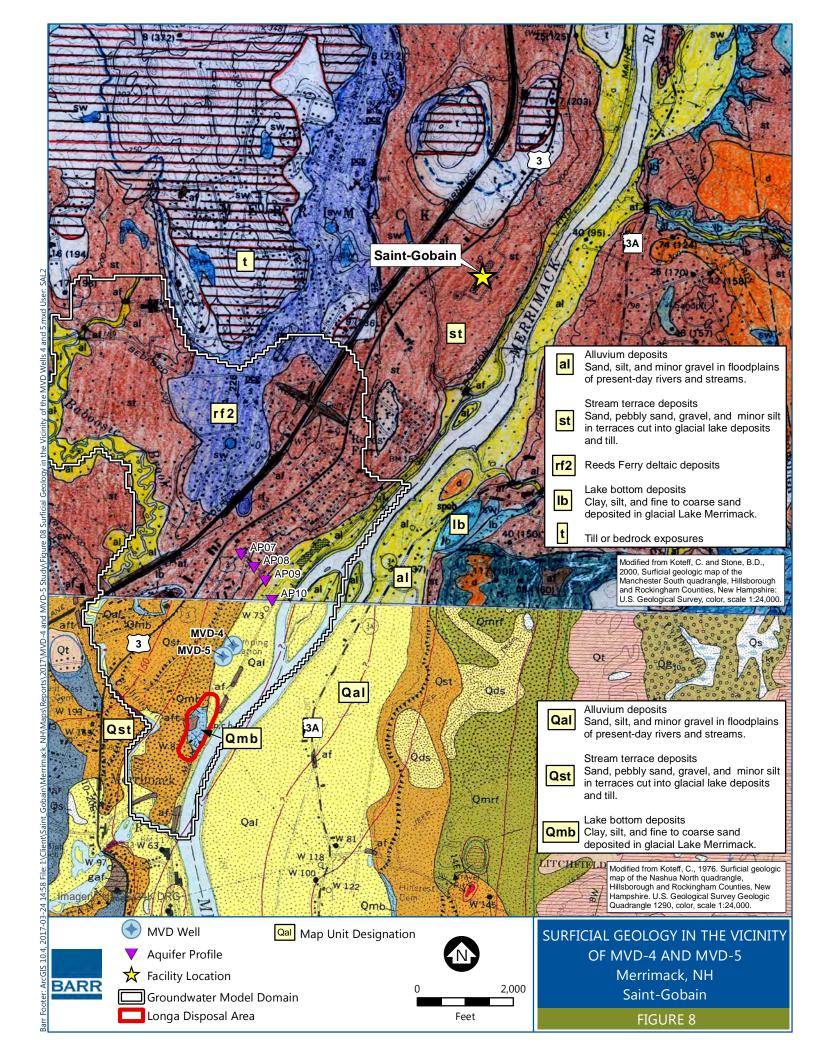


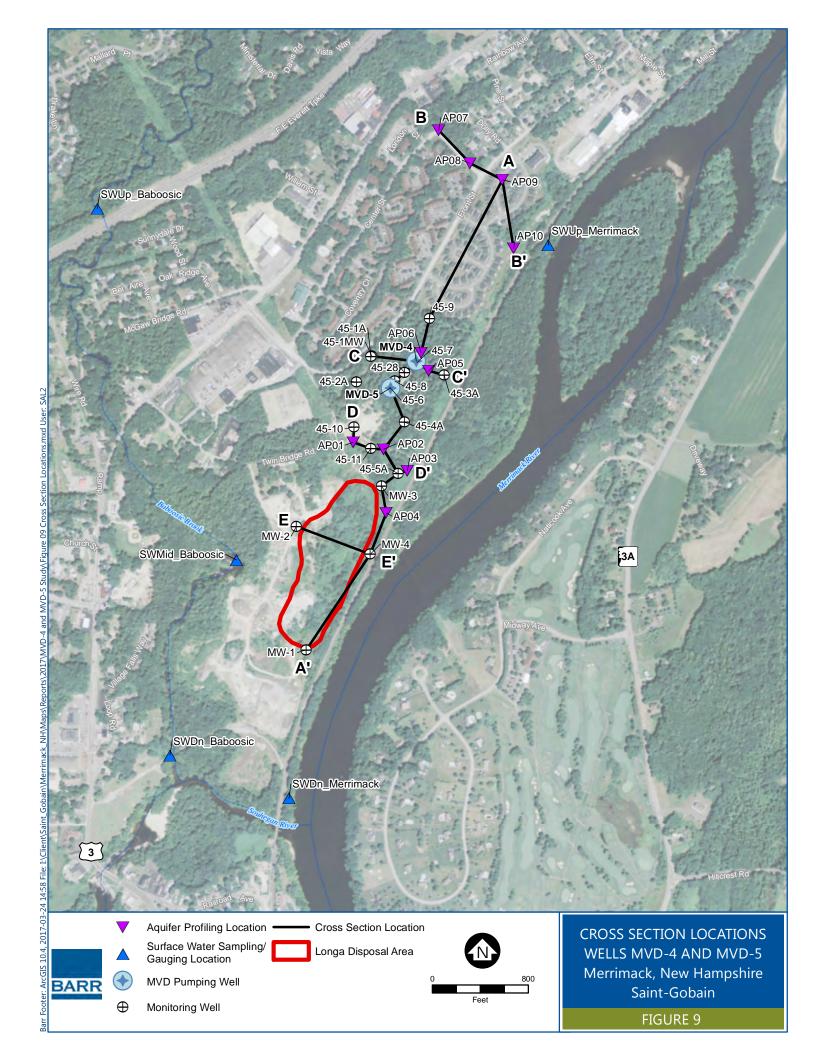


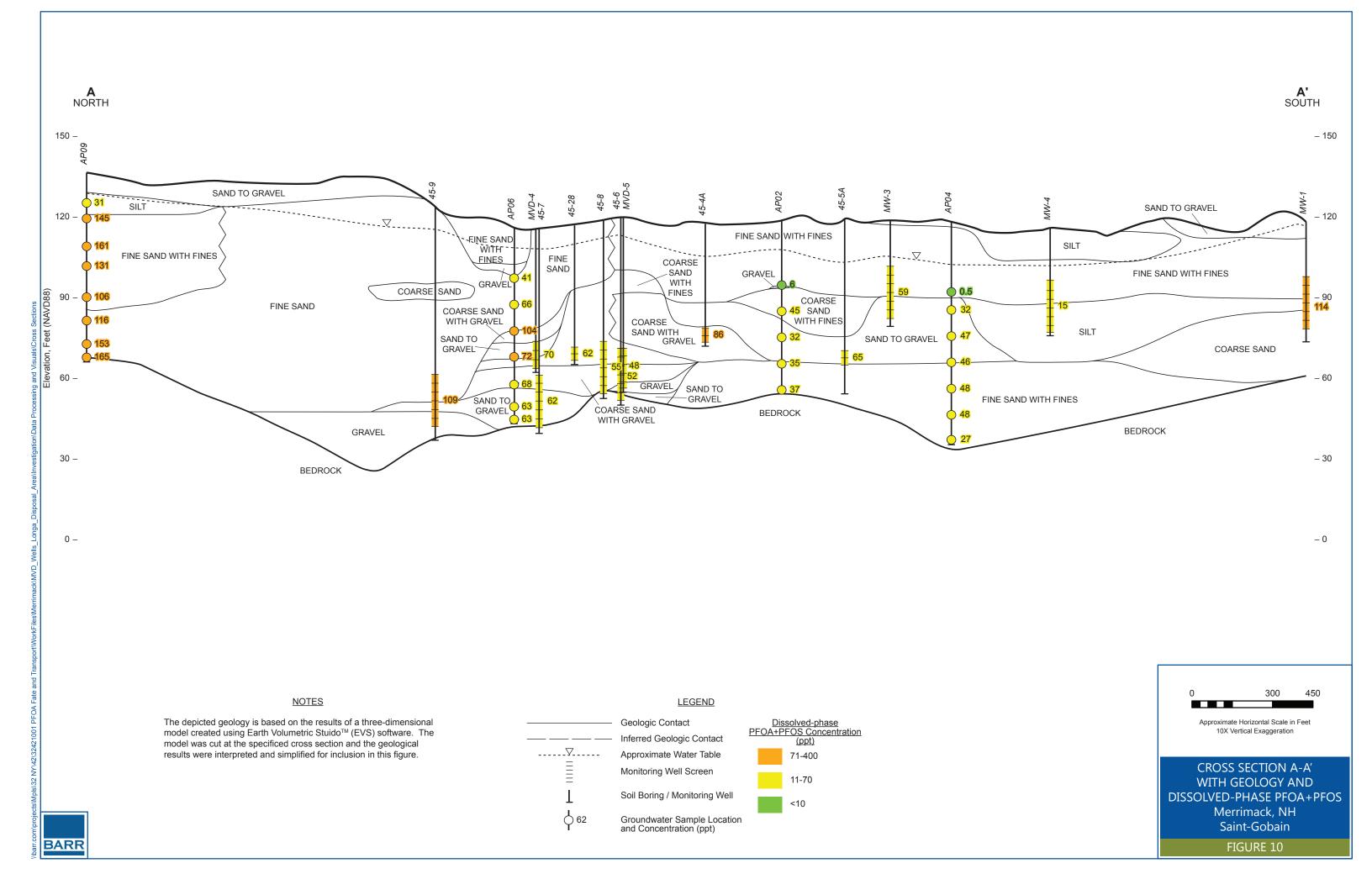


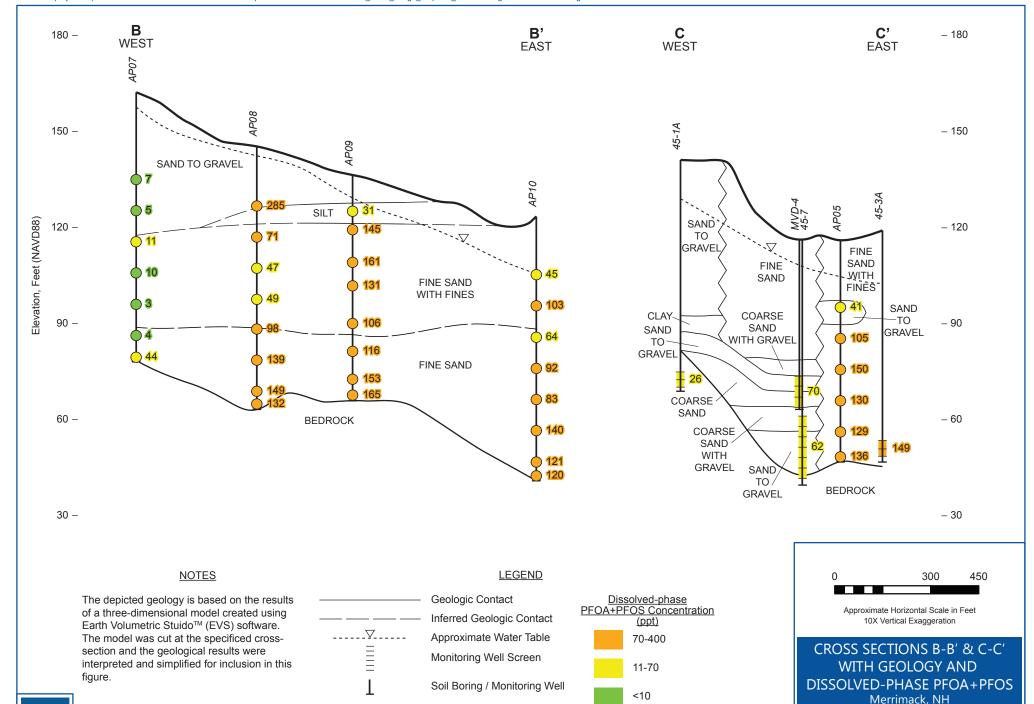












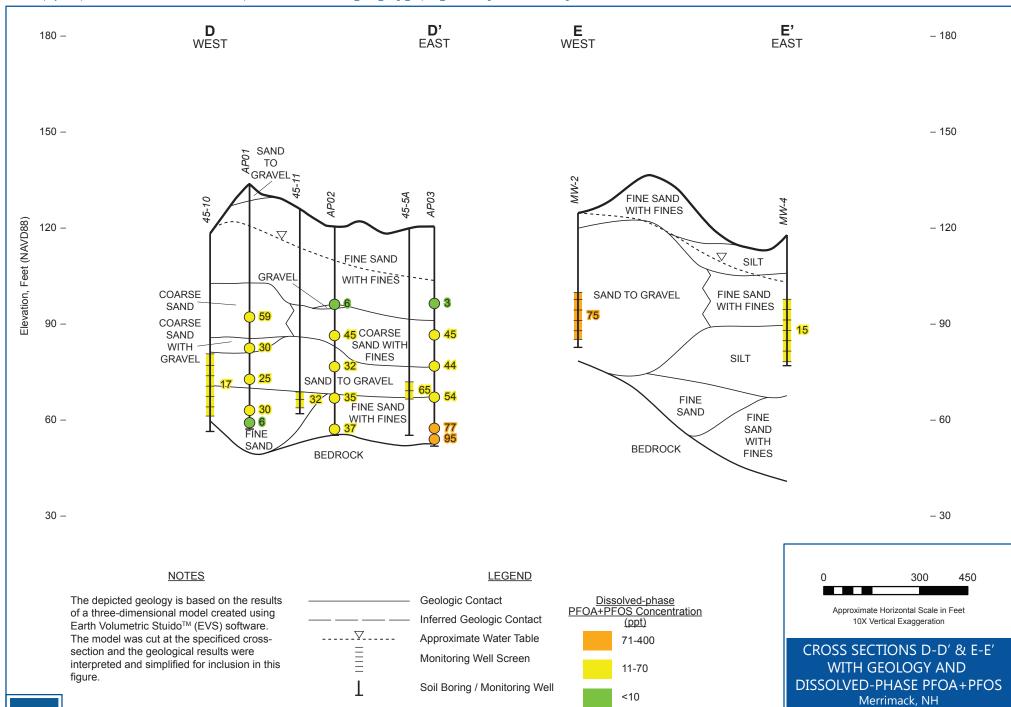
Groundwater Sample Location

and Concentration (ppt)

\(\) 62

BARR

Saint-Gobain



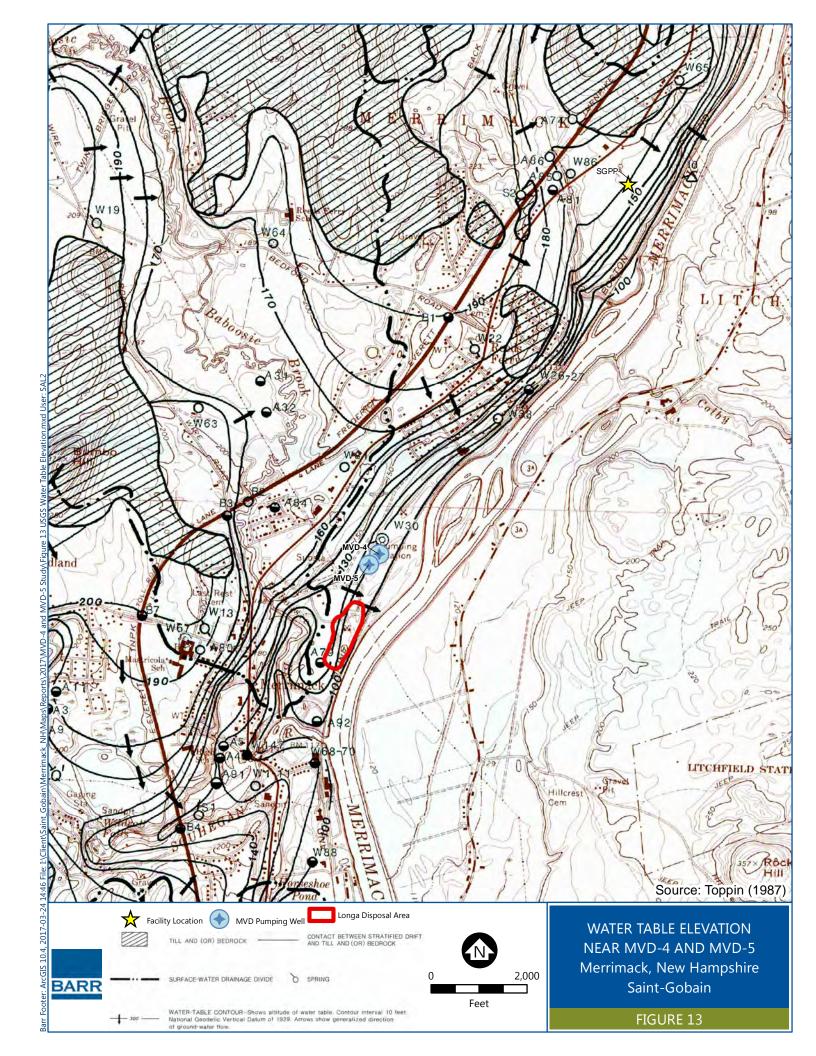
Groundwater Sample Location

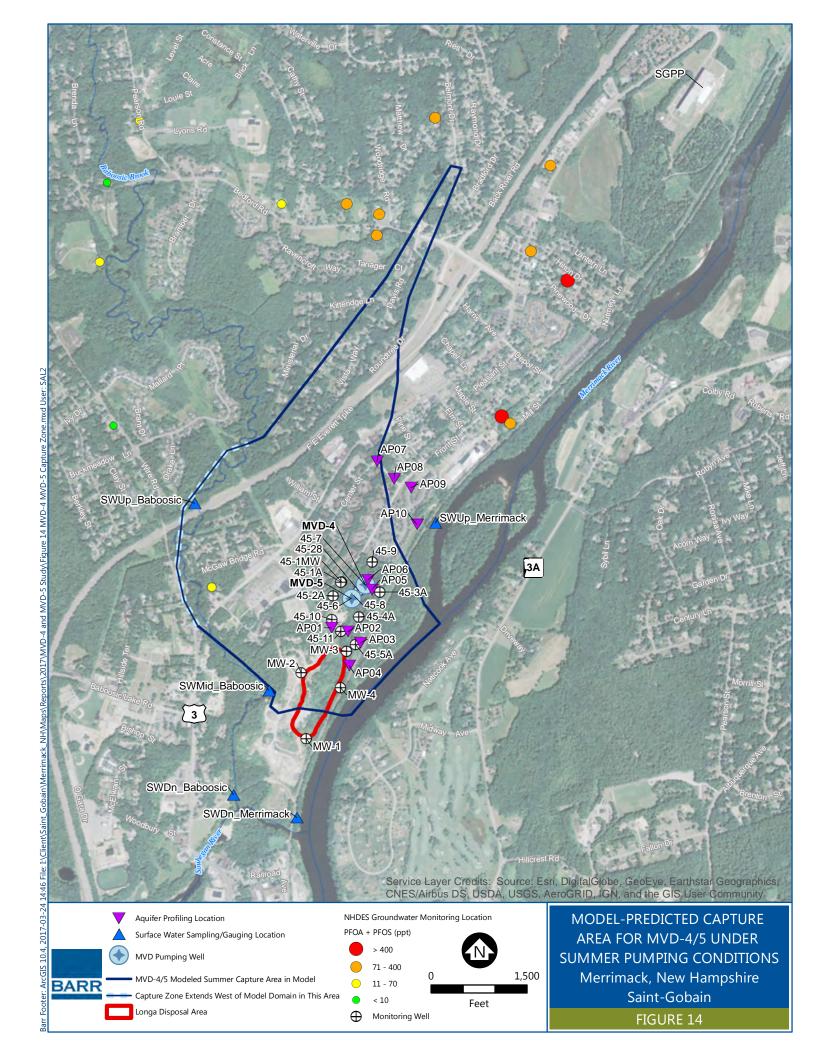
and Concentration (ppt)

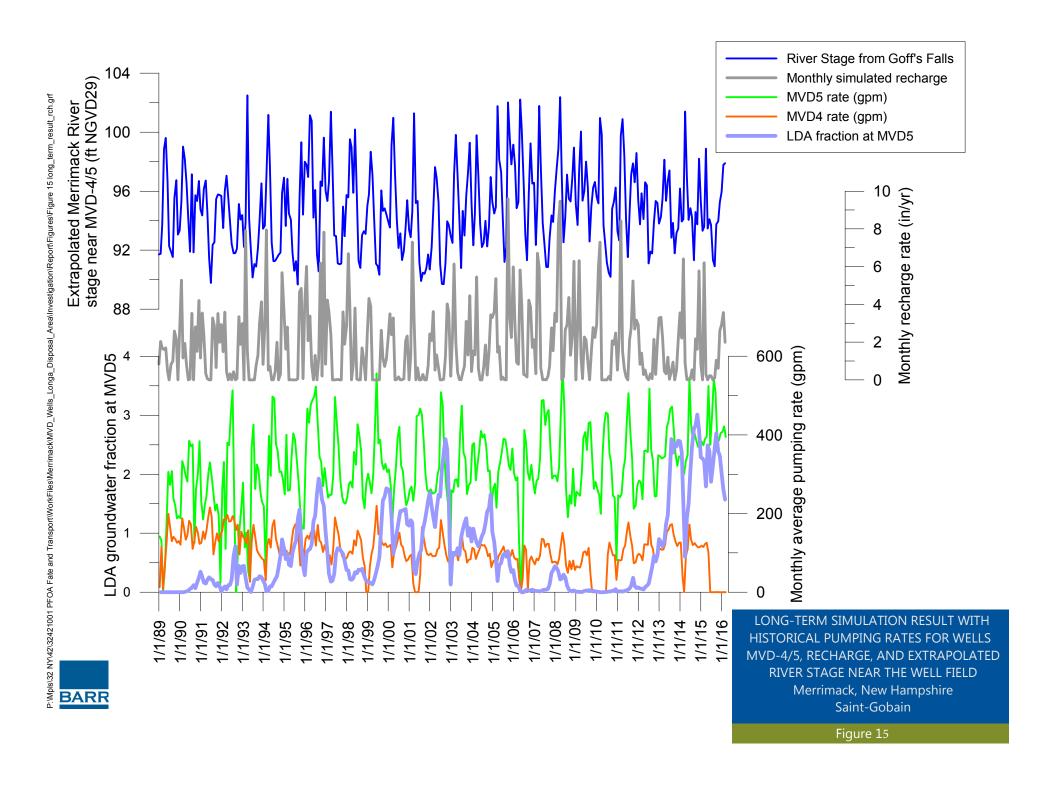
† 62

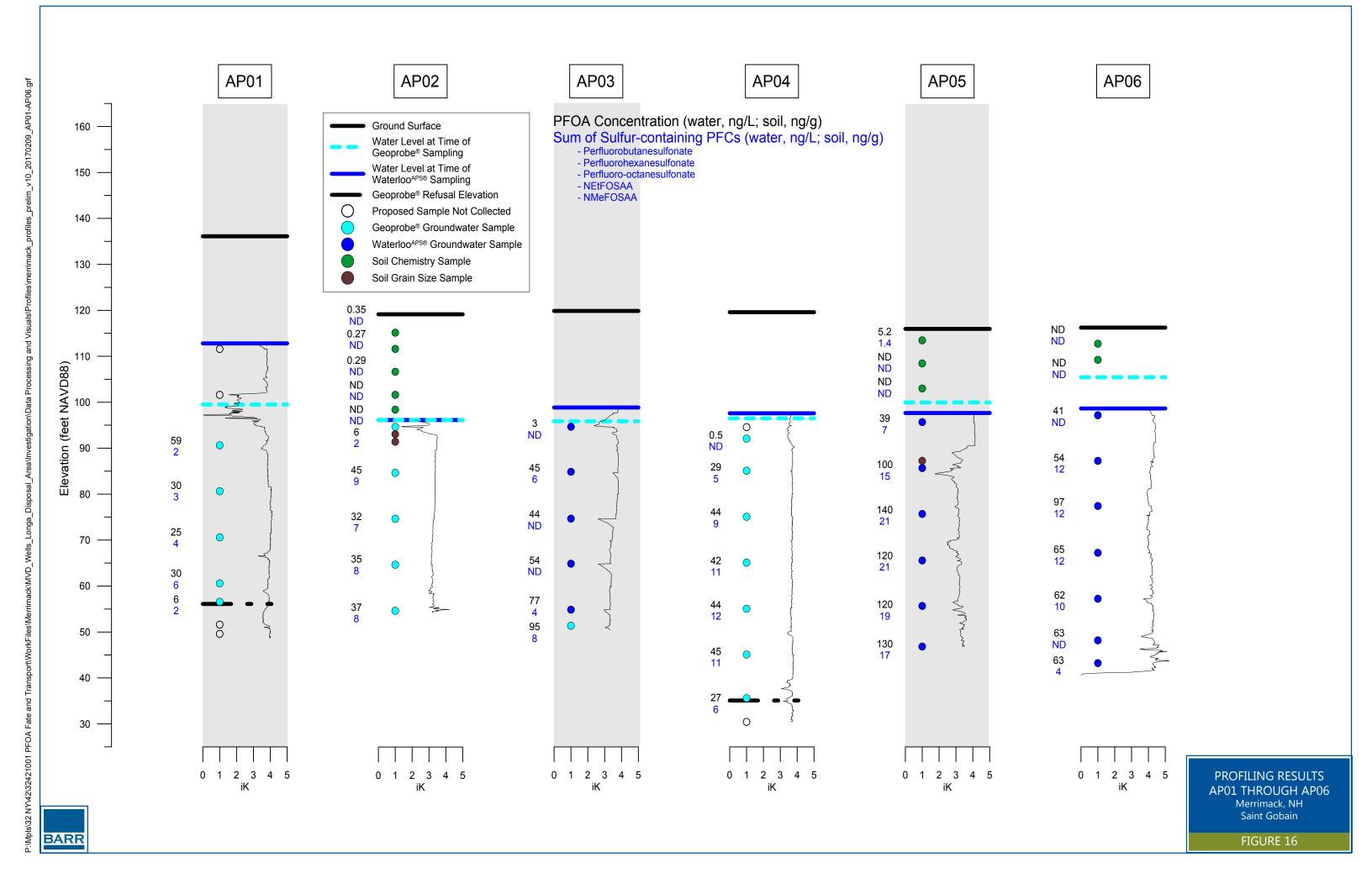
BARR

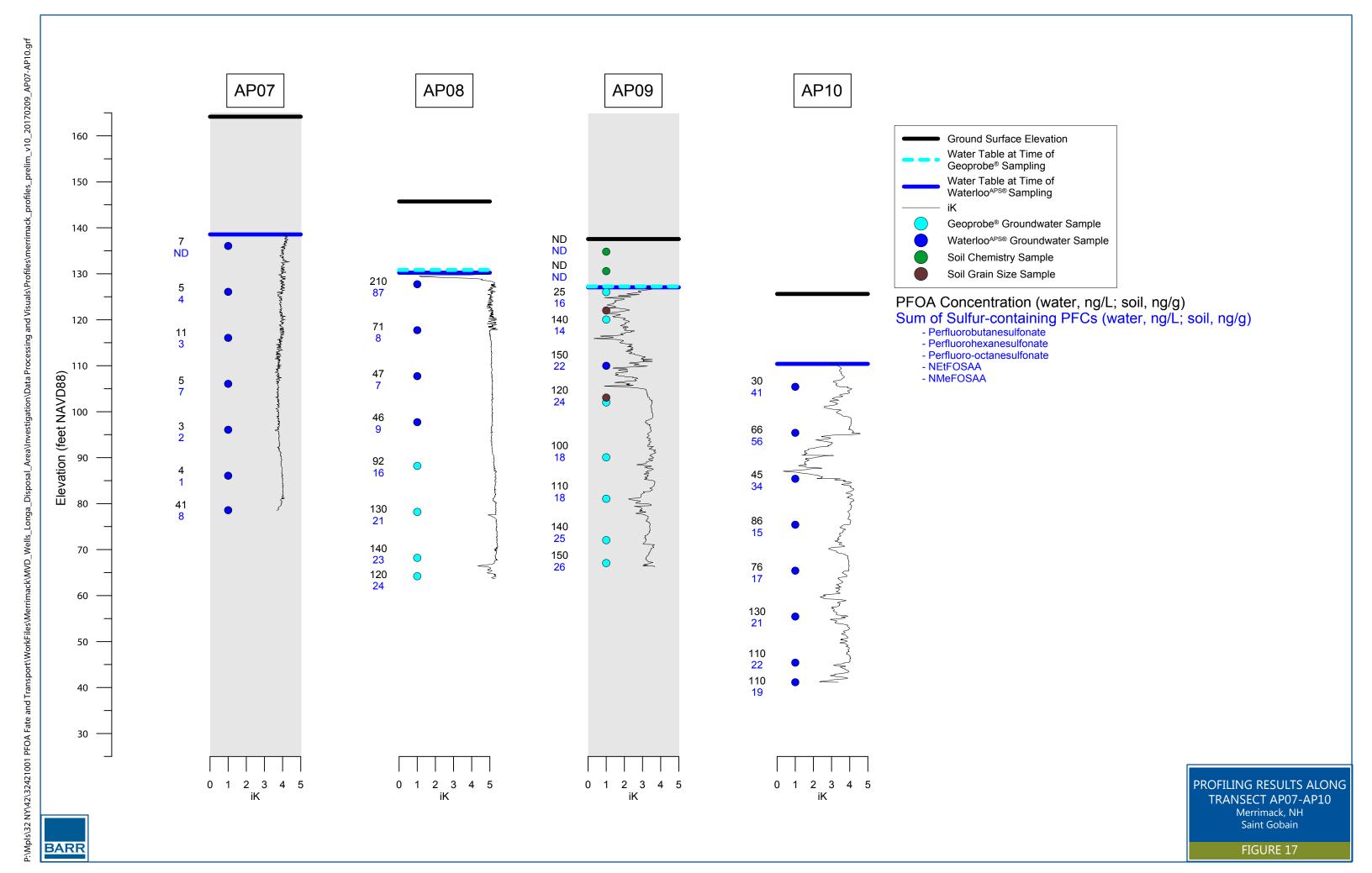
Saint-Gobain

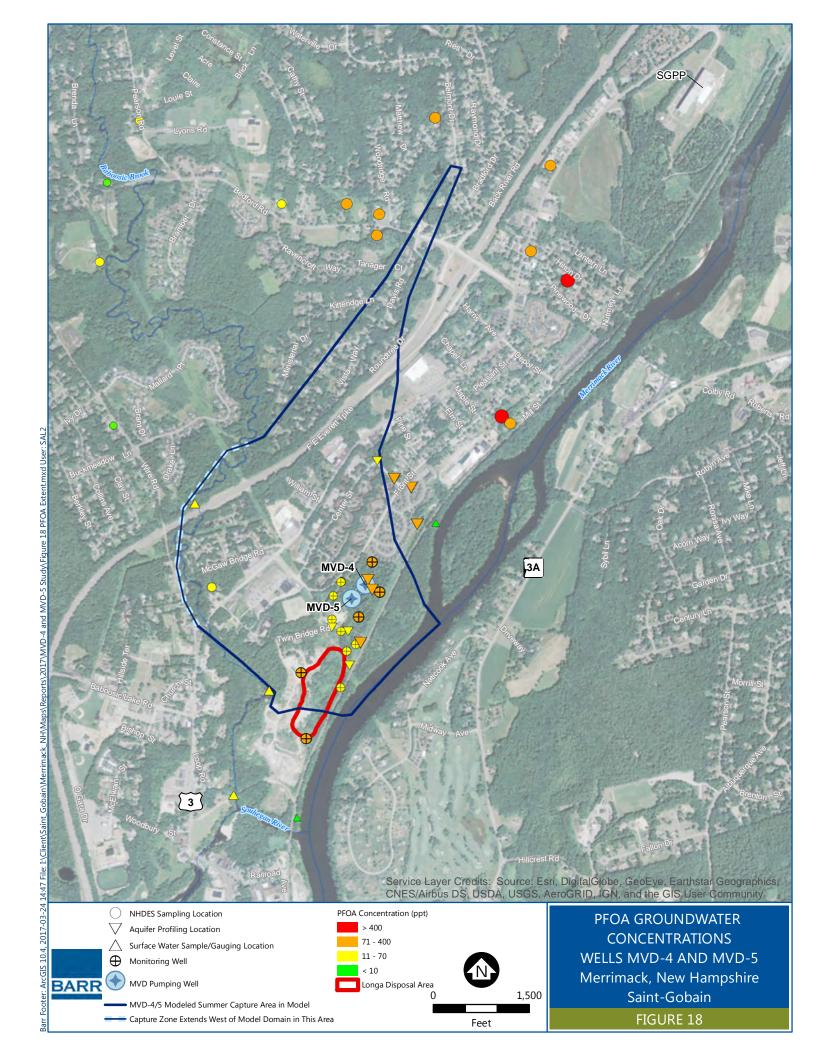


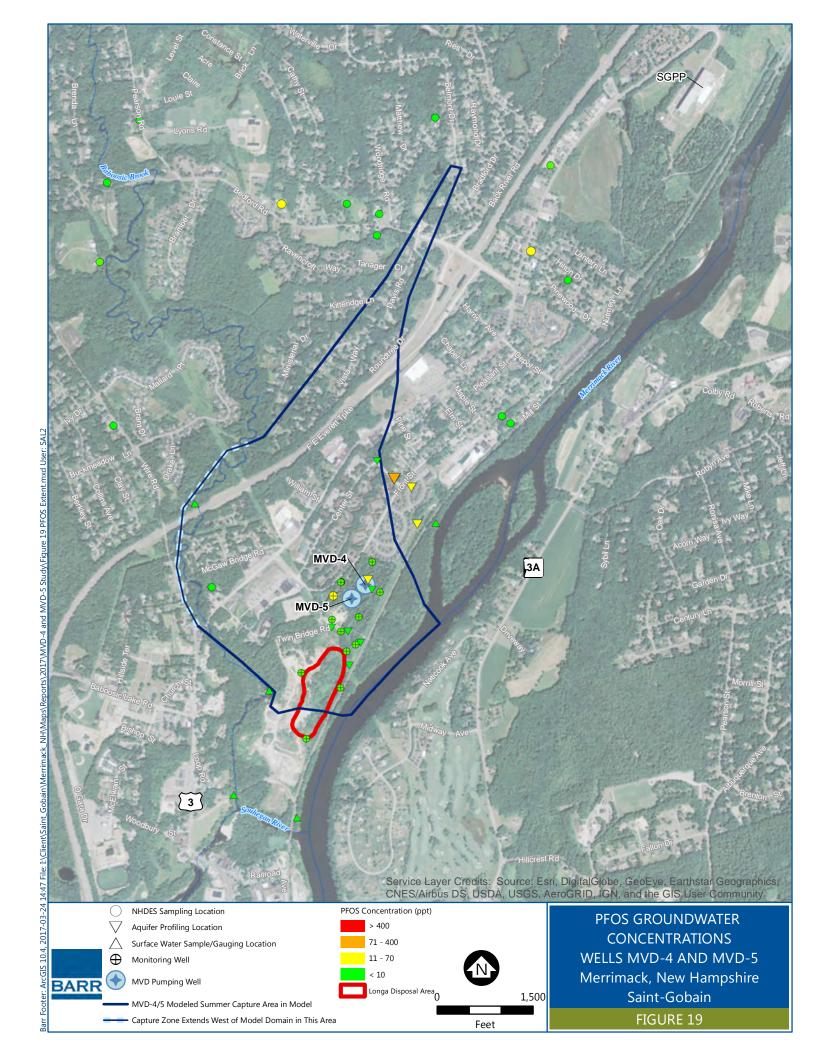


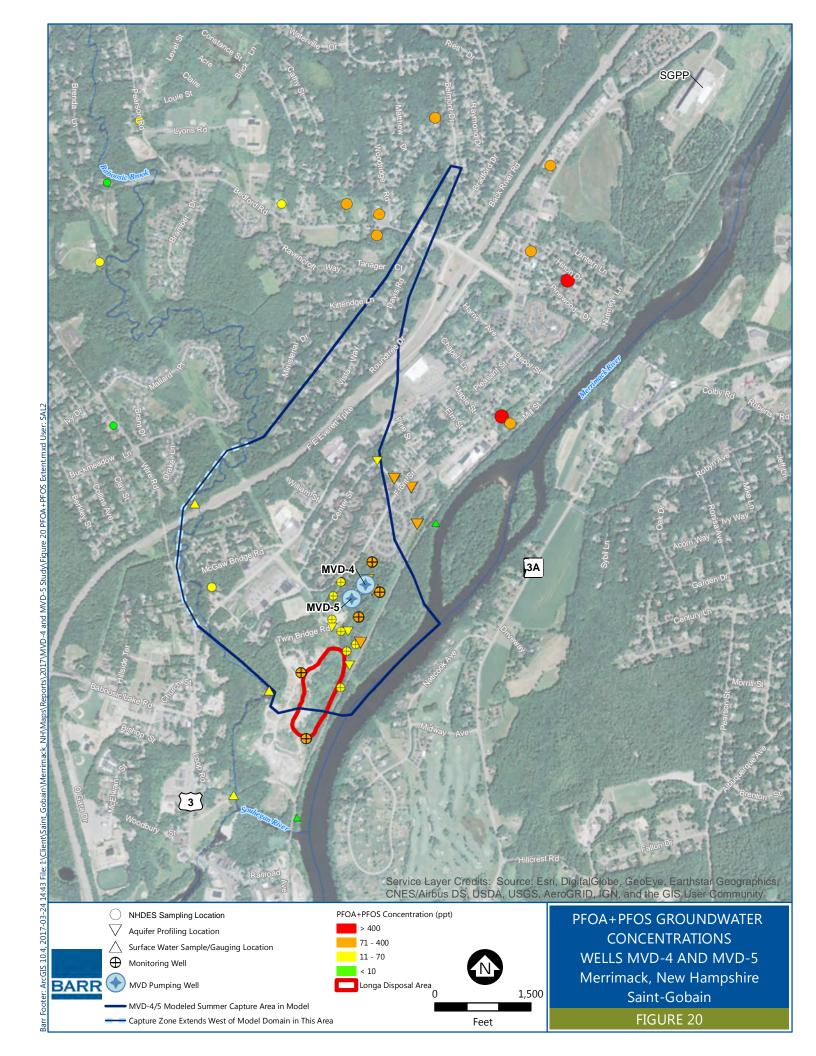


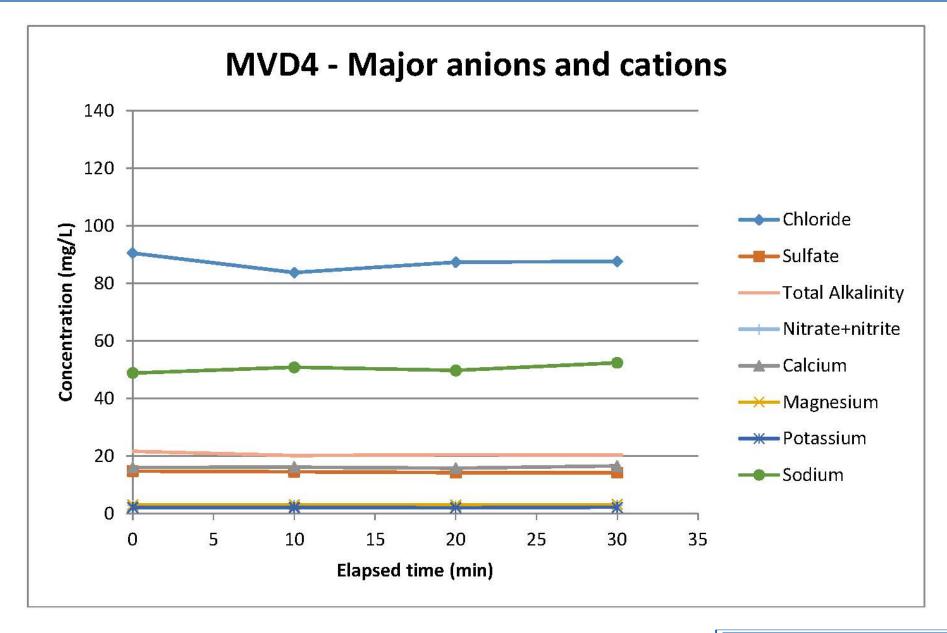






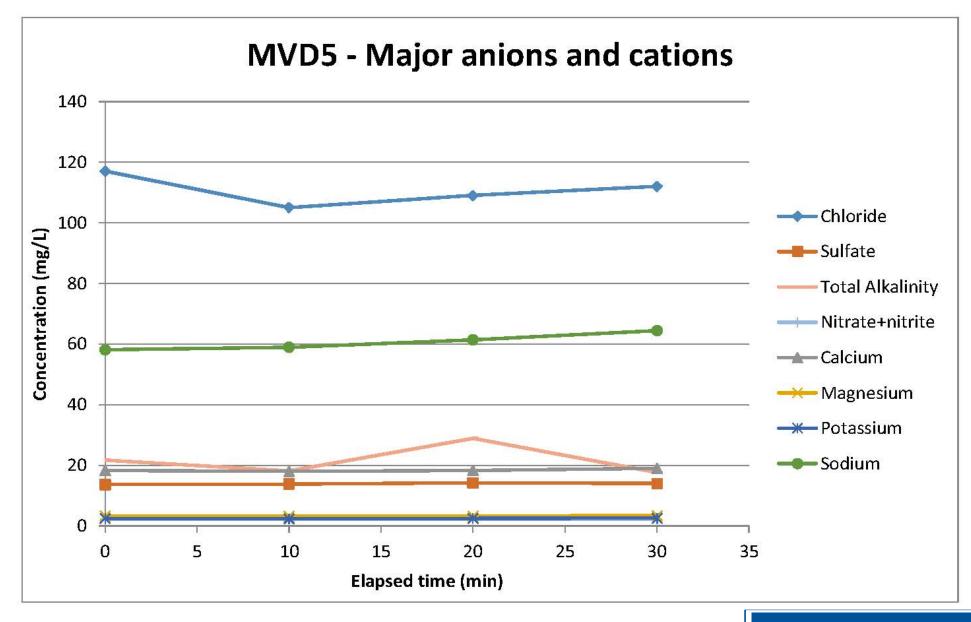






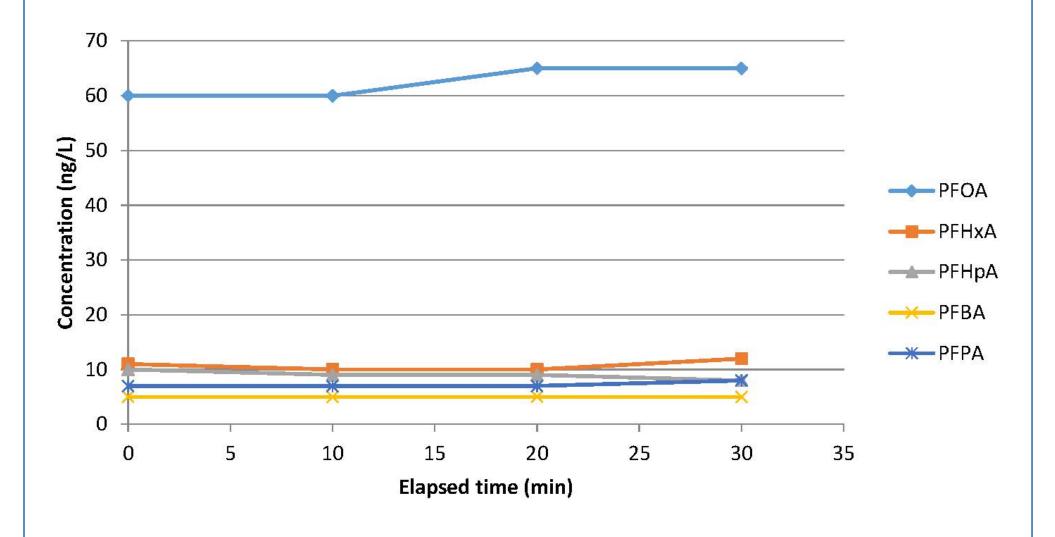


MVD-4 MAJOR ANIONS AND CATIONS Merrimack, New Hampshire Saint-Gobain



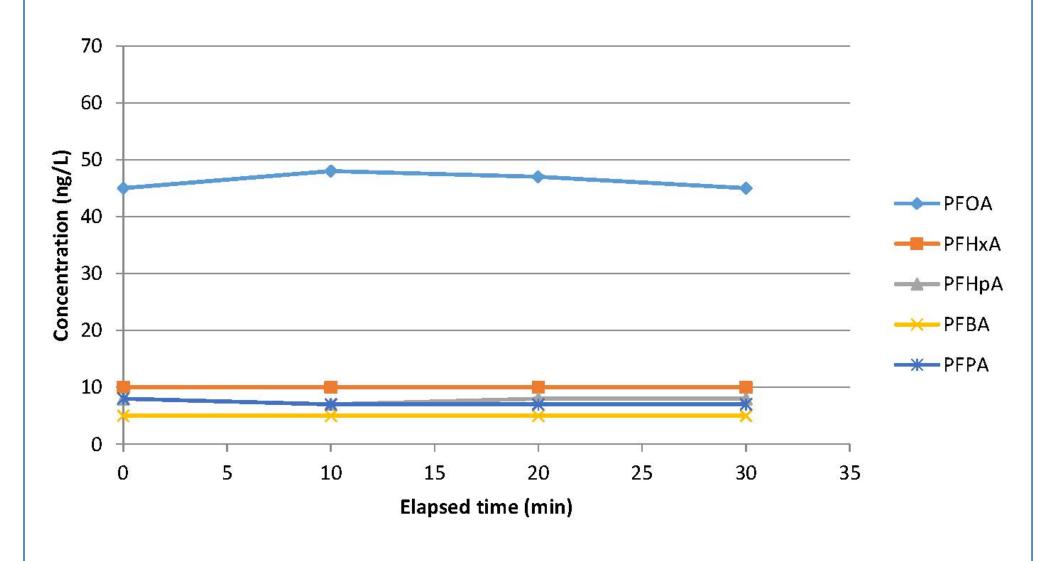


MVD-5 MAJOR ANIONS AND CATIONS Merrimack, New Hampshire Saint-Gobain





SELECT PFAS MEASURED IN MVD-4 DURING NOVEMBER 2016 TESTING Merrimack, New Hampshire Saint-Gobain



SELECT PFAS MEASURED IN MVD-5 DURING NOVEMBER 2016 TESTING Merrimack, New Hampshire Saint-Gobain



Appendix A

Aquifer Profiling and Sampling Methods



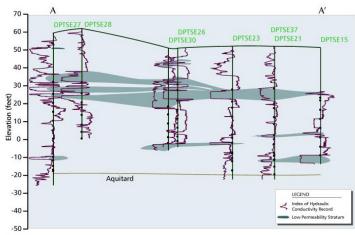
Vertical Aquifer Profiling with the Waterloo Advanced Profiling System

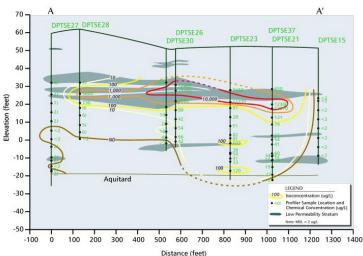
The Waterloo Advanced Profiling System (Waterloo^{APS TM}) is the next generation of the Waterloo Profiler that was originally introduced to investigation and remediation professionals in 1994.

Developed and tested extensively at the University of Waterloo, the Waterloo Profiler transferred High-Resolution Site Characterization (HRSC) capability from the groundwater research community to industry.

Built around this tool,
Waterloo^{APS TM} is a complete
subsurface data collection
platform, combining the same
high-quality, discrete sampling
capability with continuous, realtime hydrosratigraphic logging. This
system has been utilized worldwide
for the past 14 years in a broad array
of environments. Using hybrid drive
methods, the Waterloo^{APS TM} has
achieved depths of 600 feet below
ground surface.







Real time hydrostratigraphic profiling in the same push with discrete depth sampling, without withdrawing the tool between samples, allows for very efficient high-resolution groundwater contamination investigation. In this figure the $I_{\rm K}$ allowed the investigator to identify and sample sand lenses with in a clay unit that serve as major contaminant transport pathways.



Real-Time Hydrostratigraphic Logging and Sampling in a Single Push

The KPRO (hydraulic conductivity profiling) system incorporated into the Waterloo^{APS TM} is the original injection logging hydraulic profiling tool. As the tool is advanced, clean water is injected into the formation while depth, pressure, and flow rate are monitored. From these data, a real-time continuous log of the Index of Hydraulic Conductivity is calculated. It is not necessary to drive the tool once to log the hydrostratigraphy and again to sample—both are accomplished in a single push.

Saving Time and Money

The KPRO hydrosratigraphic profiling system integrated into the Waterloo^{APS ™} saves time and money in three important ways:

- KPRO helps us select depths at which
 to collect samples based on changes in
 stratigraphy as opposed to random or
 predetermined "blind" intervals. The I_K
 and sample collection are accomplished
 in a single push to obtain data more
 quickly and cost effectively.
- It enables a better understanding of the site's hydrostratigraphy for the creation of more accurate conceptual site models and flow and transport models.
- It identifies impermeable zones so time is not wasted trying to collect water samples in suboptimal locations. Low permeability zones can, and should, be sampled using high-resolution soil sampling techniques.

WATERLOO^{APS TM}

Multiple Models for Various Hydrogeologic Conditions

Waterloo^{APS ™} 225—a 2.25-inch OD version is the most robust model, built to be used with the Geoprobe 8040 rigs for maximal depth penetration. The tip has more open area for higher sampling rates and reduced clogging. The 225 can be used with either a peristaltic pump or with the downhole nitrogen drive positive displacement pump.

Waterloo^{APS TM} 175—the 1.75-inch OD version is the same diameter as the original Waterloo Profiler but utilizes more durable direct push rod and has the unique APS tip design.



One of these three profiling tip models is right for most conditions.



The KPRO system provides an integrated, high quality, high-resolution data collection system.

STANDARD OPERATING PROCEDURE

SEI-6.43.5

GROUNDWATER PROFILING AND KPRO TESTING

SOP Number: SEI-6.43.5 Date Issued: 08/13/02

Revision Number: 5 Date of Revision: 01/06/2015

1.0 OBJECTIVE

Groundwater profiling is conducted to assess the distribution of contaminants and hydrogeologic conditions of a given aquifer at a scale much smaller (several centimeters) than the conventional monitoring well system. This method uses the Waterloo^{APS} (Advanced Profiling System) to collect groundwater samples at multiple discrete depths as the profiler is advanced vertically through unconsolidated, saturated porous media at a given location. The Waterloo^{APS} is a direct push tool used to collect samples and other data at multiple depths within a single hole without withdrawing and decontaminating the tool between samples. The profiling system can generate the following data in addition to the collection of groundwater samples for analysis:

- 1) Index of hydraulic conductivity (I_k)
- 2) Depth to potentiometric surface (water table)
- 3) Specific conductance
- 4) pH
- 5) Dissolved oxygen
- 6) Oxidation/reduction potential
- 7) Temperature

The index of hydraulic conductivity provides a real-time indication of the relative changes in hydraulic conductivity which allows for decisions to be made on depths to stop driving the profiler and collect samples as well as to assess the hydro-stratigraphy across the site.

There are two types of profiler configurations: 1) a peristaltic pump configuration with a single downhole tube and 2) a gas drive pump configuration with three downhole tubes.

The peristaltic pump can be used when the depth to water is less than the suction limit (typically around 25 feet below ground surface). The gas drive pump system must be used when the depth to water is greater than 25 feet below ground surface (bgs).

2.0 POLICIES

An experienced, qualified SEI staff member will train all SEI staff using this SOP.

SEI staff will read the most current version of this SOP and other appropriate SOPs prior to starting fieldwork.

3.0 SAFETY ISSUES

The corporate Health and Safety Plan and the Site Health and Safety Plan specify the procedures to be followed and equipment to be used during site activities. The following is a brief and general overview of safety issues.

- Potential Safety Issues include:
 - o Noise Levels
 - O Heavy equipment (drill rigs or direct push rigs) hazards
 - Overhead utility hazards
 - O Underground utility hazards
 - O Traffic/ motor vehicle hazards
 - o Hazards associated with exposure to various chemicals
 - o Slip, trip and fall hazards
 - Pinch point hazards
 - O Compressed gas hazards
 - o Fire hazards from hot work (e.g., grinding)
 - o Gasoline hazards (filling generator)
- SEI staff and others under contract with SEI that may be present on-site will wear a hardhat whenever overhead hazards are present.
- Appropriate eye protection should be worn
- Hearing protection shall be worn whenever the drill rig is actively advancing profiling equipment.
- Steel toed boots will be worn.
- SEI staff will read the site health and safety plan (HASP) prior to beginning a project.
- Additional personal protective equipment shall be worn in accordance to the health and safety document.

4.0 PROCEDURE

4.1 Equipment

An equipment list is presented in Attachment 1. This list includes the equipment used for the peristaltic pump configuration and the gas drive pump configuration.

4.1.1 Drive Platform and Related Equipment

Any device that vibrates, hammers, or pushes drill tools can be used to advance the profiler. The type of drive platform selected is a function of the type of material to be sampled and the depth to which the profiler needs to be advanced. Typical drive platforms include GeoProbe 66 series probe rigs or similar rigs as well as larger conventional auger drill rigs with a breaker hammer mounted on the rig. A Geoprobe 8 series or equivalent is recommended to drive the 2.25" tip and rods. Field staff must ensure that the proper adaptors and subassemblies are provided for the particular drive platform to be used prior to taking to the field.

4.1.2 The Waterloo Profiler

This system is comprised of a 1.5, 1.75 or 2.25 -inch diameter profiling tip that is attached to 1.5 or 2.25-inch GeoProbe style rod or a quick thread style 1.75-inch diameter drill rod. The 1.5 and 2.25-inch drill rod is provided by others. The 1.75 inch rod is the standard rod size that Stone uses for profiling.



1.5, 1.75 and 2.25" Profiling Tips

The 1.5 and 1.75-inch profiling tips contain 4 removable plates, each with 4 screened sampling ports (16 total) that allow for the groundwater to pass into the tip. The 2.25-inch

Page 3 of 72

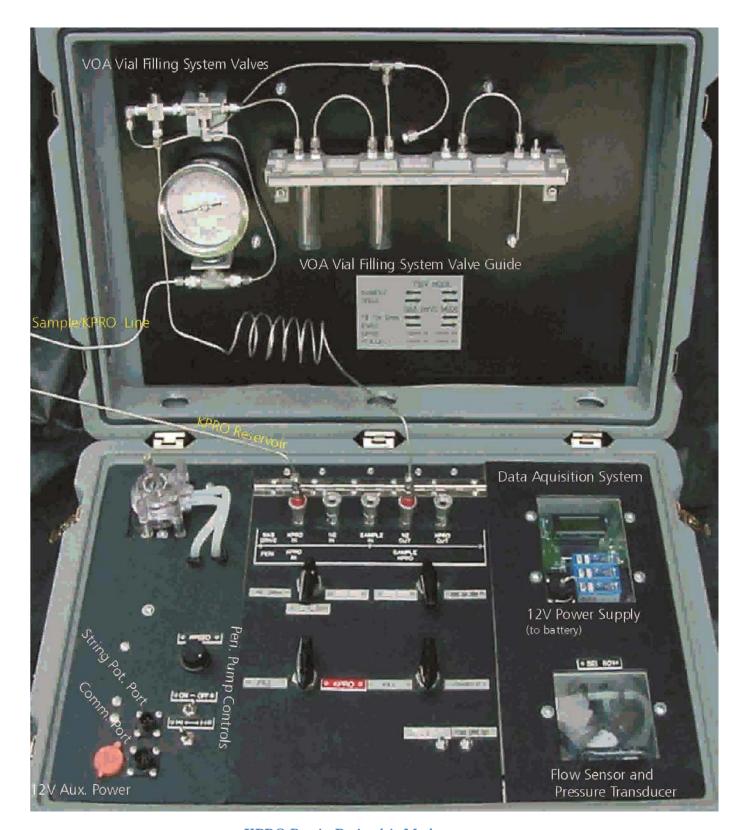
tip contains 6 plates. The plates have a slightly different design than the smaller tips in that the entire plate is more or less a sampling port. The groundwater is obtained using either a peristaltic pump or a gas-drive system (see Figure 4.1 for a schematic of these two profiler configurations).

4.1.3 Volatile Organic Analysis (VOA) Vial Filling System

The system contains as many as four vials connected in-series using stainless steel tubing and specially designed vial holders. The system is designed to mitigate losses of the volatile organic compounds (VOC) by ensuring that no exposure to the atmosphere occurs while the sample is collected. The bottle holders can accommodate up to four 40-mL VOA or 250-mL vials. The vial filling system has been incorporated into the SEI KPRO box. Although the KPRO box utilizes a peristaltic pump, the sample vials are located on the *down hole side* of the pump so that groundwater is pumped through the vials before going through the head of the pump.

4.1.4 KPRO Measurement and Data Acquisition System

The KPRO box consists of four valves, electronic enclosure, peristaltic pump and vial filling system (referred to as the sample jig). The valves can be oriented in a variety of ways in order to send water down and out of the profiling tip or to collect a groundwater sample in both peristaltic and gas drive modes. The following photo illustrates the box setup in peristaltic mode:



KPRO Box in Peristaltic Mode

The KPRO Measurement and data acquisition system consists of the following components:

- McMillan Model 102-4 (20-200mL/min) Flow Sensor
- Sensotec Model TGE/388-02TJA (0-50PSI) Pressure Transducer
- Celesco Model PT5DC-100-V62-UP-Z5-M6M String Potentiometer
- Analog Devices Acquisition System, includes signal conditioners and acquisition board. The removable container that houses the data acquisition system, flow sensor and pressure transducer is referred to as the "enclosure".
- GeoTech Model Geopump peristaltic pump
- Labview KPRO Software Program
- Notebook computer (Toughbook or other)
- USB-Serial Cable or Serial Socket Card
- USB mass storage unit for data back up
- AC/DC power inverter or 12V deep-cycle battery

The following photo illustrates how the entire system looks when it is set up in the truck:



4.1.5 Sonde Water Quality Monitoring Systems

Specific instruction regarding the use, calibration and maintenance of these systems can be found in SEI SOPs 5.27.n (Hydro Lab MS-5), 5.25.n (Troll 9000 and 9500) and 5.30.n (YSI 600XL). When coupled with the profiling equipment, calibrations and verifications are performed weekly rather than daily. If necessary a verification check may be performed at the beginning of a new work day or as needed, however, since these systems are in situ and used to verify three readings prior to sampling, full calibrations are not performed on a daily basis. The YSI 600XL, Troll 9000, Troll 9500, Hydro Lab MS-5, and Hach HQ30 Water Quality Monitoring Systems consists of the following components:

- pH/ORP Probe
- Conductivity/Temperature Probe
- Dissolved Oxygen Probe
- Custom Made Flow-Through Cell.
- 3/8th" Polyethylene tubing

4.1.6 **Record Keeping Materials**

- KPRO Calibration Log (dedicated to each profiling box).
- Groundwater Profiling Log (electronic and paper).
- Pens
- USB mass storage unit

4.2 **General Procedure**

The profiling procedure for the peristaltic pump mode and the gas drive mode consists of 6 main steps:

- Set up of the KPRO box and associated equipment
- 2. Tip / Pump assembly
- Adding rod and tubing
- Drive the tool and acquire index of hydraulic conductivity data
- Purge water from the system and obtain physico-chemical data from the Sonde water quality monitoring system
- Collect samples and record data.

4.3 KPRO Box Set Up

4.3.1 Set up common to both Peristaltic and Gas Drive Modes

- 1. Open the KPRO box and support the top by using the built in wooden tab in the truck or the metal arm and screws that are located inside the KPRO box.
 - Plug the AC/DC inverter into the receptacle in the truck. Plug the power cable into the inverter and into the three pronged receptacle on the enclosure of the box.
- 2. Plug one end of the string potentiometer communication cable into the data port on the panel of the KPRO box and screw the other end into the string pot.
- 3. Connect the data cable to the Communication Port (COM port) on the KPRO box panel. Plug the other end of the cable into one of the serial ports on the computer or the USB Serial Cable and secure it using the thumb screws on the cable.
- 4. Unpack the water quality sonde from its case. Unscrew the cal cup and screw on the flow through cell and connect the power and com cables to the sonde. Connect the com cable to one of the socket ports on the computer. Secure the sonde by putting it into the holder mounted on the counter. Connect a piece of poly tubing to the KPRO box out (peri or gas, depending on which method you are using) and the other to the bottom connection on the flow through cell. Connect a different piece of tubing to the other fitting on the flow cell. The other end of this tubing will go into a graduated cylinder. If you are using a standalone dissolved oxygen sensor, connect the "Out" tubing to the flow through cell of the DO meter, then use another length of tubing to connect to the sonde flow through cell.
- 5. Connect a male swage quick connect to a five foot length of stainless steel tubing and plug it into the female quick connect labeled KPRO In on the KPRO box. Connect the other end to the "out" port on the stainless steel KPRO reservoir using a reservoir quick connect fitting (black band).
- 6. Fill the stainless steel KPRO reservoir with analyte free water (distilled or spring water). Seal the top and close the pressure release valve.

4.3.2 Set up specific to Peristaltic Mode

- 1. Attach a low pressure regulator (0-500 psi) to the nitrogen cylinder.
- 2. Attach a five foot length of tubing to the "in" (white) port on the stainless steel KPRO reservoir using a quick connect fitting. Attach the other end to the outlet port on the nitrogen tank regulator. Open the valve on the nitrogen cylinder and set the regulator to 30 psi.
- 3. Attach a 20 foot length of stainless steel tubing to the inlet side of the SwageLok® fitting at the bottom of the pressure/vacuum gauge on the top panel. Tighten firmly. This line is the KPRO / sample line and is referred to as the harness.

4. On the KPRO box plug the male quick connect that is attached to the sample jig to the "KPRO Out" female quick connect on the KPRO box (Second from the right).

4.3.3 Set up specific to Gas Drive Mode

- 1. The gas drive system utilizes two regulators attached to the cylinder by a "T" adaptor. One of the regulators is low pressure (0-500) and the other is high pressure (0-4000).
- 2. Attach a five foot length of tubing to the "in" (white) port on the stainless steel KPRO reservoir using a quick connect fitting. Attach the other end to the outlet port on the low pressure nitrogen tank regulator. Open the valve on the nitrogen cylinder and set the regulator to 30 psi.
- Connect a five foot length of tubing to the high pressure regulator. Attach a quick connect
 to the other end and insert into the "N2 In" female quick connect on the KPRO box. Set the
 regulator to 80 psi.
- 4. On the KPRO box plug the male quick connect that is attached to the sample jig to the "Sample In" female quick connect on the KPRO box (middle connection).
- 5. The harness for gas drive mode consists of three stainless steel tubes which are labeled with colored zip ties. Plug the KPRO line male quick connect (blue) into the "KPRO Out" quick connect on the KPRO box and plug the Nitrogen line (red) quick connect into the "N2 Out" quick connect. The Sample line (yellow) does not have a quick connect. This line connects to the 1/8" Swage fitting on the pressure gauge.
- 6. Attach a one end of a length of plastic tubing (FEP or other) to the "Peri Out" port located at the bottom right of the KPRO box and put the other end into a plastic 1L graduated cylinder. Attach a similar length of tubing to the "Gas Drive Out" port and connect this to the bottom port on the flow cell of the water quality sonde.
- 7. Inside each KPRO box is a vent tube, which is a length of poly tubing attached to a quick connect. Connect this tube to the port located on the outside front of the KPRO box.

4.4 Tip and Pump Assembly for Peristaltic and Gas Drive Modes

The 1.5 and 1.75-inch profiling tips have 4 plates and the 2.25-inch tip have 6. Behind the plate is a removable mesh screen. The size of the inner screen can be altered to prevent fines from entering the profiler or to maximize flow. Screen mesh sizes range from 40 (coarse) to 120 (fine). 80 size screen is usually the default screen size and can be changed depending on site geology. For peristaltic mode either the 1.5, 1.75 or 2.25-inch diameter tips can be used. With gas drive mode only the 1.75 or 2.25-inch tips can be used.

4.4.1 Peristaltic Mode

A small diameter tube (typically ¼-inch outside diameter fluorinated ethylene propylene, or FEP) is fitted into the threaded hole in the center of the profiler tip by means of a ¼- inch NPT thread to ¼- inch SwageLok® fitting. The following procedure will outline the procedure for assembling the tip and adding rod and drive hardware.

- 1. Wrap the NPT threads of the ¼- inch NPT to ¼- inch SwageLok® fitting with Teflon tape and thread into the tip. With the tip locked into a vise, tighten the fitting as tight as you can with a 9/16" socket by hand. Most profiling tips already have this fitting installed and if so, there is no need to remove it.
- 2. Each tip has plates that are attached to the tip via T-25 torx plus screws. Each plate has sampling ports. Under each plate is a mesh screen (40-120 slot). The smaller the slot size the larger the opening is in the screen. The most common screen size used is 80 slot. If there are no plates on the tip first place the mesh screen into the space for the plate making sure to line up the screw holes. Put on the plate and tighten the screws as tight as possible using only a T handle screwdriver or similar tool. Do not use an impact driver as it will over tighten the screws. If you are using a tip that already has the plates installed, double check that the screws are tight.
- 3. Cut a 6-8" length of FEP tubing and insert a steel barb into each end.
- 4. For this step it is best to lock the tip into a vise. On the end of the FEP that will attach to the tip, slide a ¼- inch SwageLok ® nut onto the FEP and then slide on a ¼" nylon ferrule. Insert the end of the FEP tubing into the ¼" fitting on the tip making sure that it is inserted as far as it can go. Using a specialized ½" open ended socket, tighten the ¼" nut until there is approximately ½" vertical gap between the top of the steel insert and the nut as shown in the following photo:



5. For the other end of the FEP, slide on another ½" SwageLok nut and ½" nylon ferrule. Insert the end of the FEP into a ¼ "to ½" SwageLok® reducer. Using a ½" and ½" wrench, tighten the nut as before. Be careful to keep the FEP seated tightly into the fitting while tightening.

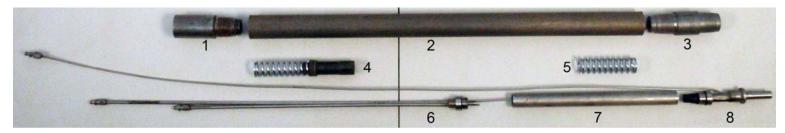
When using the 1.5" tip, a male/male adaptor must be screwed into the tip after the FEP tubing is attached to the ¼- inch fitting on the tip. This allows the rod pin to be up so that the GeoProbe drive / slip cap can be utilized. After the adaptor is attached, then the ¼ inch to ⅓ inch SwageLok® reducer can be attached. The inside diameter of the adaptor is not large enough to accommodate the reducer so it has to be fitted after the adaptor is attached.



- 6. Gently pull on the reducer after the fittings have been attached to make sure that it is attached properly. If the fittings are over tight then the FEP can snap; if they are too loose than the FEP can pull out of the fitting.
- 7. A five-foot length of 1.75-inch diameter rod is slipped over the stainless steel tubing with the pin end down and is threaded into the profiler tip. When using the 1.5 or 2.25-inch tip the rod is threaded pin up. This union should also be "stepped on" using pipe wrenches to ensure that it does not vibrate loose. A sacrificial knock out tip should be fitted with two o-rings and the shank of the tip wrapped with Teflon® tape to minimize the movement of silt into the bottom of the tip. Electrical tape should only be used to affix the knock out tip to the profiler if toluene is not an analyte of concern at the site.
- 8. The top drive cap is then threaded into the top of the 5-foot 1.75-inch rod with the stainless steel tubing protruding through the center of the drive cap. The slotted slip cap adapter is then placed over the drive cap and fitted into the bottom of the hammer on the drive platform. When using the 1.5 or 2.25-inch tip there is no threaded drive cap. Because the rods are threaded pin up, a one piece GeoProbe style slotted drive cap is used instead.

4.4.2 Gas Drive Mode

- Wrap the NPT threads of the 1/4- inch NPT thread to 1/4- inch SwageLok® fitting with Teflon tape and thread into the tip. With the tip locked into a vise, tighten the fitting as tight as you can with a ⁹/₁₆" socket by hand. Most profiling tips already have this fitting installed and if so, there is no need to remove it.
- 2. Each tip has plates that are attached to the tip via T-25 torx plus screws. Each plate has four sampling ports. Under each plate is a mesh screen (40-120 slot). The smaller the slot size the larger the opening is in the screen. The most common screen size used is 80 slot. If there are no plates on the tip first place the mesh screen into the space for the plate making sure to line up the screw holes. Put on the plate and tighten the screws as tight as possible using only a T handle screwdriver or similar tool. Do not use an impact driver as it will over tighten the screws. If you are using a tip that already has the plates installed, double check that the screws are tight.
- 3. Instead of FEP tubing, the gas drive system utilizes a 1/4" stainless steel tube ("piston"). To attach the piston, slip a 1/4" swage nut and 1/4" steel ferrule onto one end of the piston. Insert this end into the 1/4" fitting on the tip. It is best to have the tip locked in a vise for this step. Slip the open ended ⁹/₁₆" socket over the piston and tighten the nut as tight as you can.

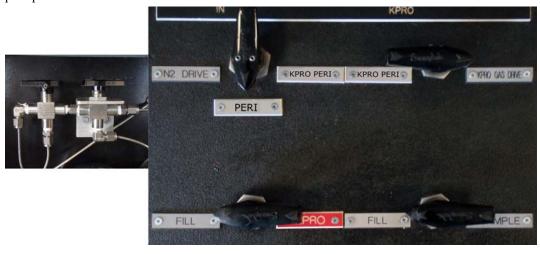


The above photo illustrates the components of the gas drive pump.

- 1. Pump Housing Top
- Pump Housing Middle 2.
- 3. Pump Housing – Bottom
- Top Spring with plastic bushing
- 5. **Bottom Spring**
- Pump Body top. Sample line is the middle tube and nitrogen is the short
- 7. Pump Body – middle
- Pump Body bottom with reed valve. The KPRO line is attached.

- 4. The gas drive pump body has three parts, the bottom (which has the KPRO line), the middle and top (which has the sample and nitrogen lines). Look into the narrow part of the pump bottom from the bottom. The piston on the tip will eventually be inserted into this end of the pump. There should be two very small rubber o-rings seated into two slots. If they are present, it is a good idea to replace them. If the o-rings get worn or dry out you will not get a proper seal between the piston and pump.
- 5. Pry the o-rings out with an angled pick and discard. Rinse out the slots with water. Replace the o-rings using the same pick.
- 6. Place an o-ring at the base of the threads of the top and bottom pump pieces and wrap the threads with Teflon® tape.
- 7. Trim a reed valve and place it onto the stub on the top of the pump bottom. In order for the reed valve to fit inside the middle pump piece, the flange of the valve must be trimmed. NOTE: There are two types of reed valves, one for depths shallower than 150' and one for profiles deeper than 150'. The storage container for the valves should be labeled as to which valve is which. Using a reed valves designed for shallow depths in a deeper profile could result in a catastrophic failure of the valve. If the container is not labeled assume the valve us for lesser pressures.
- 8. Thread the middle pump body onto the top and bottom pump pieces. Lock the middle of the pump into a vise and tighten the top and bottom pump pieces with a ⁹/₁₆" open ended wrench until tight. The o-rings should squeeze out of the joint slightly.
- 9. Slide the plastic bushing and spring over the three stainless steel tubes so it rests snug on the top of the pump. Make sure that the KPRO line is located into the slot on the bushing.
- 10. The pump housing is comprised of three pieces: the middle 2.4-foot section of rod (with female threads on both ends), the bottom which has two male threads, and the top which has one male and one female thread. The 2.25-inch pump housing has the same parts but the female male goes at the bottom and the male –male fitting is at the top. Insert the bottom spring into one end of the middle pump housing. Apply Teflon paste or tape to the male threads on all of the pump housing pieces as well as the profiling tip and first drill rod. This will prevent silt from migrating into the pump housing. Screw in the bottom housing piece so that the extended end is inside the pump. Make sure that the spring is at this end of the pump. Insert the pump into the housing. Screw on the top housing piece.
- 11. Take the profiler tip and slide the ¼-inch stainless steel tube up into the receptacle in the pump bottom. Screw the tip onto the pump housing.

- 12. With the pump in a vertical position and the tip on the ground, grasp the three stainless steel lines and push them down. You should feel the springs move up and down smoothly. If they don't, the pump must be taken out of the housing and checked. It is very important that the springs are free to move. If they cannot, the vibration of the hammer will damage the pump.
- 13. **Pressure testing the Gas Drive Pump:** The pump must be pressure tested before it is used to make sure that the o-rings and the reed valve have been installed properly. It is usually a good idea to pressure test the pump after collecting the equipment blank or decontaminating the KPRO box since the pump is attached and full of water. The following steps will lead you through this:
 - a. Connect the pump to the tubing harness (all three tubes). You will notice that the three lines coming out of the pump are at three different lengths. The difference in length is the only way to be able to differentiate between them. The KPRO line is the longest, the nitrogen line is the shortest and the sample line is in the middle.
 - b. Arrange the valves according to the following photo to start filling the pump:



c. When a steady stream of water is flowing out of the Peri Out tubing on the KPRO box then the pump is full. Turn the two valves on the sample jig so that they are closed (facing the back of the box). Turn the bottom left valve 90 degrees to shut off the flow. Turn the top left valve to N2 Drive. The pressure on the gauge will rise to where it is set on the regulator. Make sure the pressure is set to around 100 psi or the expected working pressure.

- d. Disconnect the N2 Out quick connect on the KPRO box and watch the pressure gauge. If the needle on the gauge is steady then the pump is holding pressure. If the pressure drops then there is a leak. Check that all of the fittings are tight and refill and pressurize the pump. If that does not work, there is a leak in the pump itself (either an o-ring or reed valve) or possibly there is a leaky valve in the KPRO box.
- e. **Testing the Bottom O-rings.** If there is not a tight seal between the small o-rings at the bottom of the pump and the piston, KPRO water will not be able to flow into the tip, which will result in inaccurate IK data, sampling of the water inside of the drilling rods and a clogged tip. With the pump pressurized, turn on the flow by turning the bottom left valve on the KPRO box to KPRO. You should see water flowing out the tip. Grasp the pump just above the tip and invert the pump at a 45 degree angle so that your hand blocks the flow of KPRO water. If you see water flowing out of the pump housing then it is possible that the o-rings are leaking and they need to be checked.

NOTE: A more reliable way to determine if there is a leak is to check for air bubbles flowing through the vials while collecting the equipment blank. Double check that all of the fittings on the harness, KPRO box and pump are tight. If there are still bubbles then the o-rings need to be checked. Refer to section 4.9.3 on equipment blank procedures.

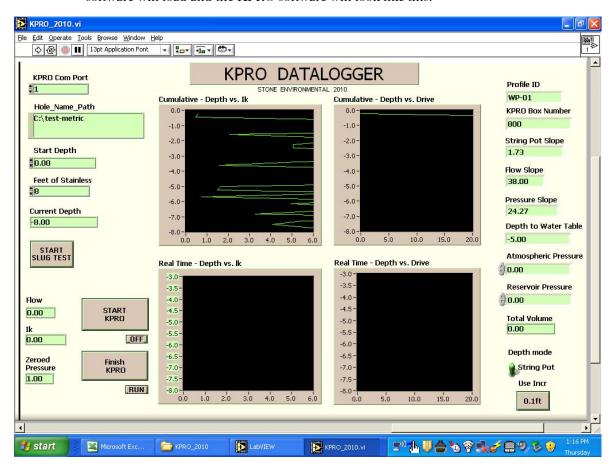
- 14. Add a 20-foot length of stainless steel tubing to each tube fitting leading from the pump.
- 15. Slide a 5' drill rod over the stainless steel tubing and screw it into the pump.
- 16. Tighten all joints by firmly by standing on the pipe wrench. To do this put one pipe wrench so that it is resting on the ground. Place the middle of the pump into the wrench. Put the other wrench on the tip and stand on it, making sure that the other end of the rod is weighted down (have a helper stand on it). This will tighten the tip and the bottom pump housing piece. Repeat for the top of the pump and rod.
- 17. The top drive cap is then threaded into the top of the 5-foot rod with the three pieces of stainless steel tubing protruding through the center of the drive cap. The slotted slip cap adapter is then placed over the drive cap and fitted into the bottom of the hammer on the drive platform.

4.5 KPRO Software Calibration and Startup

4.5.1 Calibration

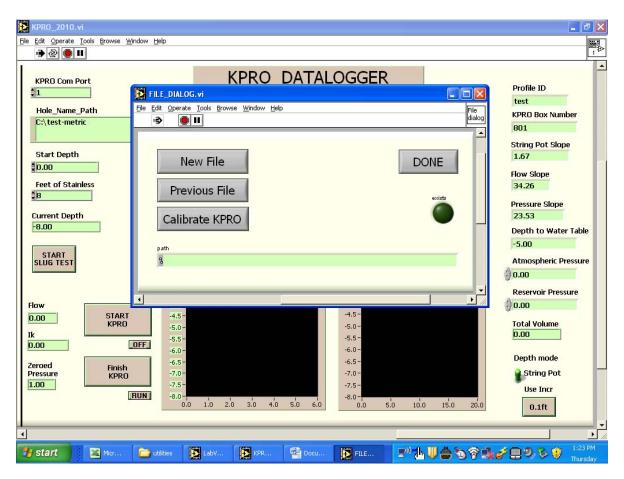
The KPRO box should be calibrated at the beginning of a new project and once weekly (or every 5 days if there is a longer shift). If an individual sensor or entire electronics enclosure is replaced then there should be a recalibration. The calibration is saved on the field computer, so if the KPRO box was calibrated with a different computer then it needs to be recalibrated.

- 1. At this point the computer should be plugged in and booted up. If not, do so now.
- 2. Find the KPRO program icon on the desktop or located in the C:\KPRO_2010 folder. The program is named "KPRO_2010.vi". Double click on the icon. The Labview software will load and the KPRO software will look like this:



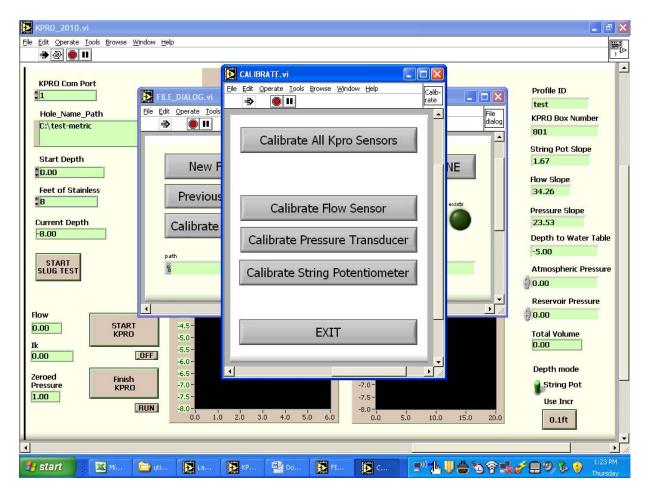
KPRO Software

- 3. Make sure that the correct COM port is provided for the KPRO box before starting the program and correct it if necessary. The text box for the COM port is located at the top left of the above figure. The COM port located at the back of the computer is COM1.
 - When using the USB-Serial cables navigate to Control Panel/System/Device Manager and scroll down to Ports. The cable will be listed as "Prolific USB-Serial" and the com port assignment will be listed. For the socket cards, click on the icon for the socket driver located in the taskbar to see which COM port numbers have been assigned to the socket card (On the figure above it is the symbol fourth from the left at the bottom right of the screen).
- 4. Start the KPRO program by clicking on the right arrow icon on the top left menu bar (above the COM port text box). There is no need to enter any data before starting the program (other than the COM port for the KPRO box), as the program will populate the fields or prompt you to enter a value.
- 5. A window opens and prompts you to enter the number of the KPRO sample box that you are using (800 through 809). Enter the number and select the enter button.
- 6. A window opens and prompts you to enter the profile ID. Enter the ID and select the enter button. The following screen will load.



Startup Screen

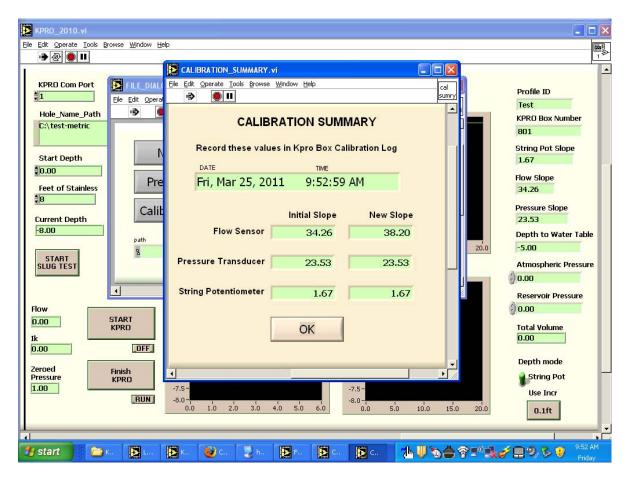
- 7. Select CALIBRATE KPRO. Make sure that there is at least a 20' foot length of stainless steel tubing attached to the profiling box when calibrating. This will ensure accurate calibration of the flow and pressure. Using a smaller piece of tubing can adversely affect the validity of the calibration.
- 8. The next screen allows you to calibrate all of the sensors or each individual sensor (string pot, flow and pressure).



Calibration

Select the "Calibrate All KPRO Sensors" or the button corresponding to each individual sensor (if you do not need to calibrate all of the sensors). The program will then lead you through the calibration. Follow the directions on the screen to calibrate the flow, pressure and string pot. After calibration is complete, if you feel that one or more of the sensors was not calibrated correctly, you can repeat the entire calibration or just repeat the calibration for an individual sensor. If you decide to recalibrate one or all of the sensors, be aware that the program will use the original slopes and not the newly calibrated slopes for the recalibration.

9. After calibration, a summary screen will open.



Calibration Summary

Record the initial and new slopes in the calibration log (yellow book in the KPRO box) for the KPRO box you are using. Slope values should be within the following parameters: string pot 1.6-1.8, flow 32-38, and pressure 22-28. (There are a few string pots that have longer cables than normal and as a result will have a slope value double the normal value, usually around 3.2-3.6). If the slopes are off from these values, recalibrate. If that does not work, you may need to change out the pressure transducer, flow meter or string pot. Select the OK button to exit this screen.

Note: The program records the slope values in two files located in the C:\KPRO_2010\Output_Files folder. The file named "slopes.txt" is used by the KPRO program to import the slopes the next time it is started and after calibration. The other file, "cal-slopes-record.txt" is used only as a record of the calibration (it records date, time and KPRO box number as well as the slopes). Do not delete the files or any of the data in them or move them to a different folder. Additional Note: If the calibration slopes are off due to a calibration error, simply go through the calibration process again. If you are having problems calibrating, see the KPRO Problem Solving Guide for more

information. It may be necessary to delete bad slope values from the slopes.txt file in order to calibrate the box. The software uses the old slopes to calculate the new slopes, so if the slope that the software is using is way off, it may not be possible to get a good new slope using this value. If this seems to be the case, open the slopes.txt file and delete the entire line of bad data. Save and close the file.

4.5.2 Startup

- 1. After calibration or after clicking on the start button, the startup screen will load (Figure 4.5-2). If you are starting a new profile, select NEW, and if you are continuing a profile select PREVIOUS. There may be a path to the file you want to use already displayed in the box at the bottom of the screen. You still need to select the PREVIOUS button and navigate to the file. When starting a new profile, after selecting NEW, navigate to the C:\Projects\Project Name\kpro_raw folder and name and save the file. Name the file the same name as the profile ID. There is no need to add a file extension (.txt, .doc) as the program will add its own. The program will then create a file by adding "_KPRO.txt" to the end of the filename. For example "WP-01" becomes "WP-01_KPRO.txt". If you selected PREVIOUS, after navigating to and selecting the file, the green indicator light next to the word "exists" will be illuminated. Make sure to select the filename with no extension when selecting an existing file (for example, select "WP-01" and not "WP-01_KPRO.txt"). Select DONE. You will now begin the software startup procedure.
- 2. The first window that appears is for setting the atmospheric pressure. Follow the instructions on screen to set the pressure. If there are only zeroes in the atmospheric readout, there is a problem with the connection between the KPRO box and the computer (incorrect COM port, bad cable) or the slopes file has been corrupted. Refer to the KPRO Problem Solvers Guide for more information. Record the atmospheric pressure on the Groundwater Profile Log. The atmospheric pressure reading should be close to 34 feet of water. If the reading is higher or lower by a few feet, the pressure transducer needs to be calibrated. This value can also change depending on where you are profiling (high or low elevations, Europe, etc). It is a good idea to check the local atmospheric pressure.
- 3. The next window is for setting the KPRO vessel pressure. Follow the instructions on screen to set the pressure. If the pressure is too high, turn the handle on the regulator counter-clockwise and release some pressure from the KPRO vessel by using the valve on the top of the vessel. If the pressure is too low, turn the handle on the regulator clockwise and allow pressure to stabilize. After adjusting the pressure make sure that the pressure has stabilized and is not falling or climbing before clicking the OK button. Record the pressure on the Groundwater Profile Log.

- 4. The next window will prompt you to enter the start depth. If you are continuing a profile, the last recorded depth will be provided. You can use this depth or enter a different depth. When entering a depth you can enter a positive or negative value; the program will make it negative regardless of the sign that was entered.
- 5. The next window will prompt you to enter the height of the sample box above the profile location. Measure the height from the ground to the pressure transducer and enter it. When profiling out of T5, T6, T7 or T8 the height is 7 feet. When profiling out of T9, the height is 5 feet. The value will be different if you are profiling out of a different vehicle or other situation. If the ground between the truck and profile location has a significant slope, this also must be accounted for.
- 6. The next window will prompt you to enter the depth to water. If you are continuing a profile, the last recorded depth to water will be provided. You can use this depth or enter a different depth. If you do not know the depth to water, you must make an educated guess. You can enter a more accurate depth later. When entering a depth you can enter a positive or negative number. Make sure you enter the depth to water from ground surface, not from the height of the KPRO box.
- 7. The last window will prompt you to zero the pressure to the ground at the profile location. Make sure that the graduated cylinder is placed on the ground as close to the profile location as possible. Follow the instructions on screen and select OK. The setup is now complete and the profiling can begin.
- 8. Recording Data Navigate to and open the Microsoft Excel "Groundwater Profiling Log with Plot" template. This file should be located in the C:\Forms folder or in the file template in the Projects folder. Rename the spreadsheet to reflect the profile name (e.g. Groundwater Profiling Log _WP-01.xls). Select the tab labeled "Groundwater Profiling Log". Fill in the top section of the log. The bottom section of the log will be empty at first but will be populated with data for each separate groundwater sample. The following photo shows the log after sample data has been entered:

Client:	ERM Started	Completed			STONE ENVI	Profile Location: APS-018					
Dates:	5/27/2010	5/28/2010		PRO Box Serial # Acquisition Laptop			_				
Location:	Plainville, CT			Troll Serial #:	o2k0934 YSI		Atmospheric Pressure: 34.89				
SEI#: 092193-R			Dr	illing Contractor.	Platform		KPRO N ₂ Pressure (set via P transducer): 70.14				
Sampler(s):	VLD		Average	Depth to Water:	-17.28		Gas Drive Pump N ₂ Pressure: 80-100				
					PHYSICOCHEMIC	CAL PARAMETERS					
Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	рН	ORP (mV)	COMMENTS			
-18.00	5/27/10 14:40	900	-17.20	519	8.00	6.50	63				
-26.70	5/27/10 15:30	850	-17.10	305	6.40	5.70	96				
-34.00	5/27/10 16:11	1300	-17.15	184	7,20	6.00	96				
-41.00	5/27/10 16:38	1000	-17.20	202	7.50	6.30	83				
-48.00	5/28/10 8:05	900	-17.70	212	6.30	6.40	38				
-55.00	5/27/10 8:43	1000	-17.20	140	7.30	6.16	53				
-63.00	5/28/10 9:36	910	-17.20	483	0.50	5.75	57				
-70.00	5/28/10 10:15	850	-17.30	763	0.46	5.90	65				
-77.00	5/28/10 10:50	900	-17.40	664	3.14	5.94	77				
-84.00	5/28/10 12:02	1000	-17.35	646	4.65	7.70	34				
-91.00	5/28/10 12:39	1000	-17.30	779	4.30	7.90	22				

Groundwater Profile Tab

4.6 Drive the Profiler/Acquire I_k data for both Peristaltic and Gas Drive Modes

- 1. Attach the harness to the tube or tubes sticking up out of the top of the profiler rod at the drive platform. Place the string pot on the ground next to the drill rig and weight it down with a pipe wrench or the rod puller. Pull out the string and attach it to head of the drill dig.
- 2. **Peristaltic Mode**: turn on the KPRO flow by arranging the valves as shown below:



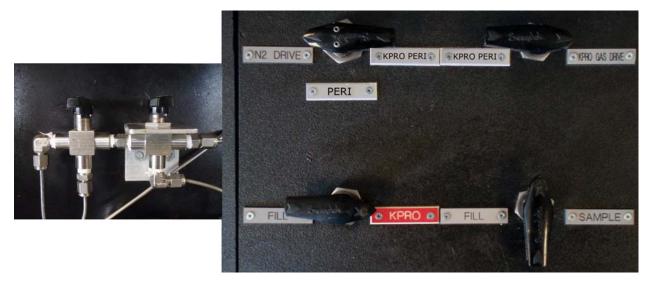
Peri Mode - Drive

Gas Drive: fill the pump by arranging the valves per the photo below:



Gas Drive Fill Pump

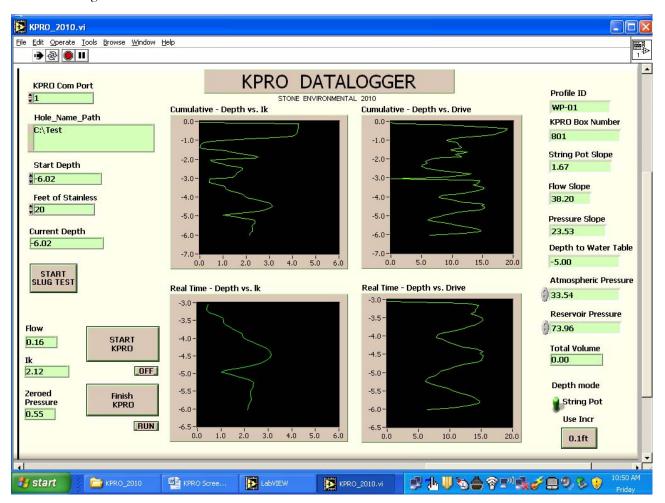
When the pump is full and a steady stream of water is flowing out of the Peri Out, lock off the pump (turn the valves on the sample jig so they face the back of the box), pressurize and turn on the flow per the following photo (make sure to lock off the pump first).



Gas Drive - Driving

- 3. With the flow on, put the profiling tip / rod assembly into the pre-cleared hole or so that the tip rests vertically on the ground surface. Have the driller lower the head of the probe so that the anvil of the probe rests on the slip cap. At this point the driller will adjust the probe so that the drill rod and probe are straight and level. **Note:** Make sure that the driller has broken through any surface concrete or asphalt. Driving through either of those will damage the tip.
- 4. When the flow value stabilizes click on the Start KPRO bottom at the bottom of the KPRO software. Make sure that the string put is extended and the head of the drill rig is resting fully on the slip cap before starting the software. The software will not read the depth correctly if it is started before the string pot is extended.
- 5. A window will open asking the depth to water. If this is the first drive, the depth provided is the depth entered during the startup procedure. If this is your second drive and the head measurement collected at the first sample location is different from the value originally entered, a new depth can be entered here. Enter a new depth or select OK. A pop up window will open showing the feet of stainless steel tubes. Set the feet of SS tubing to the correct feet of tubing used, including the 20' harness.
- 6. Signal to the rig operator that you are ready to commence driving the profiler. Just before the profiler begins to move, hit the Go button on the software.
 - **Notes on the string pot:** 1. The KPRO software only records data while the string pot is moving. 2. If during a drive the driller needs to lift the probe, there is no need to stop the KPRO software. The software will only record data once the string pot has moved past the last recorded depth.

7. Observe the I_k plot on the screen as the tool is advanced as shown in the following figure:



KPRO Software Screen While Driving

The current I_k , flow and pressure are displayed at the bottom left of the screen. The I_k for the current drive is displayed in real time in the graph at the lower left. The cumulative I_k for the entire profile is displayed in the graph at the top left. The drive rate (feet/minute) for the current drive is displayed in the bottom right graph, and the cumulative drive rate is displayed in the top right graph. A larger I_k plot can be seen by scrolling the software screen to the left. The screen looks like this:



KPRO Software Screen While Driving

Notes on I_k : I_k can range from 0 to 6+. Fine grained (silts and clay) or compacted sediment will have an I_{kv} towards the lower end, and sands, gravels and looser material towards the middle to higher end. The software will correct the Ik for depth using a head loss equation, so I_k should remain relative for the profile regardless of how much stainless tubing is attached (even though the flow is lower and the pressure is higher). I_k is only calculated and recorded by the software if the string pot is moving. In some cases the flow will drop after hammering has stopped, which results in a lower I_k . Since the string pot is not moving this new I_k value is not displayed on the screen and is not recorded. In this case take note of the flow, because the flow reading on the software is constantly updating, whether or not the string pot is moving. I_k behavior when tooling advance has stopped should be recorded on the "Profile Info" tab of the Groundwater Profiling Log (see below).

8. When you reach a zone that you wish to sample, signal to the rig operator that he/she should stop. When he/she stops press and hold the Finish KPRO button down until the icon (located below the button) changes from Run to Done.

9. **Determining whether to sample or not:** Observe the flow. If the flow drops significantly it may be an indication that the sample interval will not yield a timely sample. If the flow stays the same or increases, then it is probably a good interval to sample. In the Groundwater Profiling Log there is a "Profile Info" tab. The purpose of this worksheet is to record additional data regarding the driving and sampling of the profiler.

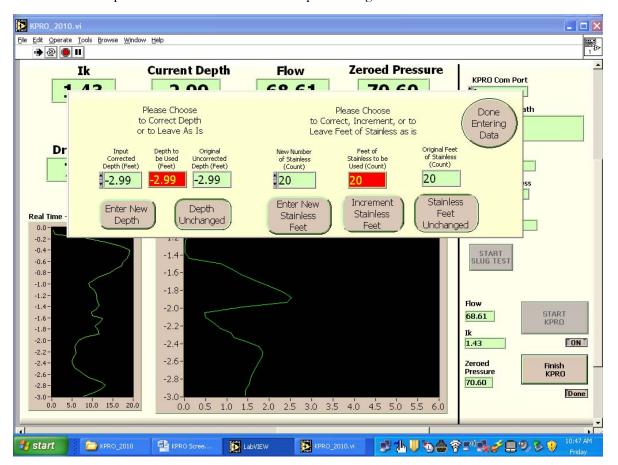
Client:	ERM		I _k and Sar		Profile Location: APS-018				
Date:	5/27/2010		KPRO Box	Serial #:	808/ Rasc7	Gas Drive or Peri Pump: Gas			
Location:	Plainville, CT		Trol	Serial #:	o2k0934 YSI	o2k0934 YSI Atmospheric Pressu			
SEI#:	092193-R		Drilling C	ontractor:	Platform	N ₂ Pressure (set via P tranducer): 70.14			
Sampler(s):	VLD		Depth	to Water:	-17.28	Gas Drive Pump N ₂ Pressure: 80-100			
Depth (ft)	I _K Behavior Type		Unsuccessful Sample Attempt		Hole Termination Type		COMMENTS		
-8.00	No change when hammer stops	3		#N/A		#N/A			
-13.00	No change when hammer stops	3		#N/A		#N/A			
-18.00	No change when hammer stops	3		#N/A		#N/A			
-23.00	No change when hammer stops	3	Could not produce water	4		#N/A			
-26.70	IK increase when hammer stops	2		#N/A		#N/A			
-28.00	No change when hammer stops	3		#N/A		#N/A			
-33.00	IK decrease when hammer stops	1	Yield deemed too slow	6		#N/A			
-38.00	No change when hammer stops	3		#N/A		#N/A			
-41.00	No change when hammer stops	3		#N/A		#N/A			
-48.00	No change when hammer stops	3		#N/A	ROP dropped below threshold	9			

Profiling Info Tab

Each time the hammer is stopped (to add rod, sample, determining whether or not to sample), the I_k Behavior column must be filled in. Record the depth and behavior type from the drop down menu.

It will take experience to get a feel for which intervals will yield fast samples and which will not. The I_k and flow are a good indication as to which samples will be fast or slow but remember that the flow decreases with the amount of stainless tubing that is

- attached. So at shallower depths a flow of 60 ml/min may be slow but at a depth of 60 feet it may be fast.
- 10. Turn off the KPRO flow by turning the lower left valve from the red KPRO label 90 degrees to an off position.
- 11. Measure the stick up from the ground surface to where the drive cap abuts the top of the 1.75-inch rod, or to the shoulder if using the 1.5 of 2.25-inch rod. Subtract the stick up from the total length of rod in the ground including tip and/or pump. For peristaltic, the tip length used is 0.4 feet. For gas drive, the length of the tip and pump is 3.2', so add this to the length of rod in the ground.
- 12. Compare the measured value to the depth reading on the screen:



Correct Depth

If the measured depth is different than the depth given in the "Original Uncorrected Depth" box, enter the correct depth into the "Input Corrected Depth" box and click on the "Enter New Depth" button. You can also change the feet of stainless if required. If no other data needs to be corrected, click on the "Done Entering Data" button on the software.

13. **Measuring Hydraulic Head:** Observe the Zeroed Pressure text box. When this value equilibrates, record the value on the field form along with the depth (Attachment 2). The water in the stainless steel tubing will equilibrate to the head of the groundwater when the flow is turned off. Turn on the flow and leave it on for 30 seconds. Turn off the flow and again observe the Zeroed Pressure and wait for equilibration. If this value matches the first value, the head measurement is valid. If it is different, repeat turning the flow on / off until two successive head readings are obtained.

NOTE: When the water table is at a depth of more than 25' the head value is not valid. When using gas drive mode this is often the case. If so do not record the head value.

- 14. Double click on the appropriate Sonde water quality monitoring system icon on the notebook computer desktop (Ecowatch for the YSI, Win-Situ for the Troll, and HydraS3 LT for the Hydrolab). Instructions on how to operate the specific software for each Sonde can be found in SEI SOP 5.27.*n* (Hydro Lab MS-5), 5.25.*n* (Troll 9000 and 9500) and 5.30.*n* (YSI 600XL).
- 15. **Missing a sampling interval**. It may be required to pull the profiler up to sample an interval that was passed on the way down. To do this first make sure that the "Finish KPRO" button has been clicked. For Peri mode make sure that the flow is on, and in gas drive mode make sure that the pump is pressurized and the flow is on. Determine at what interval you would like to sample. Hold a measuring stick next to the drill rod as the driller pulls back on the rod and have the operator stop when the depth is achieved. Check the flow on the software to be sure that the interval will yield a timely sample. It is also possible to watch the flow on the KPRO software as the driller pulls the rod up. When the flow increases, tell the driller to stop. Measure the stickup and record in the paper log that the profiler was pulled up and record the new depth. Before your next drive you will have to correct the depth in the KPRO software. To do this do a "fake" drive by starting and stopping the software as you would during a drive but correct the depth to the new depth. You can also mark the rod before pulling it back and then drive the rod back to that depth (with the flow on) before starting the program.

4.7 Purging the Profiler and Sample Collection

4.7.1 Purging in Peristaltic Mode

- 1. Turn on the peristaltic pump and set the +/- selector to –
- 2. Set the valves shown below.



Peri Mode Purging

- Observe the vacuum gauge. A vacuum should build toward -30 inches of mercury
- Observe water flowing through the bottles. The water will be clear at first but should become silty. This is because there is some KPRO water still in the tubing.
- If vacuum does not build and water does not flow it is possible that there is a leak in the system. Refer to the Problem Solver's Guide on how to proceed.
- Observe the volume of water in the graduated cylinder into which the purge water discharges. On the Groundwater Profiling Log, select the tab "Sample 1". The top section of the sheet except the date should be populated with data that was entered on the first tab. Record the time, cumulative purge volume and physio-chemical parameters in the Excel spreadsheet after every 50-100 mL of sample discharges to graduated cylinder. This data is used as a benchmark for future readings and is not recorded in the field form (paper log).
- If the sample purge rate is slow (less than 10 ml/min) then it may be necessary to surge the pump. Sometimes silt can get smeared on the outside of the profiling tip or can be drawn into the tip. Surging the pump can loosen up the silt to increase the flow. Reverse the flow of the pump by turning it off, then switching the directional switch. Turn the pump back on and observe the pressure gauge. Once the gauge maxes out, turn off the pump and reverse again. Repeat this two to three times. Continue to purge the sample. If the purge rate is still slow, it may be necessary to drive the profiler to a better sampling interval. If no sample was collected, record this in the Profile Info tab of the log.

8. When all of the physico-chemical parameters stabilize on two successive readings (separated by 50-100 mL, indicated by yellow in the Microsoft Excel worksheet) record the depth, time, head value, total volume purged and the values of the physico-chemical parameters on the paper field form (only record the final line of stabilization parameters). The paper log serves as a backup in case there is a problem with the electronic Groundwater Profiling Log. Put any character in the column labeled "Final?" (located to the left of the depth column) next to the last row of data. This tells the spreadsheet to display that row of data on the "Groundwater Profiling Log" tab. The following photo illustrates what the data looks like for a sample that has equilibrated.

Client:		EF	RM	PARAMETER EQUILIBRATION LOG Stone Environmental inc								Profile Location:	APS-018
Date:	5/27/2010			KPRO Box Serial #: 808/ Rasc7 Troll Serial #: 02K934 YSI						Gas Drive or Peri Pump: Gas Atmospheric Pressure: 34.89 KPRO N ₂ Pressure (set via P tranducer): 70.14 Gas Drive Pump N ₂ Pressure: 80-100			
Location:	Plainville, CT												
SEI#:	092193-R			Drilling Contractor: Platform									
Sampler(s):	VLD			Depth to Water: -17.2818182									
						PHYSICO	CHEMICAL PARA	METERS			_		
Depth (ft)	Head (ft)	Time	Volume Purged (mL)	SC (uS/cm)	SC %Change	DO (PPM)	DO %Change	рН	pH %Change	ORP (mV)	ORP %Change	COMMENTS	
-41.00	-17.20	16:27	300	136		5.50		6.30		81			
		16:29	480	159	16.9	6.60	20.0	6.30	0.0	77	4.9		
		16:32	650	183	15.1	8.00	21.2	6.36	1.0	78	1.3		
		16:34	800	197	7.7	8.20	2.5	6.35	0.2	80	2.6		
		16:36	900	201	2.0	7.60	7.3	6.33	0.3	83	3.8		
		16:38	1000	202	0.5	7.50	1.3	6.30	0.5	83	0.0		

Sample Log Showing Equilibrated Sample

Notes on Purging the Sample: Make sure to purge at least 500ml before collecting a sample. The first few physico-chemical readings may indicate that the sample has equilibrated but that is because the tubing contains the analyte free water and there is still water from the previous sample interval in the flow through cell of the water quality sonde. The volume of the flow cell is usually 100-200 ml, so it will take some time for the groundwater from the current interval to replace the water in the flow cell from the previous sample. There are conditions where stabilization of Dissolved Oxygen and ORP values may not be practical. When Dissolved Oxygen values are less than 1 mg/L and ORP values approach 0 after an acceptable volume of water has been purged (usually 600ml for peristaltic and 800ml for gas drive), a small change in the value can result in a change greater than the stabilization criteria of 10%. In these

situations the sampler can collect the sample before these values have stabilized as long as Specific Conductance and pH are stable.

4.7.2 Collect Sample in Peristaltic Mode

- 1. Turn the top right valve on the sample jig so that it is locked off (pointing towards the back of the box).
- 2. Reverse the direction of the pump by changing the toggle switch on the box panel from minus (-) to plus (+).
- 3. Run the pump backward for 2 to 3 seconds
- 4. Shut off the pump
- 5. Remove the sample bottle on the left.
- 6. Remove the bottle on the right.
- 7. If there is headspace in the tops of the vials (this is normal), hold a vial cap under the right bottle holder and run the pump in reverse slowly. Water will flow into the vial cap. Transfer this water from the vial cap to the vials until the headspace is gone and cap the vial. Turn the vial upside down and tap the vial lightly on the palm of your hand. If there are any air bubbles present, you must uncap the bottle and repeat the headspace procedure.
- 8. Label the vials appropriately. Note the time of sampling on the field form.
- 9. Replace the vials with new vials. Prepare to drive as before after adding tubing and rod as necessary.

4.7.3 Purging in Gas Drive Mode

1. At this point the pump is already pressurized from driving. Arrange the valves per the following photo:



Pressurized Gas Drive Pump Ready to Purge

Turn the top right valve on the sample jig slowly to the right. This allows the nitrogen to push the water up from the pump and through the sample jig. The pressure on the gauge will drop and stabilize as the water flows.

- Observe the pressure gauge. Just before the pump body is completely emptied, the pressure will start to rise. When you observe the rise, turn the top left valve on the KPRO box 90 degrees clockwise, which will stop the flow of nitrogen and vent the gas out of the pump (you will hear a hissing sound).
- 3. Watch the pressure gauge and when the pressure drops below zero, lock off the right valve on the sample jig and spin the top left valve on the KPRO box clockwise to Peri. Make sure that the peristaltic pump is on. At this point the pump is depressurized and is filling with groundwater. These three steps complete one pump purge, or "whack".
- Observe the volume of water in the graduated cylinder into which the purge water discharges. Record the time, cumulative purge volume and physico-chemical parameters in the Excel spreadsheet after every purge of sample discharges to graduated cylinder. This data is used as a benchmark for future readings and is not recorded in the field form (paper log). The first whack will be larger than most because the pump and lines are already filled with water. If after the second whack the amount of sample discharged is less than 80 ml then you need to wait longer between evacuations (3-4 minutes). If after waiting 5-6 minutes the pump evacuation yields less than 50 ml, it may not be prudent to collect a sample at that location. Check with the client oversight to see if they want you to continue sampling or drive to a better sampling interval. If

the volume is significantly larger (150-200ml) you can evacuate the pump more often (1-2 minutes). If no sample was collected, record this in the Profile Info tab of the log.

Note on purge volume: The volume of the gas drive pump is 100 ml. The volume of the stainless steel tubing is 0.8 ml/ foot, and there are two lines (the sample and gas lines) that are full of water (water from the previous sample and water used to fill the pump). For example, if you have 60 feet of tubing attached, the volume would be 100ml + (2*60*0.8), for a total of 196 ml. When purging a sample this water will be purged first so the physico-chemical parameters may appear to be stable. It is common to see the parameters rise (previous sample water left in pump), then fall (analyte free water used to fill the pump) before starting to equilibrate (fresh groundwater).

- 5. After the previous whack, allow some time (as explained in step 4) for the pump body to fill such that you receive at least 50 mL of sample on subsequent evacuation (Step 4).
- 6. To purge the pump turn the top left valve on the KPRO box to N2 and watch the pressure gauge. When the pressure crosses zero, turn the top right valve on the sample jig to the right. You are now back at Step 1. Follow the rest of the steps to complete the whack and record the parameters.
- 7. When all of the physico-chemical parameters stabilize on two successive readings (indicated by yellow in the Microsoft Excel worksheet) record the depth, time, head value, total volume purged and the values of the physico-chemical parameters on the paper field form. The paper log serves as a backup in case there is a problem with the electronic Groundwater Profiling Log. Put any character in the column labeled "Final?" next to the last row of data. This tells the spreadsheet to display that row of data on the "Groundwater Profiling Log" tab. There are conditions where stabilization of Dissolved Oxygen and ORP values may not be practical. When Dissolved Oxygen values are less than 1 mg/L and ORP values approach 0 after an acceptable volume of water has been purged (usually 600ml for peristaltic and 800ml for gas drive), a small change in the value can result in a change greater than the stabilization criteria of 10%. In these situations the sampler can collect the sample before these values have stabilized as long as Specific Conductance and pH are stable.

4.7.4 Collect Sample in Gas Drive Mode

- 1. Arrange the valves as you would for purging the pump but when the pressure builds do not open the valve on the sampling jig.
- 2. Remove the sample bottle on the left.
- 3. Hold the sample vial under the straw for the first vial holder on the sample jig. Slowly open the right valve on the sample jig. Water will flow out of the straw and into the vial. When you have a mounding of water on the top of the vial, shut the valve and cap the vial. Repeat this process for subsequent vials. Check for bubble by inverting the vial

and lightly tapping it on the palm of your hand. If there are bubbles, uncap the vial and fill again.

- 4. Label the vials appropriately. Note the time of sampling on the field form.
- 5. Replace the vials with new vials.
- 6. Prepare to drive as before after adding tubing and rod as necessary by filling and pressurizing the pump. Refer to section 4.6 above for the procedure.

4.8 How to Determine the End of the Profile

There are several ways to determine the end of a profile. Some profiles have a predetermined depth set by the client. The end of the profile is most often determined by the Drive Rate. As the profiler is advanced into the ground the drive rate will decrease as the skin friction of the rod in the ground increases. There are also stratigraphic layers that are more compact than others (clays, tills) that can slow the drive rate. It is important not to drive the profiler once the drive rate gets below 1.5-2 ft per minute for the 1.5 and 1.75-inch rods and 0.5-1.0 ft per min for the 2.25-inch rods. If the rods, tips and drive hardware are hammered on too much they can fatigue and break, crack or bend. The skin friction can also become too great so that the profiling rods cannot be pulled back out of the ground. Consult with the driller / probe operator during profiling to determine when to stop drilling.

It is also possible to drill into bedrock or other subsurface objects (boulders, cobbles, concrete chunks or slabs, etc.). In this case the drive rate can drop very quickly. Stop hammering immediately and discus with the driller and client how to proceed.

Be sure to note on the paper field log as well as the Profile Info tab in the Groundwater Profiling Log how the profile was completed.

4.9 Decontamination

The only decontamination step required between samples in the same hole is to flush the line with analyte free water (distilled or spring water) while driving to the next depth. There are required decontamination procedures for the tip and pump, drill rod, stainless steel tubing and KPRO box that need to be completed at the end of a profile. Some sites and clients may require that all the down-hole tooling be decontaminated using a steam cleaner. If this is the case remove the plates and screens from the tip and take the pump out of the housing so that all of the parts can be cleaned. Usually the drillers will provide the steam cleaner and will clean everything.

4.9.1 Tip and Pump Decontamination

The tip and pump need to be disassembled and cleaned prior to reuse. For the tip, remove the plates and screens. The screws can be reused if they are not rusted or stripped. It may be required to use an impact driver to remove the screws if they are stuck. Rinse out the inside of the tip as well as the screens and plates with Alconox and water to remove all sediment. Scrub the tip and plates with

a firm brush or use a pipe cleaner to lean the inside of the tip. Carefully check the plates to make sure that the sampling ports are clear. Use a pick to remove any sediment from the sampling port holes. Remove and replace the FEP tubing. The piston for the gas drive system can be reused.

For the pump: unthread the tip from the pump housing and unthread the top and bottom housing pieces. Take the pump body out of the housing. Use a brush and bucket of Alconox and water to clean the inside and outside of the housing pieces and pump as well as the springs and plastic bushing. Disassemble the pump body and discard the o-rings, reed valve and Teflon tape. Rinse out the inside of the pump with Alconox and water and then clean water. Check the small o-rings at the narrow end of the pump bottom and replace if necessary.

4.9.2 Drill Rod and Stainless Steel Tubing Decontamination

Upon completion of the sampling and grouting of the hole, the drill rods should be cleaned by steam cleaning, pressure washing or by washing with Alconox and water. It is important to clean the inside, outside and threads of the rod. The stainless steel tubes should have any grout, drilling mud or soil removed from the outside using a steam cleaner, pressure washer or Alconox and water. The inside should be rinsed with analyte free water (distilled or spring water). It is very important that before the stainless steel tubing is reused that it is checked for clogs by using a garden sprayer with an adaptor.

4.9.3 KPRO Box Decontamination and Equipment Blank Procedure

The KPRO box should be decontaminated at the end of each profiling location to make sure that there is no possibility of cross contamination between profiles.

- 1. The four o-rings located at the top of each bottle holder on the sample jig should be replaced at the completion of the profile. Remove any vials from the sample jig and discard them. Remove the o-rings located at the top of each bottle holder with a straight or slightly angled pick, being careful not to score the threads on the plastic bottle holder. Alconox and water should be squirted up into the top of each bottle holder before the new o-rings are installed.
- 2. After changing out the o-rings on the sample jig, the box and jig should be flushed out with at least 1L of Alconox and water and 1L of clean water. This can be done in conjunction with the collection of an equipment blank (as required).
- 3. For peristaltic mode, connect a clean profiling tip to the KPRO box via the harness. Place the tip into a clean vessel containing Alconox and water (the vessel needs only to be as deep as to make sure all of the ports on the tip are submerged). Screw four new vials into the sample jig and arrange the valves on the box to the same orientation for sample collection. Turn on the peristaltic pump. Top off the water in the vessel as the water is pumped through the box. Once you have pumped 1L of Alconox and water, place the profile tip into

- a second clean vessel containing only clean, analyte free water and pump 1L of clean water through the box.
- 4. For gas drive mode, connect all three stainless steel tubes from the pump to the corresponding tubes on the harness and place the tip of the pump in a clean vessel containing Alconox and water. Screw four new vials into the sample jig and arrange the valves on the box to the same orientation for sample collection in peristaltic mode. Disconnect the N2 Out quick connect from the KPRO box. Disconnect the Sample In quick connect and connect it to the N2 Out quick connect and turn on the peristaltic pump. Top off the water in the vessel as the water is pumped through the box. Once you have pumped 1L of Alconox and water, place the profile tip / pump into a second clean vessel containing only clean, analyte free water and pump 1L through the box.
- 5. If an equipment blank is required, simply collect the required number of voa vials from the sample jig as you would if you were collecting a groundwater sample using the peristaltic mode. If no equipment blank is required, the decontamination process is complete.
- 6. Record on the paper Groundwater Profile Log that the box has been decontaminated with 1L of Alconox and water and 1L of clean water. Record the date, time and name of the equipment blank (if required).

4.10 Profile Field Data Deliverables

One of the biggest advantages to using the Waterloo APS is that field data can be quickly processed in the field and given to the client in a matter of minutes. At the end of the profile the raw data needs to be processed so that it can be imported into either Origin to provide a field log to the client or into gINT.

The data should be processed as soon as possible after finishing a profile; either during the decontamination of the KPRO box or during the collection of the first few samples of the following profile. All efforts should be made to get the data to the client by the end of the working day unless otherwise directed. These are the steps:

- 1. Open the kpro_raw.txt file associated with the profile. Select All (shortcut Control A) and Copy All (Control C).
- 2. In the Groundwater Profiling Log Excel workbook, select the Processed Ik tab. Select the top left cell and Paste (Control V) the raw data.
- 3. This is where alterations or corrections can be made to the data. You can change the depth to water, feet of stainless or other parameters that the software uses to calculate the I_k. If you pulled the profiler up you can delete duplicate data as well.
- 4. After any corrections are made, scroll to the two far right columns of data; "Corrected Depth to Water" and "New Ik". Both of these columns have data in the first row only. Highlight

- the data cell and double click on the small black square at the bottom right corner of the cell. This will populate the entire column with data. Do this for both columns.
- 5. Copy the entire New Ik column. Right click on the top row of the Ik column and select Paste Special Values. This will overwrite the I_k that was generated by the software in real time with a corrected Ik based on any changes that were made to the data. Even if no changes were made to the data this step should be done anyway.
- 6. Select the Ik Plot tab. Follow the instructions on the screen to plot the Ik data. Carefully check the plot for any errors or bad data. Bad data can be generated a variety of ways and should be deleted from the plot. Examples of bad data are: driving the profiler with the flow off (flow is zero), driving the profiler without starting the software (no data is recorded), not stopping the software after a drive, entering the wrong depth after a drive, etc. If any of these things happen, delete or change the bad data from the Processed Ik tab. Leave a blank row where the data was deleted so that the Ik Plot does not connect the data with a straight line.

There are other cases where after adding a length of stainless tubing the flow drops so there is a horizontal line on the plot. This data must be shifted up or down to match the previous data. Consult the Data Manager or Project Manager on how to proceed.

- 7. Open the Origin file named "Physchem_hole_id.opj". This file should be located in the Origin folder in the project directory or in the Forms folder. Save the file to reflect the profile name (Pyschem_WP-01.opj). If you are using gas drive mode and did not collect head measurements, select the file "Physchem No Head hole id.opj".
- 8. Select and copy all the data on the Processed Ik tab on the Groundwater Profiling Log. On the Origin file select the Ik record sheet from the bottom of the screen. Select the top left cell and paste the data. It may take a few seconds to paste all of the data.
- 9. Back on the Groundwater Profiling Log click on the Groundwater Profiling Log tab. Select all the data and paste it into the Physchem sheet in the Origin file.
- 10. Click on the Layout sheet on the bottom of the Origin file. Check the plots to make sure that the scale is correct and all the data is displayed properly. If the scale needs to be changed select the PhysPlot sheet on the Origin plot and select the axis of the graph you want to change. Select the Scale tab to change the range of values. It is important that all of the plots from a particular site are consistent. Finally, save the file ad a PDF.
- 11. Provide the client with a copy of the Origin plot by copying the PDF file to a data stick or printing out a hard copy. Double check the Groundwater Profiling Log and make sure that all of the fields on the Groundwater Profiling tab, Profile Info tab and processed Ik tab are completed. At the end of the day email the data (only the Groundwater Profiling Logs and a scan or photo of the field form) to the Project Manager and/or Data Manager and back up the entire project folder to a data stick.

12. Metric Data – There are versions of all of the electronic field logs in metric (either as depth in meters or elevation). There is also a version of the KPRO software that displays the depth in meters but does not record the depth in meters to the kpro_raw file. Before importing the data to the Origin plot it needs to be converted from feet to meters in the Processed Ik tab. To do this insert a blank column to the right of the Corrected Depth column after all of the changes or corrections have been made to the data. In the first cell of the new column create a formula that divides the Corrected Depth by 3.281. (=C2/3.281 where C2 is the cell of the depth you want to convert). Copy this formula to the entire column. Select and copy the entire column and right click on the Corrected Depth column and select Paste Special – Values. Delete the column where the data was copied from.

4.11 Cold Weather Operation

During the winter months when temperatures fall below freezing special precautions need to be taken to protect and successfully operate the Waterloo^{APS} equipment, KPRO box, and associated equipment.

4.11.1 Exposed Stainless Steel Tubing and Rods

While attempting to collect a groundwater samples with below freezing temperatures a cold weather harness may be required. The cold weather harness is a combination of heat tape and pipe insulation wrapped around the stainless steel tubing exiting the KPRO Box. In extreme cold the rod stickup and stainless steel tubing exposed between the cold weather harness and the ground may need to be heated using either a brush-burner or torpedo heater. Flexible duct work can be used to cover the stainless steel and exposed rod to direct the heat from the torpedo heater and to help insulate.

4.11.2 Leaving the site overnight

If freezing conditions will occur overnight the KPRO Box needs to be winterized. The enclosure should be removed and stored where temperatures will not fall below freezing. The KPRO box and cold weather harness should be drained of water:

- 1. Disconnect the stainless steel tubing harness from the down-hole tubing.
- 2. Remove the enclosure and replace with a short piece of stainless steel tubing with a female quick connect at each end or leave the enclosure in place.
- 3. Disconnect the nitrogen "in" (white) KPRO vessel quick connect.
- 4. Remove the water "out" (black) KPRO vessel quick connect.
- 5. Turn the regulator dial counter clockwise so that regulator is off. Attach the stainless steel piece that was connected to the "out" (black) quick connect to the low pressure regulator on the nitrogen tank.

- 6. In the peristaltic pump mode set up the valves on the box as if you were in drive mode and slowly turn the knob on the regulator clockwise slowly until the smallest amount of nitrogen is flowing. If the pressure is too high the flow meter in the enclosure can be damaged. After a few seconds you should see water being pushed out of the harness. After all of the water has been pushed out turn off the nitrogen regulator.
- 7. In gas drive mode you need to blow out the KPRO box as well as all three of the harness lines. To blow out the nitrogen line, simply turn the 5 way valve to the N2 Out and wait for all of the water to be pushed out of the nitrogen line on the harness. To blow out the sample line (middle tube on the harness), arrange the valves as you would if you were filling the pump. Disconnect the N2 In and KPRO in quick connects ont eh KPRO box. Connect the N2 In to the KPRO In. Slowly turn the knob on the regulator clockwise slowly until the smallest amount of nitrogen is flowing and wait for all of the water to be pushed out of the sample line. To blow out the KPRO line, set up the valves on the box as if you were in drive mode and slowly turn the knob on the regulator clockwise slowly until the smallest amount of nitrogen is flowing. If the pressure is too high the flow meter in the enclosure can be damaged. After a few seconds you should see water being pushed out of the harness. After all of the water has been pushed out turn off the nitrogen regulator.

The KPRO enclosure, KPRO vessel, "out" (black) quick connect, Sonde water quality monitoring system, and calibration solutions should be stored where temperatures will not fall below freezing.

4.12 Other Profiling Configurations

It is possible to set up the KPRO box on a table, cart, tailgate or other surface in order to profile in locations that cannot be accessed with the truck. In instances such as this it may be necessary to power the equipment using a battery. Do not use a standard car battery as repeated draining and charging will diminish its capacity over time. It is better to use a deep cycle RV or similar battery that is designed to power devices and not for starting engines. It is possible to power the KPRO box (including peristaltic pump), field computer and water quality sonde off of a battery for an entire 10 hour day as long as the battery is charged at night. The KPRO box can be connected directly to the battery because it already is 12V. The computer and sonde need to be connected to a DC to AC power inverter that is connected to the battery.

5.0 RESPONSIBILITIES

1. It is the responsibility of the individual employee to read SOPs and document training associated with the area of work they are performing.

- 2. It is the responsibility of the individual employee to follow SOPs covering activities in his/her work area or to identify a deviation from the written SOP.
- 3. All personnel will legibly record data and observation to enable others to reconstruct project events and provide sufficient evidence of activities conducted.
- 4. All personnel will label each page with the date, the signature of the person taking notes (initials may also be appropriate), and the page number. All notes, signatures, and other observations should be entered in the field at the time the notes are taken.
- 5. SEI field staff should take care to ensure proper data management and integrity of samples.

6.0 DEFINITIONS

KPRO: Hydraulic Conductivity (K) Profiling

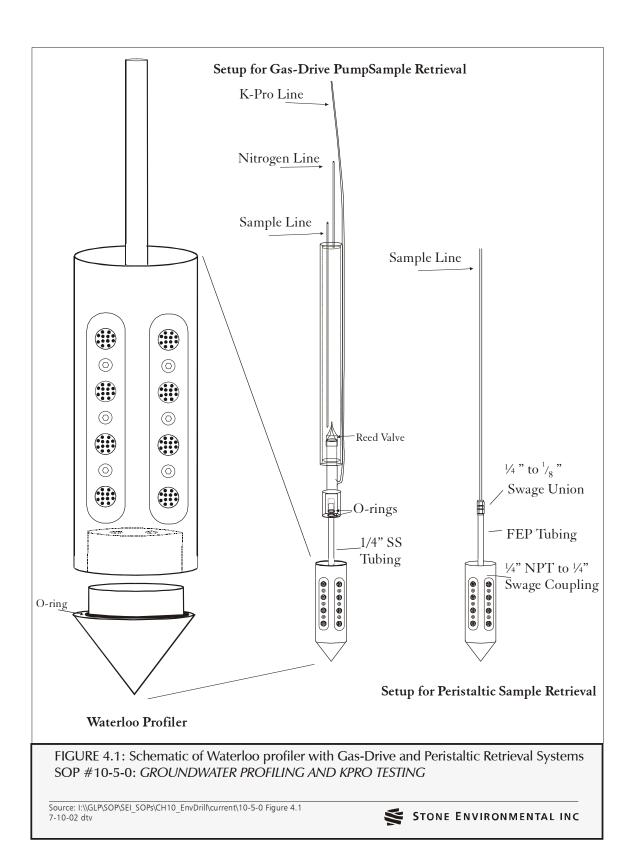
7.0 REFERENCES

None

8.0 TABLES, DIAGRAMS, FLOWCHARTS, AND VALIDATION DATA

Diagrams and Attachments:

- Schematic of Waterloo Profiler Tips and Gas Drive Pump
- Attachment 1: Groundwater Profiling and KPRO Testing Equipment List
- Attachment 2: Groundwater Profiling Field Form



9.0 AUTHORIZATION

Revised by

Vincent DeLeone, Water po APS Service Leader

Approved by:

Seth Pitkin, Vice President

10.0 REVISION HISTORY

Revision 1:

- 1. Modified Attachment 1: Groundwater Profiling and K-Pro Testing Equipment Checklist.
- 2. Modified Attachment 2: Groundwater Profiling Log

Revision 2:

- 1. ADD trade name APS Advance Profiling System to Waterloo.
- 2. Under Section 4, changed startup and calibration procedures for the KPRO software to reflect the new KPRO-2006 revision.

Revision 3:

- 1. Renumbered to take out of laboratory SOP location.
- 2. Changed and added text
- 3. Changed the order of steps
- 4. Replaced photos of valve orientation
- 5. Deleted old KPRO box photos
- 6. Added photos of KPRO software
- 7. Added text for Data Processing
- 8. Replace KPRO checklist
- 9. Update Problem Solver
- 10. Update quick reference Guide
- 11. Added text and figures about the 2.25" tip and rod

Revision 4:

1. Updated Section 4.1.5 for clarification that water quality sonde's are calibrated or verified weekly rather than daily as these instruments are in-situ.

Revision: 5

1. Updated Section 4.7.1 and 4.7.3 for clarification on stable water quality parameters. There are conditions where stabilization of Dissolved Oxygen and ORP values may not be practical. When Dissolved Oxygen values are less than 1 mg/L and ORP values approach 0 after an acceptable volume of water has been purged (usually 600ml for peristaltic and 800ml for gas drive), a small change in the value can result in a change greater than the stabilization criteria of 10%. In these situations the sampler can collect the sample before these values have stabilized as long as Specific Conductance and pH are stable."

2.

ATTACHMENT 1

GROUNDWATER PROFILING AND KPRO TESTING EQUIPMENT CHECKLIST

PROFILING EQUIPMENT

- Profiler Tips (Sac-tip or Integral)
 - Sacrificial Tip
 - O-rings for Sac Tip
 - SS Profiler Screens (4 per tip)
 - SS Allen Screws for Screen Plates
- 5' x 1.75" Drill Rod (2 X max. anticipated depth)
- 2' x 1.75" Drill Rod (1)
- Swivel pull
- Geoprobe Pull Clamp for 1.75" Rod
- Drive Cap (3-4)
- Slip Cap (3)

- ¹/₈" SS Tubing
- SS Caps for SS Tubing
- Extra ¹/₈" SS Compression Fittings
- Stainless steel mesh for tips
 - o 80 X 80
 - 60 X 60
 - 100X 100
- 11/2" Geoprobe X 13/4" Rope crossover (for

hooking to grout pump swivel)

KPRO TESTING BOX AND RELATED EQUIPMENT

- String Pot
 - Com Cable (2)
 - **Quick Clamp**
- Compressed N2 Tank (Large(T) for Gas drive, Small(Q) for peri-sampling)
- Dual phase regulator (0-60 psi) for K-pro
- Double Pressure Regulator Set (1, 0-60 psi; 1, 0-600 psi), if gas drive
- Pressure Vessel (2)
- Pressure Vessel quick connects
 - o White-N₂ side (2)
 - Black-Water side (2)
- ¹/₈" SS Tubing Harness
 - ¹/₈" swage to quick connect (peri/gas) (2+spare)
 - ¹/₈"swage to quick connect (gas drive) (5+spare)
- **KPRO Box**
 - Com Cable (2)
 - Power Cable (2)
- **Regulated Power Supply**
- 1 Liter Graduated Cylinder (plastic)
- Field Computer (2)
 - Serial Port Card, PCMCIA

- **Power Adapter**
- **CD-Drive**
- Floppy Drive
- Extra Battery and Charger
- **USB Data Stick**
- External Keyboard and Mouse, USB
- **USB** Hub (optional)
- Field Software CD
- **Current Templates**
- Blank CD's
- **Color Printer**
 - Com Cable (parallel or USB)
 - Power Cable
- **Printer Paper**
- 5 Gallon Pails for Purge Water/Decon (2)
- Water Quality Sonde
 - Com Cable
 - Flow Cell
 - extra D-cell Batteries (Troll)
 - power cable (YSI)
 - **Calibration Standards**
 - DO membrane maint. kit (Troll)
- Field Book/Field Forms

GAS DRIVE PUMP ASSEMBLY

2.4' x 1.75" female – female drill rod (3-4)

male – male pin (bottom) (3-4)

male – female pin (top) (3-4)

Springs (2 per pump)

Nylon Bushing (1 per pump)

Pump Bottom

Pump Body

Pump Top

Reed Valves (bag of 50)

O-rings for Pump Body

O-rings for Pump Bottom

1/4" SS Tubing (10)

1/4" NPT male to 1/4" compression fitting

1/4" Ferrules, SS

PERI MODE TIP ASSEMBLY

FEP Tubing (1/4" OD X 3/16 ID)

1/4" NPT male to 1/4" compression fitting

Ferrules, Nylon

Barbed inserts for FEP Tubing, SS (3/16 OD)

1/4" compression to 1/8" compression fitting

SAMPLE COLLECTION

Quatro-rings for Sample Jig

40mL VOA Vials (Eagle Pitcher) (2-3 cases)

Vial Labels

Silicon tubing for Peri Pump (10 feet)

Coolers and Ice

DECONTAMINATION EQUIPMENT

Alconox

Squirt Bottles

Garden Spray Bottle (3 gallon)

Plastic Sheeting

Contractor Garbage Bags

AUXILIARY EQUIPMENT

Lumber Crayons

100' Engineers Tape

Electrical Tape

Ratchet Straps and Bungee Cords

Teflon Tape Colored Zip Ties

Halogen Work Lights

Fan (optional)

Extra Bulb

Chair

Coffee Maker

Green Mountain Coffee French Roast Beans

Grinder (if whole beans used)

Filters

Coffee Cups

Paper Towels

Broom

Ground Fault Circuit Interrupt

Extension Cords

Land line for Circuit panel

Surge Protector

PERSONAL PROTECTIVE EQUIPMENT/SAFETY EQUIPMENT

Nitrile Gloves (2 cases)

Safety Glasses

Cotton liner Gloves (4-6 pairs)

Padlock with Long Hasp

Hardhats (1 per person + spare)

Leather Work Gloves

Hearing Protection

Tyvek Suits Spill Kit

Emergency Eyewash Spare absorbent Pads First Aid Kit Fire Extinguisher Compressed Air Horn Flashlight

Respirator and Cartridges

HAND TOOLS AND POWER EQUIPMENT

⁷/₁₆" Wrenches (4) Vise Grips Pipe Wrenches, 2, 24" Wire Strippers

Open Ended Wrenches, Standard, Full Set Electrical Multi-meter Screw Drivers, Regular and Phillips Soldering Iron

Impact Wrench Tin Snips

Oil Filter Wrench (suitable to SS Screen Hole Punch

Allen Wrenches, Standard and Metric Files

Crescent Wrench **Utility Knife** Socket Set, Standard, Full Set Extra Blades

9/16" Socket, Open Ended for removing fittings **Tubing Cutter**

from Profile Tip Sledge Hammer, 3lb **Taps for Profiler Tip Screws Butane Lighter**

Tap Handle **Electric Drill** Torx Bits, T-25 Drill Bits, Full Set

Picks, Full Set Carbide Bit for Reaming SS Tubing

Pliers, Standard, Needle Nose, and Channel Lock Angle Grinder

ADDITIONAL WINTER GEAR

Pipe Insulation Propane Heaters Heat Tape Kerosene Heaters

SWAGE BOX

Ferrules

-1/4" Nylon

-1/8" Stainless Steel

-1/4"Stainless Steel Spare 5-way valve Extra Profiler Tip Plates (4) Spare 3-way valve

O-Rings for K-pro Reservoir (large and small) -1/4" NPT

-1/8" NPT **Hose Clamps**

1/8" SS tube Caps 1/8" Elbows -Barb/NPT fittings **Extra Regulators**

-Compression/NPT fittings - 100 psi - 300psi **Spare Pressure Transducer**

Extra pressure gauge Spare Flow Meter

Screws for tip (3/8" #10/32, flathead T-25) 1/4" to 1/4" Barb Plastic-NPT

1/4" to 1/4" Barb Plastic T's Quick disconnect for stainless (4)

1/4 " in-line Filters

DOT REQUIRED EQUIPMENT

Driver's Log Notebook

Spare Bus Fuses

Flares/Reflective Triangles

Fire Extinguisher in Cab

Windshield Wiper Fluid

Flashlight

VEHICLE MAINTENANCE EQUIPMENT

Generator Maintenance Log

Truck Maintenance Log

Owners/Shop Manual (Generator and Truck)

Spare Oil (Generator and Truck)

Spare Oil Filters (Generator and Truck)

Antifreeze

Oil Filter Wrench (Generator and Truck)

Battery terminal brush

Oil Funnel

RENTAL TRUCK GEAR

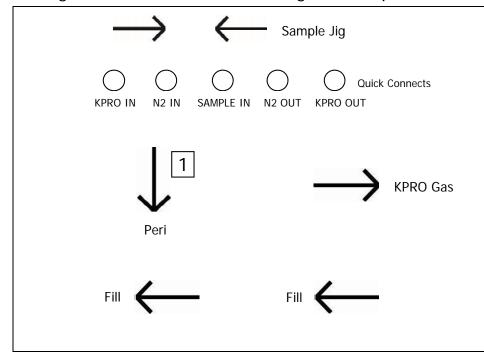
(In addition to the equipment listed above)

ATTACHMENT 2

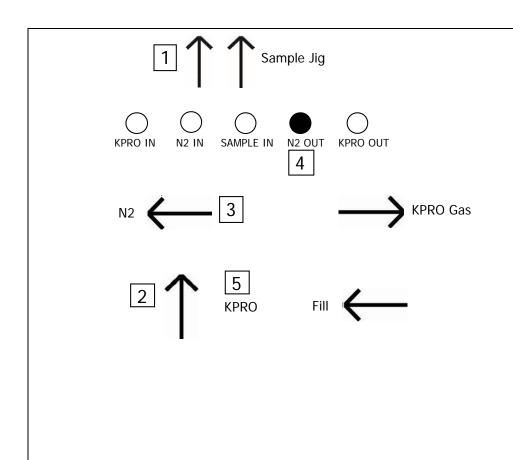
KPRO Quick Reference Guide

Gas Drive Quick Reference Guide

Filling For Drive / Pressure Testing the Pump



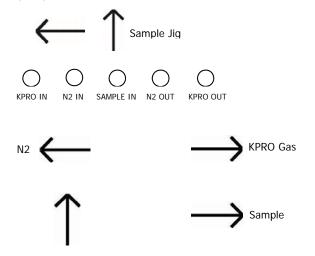
- Connect the pump to the harness.
- 2. Arrange the valves as shown. Always turn the 5-way valve clockwise (the top left valve on the bottom, labeled as 1).
- Make sure that the regulator on the nitrogen tank that supplies the nitrogen to the "N2 IN" is set to the pressure the pump will be used at (to find the pressure, halve the depth, so for 400 feet set the regulator at 200 psi).
- Turn on the peristaltic pump.
- The pump is now filling with KPRO water. When the pump is full, you will see water flowing out of the "PERI OUT" tube located at the bottom right hand corner of the KPRO box. This can take several minutes depending on depth. The deeper you are, the longer it will take.
- Let the water flow out until there are no air bubbles and you get a steady stream.



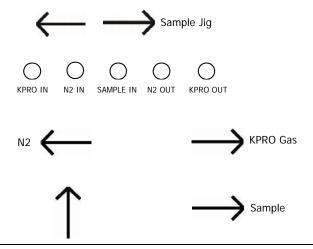
- 1. Lock off the valves on the sample jig by turning them towards the back (perpendicular to the tubing).
- 2. Turn off the flow by turning the bottom left valve one quarter turn (which may be to the right or left depending on how the valve was installed.
- 3. Turn on the nitrogen by turning the top left valve one quarter turn clockwise. You will see the pressure on the gauge rise to the approximate pressure set on the regulator.
- 4. Disconnect the "N2 OUT" guick connect from the KPRO box. (Second from the right). Observe the pressure gauge. The pressure should drop slightly, then hold. This means that the pump is holding pressure. If the pressure drops significantly then there is a leak. Double check that the fittings connecting the harness to the pump are tight. If this doesn't work, then double check the O-rings and reed valve. If there is still a leak it could be the 5-way valve. Check the Problem Solving Guide for troubleshooting tips./
- If the pump holds pressure, reconnect the N2 out and turn the flow on by turning the bottom left valve one guarter turn clockwise to "KPRO".

Sampling / Purging The Pump

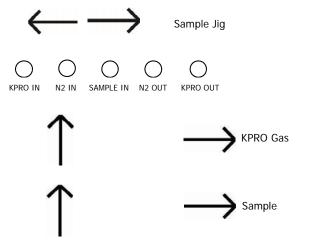
1. After driving to the sample depth and hitting the "Finish" button on the KPRO software, arrange the valves as shown below by turning the left valve on the sample jig to the left and the bottom right valve one half turn clockwise to "Sample". Make sure the Peri pump is on. The Peri pump will help the sample to come in faster at depths up to around 200 feet. Samples deeper do not require the Peri pump to be on.



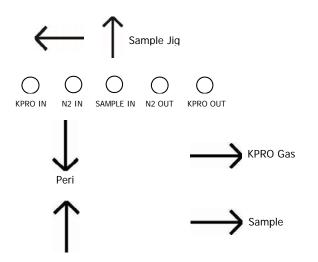
2. Since the pump is already pressurized, turn the right valve on the sample jig so it is facing to the right. This will allow the nitrogen to push the water up from the pump through the sample jig. You should see the VOAs begin to fill. The pressure on the gauge will drop and stabilize.



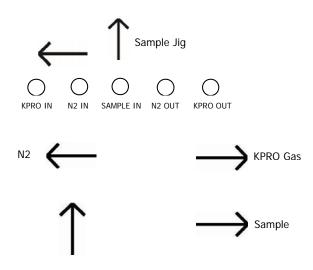
3. Keep a close eye on the pressure gauge. When the pressure gauge starts to move up, turn the top left valve a quarter turn clockwise. This will vent the nitrogen, which will make a hissing sound.



4. After venting the nitrogen, the pressure gauge will drop. When it crosses zero, turn the right valve on the sample jig towards the back (locked off). Wait for all of the gas to vent (the hissing sounds will dissipate) and turn the top left valve one half turn clockwise so it is on "Peri". Record the physchem values.



5. After waiting three minutes (or more or less, depending on how much water was purged during the previous whack) turn the top left valve one quarter turn clockwise to "N2". This will send nitrogen down to pressurize the pump. This is called a "whack". Watch the pressure gauge. When it moves up past zero, turn the right valve on the sample jig to the right. Go back up to step 3 above and follow the sequence.



6. Once the physchem parameters have stabilized and the sample vials have been collected, the pump needs to be filled and pressurized again for driving. Go back up to that section for instructions.

Some notes:

After driving, the stainless steel lines and pump are filled with KPRO water. This water needs to be purged before formation water will appear. To calculate how much KPRO water is in the tubing and pump, multiply the amount of stainless by two, then by 0.8, then add 100. (This accounts for the volume of the tubing going down, coming back up and the pump. There is 0.8 ml per foot of tubing). The first whack should produce almost all of this volume of water.

A good whack should yield 50-60 ml minimum. If you do not get this volume after waiting 3 minutes, wait longer (4 minutes, then 5, etc). If you get more volume than 50-60, do the whacks more often (2 minutes). If you do not get 50-60 ml after waiting 5 or 6 minutes, you may want to drive to a better sampling interval.

If after the first whack you have purged the volume of KPRO that is in the pump and tubing, and after waiting longer between whacks you get nitrogen coming back up instead of water, chances are the sampling interval will not yield a sample. To double check, refill the pump with KPRO water and start the purging/sampling process again.

If you have just added stainless and notice that the flow is a lot lower than it was at the end of the previous drive, you may have a blocked or kinked piece of stainless. Before driving, disconnect the stainless and blow it out with water to make sure all the lines are clear.

Please see the Problem Solving Guide if you have problems that aren't listed here, or if you can't figure it out call the office or somebody to help.



ATTACHMENT 3

Profiling Problem Solvers Guide



KPRO Trouble Shooting Guide

Version 1.0 Updated 2-26-08 by VLD

Software / Electrical Issues

Symptom	Possible Problem	Solution
Kpro Software Will Not Recognize Box	COM port set incorrectly in Software Wiring harness inside Kpro box not connected/ or is loose	There is a text box labeled "Kpro Com Port" on the Kpro software. Make sure that the number matches that of the com port where the Kpro box is plugged in. If it is plugged into the Com port on the back of the computer it is Com 1. If it is plugged into the socket card, click on the socket icon on the toolbar at the bottom right corner of the computer screen to determine which Com ports the computer has assigned to the socket card. A fast way to determine if the box is reading is to start the Kpro software and select "Calibrate" when the dialogue box pops up. Select one of the three choices (Flow, Pressure, String Pot). If the red light in the enclosure comes on and blinks and there are numbers other than zero for the readings, you have a good connection. Double check that the wiring harness inside the Kpro box is securely connected to the enclosure.
	Computer assigns higher com port for serial card Bad data cable	On the newer tough book laptop computers (Rasc 6,7 and 8), sometimes the socket cards are given Com ports of 9 and or 15 and 16. The Kpro software does not like these higher numbers. Click on the socket card icon at the bottom right corner of the computer screen. Change the com ports of the socket card to Com 2 and 3. If the Kpro box is connected to the socket card, make sure you change the number in the software. If for some reason the socket card will not change the com ports, connect the Kpro box to Com 1 and the water quality sonde to Com 9. After checking all of the above, the data cable may be broken. Double check the connections and maybe try another cable.

Bad data cable connector Check the connection plugs on the left-side of the Kpro box. All of the pins should be sticking out about the same distance. If not try using pliers to gently pull out any sunken in pins to the same level as the others. If this is not the case or does not work, if the truck has a spare wiring harness connect that to the enclosure and plug the data and string pot cables directly to it. If there is no spare harness and the truck has another Kpro box, swap out the boxes. Insert the serial com card and click on the socket card icon on the Computer is not reading the serial card (dual or single) lower right corner of the computer screen. If the text box says "no socket card detected" then the driver needs to be installed. On the software disk with each computer there is a socket driver folder with a read me text file in it. Open the text file and follow the instructions. Blown Fuse The fuses are located inside the top compartment of the enclosure No power to enclosure to the right of the LED voltage readout. Remove and inspect the fuses. Bad Power cable Check that the ends of the power cable are securely fastened to the power inverter. If they are and the inverter is on, try replacing the power cable. Bad Power inverter The on/ off switch on the inverter will light up when it is on. **Broken Enclosure** If after trying all of the above and the enclosure still will not power up, then the enclosure may be broken. You can either swap out the enclosure or the entire Kpro box. String pot reads intermittently String Pot Malfunction Make sure that the connection form the cable to the string pot is tight and that the cable is properly connected to the Kpro box. If they are, try swapping out the cable. If that doesn't work try swapping out the string pot. Also make sure that the wire that extends out of the string pot is not getting hung up on the drill rig or something else (wrench or pulling plug used to weight it down). String pot not reading at all Make sure that the cable is properly connected to the string pot and the box. If there is still no reading, try swapping out the cable and/ or the string pot. Make sure that the string pot is extended before pressing the "Start String pot not reading during drive Kpro" button on the software. If the button is pressed when the string pot is retracted, it will not read.

	String pot reading long/ short	Recalibrate the string pot. If that does not work and the string pot it not off by that much (+/5') then correct the depth at the end of the drive or when you stop to collect a sample. If it is off by more than that, try swapping out the string pot, then recalibrate. The string pot slope should be around 1.65 (+/ - 0/2). If it is more or less than that, swap out the cable or string pot.
Flow Meter Issues	Flow seems too high/ or low	Make sure that all of the connections inside the enclosure are tight. Flow out with one piece of stainless attached should be between 170-270. The flow slope should be close to 38 (+/- 2). Recalibrate the flow. If after recalibrating the slope is above or below this, try replacing the flow meter and recalibrating. You can also do a manual check of the flow by timing how long it takes to fill 100ml. If the flow rate matches what the software is reading and it is too high or low, change out the flow meter.
	No flow	Double check that the quick connects that go to the enclosure are connected. Make sure that the bottom left valve is on "Kpro". Check Kpro reservoir for water. In Peri mode, make sure that the top left and right valves are in the "Kpro Peri" position. For gas drive make sure that the top right valve is in "Kpro Gas Drive" position.
	Flow out but flow meter does not read any flow	Make sure that the flow meter is properly connected (electronics cable and plumbing). Make sure that the Kpro software is on and is connected properly. If it is, then replace the flow meter.
Pressure Transducer	Pressure seems too high/ or low	First, make sure that there are no leaks in the enclosure. When checking atmospheric pressure, the pressure should be between 32 and 36. If it is higher or lower, recalibrate the pressure transducer. The pressure slope should be around 22-28. If it is higher or lower than this and the transducer is still reading way off, replace the pressure transducer.
Calibration Problems	KPRO software folder in wrong directory	Make sure that the KPRO_2006 folder is located in the root directory of the C drive (*C:\Kpro_2006). There is an output file that gets written to and if the folder is in the wrong place, the software does not know where to find it.

SEI-6.43.5

Slopes do not change, unrealistic numbers

If the slopes were calibrated with a bad cable, flow meter or pressure transducer, the program can come up with some crazy slopes (-16777 for string pot). The program uses the old slope to calculate the new slope, so it cant create a proper slope based on some crazy unreal number. After replacing the bad component, go to C:\Kpro_2006\Output Files\slopes.txt. Open the file and delete the bad slopes from the file. Make sure that the cursur is at the end of the line with the slopes when you save the file, otherwise the Kpro software will read in from the next line, which is blank, and will give a "NAN" (Not A Number) in place of the slope. Save and close the file, then try calibrating.

Note on calibration: If you calibrate and want to recalibrate right away due to a bad calibration, the program will NOT use the freshly calibrated slopes, but will use the slope that was read in when the program first started. So if you think the newly re-called slopes are bad, simply recalibrate. If you think that the slopes the program are using are bad, go in and delete the bad slopes from the text file according to the directions above.

KPRO Box Issues

General Peristaltic Pump Problems

Symptom	Possible Problem	Solution
Peri pump not working - no power Pump head will not spin but pump motor is on	Loose connection / bad switch Broken spindle	Make sure that the wiring harness is connected, the power cord is connected, all other connections are good. Some peristaltic pumps are connected to the power supply via a cigarette lighter plug located inside the Kpro box. Make sure that this connection is tight and that there is no corrosion/ and or dirt on the plug. Double check that the connections from the wiring harness to the pump are tight and there is no corrosion on the connectors and switches. If all the connections and switches appear to be fine, then the problem is probably in the wiring harness. In this case you will need to replace the harness or bypass the harness with a spare, or use a different Kpro box. There is a plastic piece inside the pump that has a slot in it that the shaft from the pump head fits into. Over time the slot can get worn
		and break off. If this happens you need to open up the pump and replace the spindle, or replace the entire pump.

Peristaltic Pump Repair / Replacement

If there is time, remove all the tubing and electrical connections and detach the old pump from the black plastic piece that holds it in the box. Connect the new pump to the black plastic piece and rewire the switches to connect to the switches on the kpro box and reconnect the tubing. A quicker solution is to disconnect the tubing and electrical connection and remove the old peri (black plastic piece and all) and put in the new pump by laying it in the open space in the box and connecting the tubing and electrical. When changing the tubing in the pumps do not tighten the pump head down with a screwdriver, these are meant to be finger tight, using a screwdriver causes the plastic framework within the pump to fatigue and break.

None of the fittings for the pump between the black plastic and the switches/pump body are water tight which has lead to corrosion and switch failure. In an effort to extend the life of this equipment using a little silicon sealant at these points is a good idea, if you are working on a box that does not have this please apply a small amount between the 2 parts, any questions please feel free to call me.

Peristaltic Mode

Cannot pull vacuum

Upper left valve on box not on peri

Worn out silicon tubing

Peri pump on reverse

Check if problem is in sample jig or other stainless

If leak is in sample jig:

Loose fittings

Should be on "Kpro Peri" during drive, need to switch to "Peri" when pulling sample.

The silicon tubing located inside the head of the pump gets worn and needs to be replaced. Remove the four screws and remove the top half of the head assembly. Replace the silicon with a new piece cut to the same length. Replace the head and only finger tighten the screws.

Make sure that the peri pump is going in the right direction. If while the pump is on and there is a positive pressure reading on the gauge, stop the pump, reverse direction and restart the pump.

Turn the valves on the sample jig so that they face one another, therefore bypassing the jig. If the pressure drops and a vacuum is achieved then there is a leak in the sample jig.

Double check that all of the swage fittings on the sample jig are tight.

Loose Vials / Bad vials Make sure that the sample vials are tight. They should not be

excessively tight. If there is still a leak, replace the vials.

Sometimes the threads on the vials can be slightly off and wont fit

correctly in the bottle holder.

There are special quad o-rings that are located in the bottle holder. No o-rings or bad o-rings

Double check that there are o-rings in there and that they are in

good condition (not dried out, cracked or cut).

Sample straw too close to vial bottom

On some of the sample jigs, the straw that extends down into the sample vial is too long and will come in contact with the bottom of the vial. Sometimes this will result in the vial bottom breaking. Other times it will block the straw and water will not be able to pass through. If it looks as if the straw is too long, try inserting an additional o-ring in the bottle holder. If this does not work, file down the straw or cut a small amount off the bottom with a tubing cutter or

grinder.

Plastic bottle holder is worn out / scarified

The threads of the bottle holder can become scarified from people not being careful when removing the o-rings with a pick. If after trying all of the above, the bottle holder may need to be replaced. There are screws located on the under side of the plastic piece (hex screws). Once the holder has been removed, inspect the inside of the threads and if they are scratched and gauged then replace the plastic piece.

If leak is not in sample jig:

Leaky fittings

If it is determined that the leak is not in the sample jig, then you may have a leaky fitting on the harness or down hole. Double check that all the fittings on the Kpro box, harness and stainless are tight.

Gas Drive Mode

Possible Problem Symptom

No inflow of sample water

No Flow during whack. Pressurize pump then open sample jig, but no water flows.

Solution

Make sure the bottom right valve is on "sample". Make sure that there are no kinks in the tubing coming out of the box and going to the water quality sonde's flow cell. Also sample straw in jig could be too close to the bottom of the sample vial and is preventing flow. Try loosening the vials to see if you get flow.

Gas bubbles when filling pump for drive

Leaky 5-way valve

Silicon tubing pops off peri pump

Leaky 5-way valve

Replacing 5-way valve

Profiling Problems

Peristaltic Mode

Possible Problem Symptom

If the 5-way valve (the top left valve on the Kpro box) is leaking, nitrogen can leak through. Tighten the valve by first removing the know with a hex wrench. Remove the metal plate. If you see metal shavings, it is possible that the pump has been tightened before and needs to be replace. Insert needle nosed pliers into the two holes on the valve and turn. If the valve still leaks, it needs to be replaced.

See above. Another test to determine if the valve is leaking is to pop off the silicon tubing and put your finger over the peri intakes and remove it after a second or two. If you hear a pop, then gas is leaking through the valve. Another way is that with the valve pointed to "Peri", place the vent tubing into some water. If there are bubbles coming out of the tubing, the valve is leaking. Disconnect the "N2 in" quick connect from the Kpro box. Before removing the valve, take note of which way the fittings are pointing on the under-side of the valve. Is is helpful to make a drawing showing how they are oriented. Remove the knob of the valve with a hex wrench. There is a large nut/ ring on the top-side of the valve that can be removed using a crescent wrench. Disconnect the valve (there are 5 connections). Remove the fittings from the valve, and re-use them if you can. Some of the plastic fittings can become worn out and break, so do not reuse these (there should be new ones in the Swage box). Before installing the fittings on the new valve, wrap the threads with teflon tape. It is much easier to install the fittings onto the valve before putting the valve into the box. Orient the fittings the same way that they were on the old valve, making sure that they are tight. This will make re-installation much easier. It is also easier to re-attach all of the connections before putting the valve through the hole in the plastic and securing the nut/ ring on the top side of the valve.

Solution

Head values seem odd FEP is broken or disconnected If you know you are in the water table, and based on previous head readings the head value seems wrong (i.e. a previous head reading was -10, and now it is -1) the FEP tubing could be broken. Slightly pull on the stainless steel tubing coming out of the rods. If you feel resistance, then the tubing is still intact. Loose fitting If the FEP is still intact, there could be a loose fitting that is leaking. To test this, pour water down the rods and watch the pressure reading on the Kpro software. If the pressure rises, there is a leak and the tooling needs to be tripped out and replaced. If the profiling tip is in lower-lk zone, it can take a while for the head Silty layer value to settle, and it still may settle at a value different than the previous head value (usually a few feet above). Wait a few minutes and record the head value once it stabilizes. Orient the valves and turn on the peri pump to start pulling a sample. If you do not get a sample, the profiler needs to be advanced to a higher lk zone. No flow out Valves in wrong position Make sure that the valves on the sample jig are pointing towards each other, then that the top left and right valves on the box is pointing towards "Kpro Peri", and that the bottom left valve is turned towards "Kpro". Tip is clogged After attempting to pull a sample, orient the valves for flow and turn on the Kpro. If the flow was good before pumping and is now zero, then the tip became cloqued during pumping. Try to advance the profiler, as sometimes the vibration will loosen the soil in the tip and can free it up. If after a few feet there is still no flow, trip out the tooling and replace the tip. Kpro reservoir is empty Make sure there is water in the Kpro reservoir. Disconnect the line going from the nitrogen regulator to the reservoir before opening the top. Good flow out, no water Develop the formation by alternately flowing Kpro water out the tip Tip is slightly encased with soil and pumping, or by alternating the direction of the peri pump for a back few seconds. Make sure to turn the pump off before switching between forward and reverse because it can damage the pump. Not deep enough in water table The profile tip should be at least 6" into the water table. Not pulling vacuum Check previous section listed above FEP is broken or disconnected Check previous section listed above Stainless is broken or has sheared off If the drill rod has broken off it will shear the stainless steel. Pull on the stainless to see if it is still connected.

Pull in very dirty sample	Water from drilling rods is being pulled in	If the sample water is excessively silty and a lot of silt has filled up the sample vials, then there is a chance that the FEP tubing is broken. Check FEP - see above.
Start to get good sample return, then nothing	Tip is clogged	Develop the formation by alternately flowing Kpro water out the tip and pumping, or by alternating the direction of the peri pump for a few seconds. Make sure to turn the pump off before switching between forward and reverse because it can damage the pump.

Gas Drive Mode

Symptom	Possible Problem	Solution
No flow out tip	Tip is clogged / smeared Kpro line is clogged	The profile tip can become clogged after pulling in a sample that contains fine particles such as silty or fine sand. If after pulling a sample the flow out the tip is lower than before pulling the sample, try advancing the tip a few feet. If during the drive the flow is good but drops off when the hammer is stopped, there is a good chance that the tip is clogged and must be changed. When profiling through a clay layer, it is possible that clay will smear on the tip and cover the sampling ports. See the clogged lines section below
No flow out tip - deep profiling	Rubber inner tube still on tip	When profiling using a drill rig where the drill rods are lowered down into casing filled with drilling mud, it is necessary to put a rubber inner tube over the profile tip to prevent it from clogging. The tip must be advanced at least 1-1.5 feet for the inner tube to be pushed back to expose the sampling ports on the tip.
Cannot fill pump for drive	Nitrogen pressure set to high - reed valve failure	Make sure that the pressure regulator is set at the appropriate pressure for the depth. the conversion is 1 psi = 2.3 feet of water (So for a depth of 200 feet, the regulator should be set around 90 psi, at 500 feet at 220 psi). If the pressure is set to high the reed valve will fail.

Leaky fitting / reed	valve,	reed	valve	silted
up				

Make sure that the fittings on the harness are tight. The pump will not fill if the reed valve located in the pump is not closing correctly due to silt or a defective valve. Sometimes it is possible to "shock" the reed valve by first making sure that the valves on the sample jig are facing each other, then connecting the "sample out" line to the "N2 out" line and turning the valve on the top right of the box to "N2". This will send nitrogen down the sample line (the sample line inside the pump ends above the reed valve) hopefully mobilizing any silt, or by forcing the valve to close. If this does not work, then the pump needs to be removed from the hole and the reed valve must be replaced.

Cannot pressurize pump Leaky fitting / reed valve, reed valve silted

up / pressure set to high

See above.

Pump loses pressure during drive

Leaky fitting / reed valve, reed valve silted up / pressure set to high

See above. See above.

Good flow out, no sample back

Tip is clogged

Sometimes while driving the vibration from the hammer will allow flow out, but when the hammer stops flow will drop. If the flow goes to zero or very low after the hammer is stopped, the tip could be clogged or the formation is tight. You need to either pull out the tooling or drive further.

Kpro line is loose or came unscrewed

If the flow out is high enough where you think a sample can be pulled but you get no water back when whacking, the Kpro line could be broken of unscrewed. While driving, the tip will become clogged if no water is flowing out. The Kpro water will flow out the open stainless giving the illusion of high lk. Another clue to this is if you cannot pull a sample and the lk is high and didn't vary at all over a large depth.

Small sample return (small volume whacks)

Lines are switched

If you are well into the water table and the lk is high and the whacks are small (less than 50 ml) then the stainless steel lines could be reversed. If there are two lines that are very close in length (usually the sample and nitrogen lines) a short piece of stainless can be

added to sample line to separate them.

Sparge sample Tip is clogged The pump volume is approximately 120 ml and there is approximately 0.8 ml per foot of stainless. If after purging the appropriate amount of water to fill the pump and stainless the sample sparges, refill the pump, pressurize the pump and turn on

the Kpro to see if the tip is clogged.

Ik is too low to sample Wait longer between whacks. If you purge the volume of the lines

and pump and do not see formation water (usually silty) advance

the profiler.

Not venting nitrogen when needle moves

If excess nitrogen gets into the pump the sample will sparge. Be sure to vent the nitrogen as soon as the needle on the gauge tips up. If it sparges, try doing smaller whacks by venting the nitrogen before the needle tips up. If the sparge is too much try refilling the pump and starting over.

Clogged Lines

- 1. Before attempting to unclog any lines, turn the valves on the sample jig so that they are facing each other, thereby bypassing the sample jig.
- 2. If you think a line is clogged, the first and fastest thing to check is the harness. The harness can become plugged if it touches the ground while adding stainless. Try disconnecting the harness from the stainless lines and turn on the nitrogen and kpro and see if the lines are clear. You can check the sample line by putting the valves on fill, or plugging the sample line into the kpro out and turning the kpro on.

Determining if a line is clogged

Line	Problem	Solution
Kpro line	No flow - pump is full and pressurized, flow bottoms out to zero before driving.	Depressurize the pump by venting the nitrogen and turn the valves on the sample jig in. Turn on the Kpro and look at the flow on the Kpro software. Since the pump is de-pressurized and pressure in the pump is less than the pressure outside the tip, Kpro water should flow up into the pump at about 10-20 ml/min. If the flow is still zero, the Kpro line is clogged. See the "Unclogging lines" section below.

Sample Line Pump does not fill

Nitrogen Line Pump does not fill

Unclogging Lines Kpro Line

Nitrogen Line and Sample Line

Turn the left valve on the sample jig so that it faces the wall (closed) if the needle on the pressure gauge does not drop, the line is probably clogged. To double check, plug the sample line into the Kpro out and turn on the Kpro. Watch the flow on the computer. If the flow is zero, then the line is clogged. See the "Unclogging lines" section below.

Plug the nitrogen out line into the Kpro out and turn on the Kpro. Watch the flow on the computer. If the flow is zero, then the line is clogged. See the "Unclogging lines" section below.

- Isolate zero-headspace sampling apparatus by pointing the two valves handles, located above pressure gauge, inward towards each other.
- Place "KPRO out" quick connect into "Nitrogen Out" quick connect slot.
- Turn nitrogen/peri valve to "Gas Drive" position, which will allow nitrogen flow down the KPRO line and out into the formation.
- Listen to gas drive regulator to determine if regulator stops delivering flow, as indicated by the regulator becoming silent. If regulator continues to make "hissing noise", then the KPRO line is free of any obstructions.
- If the obstruction cannot be removed via the nitrogen pressure, the tool must be removed from the ground and inspected to determine where the clog is present.
- Isolate zero-headspace sampling apparatus by pointing the two valves handles, located above pressure gauge, inward towards each other.
- Turn nitrogen/peri valve to "Gas Drive" position and disconnect the sample line from where it enters the pressure gauge. This will allow nitrogen flow down the nitrogen line and up the sample line.
- Listen to gas drive regulator to determine if regulator stops delivering flow, as indicated by the regulator becoming silent. If regulator continues to make a "hissing noise" and nitrogen flow is observed at the effluent of the sample line, then the nitrogen line, the gas drive pump and the sample line are free of any clogs. If regulator stops delivering flow, as indicated by the regulator becoming silent, then either the sample line, the nitrogen line, or the

gas drive pump may be clogged.

to determine where the clog is present.

If the obstruction cannot be removed via the nitrogen pressure, the tool must be removed from the ground and inspected

Water Quality Sondes

_		
Symptom	Possible Problem	Solution
Sonde is not recognized by the computer	Wrong Com Port in Software	Make sure that the com port assigned in the software is the same one that the sonde is connected to. Most of the software will only go up to Com 9.
	Power not connected/ batteries are dead	The YSI and Hach sondes have a power supply. The Trolls have batteries. To change the batteries first unscrew/ disconnect the data cable and then unscrew the top of the sonde.
	Cable is broken	If after trying the first two steps listed above there is still no connection between the sonde and the computer, the data cable connecting the sonde to the computer could be faulty. Try a different cable.
Water quality parameter values are way off	Computer/ Sonde needs to be restarted or recalibrated.	Sometimes the sondes can read strange numbers (i.e. pH of 100, DO of 300). The first thing to try is to restart the computer. If this does not work try recalibrating the sonde. It is better to calibrate/check each probe individually rather than using an all in one cal solution (such as Quick Cal). If the sonde is still off, look below.
	Individual probes need to be changed.	From time to time the individual probes on the sondes can be faulty. Each troll/ YSI case should have extra probes. Swap out the probe and check/ and or recalibrate. Make sure when checking/ calibrating that the probes are fully immersed in the cal solution. Also, it is very important to store the probes in the correct manner. Never store the probes dry, even overnight. At the end of the day, take the sonde out of the flow cell and store it in the screw on cap filled with pH 4 solution. For long term storage (longer than a week) remove the individual probes and store them in the appropriate solution (check the manual for the particular sondes for the correct

way to do this).

	Bad Cal Solutions	Calibration solutions can go bad if they have been opened for a while (especially conductivity). Always write the date opened on any bottle of solution when it is opened for the first time. If you think they solution may be old, recheck or calibrate with fresh solution.
	Water Temperature - DO calibration	When calibrating or checking the DO using the water saturated air method, make sure that the water you are using is relatively warm. If you are checking the sonde first thing on a cold morning with water that was in the truck, it will take longer for the water to vaporize in the flow cell and therefore the calibration will take longer or won't happen at all. Try heating the water in a cup using a space heater prior to calibration. Make sure to record the DO value and temperature in the log book for the sonde after calibration or check.
Values do not change	Clogged flow cell - silted up probes	Make sure that the sonde is kept vertical, otherwise sediment can build up in the flow cell and coat the probes.
Calibration Notes for Hach Hydrolab		1. There is a reference solution for the PH/ORP probe that needs to be changed monthly (not sure if that is only in use or always) it is very easy to do following the instructions in the manual.
		2. When you calibrate the PH on these units it is IMPORTANT to calibrate the PH 7 standard first followed by either the 4 or 10 or both as the calibration method uses the 7 as zero and calculates the slope with the 4/10.

Torpedo/ Salimander Heaters

********** UNPLUG THE HEATER WHEN YOU ARE TROUBLESHOOTING IT EXCEPT IN AN ATTEMPT TO START IT******

Symptom	Possible Problem	Solution
Unit will not start / shuts off	Not plugged in / no power Fuel	 Make sure the unit has Power. Check your fuel source for diesel treatment; they do not fire quite the same as a diesel engine and the treatment in the fuel may not be working for the heater. Possible solutions include more additive, a different additive and using kerosene.

Starter element is bad 3. Look inside the unit (FROM THE REAR) as it tries to start, if

there is not a red glow inside then the element must be replaced,

parts available at Home Depot.

Air filter is plugged / clogged. 4. Check the air filter on the back of the unit: This can become iced

up or plugged with dust/dirt. Clean it!

Fuel filter 5. If the temperature isn't far below freezing and the fuel is not in

> question you may try replacing the fuel filter. This can be found by removing the control panel (2 Philips screws above the controls) it is a white inverted cone with a black tube attached to it sticking out of the fuel tank. To remove the filter you most pull out the rubber bushing it sits in; failure to do this will remove the fuel pickup tube from the bottom of the filter and cause the unit to only be able to utilize 10% of the fuel tank capacity (the first 10) replacement filters

can be purchased at Home Depot.

Fuel line 6. Check the fuel pickup line mentioned above.

Other issues:

1. If the unit runs for a while then shuts off repeatedly it is likely 2 or 6 above.

- 2. Sometimes the unit will start with the top cover off and not with it on. I have come across this while troubleshooting and it is the result of improper fuel supply pressure, this can be corrected with the pressure gauge from the manufacturer but they are too costly to have in every truck. For a temporary solution you can restrict the airflow from the back with a piece of cardboard to get it to fire then remove the cardboard for operation, doing so will cause the fuel supply to spread further and interact properly with the igniter.
- 3. They get very hot, allow them to cool after use before placing them in a truck.
- 4. While in operation they are a serious hazard and must be used in such a manner as to not melt nearby objects (people, drill rigs etc.) keep in mind that the heat from these is dangerous for more than 10 feet.
- 5. Do not fuel them while in use.
- 6. Do not fuel them to the very top, the caps have a vent that will leak if not perfectly level.

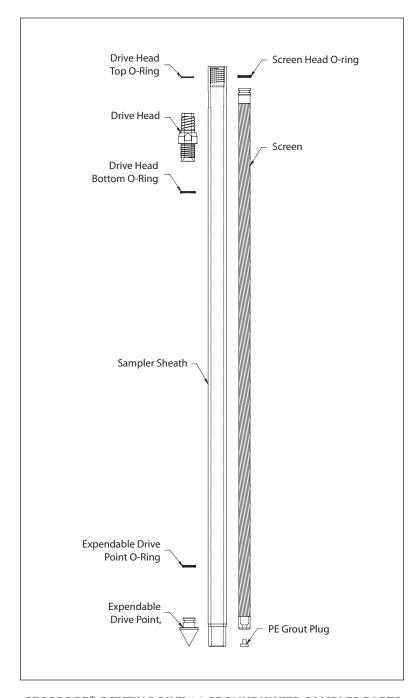
DO NOT USE GASOLINE IN THEM !!!

GEOPROBE® SCREEN POINT 16 GROUNDWATER SAMPLER

STANDARD OPERATING PROCEDURE

Technical Bulletin No. MK3142

PREPARED: November, 2006



GEOPROBE® SCREEN POINT 16 GROUNDWATER SAMPLER PARTS



Geoprobe® and Geoprobe Systems®, Macro-Core® and Direct Image® are Registered Trademarks of Kejr, Inc., Salina, Kansas

Screen Point 16 Groundwater Sampler is manufactured under U.S. Patent 5,612,498

COPYRIGHT© 2006 by Kejr, Inc. ALL RIGHTS RESERVED.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from Kejr, Inc.

1.0 OBJECTIVE

The objective of this procedure is to drive a sealed stainless steel or PVC screen to depth, deploy the screen, obtain a representative water sample from the screen interval, and grout the probe hole during abandonment. The Screen Point 16 Groundwater Sampler enables the operator to conduct abandonment grouting that meets American Society for Testing and Materials (ASTM) Method D 5299 requirements for decommissioning wells and borings for environmental activities (ASTM 1993).

2.0 BACKGROUND

2.1 Definitions

Geoprobe®: A brand name of high quality, hydraulically powered machines that utilize both static force and percussion to advance sampling and logging tools into the subsurface. The Geoprobe® brand name refers to both machines and tools manufactured by Geoprobe Systems®, Salina, Kansas. Geoprobe® tools are used to perform soil core and soil gas sampling, groundwater sampling and monitoring, soil conductivity and contaminant logging, grouting, and materials injection.

Screen Point 16 (SP16) Groundwater Sampler: A direct push device consisting of a PVC or stainless steel screen that is driven to depth within a sealed, steel sheath and then deployed for the collection of representative groundwater samples. The assembled SP16 Sampler is approximately 51.5 inches (1308 mm) long with an OD of 1.625 inches (41 mm). Upon deployment, up to 41 inches (1041 mm) of screen can be exposed to the formation. The Screen Point 16 Groundwater Sampler is designed for use with 1.5-inch probe rods and machines equipped with the more powerful GH60 Hydraulic Hammer. Operators with GH40 Series hammers may chose to use this sampler in soils where driving is difficult.

Rod Grip Pull System: An attachment mounted on the hydraulic hammer of a direct push machine which makes it possible to retract the tool string with extension rods or flexible tubing protruding from the top of the probe rods. The Rod Grip Pull System includes a pull block with rod grip jaws that are bolted directly to the machine. A removable handle assembly straddles the tool string while hooking onto the pull block to effectively grip the probe rods as the hammer is raised. A separate handle assembly is required for each probe rod diameter.

2.2 Discussion

In this procedure, the assembled Screen Point 16 Groundwater Sampler (Fig. 2.1A) is threaded onto the leading end of a Geoprobe® probe rod and advanced into the subsurface with a Geoprobe® direct push machine. Additional probe rods are added incrementally and advanced until the desired sampling interval is reached. While the sampler is advanced to depth, O-ring seals at each rod joint, the drive head, and the expendable drive point provide a watertight system. This system eliminates the threat of formation fluids entering the screen before deployment and assures sample integrity.

Once at the desired sampling interval, extension rods are sent downhole until the leading rod contacts the bottom of the sampler screen. The tool string is then retracted approximately 44 inches (1118 mm) while the screen is held in place with the extension rods (Fig. 2.1B). As the tool string is retracted, the expendable point is released from the sampler sheath. The tool string and sheath may be retracted the full length of the screen or as little as a few inches if a small sampling interval is desired.

There are three types of screens that can be used in the Screen Point 16 Groundwater Sampler. Two of the these, a stainless steel screen with a standard slot size of 0.004 inches (0.10 mm) and a PVC screen with a standard slot size of 0.010 inches (0.25 mm), are recovered with the tool string after sampling. The third screen is also manufactured from PVC with a standard slot size of 0.010 inches (0.25 mm), but is designed to be left downhole when sampling is complete. This disposable screen has an exposed screen length of approximately 43 inches (1092 mm). The two screens that are recovered with the sampler both have an exposed screen length of approximately 41 inches (1041 mm).

(continued on following page)

An O-ring on the head of the stainless steel screens maintains a seal at the top of the screen. As a result, any liquid entering the sampler during screen deployment must first pass through the screen. PVC screens do not require an O-ring because the tolerance between the screen head and sampler sheath is near that of the screen slot size.

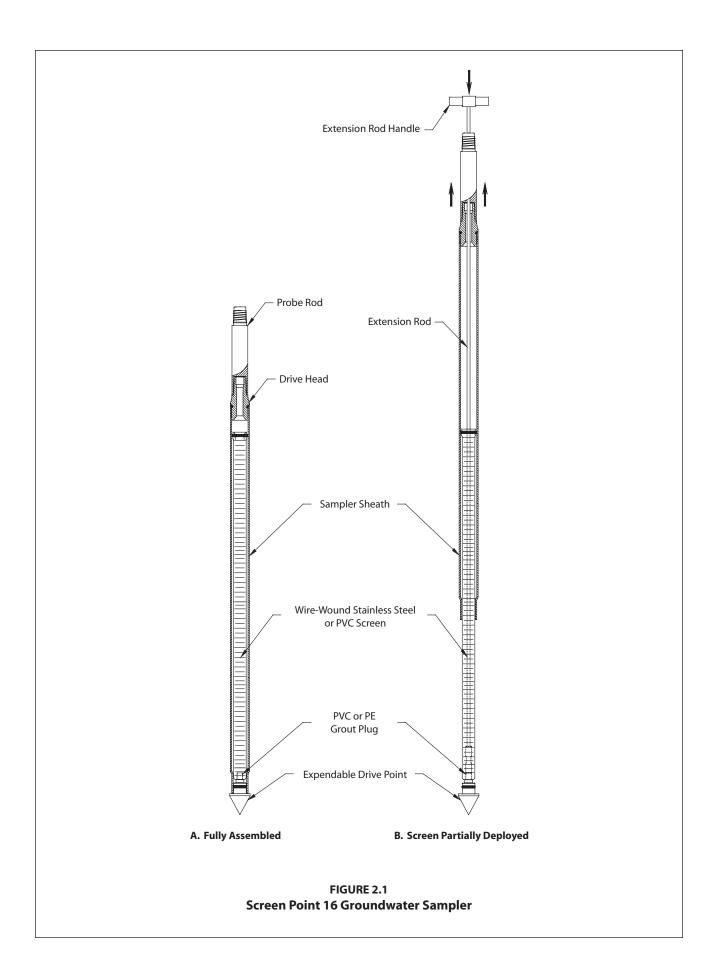
The screens are constructed such that flexible tubing, a mini-bailer, or a small-diameter bladder pump can be inserted into the screen cavity. This makes direct sampling possible from anywhere within the saturated zone. A removable plug in the lower end of the screens allows the user to grout as the sampler is extracted for further use.

Groundwater samples can be obtained in a number of ways. A common method utilizes polyethylene (TB25L) or Teflon® (TB25T) tubing and a Check Valve Assembly (GW4210). The check valve (with check ball) is attached to one end of the tubing and inserted down the casing until it is immersed in groundwater. Water is pumped through the tubing and to the ground surface by oscillating the tubing up and down.

An alternative means of collecting groundwater samples is to attach a peristaltic or vacuum pump to the tubing. This method is limited in that water can be pumped to the surface from a maximum depth of approximately 26 feet (8 m). Another technique for groundwater sampling is to use a stainless steel Mini-Bailer Assembly (GW41). The mini-bailer is lowered down the inside of the casing below the water level where it fills with water and is then retrieved from the casing.

The latest option for collecting groundwater from the SP16 sampler is to utilize a Geoprobe® MB470 Series Mechanical Bladder Pump (MBP)*. The MBP may be used to meet requirements of the low-flow sampling protocol (Puls and Barcelona 1996, ASTM 2003). Through participation in a U.S. EPA Environmental Technology Verification study, it was confirmed that the MB470 can provide representative samples (EPA 2003).

*The Mechanical Bladder Pump is manufactured under U.S. Patent No. 6,877,965 issued April 12, 2005.



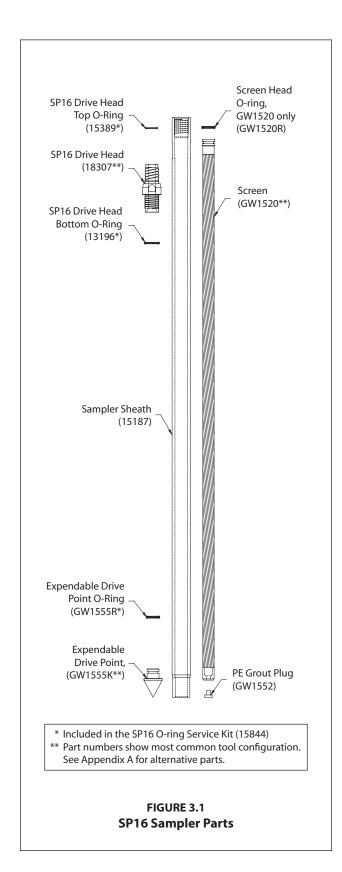
3.0 TOOLS AND EQUIPMENT

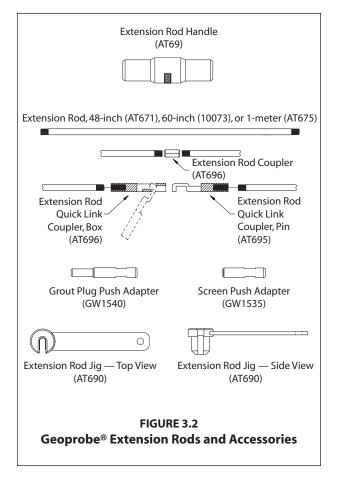
The following tools and equipment can be used to successfully recover representative groundwater samples with the Geoprobe® Screen Point 16 Groundwater Sampler. Refer to Figures 3.1 and 3.2 for identification of the specified parts. Tools are listed below for the most common SP16 / 1.5-inch probe rod configurations. Additional parts for optional rod sizes and accessories are listed in Appendix A.

SP16 Sampler Parts	Part Number
SP16 Sampler SheathSP16 Drive Head, 0.5-inch bore, 1.5-inch rods*	
SP16 O-ring Service Kit, 1.5-inch rods (includes 4 each of the O-ring packets below)	
O-rings for Top of SP16 Drive Head, 1.5-inch rods only (Pkt. of 25)	
O-rings for Top of SP16 Drive Head, 1.5-Inch Tods only (Pkt. of 25)	
O-rings for GW1520 Screen Head (Pkt. of 25)	
O-rings for SP16 Expendable Drive Point (Pkt. of 25)	
Screen, Wire-Wound Stainless Steel, 4-Slot*	
Grout Plugs, PE (Pkg. of 25)	
Expendable Drive Points, steel, 1.625-inch OD (Pkg. of 25)*	GW 1555K
Screen Point 16 Groundwater Sampler Kit, 1.5-inch Probe Rods (includes 1 each of:	15770
15187, 18307, 15844, GW1520, GW1535, GW1540, GW1555K, and GW1552K)	15//0
Probe Rods and Probe Rod Accessories	Part Number
Drive Cap, 1.5-inch probe rods, threadless, (for GH60 Hammer)	12787
Pull Cap, 1.5-inch probe rods	
Probe Rod, 1.5-inch x 60-inch*	
Extension Rods and Extension Rod Accessories	Part Number
Screen Push Adapter	
Grout Plug Push Adapter	
Extension Rod, 60-inch*	
Extension Rod Coupler	
Extension Rod Handle	AT69
Extension Rod Jig	AT690
Extension Rod Quick Link Coupler, pin	
Extension Rod Quick Link Coupler, box	AT696
Grout Accessories	Part Number
Grout Nozzle, for 0.375-inch OD tubing	
High-Pressure Nylon Tubing, 0.375-inch OD / 0.25-inch ID, 100-ft. (30 m)	
Grout Machine, self-contained*	
Grout System Accossories Package, 1.5-inch rods	
Groundwater Purging and Sampling Accessories	Part Number
Polyethylene Tubing, 0.375-inch OD, 500 ft.*	
Check Valve Assembly, 0.375-inch OD Tubing*	
Water Level Meter, 0.438-inch OD Probe, 100 ft. cable*	
Mechanical Bladder Pump**	
Mini Bailer Assembly, stainless steel	GW41
Additional Tools	Part Number
Adjustable Wrench, 6.0-inch	
Adjustable Wrench, 10.0-inch	
Pipe Wrenches	

^{*} See Appendix A for additional tooling options.

^{**} Refer to the Standard Operating Procedure (SOP) for the Mechanical Bladder Pump (Technical Bulletin No. MK3013) for additional tooling needs.





4.0 OPERATION

4.1 Basic Operation

The SP16 sampler utilize a stainless steel or PVC screen which is encased in an alloy steel sampler sheath. An expendable drive point is placed in the lower end of the sheath while a drive head is attached to the top. O-rings on the drive head and expendable point provide a watertight sheath which keeps contaminants out of the system as the sampler is driven to depth.

Once the sampling interval is reached, extension rods equipped with a screen push adapter are inserted down the ID of the probe rods. The tool string is then retracted up to 44 inches (1118 mm) while the screen is held in place with the extension rods. The system is now ready for groundwater sampling. When sampling is complete, a removable plug in the bottom of the screen allows for grouting below the sampler as the tool string is retrieved.

4.2 Sampler Options

The Screen Point 15 and Screen Point 16 Groundwater Samplers are nearly identical. Subtle differences in the design of the SP16 sampler make it more durable than the earlier SP15 system. Operators of GH60-equipped machines should always utilize SP16 tooling. Operators of machines equipped with GH40 Series hammers may also choose SP16 tooling when sampling in difficult probing conditions.

A 1.75-inch OD Expendable Drive Point (17066K) and Disposable PVC Screen (16089) provide two useful options for the SP16 sampler. The 1.75-inch drive point may be used when soil conditions make it difficult to remove the sampler after driving to depth. The disposable PVC screen may be left downhole after sampling (when regulations permit) to eliminate the time required for screen decontamination.

4.3 Decontamination

In order to collect representative groundwater samples, all sampler parts must be thoroughly cleaned before and after each use. Scrub all metal parts using a stiff brush and a nonphosphate soap solution. Steam cleaning may be substituted for hand-washing if available. Rinse with distilled water and allow to air-dry before assembly.

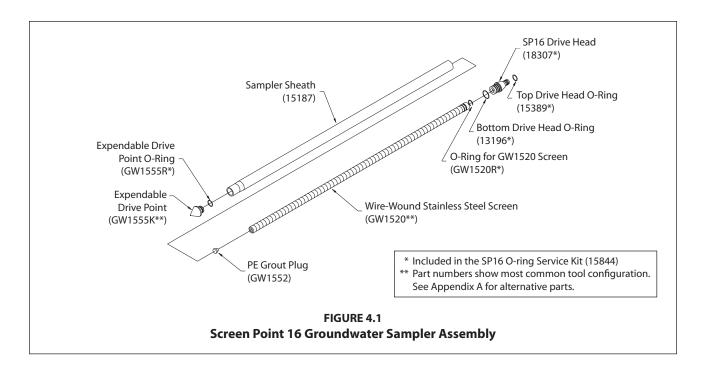
4.4 SP16 Sampler Assembly (Figure 4.1)

Part numbers are listed for a standard SP16 sampler using 1.5-inch probe rods. Refer to Page 6 for screen and drive head alternatives.

- 1. Place an O-ring on a steel expendable drive point (GW1555K). Firmly seat the expendable point in the necked end of a sampler sheath (15187).
- 2. Install a PE Grout Plug (GW1552) in the bottom end of a Wire-wound Stainless Steel Screen (GW1520). Place a GW1520R O-ring in the groove on the top end of the screen.
- 3. Slide the screen inside of the sampler sheath with the grout plug toward the bottom of the sampler. Ensure that the expendable point was not displaced by the screen.
- **4.** Install a bottom O-ring (13196) on a Drive Head (18307 or 15188). Thread the drive head into the sampler sheath using an adjustable wrench if necessary to ensure complete engagement of the threads. Attach a Drive Cap (12787 or 15590) to the top of the drive head.

NOTE: The 18307 drive head should be used whenever possible as the smaller 0.5-inch ID provides a greater material cross-section for increased durability.

Sampler assembly is complete.

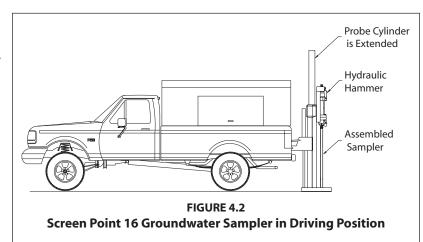


4.5 Advancing the SP16 Sampler

To provide adequate room for screen deployment with the Rod Grip Pull System, the probe derrick should be extended a little over halfway out of the carrier vehicle when positioning for operation.

- **1.** Begin by placing the assembled sampler (Fig. 2.1.A) in the driving position beneath the hydraulic hammer of the direct push machine as shown in Figure 4.2.
- **2.** Advance the sampler with the throttle control at slow speed for the first few feet to ensure that the sampler is aligned properly. Switch to fast speed for the remainder of the probe stroke.
- **3.** Completely raise the hammer assembly. Remove the drive cap and place an O-ring in the top groove of the drive head. Distilled water may be used to lubricate the O-ring if needed.

Add a probe rod (length to be determined by operator) and reattach the drive cap to the rod string. Drive the sampler the entire length of the new rod with the throttle control at fast speed.



- **4.** Repeat Step 3 until the desired sampling interval is reached.
 - Approximately 12 inches (305 mm) of the last probe rod must extend above the ground surface to allow attachment of the puller assembly. A 12-inch (305 mm) rod may be added if the tool string is over-driven.
- **5.** Remove the drive cap and retract the probe derrick away from the tool string.

4.6 Screen Deployment

- 1. Thread a screen push adapter (GW1535) on an extension rod of suitable length (AT671, 10073, or AT675). Attach a threaded coupler (AT68) to the other end of the extension rod. Lower the extension rod inside of the probe rod taking care not to drop it down the tool string. An extension rod jig (AT690) may be used to hold the rods.
- 2. Add extension rods until the adapter contacts the bottom of the screen. To speed up this step, it is recommended that Extension Rod Quick Links (AT695 and AT696) are used at every other rod joint.
- **3.** Ensure that at least 48 inches (1219 mm) of extension rod protrudes from the probe rod. Thread an extension rod handle (AT69) on the top extension rod.
- **4.** Maneuver the probe assembly into position for pulling.
- **5.** Raise (pull) the tool string while physically holding the screen in place with the extension rods (Fig. 4.3.B). A slight knock with the extension rod string will help to dislodge the expendable point and start the screen moving inside the sheath.

Raise the hammer and tool string about 44 inches (1118 cm) if using a GW1520 or GW1530 screen. At this point the screen head will contact the necked portion of the sampler sheath (Fig. 4.3.C.) and the extension rods will rise with the probe rods. Use care when deploying a PVC screen so as not to break the screen when it contacts the bottom of the sampler sheath.

The Disposable Screen (16089) will extend completely out of the sheath if the tool string is raised more than 45 inches (1143 mm). Measure and mark this distance on the top extension rod to avoid losing the screen during deployment.

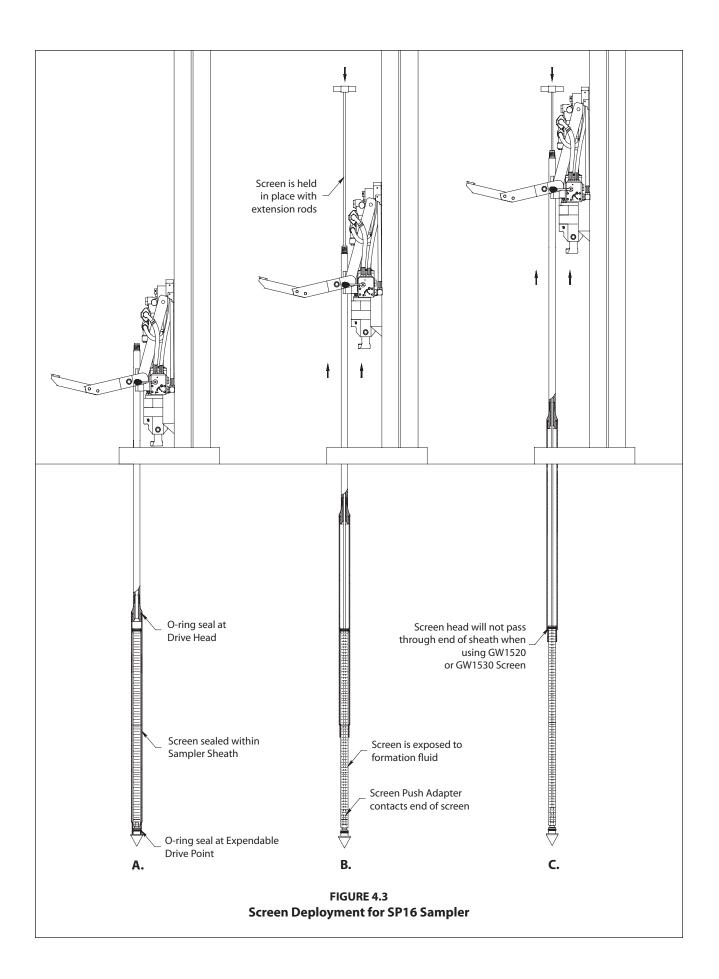
- **6.** Remove the rod grip handle, lower the hammer assembly, and retract the probe derrick. Remove the top extension rod (with handle) and top probe rod. Finally, extract all extension rods.
- **7.** Groundwater samples can now be collected with a mini-bailer, peristaltic or vacuum pump, tubing bottom check valve assembly, bladder pump, or other acceptable small diameter sampling device.

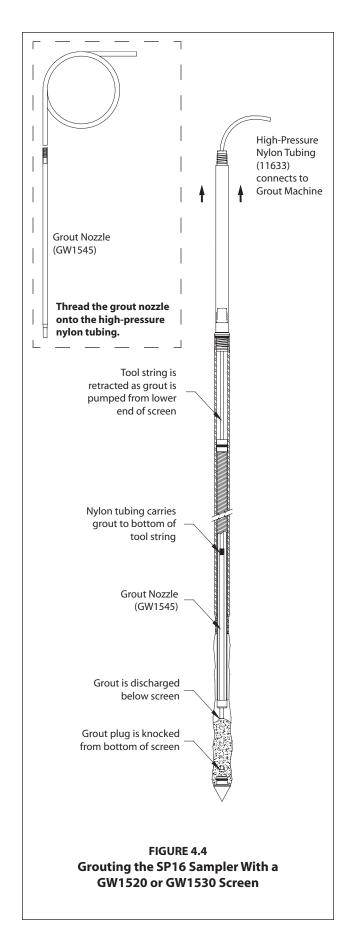
When inserting tubing or a bladder pump down the rod string, ensure that it enters the screen interval. The leading end of the tubing or bladder pump will sometimes catch at the screen head giving the illusion that the bottom of the screen has been reached. An up-and-down motion combined with rotation helps move the tubing or bladder pump past the lip and into the screen.

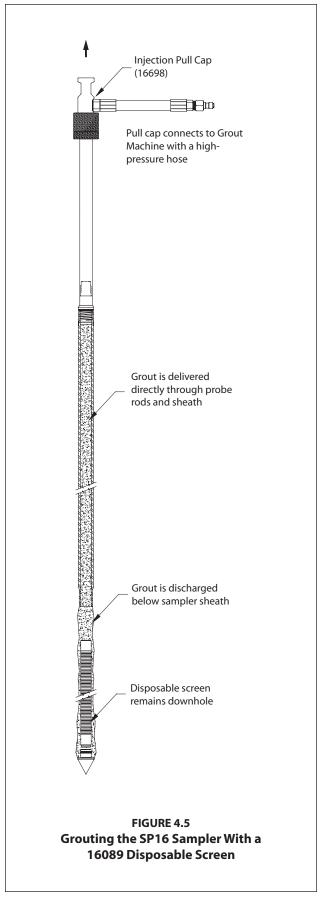
4.7 Abandonment Grouting for GW1520 and GW1530 Screens

The SP16 Sampler can meet ASTM D 5299 requirements for abandoning environmental wells or borings when grouting is conducted properly. A removable grout plug makes it possible to deploy tubing through the bottom of GW1520 and GW1530 screens. A GS500 or GS1000 Grout Machine is then used to pump grout into the open probe hole as the sampler is withdrawn. The following procedure is presented as an example only and should be modified to satisfy local abandonment grouting regulations.

- 1. Maneuver the probe assembly into position for pulling. Attach the rod grip puller to the top probe rod. Raise the tool string approximately 4 to 6 inches (102 to 152 cm) to allow removal of the grout plug.
- 2. Thread the Grout Plug Push Adapter (GW1540) onto an extension rod. Insert the adapter and extension rod inside the probe rod string. Add extension rods until the adapter contacts the grout plug at the bottom of the screen. Attach the handle to the top extension rod. When the extension rods are slightly raised and lowered, a relatively soft rebound should be felt as the adapter contacts the grout plug. This is especially true when using a PVC screen.







3. Place a mark on the extension rod even with the top of the probe rod. Apply downward pressure on the extension rods and push the grout plug out of the screen. The mark placed on the extension rod should now be below the top of the probe rod. Remove all extension rods.

Note: When working with a stainless steel screen, it may be necessary to raise and quickly lower the extension rods to jar the grout plug free. When the plug is successfully removed, a metal-on-metal sensation may be noted as the extension rods are gently "bounced" within the probe rods.

4. A Grout Nozzle (GW1545) is now connected to High-Pressure Nylon Tubing (11633) and inserted down through the probe rods to the bottom of the screen (Fig. 4.4). It may be necessary to pump a small amount of clean water through the tubing during deployment to jet out sediments that settled in the bottom of the screen. Resistance will sometimes be felt as the grout nozzle passes through the drive head. Rotate the tubing while moving it up-and-down to ensure that the nozzle has reached the bottom of the screen and is not hung up on the drive head.

Note: All probe rods remain strung on the tubing as the tool string is pulled. Provide extra tubing length to allow sufficient room to lay the rods on the ground as they are removed. An additional 20 feet is generally enough.

- 5. Operate the grout pump while pulling the first rod with the rod grip pull system. Coordinate pumping and pulling rates so that grout fills the void left by the sampler. After pulling the first rod, release the rod grip handle, fully lower the hammer, and regrip the tool string. Unthread the top probe and slide it over the tubing placing it on the ground near the end of the tubing.
- **6.** Repeat Step 5 until the sampler is retrieved. Do not bend or kink the tubing when pulling and laying out the probe rods. Sharp bends create weak spots in the tubing which may burst when pumping grout. Remember to operate the grout pump only when pulling the rod string. The probe hole is thus filled with grout from the bottom up as the rods are extracted.
- 7. Promptly clean all probe rods and sampler parts before the grout sets up and clogs the equipment.

4.8 Abandonment Grouting for the 16089 Disposable Screen

ASTM D 5299 requirements can also be met for the SP16 samplers when using the 16089 disposable screen. Because the screen remains downhole after sampling, the operator may choose either to deliver grout to the bottom of the tool string with nylon tubing or pump grout directly through the probe rods using an Injection Pull Cap (16698). A GS500 or GS1000 Grout Machine is needed to pump grout into the open probe hole as the sampler is withdrawn. The following procedure is presented as an example only and should be modified to satisfy local abandonment grouting regulations.

- 1. Maneuver the probe assembly into position for pulling with the rod grip puller.
- 2. Thread the screen push adapter onto an extension rod. Insert the adapter and extension rod inside the probe rod string. Add extension rods until the adapter contacts the bottom of the screen. Attach the handle to the top extension rod.
- **3.** The disposable screen must be extended at least 46 inches (1168 mm) to clear the bottom of the sampler sheath. Considering the length of screen deployed in Section 4.7, determine the remaining distance required to fully extend the screen from the sheath. Mark this distance on the top extension rod.
- **4.** Pull the tool string up to the mark on the top extension rod while holding the disposable screen in place.

The screen is now fully deployed and the sampler is ready for abandonment grouting. Apply grout to the bottom of the tool string during retrieval using either flexible tubing (as described in Section 4.7) or an injection pull cap (Fig. 4.5). This section continues with a description of grouting with a pull cap.

- **5.** Remove the rod grip handle and maneuver the probe assembly directly over the tool string. Thread an Injection Pull Cap (16698) onto the top probe rod and close the hammer pull latch over the top of the pull cap.
- **6.** Connect the pull cap to a Geoprobe® grout machine using a high-pressure grout hose.
- 7. Operate the pump to fill the entire tool string with grout. When a sufficient volume has been pumped to fill the tool string, begin pulling the rods and sampler while continuing to operate the grout pump. Considering the known pump volume and sampler cross-section, time tooling withdrawal to slightly "overpump" grout into the subsurface. This will ensure that all voids are filled during sampler retrieval.

The grouting process can lubricate the probe hole sufficiently to cause the tool string to slide back downhole when disconnected from the pull cap. Prevent this by withdrawing the tool string with the rod grip puller while maintaining a connection to the grout machine with the pull cap.

4.9 Retrieving the Screen Point 16 Sampler

If grouting is not required, the Screen Point 16 Sampler can be retrieved by pulling the probe rods as with most other Geoprobe® applications. The Rod Grip Pull System should be used for this process as it allows the operator to remove rods without completely releasing the tool string. This avoids having the probe rods fall back downhole when released during the pulling procedure. A standard Pull Cap (15164) may still be used if preferred. Refer to the Owner's Manual for your Geoprobe® direct push machine for specific instructions on pulling the tool string.

5.0 REFERENCES

American Society of Testing and Materials (ASTM), 2003. D6771-02 Standard Practice for Low-Flow Purging and Sampling for Wells and Devices Used for Ground-Water Quality Investigations. ASTM, West Conshocken, PA. (www.astm.org)

American Society of Testing and Materials (ASTM), 1993. ASTM 5299 Standard Guide for Decommissioning of Groundwater Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities. ASTM West Conshohocken, PA. (www.astm.org)

Geoprobe Systems®, 2003, Tools Catalog, V.6.

Geoprobe Systems®, 2006, Model MB470 Mechanical Bladder Pump Standard Operating Procedure (SOP), Technical Bulletin No. MK3013.

Puls, Robert W., and Michael J. Barcelona, 1996. Ground Water Issue: Low-Flow (Minimal Drawdown) Ground Water Sampling Procedures. EPA/540/S-95/504. April.

U.S. Environmental Protection Agency (EPA), 2003. Environmental Technology Verification Report: Geoprobe Inc., Mechanical Bladder Pump Model MB470. Office of Research and Development, Washington, D.C. EPA/600R-03/086. August.

Appendix A ALTERNATIVE PARTS

The following parts are available to meet unique soil conditions. See section 3.0 for a complete listing of the common tool configurations for the Geoprobe® Screen Point 16 Groundwater Sampler.

SP16 Sampler Parts and Accessories	
SP16 Drive Head, 0.625-inch bore, 1.5-inch rods	
Expendable Drive Points, aluminum, 1.625-inch OD (Pkg. of 25)	GW1555ALK
Expendable Drive Points, steel, 1.75-inch OD (Pkg. of 25)	17066K
Screen, PVC, 10-Slot	GW1530
Screen, Disposable, PVC, 10-Slot	16089
Groundwater Purging and Sampling Accessories	Part Number
Polyethylene Tubing, 0.25-inch OD, 500 ft	TB17L
Polyethylene Tubing, 0.5-inch OD, 500 ft	
Polyethylene Tubing, 0.625-inch OD, 50 ft	TB50L
Check Valve Assembly, 0.25-inch OD Tubing	GW4240
Check Valve Assembly, 0.5-inch OD Tubing	GW4220
Check Valve Assembly, 0.625-inch OD Tubing	GW4230
Water Level Meter, 0.375-inch OD Probe, 100-ft. cable	
Water Level Meter, 0.438-inch OD Probe, 200-ft. cable	GW2002
Water Level Meter, 0.375-inch OD Probe, 200-ft. cable	GW2003
Water Level Meter, 0.438-inch OD Probe, 30-m cable	GW2005
Water Level Meter, 0.438-inch OD Probe, 60-m cable	GW2007
Water Level Meter, 0.375-inch OD Probe, 60-m cable	GE2008
Grouting Accessories	Part Number
Grout Machine, auxiliary-powered	
Probe Rods, Extension Rods, and Accessories	Part Number
Probe Rod, 1.5-inch x 1-meter	
Probe Rod, 1.5-inch x 48-inch	
Drive Cap, 1.5-inch rods (for GH40 Series Hammer)	
Rod Grip Pull Handle, 1.5-inch Probe Rods (for GH40 Series Hammer)	
Extension Rod, 48-inch	
Extension Rod, 1-meter	
LACTION NO. 1 MCCCI	(10/3

Equipment and tool specifications, including weights, dimensions, materials, and operating specifications included in this brochure are subject to change without notice. Where specifications are critical to your application, please consult Geoprobe Systems[®].



Corporate Headquarters 601 N. Broadway • Salina, Kansas 67401 1-800-GEOPROBE (1-800-436-7762) • Fax (785) 825-2097 www.geoprobe.com

Appendix B

Laboratory Analyses and Quality Assurance/Quality Control Review

Appendix B

Laboratory Analyses and Quality Assurance/Quality Control Review

A quality assurance and quality control review was conducted to assess the integrity of the field procedures and the validity of the analytical results for the October 2016 to January 2017 sampling period. The analytical data were evaluated according to the procedures outlined in the Barr Standard Operating Procedures (SOPs), which are based in part on guidance from the National Function Guidelines as well as QA/QC protocols from approved analytical methods.

Field Procedures

A review of the analytical results for the blanks associated with field and transport activities (variously named trip, field, equipment and rinsate, depending on function) and field duplicates were conducted to assess the integrity of the sampling procedures and the analytical results. Trip blanks are typically constrained to volatile analyses; however, trip blanks were analyzed separately for PFAS and were treated as traditional trip blanks for the purposes of QC review.

Blanks associated with field and transportation activities were analyzed to determine the extent of potential contamination introduced during sample collection and transport. During most sampling events one or more target analyte was observed in at least one of the various types of blanks. Because nearly every sample delivery group (SDG) was submitted with one or more of the various blanks categories, the results from blank detection were applied to samples submitted only within the concurrent SDG and not to adjacent sampling periods. Where a blank measuring field activities was not collected with a SDG, the resultant data was not evaluated for blank contamination. Where two or more blank types associated with a SDG had detectable concentrations of target parameters, the highest reported concentration was used for the determination of qualification based on potential blank contamination. The field and transportation blank results were not used in several cases where method blanks indicated a potential intra-laboratory blank contamination issue and the collected blanks were less than five times that of the method blank.

Where sample detections of target parameters were less than five times that detected in the field or transportation blanks, the result was qualified as potential blank contamination. No qualifiers were applied to samples results greater than five times that detected in the field or transportation blanks.

Field duplicate samples were collected and analyzed to determine the precision of the analytical data. In general, field duplicate data are considered valid if the relative percent difference (RPD) does not exceed 30 percent for aqueous matrices and 40 percent for solid matrices. The 30/40 percent criteria excludes instances where data are reported less than five times the reporting limit, a level where small absolute concentration differences can result in very high calculated RPDs even though the sampling and analytical reproducibility otherwise meets all project needs.

No qualification was applied when the exceedance was slightly above the target acceptance criteria in accordance with Barr SOPs and the recommendations found in the National Functional Guidelines for data review. All other cases not falling within the above criteria were qualified accordingly as estimated values. All remaining field duplicate samples displayed acceptable RPDs for all target compounds.

Laboratory Procedures

Technical Holding Times

Technical holding times were evaluated for each sample and target parameter based on the EPA recommendations listed in SW 846 "Test Methods for Evaluating Hazardous Waste".

All technical holding times were within recommendations.

Precision and Accuracy Data

The accuracy and precision of the analytical process was reviewed by comparing sample matrix spike (MS) and matrix spike duplicate (MSD), laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) percent recoveries for spiked target compounds. Accuracy was evaluated by comparing the percent recoveries of the target compounds to laboratory acceptance limits. Precision was evaluated using the percent recoveries of the LCS/LCSD and MS/MSD data and calculating the relative percent difference between the two recoveries.

LCS/LCSD recoveries for NEtFOSAA and PFTriA were slightly outside laboratory acceptance criteria in two separate SDGs. Because the deviations were less than 5 percent in either case, no significant impact is expected to have occurred on the associated results and no qualifiers were applied. In a separate SDG, the LCS and LCSD recoveries for acetone were above laboratory acceptance criteria. As none of the associated sample sin the SDG reported detectable concentrations of acetone, no qualification was required. All remaining LCS and LCSD recoveries met laboratory acceptance criteria.

It is noted that MS/MSD sample results reported by the laboratory included project and non-project specific samples. Where MS/MSD recoveries and/or associated RPDs failed acceptance criteria and where the sample was associated with another laboratory client, acceptance of the sample results were based on the acceptable LCS/LCSD data which indicate in-control analytical systems during this project. Results of MS/MSD samples not specific to this project are not discussed herein.

In several cases over the course of the sampling period, MS and/or MSD recoveries were slightly outside laboratory acceptance criteria. In accordance with Barr SOPs for standard-level data review, results were not qualified for cases of minor deviations from laboratory acceptance criteria. MS/MSD recoveries for several analyses of nitrate+nitrite, PFOS, chloride and sulfate were outside laboratory acceptance criteria and the associated source samples were qualified accordingly as estimated values. MS and/or MSD recoveries for 1,2-Dibromo-3-chloropropane, 2-hexanone, NEtFOSAA and NMeFOSAA were above laboratory acceptance criteria for one sample, indicating a potential high bias. Due to the source sample

being non-detect for all of the affected parameters, no qualification was required. All remaining MS/MSD sample results displayed acceptable percent recoveries and RPDs.

Surrogate Standards

Surrogate standard percent recoveries were evaluated for all organic samples. A number of samples displayed multiple surrogate recoveries for PFAS that were outside laboratory acceptance limits. The laboratory includes the following statement with each report:

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

As such, some flexibility was allowed in terms of surrogate recoveries based on the trends observed in the surrogate recoveries, which seemed to indicate a broader statistical acceptance criteria would likely be adopted in the future, at least on the lower end of acceptance. As a result, samples with recoveries less than 5 percent outside the stated advisory limits (70-130%) were not qualified. In all other cases where surrogate recoveries were greater than 5 percent outside acceptance criteria, sample results were qualified as estimated values. Qualification was constrained to the target PFAS structurally-associated with the labeled PFAS which failed to meet the transitional surrogate recovery limits. In general, surrogate recoveries for PFAS were below advisory acceptance criteria when outside the transitional limits.

All remaining surrogate recoveries were within laboratory acceptance limits.

Laboratory Method Blank Results

Total alkalinity and calcium occurred a number of times in the method blanks. In general, the sample concentrations were greater than five times that in the method blank and no qualification was required. In a few instances, sample results were below this threshold and were qualified accordingly as potential blank contamination. Method blanks for samples collected in October 2016 occasionally reported trace concentrations of the following PFAS: PFOA, PFBA, PFPeA, and PFHxA. Two method blanks associated with samples submitted in mid-January 2017 additionally had trace detections of magnesium. In all cases, where associated samples reported concentrations less than five times that in the method blank, the affected results were qualified to indicate potential blank contamination. No other method blanks contained detectable concentrations of target compounds.

Conclusion

The quality control review determined all data acceptable as presented in the data tables.

Appendix C

Groundwater Flow Modeling

Appendix C

Groundwater Flow Modeling

1.0 Introduction

A groundwater flow model was developed and used to simulate flow in the saturated groundwater flow system near the Merrimack Village District (MVD) municipal water supply wells #4 and #5 (MVD-4/5) in Merrimack, New Hampshire (Figure 1-1). The groundwater flow model was developed to assess hydraulic capture of wells MVD-4/5 from potential poly-and perfluoroalkyl substances (PFAS) sources by quantifying the water balance of the pumping wells at various historical operational rates. The purpose of the model is to help understand how PFAS compounds may have reached the MVD wells by delineating where the wells draw water from under various pumping conditions. For example, the modeling results indicate that the fraction of water pumped from wells MVD-4/5 ranges for 0 under long-term average pumping conditions to 12 percent under summer pumping conditions under normal recharge rates and river stages. The following sections provide details on the groundwater flow modeling.

The groundwater flow model was developed using the U.S. Geological Survey's MODFLOW-NWT code (Niswonger et al., 2011). The MVD-4/5 Model was calibrated using historical aquifer test data (EGGI, 2003), synoptic water level measurements, and estimated water table elevations from the northern aquifer profiling transect. The sensitivity of the calibrated model to its parameter values was assessed along with the uncertainty of a prediction of the fraction of water withdrawn by wells MVD-4/5 under summer pumping conditions that passes under the Longa Disposal Area (LDA). This prediction ranges from less than 1.6 percent to approximately 15 percent.

A long-term simulation of pumping rate, recharge, and river stage variation was performed. Results from the long-term simulation, using only the calibrated model parameters, indicate that the prediction ranges from 0 to approximately 3 percent through time, depending primarily on the pumping rate of wells MVD-4/5.

This document is an appendix to a report on the MVD-4/5 area investigation (MVD-4/5 Report). An upcoming report will describe conceptual modeling of PFAS fate and transport throughout the Merrimack, New Hampshire region (CSM Report; Barr, 2017). Due to timing considerations, the model described in this appendix was developed prior to completion of the regional-scale model that will be presented in the CSM report.

All groundwater flow models are simplifications of reality and have uncertainty related to their construction, their inputs, and, consequently, their outputs. As noted above, the uncertainty of a specific model prediction was evaluated. The uncertainty in that prediction stems from a combination of the assumptions made in constructing the model and defining the model inputs, the inherent variability of the physical properties represented by the model inputs, the calibration methodology, and the methodology used in evaluating the predictive uncertainty. The model is useful for evaluating groundwater flow to wells MVD-4/5.

2.0 Groundwater Flow Model Development

Sources of data that were used for construction and optimization of the groundwater flow model include the data collected during the current investigation, the report on the geology, hydrogeology, and previous aquifer testing at wells MVD-4/5 (EGGI, 2003); and State of New Hampshire and U.S. Geological Survey (USGS) reports, and data sets regarding the thickness and transmissivity of the unconsolidated aquifer, water table elevation, and stream locations and elevations.

2.1 Miscellaneous Modeling Details

2.1.1 Code Selection

MODFLOW was selected for simulating groundwater flow based on its extensive benchmarking; it is the most widely-used groundwater flow model in the world. The NWT version of the MODFLOW was selected for its capability of simulating units with varying saturated thickness, a critical factor in a rechargedominated system with an unconfined uppermost aquifer such as the MVD-4/5 well field.

2.1.2 Horizontal Datum and Vertical Datum

The horizontal datum chosen for model development is UTM NAD83 Zone 19N meters. For groundwater flow modeling purposes using MODFLOW, the horizontal and vertical distance units must be the same, therefore meters were used for vertical distances to be consistent with the horizontal datum.

The vertical datum chosen for model development is NGVD 29 meters. EGGI (2003) used NGVD 29 feet in reporting groundwater elevations and river stages. The USGS uses NGVD 29 feet for the Merrimack River gauge at Goffs Falls (USGS, 2016b). CT Male uses NAVD 88 feet in their surveying, groundwater elevation, and river stage recordings.

2.2 Conceptual Hydrogeologic Model

A conceptual hydrogeologic model (CHM) represents "an interpretation or working description of the characteristics and dynamics" of a physical system (ASTM, 2013). The CHM is based on interpretation of available site data and review of work by others in the model domain. The CHM is presented in pictorial representations and represents a simplification of the field problem for purposes of analysis (Anderson and Woessner, 1992). The CHM is a simplification of the real-world groundwater problem that captures the essential features of the real-world problem, and facilitates a mathematical representation of the problem (Haitjema, 1995).

This section presents the CHM for the MVD well field. Figure 2-1 illustrates the CHM and is discussed in more detail below. The overall hydrogeologic setting is summarized and site specific information about groundwater-surface water interactions is presented along with a discussion of interaction with the bedrock aquifer system.

2.2.1 Hydrogeologic Setting

A detailed description of the hydrogeologic setting of the MVD-4/5 well field will be presented in the CSM Report; a summary is presented here.

Merrimack is located in the Northeastern Appalachians groundwater region (Randall et al., 1988), and the following summary is condensed from that resource unless otherwise indicated. This region is characterized by rolling topography that primarily reflects the weathered bedrock surface with glacial and fluvial landforms mantling the bedrock. The bedrock consists of folded and faulted metamorphosed sedimentary rocks with low primary porosity. Water is conducted in the bedrock through secondary porosity (see note E, Figure 2-1). Recharge from infiltrating precipitation is generally the most important source of groundwater and discharge to rivers is the most important groundwater sink. Characterizing recharge and discharge is the key to understanding groundwater flow directions.

Glacial erosion and deposition produced changes in drainage and topography and deposited a nearly continuous layer of unconsolidated till over the bedrock. Stratified drift units, chiefly sand and gravel, follow the larger valleys such as those of the Merrimack River. These stratified drift units are referred to as valley-fill aquifers (Kontis, et al, 2004).

Recharge to the bedrock is controlled by the permeability and thickness of the overlying glacial deposits and overburden. Runoff in upland areas is focused to seasonal streams that typically lose discharge in areas in which they flow over stratified drift at the margins of the larger valleys (note D, Figure 2-1). Recharge to bedrock wells that are pumped continuously may occur from adjacent stratified drift aquifers (notes A and 5, Figure 2-1). Discharge is primarily from the bedrock to wells and to the stratified drift in the large valleys. Inter-basin flow systems with significant discharge have not been discovered in the bedrock.

In addition to discharge to the stratified drift filling the larger valleys from minor upland streams, recharge to these units is from direct infiltration of precipitation, and discharge from bedrock (notes B and E, Figure 2-1). Recharge from the larger rivers may take place in the vicinity of localized pumping from the stratified drift (note F, Figure 2-1). Under normal conditions, the main stream in the major valleys consistently gains water from stratified drift aquifers (Kontis, et al, 2004). The Merrimack River acts as a source of groundwater in the aquifer adjacent to the river during periods of rising river stage (a process known as bank storage; Kontis, et al, 2004) and a sink for groundwater during periods of falling and sustained low river stage. Discharge from the stratified drift is via pumping wells, evapotranspiration, and to the larger rivers when their stage is at or below typical levels.

2.2.2 Groundwater-Surface Water Interactions

Aquifer testing performed in 2003 using (EGGI, 2003) using wells MVD-4/5 indicated the alluvial materials along the Merrimack River have a strong hydraulic connection with the river. Two temporary piezometers and a river stage monitoring gauge were installed for the 2003 testing. Hydrographs from both of the piezometers and the river showed quite similar elevations and similar variations in elevation during the testing period. The river hydrograph and one of the piezometer hydrographs are presented in Figure 2-2.

No measureable drawdown occurred in the temporary piezometers. The hydrograph from the permanent well 45-5A showed an apparent influence from the river stage variations (Figure 2-2). Well 45-5A was the closest permanent well to the river at that time and the only permanent well in which influence from the river was noted. The hydrograph from well 45-4A, unaffected by river stage variations, is included on Figure 2-2 to illustrate a typical response to the aquifer testing.

The relatively high contribution of groundwater to the flow in rivers and streams in the investigation area is supported by an assessment of baseflow. Baseflow is the component of streamflow that is sustained by groundwater discharge to the stream, and the baseflow index (BFI) for a streamflow measurement location is the proportion of total streamflow that is baseflow. A BFI of approximately 0.69 was estimated for the Merrimack River in Lowell, MA (USGS Gage 01100000) (CDM, 2004). This value indicates that approximately 70 percent of the total streamflow measured at the gaging station originates as baseflow.

Some component of downvalley groundwater flow likely occurs in the stratified drift beneath the Merrimack River and in places where a floodplain has developed adjacent to the river. Downvalley groundwater flow occurs in areas where the hydraulic gradient parallels and roughly equals the downvalley slope of the floodplain and is referred to as underflow (Kontis, et al, 2004). The Merrimack River is incised through terrace deposits and has very narrow alluvial deposits on the west (right) bank through much of the reach between the St. Gobain Facility and the MVD well field (Figure 2-3). The alluvial deposits on the right bank widen in the vicinity of the MVD well field.

The USGS water table map of the area (Toppin, 1987), indicates no significant zone of downvalley groundwater flow at any appreciable distance from the Merrimack River; groundwater flows directly toward the Merrimack River (Figure 2-4A). Groundwater elevation contours for a site investigation within the model domain also indicate underflow is not occurring at a large scale between the SGPP facility and the MVD wells (Aries Engineering, Inc., 1990). The location of this site, known as the Yield House Site, is shown on Figure 2-4A. The groundwater elevation contour map for the site is shown on Figure 2-4B.

Pumping of wells MVD-4/5 created a cone of depression that extended to the river and created roughly radial flow toward the wells and induced some amount of recharge from the river to the valley-fill aquifer near the well field (EGGI, 2003). Medalie and Moore (1995) refer to this process as induced infiltration. Overall, underflow is not believed to be a significant factor in the model domain, particularly in the reach between the St. Gobain Facility and the MVD well field due primarily to the limited extent of alluvial deposits in that reach. In other words, groundwater discharging to the alluvial deposits may move some distance downstream prior to discharging to the Merrimack River, but that downstream distance is limited due to the narrow width of the alluvial deposits.

2.2.3 Interaction with bedrock

EGGI (2003) considered contributions from the underlying bedrock aquifer to be negligible, however, the report states that they did not evaluate those contributions in their investigation. Flow of groundwater from the bedrock, through the unconsolidated materials, and discharging to the regional discharge zone (the Merrimack River in this case) is an integral part of the regional CHM (e.g., Randall, et al, 1988; Kontis,

et al, 2004), therefore a mechanism was included in the MVD-4/5 Model to simulate such discharge as described below.

2.3 Model Domain

The model encompasses the unconsolidated aquifer from which the MVD wells withdraw water from the well field to major hydrologic features (Baboosic Brook, the Souhegan River, and the Merrimack River), and extends to areas where the unconsolidated aquifer pinches out.

The extent of the model domain in MVD-4/5 Model layer 1 is shown on Figure 1-1. The model domain in layer 1 extends beyond Baboosic Brook and the reach of the Souhegan River downstream of the confluence with Baboosic Brook (to the south and west) and to the midpoint of the Merrimack River (to the east). The northern extent of the model follows areas of thin or absent unconsolidated aquifer, as defined by the USGS (Toppin, 1987; Koteff and Stone, 2000) and shown on Figures 2-3 and 2-4. With one minor exception, all of the lateral model boundaries are physical boundaries as defined by Anderson, Woessner, and Hunt, (2015). See Section 2.5 for details on the model boundary conditions.

If the model included one or more layers to explicitly simulate the bedrock, extension of the model domain to physical boundaries with respect to the bedrock aquifer would likely have resulted in a model that was too large to accomplish the stated objectives and intended uses for the MVD-4/5 Model. As noted above, a regional groundwater flow model was not available for establishing hydraulic boundaries (Anderson, Woessner, and Hunt, 2015), such as head-dependent flux boundaries, to represent the bedrock aquifer beyond the limits of a model domain including a bedrock layer or layers. The decision was therefore made to simulate inflow from the bedrock using the boundary conditions described below.

2.4 Model Discretization

As related to MODFLOW models, the term "discretization" refers to division of a model domain into cells in plan view and into layers vertically and division of a time-varying simulation into segments of time referred to as stress periods. Stress periods may be further subdivided into multiple time steps.

2.4.1 Spatial Discretization

The model domain was discretized in plan view with an irregular grid with cell sizes ranging from 3 to 30 meters. The finest grid spacing is around wells MVD 4 and 5. The grid is not rotated; rows are oriented east-west and columns are oriented north-south.

Based on the various screen elevations of MVD observation wells and the overall thickness of the unconsolidated aquifer, three vertical layers were used. Three layers were sufficient to capture the geometry of the unconsolidated aquifer, the aquifer's "pinching out" to the west from the Merrimack River valley, and the effects of partial penetration of the water supply and monitoring wells.

A regional water table map was used to define the top of the MVD-4/5 Model (Toppin, 1987, Plate 3). Saturated thickness values derived from a regional map (Toppin, 1987, Plate 4), augmented with available

data from the EGGI study (2003) and the current investigation, were subtracted from the water table surface to define the base of the MVD-4/5 Model. This surface was used for the base of layer 1 beyond the active limits of layers 2 and 3 and for the base of layer 2 beyond the active limits of layer 3, and for the base of layer 3 throughout the active limits of this layer.

2.4.2 Temporal Discretization

MODFLOW model inputs were developed to simulate the EGGI (2003) aquifer testing and conditions in November 2016 when synoptic groundwater elevation measurements and other estimates were made as part of current investigation. Table 1 summarizes the transient stress period definitions for simulating the 2003 aquifer testing.

Table 1 MODFLOW Stress Period Definitions for Simulating the EGGI (2003) Aquifer Testing

Begin SP ¹	End SP	Date/time	SP length (days)	Time steps	Comment/event
				20	Last cycling of pump in MVD5; MVD4
		/ /		20	not logged at this time - likely also
1	NA	04/28/2003 21:25:26	7.524		cycled. Start of shutdown period.
2	1	05/06/2003 10:00:00	1.0	10	MVD5 pumping alone
3	2	05/07/2003 10:00:00	5.0	15	MVD4 pumping starts
4	3	05/12/2003 10:00:00	7.0	20	Both pumps shut off
NA	4	05/19/2003 10:00:00			End of recovery monitoring

¹SP – MODFLOW stress period

2.5 **Boundary Conditions**

Boundary conditions in MODFLOW allow for simulation of the influence of hydrologic features such as surface water bodies, portions of the aquifer system beyond the domain of the current model, or wells on the simulated groundwater flow system. As noted in Section 2.3, the model domain is defined with physical boundaries which are the most robust and defensible type of boundary condition to use; physical boundaries include contacts with units of low hydraulic conductivity and surface water features (Anderson, Woessner, and Hunt, 2015). Use of physical boundaries does not preclude the flow of water from beyond those boundaries into the model domain. The boundary conditions defined for the MVD-4/5 Model are described below.

2.5.1 Recharge

The amount of direct precipitation that infiltrates the land surface and moves below the root zone is the maximum amount of water available to recharge the groundwater system. This amount is dependent upon the rate and duration of precipitation, the soil type, land cover, land use, evapotranspiration, and topography.

Recharge to the aquifer from infiltrating precipitation was estimated using the Soil Water Balance (SWB) model, developed by (Westenbroek et. al., 2010). SWB was used to calculate spatial and temporal variations of infiltration rates across the study area.

The SWB model calculates components of the soil water balance on a daily basis. Inputs to the SWB model include the following:

- Daily precipitation and daily minimum and maximum temperatures: These data were obtained for a single location representing the Merrimack area for the period 1989 to 2016.
- Land cover classifications: These data were obtained the National Land Cover Database.
- Hydrologic soil group and soil water capacity: These data were obtained from the Natural Resources Conservation Service soil survey geographic database.
- Surface flow direction as inferred from topography: Topography data were obtained from the U.S. Geological Survey seamless elevation dataset.
- Monthly infiltration grids, as output from the SWB model, were used to define the recharge boundary in the groundwater flow model.

Strictly speaking, infiltration is similar to but differs from groundwater recharge. The most important distinction between infiltration and recharge is the time lag between infiltration of water past the root zone and recharge at the water table. In addition, small-scale processes such as local flow systems and rejection of infiltration due to saturated soils at the ground surface often result in differences between recharge and infiltration. Despite these differences, calculated infiltration rates and groundwater recharge are considered to be approximately equal and are treated as such in this evaluation.

The calibrated MVD-4/5 Model uses the average 2003 infiltration rate on a cell-by-cell basis for input to the recharge package (Figure 2-5). The simulated recharge rate over the model domain averages 21.1 inches per year. Recharge rates for a stratified drift aquifer in the same county were estimated at 19.8 inches per year (Ayotte and Toppin, 1992). Average annual recharge of 21 inches per year was inferred from streamflow records in basins throughout Vermont and New Hampshire for the period of record from 1961 to 1990 (Flynn and Tasker, 2004). A reasonable rate of recharge through sandy soils in New Hampshire is considered to be 18 to 21 inches per year (Emery & Garrett Groundwater, Inc., 2003, p. 13). Baseflow indices for the Merrimack River at Lowell, MA expressed as an effective recharge rate range from 11.55 inches per year for drought periods, to 19.22 inches per year for periods with normal precipitation, to 22.72 inches per year for wet periods (CDM, 2004).

2.5.2 Area Rivers and Brooks

The Merrimack River, Baboosic Brook, and the Souhegan River are represented using the river package (Figure 2-6). The distribution of these boundary cells in the model was set by intersecting hydrography coverages (USGS, 2016a) with the MVD-4/5 Model grid.

As discussed in Section 3.1.5 of the Investigation Report, the slope on the Merrimack River near MVD-4/5 calculated for 11/7 and 11/23/2016 was very low. These are the only available, site-specific estimates of river slope. They are considered representative of long-term conditions based on consistency with field

observations, aerial photo review which show no signs of rapids in the reach adjacent to the MVD-4/5 well field, topographic map review, DEM information (FEMA, 2012), and hydrography coverages (USGS, 2016a).

Baboosic Brook stages and stages assigned to other, unnamed drainages in the model domain were assigned based on interpolating elevations from a LiDAR-based digital elevation model (FEMA, 2012) to the locations of MVD-4/5 Model cells representing these drainages.

Merrimack River stages were assigned based on data collected by EGGI (2003) and data collected during the current investigation. Data gathered during the 2003 aquifer testing (EGGI, 2003) were used to extrapolate river stages near MVD-4/5 based on data available online for the USGS gauging station at Goffs Falls (USGS, 2016b). Historical discharge data and periodic stage measurements were available for the Goffs Falls station. Figure 2-7 shows a rating curve developed for that location. The average daily Merrimack River stages recorded during the 2003 aquifer testing period are plotted against Merrimack River stage at Goffs Falls estimated using the rating curve with daily average discharge during the 2003 aquifer testing period in Figure 2-8. The linear fit to this scatter plot illustrated in Figure 2-8 was used to estimate the river stage near MVD-4/5 and compared with the river stage as recorded at the upstream gauge installed during the current investigation (Figure 2-9).

The river stage comparison shown in Figure 2-9 indicates that the extrapolation method is not as accurate at times when the river stage is changing rapidly. Therefore, the extrapolation is considered applicable to time periods of months, not days or shorter periods (see Section 4.2).

2.5.3 Lateral Boundaries on the Western Margin of Layer 1

The MODFLOW Well Package was used to simulate groundwater flow into the model domain from beyond the physical boundaries selected as the limits of the domain, an approach that is referred to as specified flow boundaries (Anderson, Woessner, and Hunt, 2015). Head-dependent flow boundaries, such as those simulated using the MODFLOW General Head Boundary Package (GHB), were not selected in this case for the following reasons:

- Flow is expected to be unidirectional in all scenarios; in other words, groundwater flow from the opposite side of Baboosic Brook and the Souhegan River is expected to be toward those surface water bodies, not away from them. As noted in Section 4.1, some underflow beneath Baboosic Brook is indicated by the model.
- Use of the GHB Package would have required applying hydraulic heads derived from some independent source and calibrating a conductance term. The net result would have been simulation of groundwater flow into the model domain – the same result produced by using the Well Package.

Well cell zones 1 to 3 represent flux into the model domain from unconsolidated materials beyond the active extent of the model (Figure 2-6).

2.5.4 Lateral Boundaries representing bedrock interactions

As noted above, the northern extent of the model follows areas of thin or absent unconsolidated aquifer. Based on the material types (bedrock and or till), the hydraulic conductivity in this area beyond the model domain is expected to be much lower but not zero, therefore, flow into the model domain in this area is allowed. This boundary is represented as a specified flow boundary in layer 1 to simulate the far-field effects of seepage from the bedrock aquifer and/or till into the unconsolidated aquifer (well cell zone 4, Figure 2-6). The more permeable stream terrace and deltaic deposits pinch out in this area (Figure 2-3), therefore, this flux was expected to be small compared to other water sources to the unconsolidated aquifer. The calibration results are consistent with this expectation.

Specified flow boundaries were also included on the western edges of the active extents of layers 2 and 3 to simulate flow from the bedrock toward the discharge zone (well cell zones 5-7 and 9-11, Figure 2-6). These flows are simulated where the layers pinch out against bedrock rather than across the bottom faces of the active cells in each layer based on the concept that horizontal hydraulic conductivity within the valley-fill aquifer is higher (in many cases much higher) than the vertical hydraulic conductivity.

Figure 2-6 illustrates that physical boundaries representing the interface between the valley-fill aquifer and bedrock in layer 2 are located near the footprint of the LDA and in layer 3 pass beneath the footprint of the LDA. This is not as great a limitation as it may appear. If the bedrock were explicitly modeled with an additional model layer, groundwater flow from the layer representing the bedrock to the layer representing the overlying valley-fill aquifer would be simulated in every cell located in the footprint of the LDA.

2.5.5 Lateral Boundaries representing underflow

The boundary along the northern model extent near the Merrimack River in layers 2 to 3 (well cell zones 8 and 12, Figure 2-6), is represented by a specified flow boundary that is conceptualized as simulating flow from the bedrock to the unconsolidated deposits in areas outside the Merrimack Valley and underflow in the alluvial deposits adjacent to the river. In other words, these boundary cells simulate the potential for a component of flow down the valley in valley-fill aquifer. The available data do not allow differentiation of flow from bedrock from underflow in this part of the model domain.

The boundary along the southern model extent near the Merrimack River in layers 1 to 3 is represented by MODFLOW General Head Boundary Package cells with heads set 0.01 meter lower than the estimated stage of the Merrimack River at the downstream limit of the model domain (Figure 2-6). This modeling approach allows for simulation of induced flow toward the MVD wells when the wells are pumping and down-valley flow out of the model domain when the MVD wells are not pumping (see Section 4.1). This is the one exception to the statement in Section 2.3 that all of the lateral model boundaries are physical boundaries

2.5.6 Outer Model Boundary under the Merrimack River

No additional boundary conditions were applied to the model cells beneath the Merrimack River, therefore the outer edge of the model in this area is a no-flow boundary. This is consistent with the observation that pumping of wells MVD-4/5 did not cause measureable drawdown near the river (EGGI, 2003). The induced infiltration from the river was apparently sufficient to offset the effects of pumping.

2.5.7 Wells

Information on area wells was obtained from the NHDES Water Well Inventory (NHDES, 2016b). Figure 2-10 shows the pumping rates of wells MVD-4/5 in the period of record of these data. Wells MVD-4/5 are the wells in the well inventory located in the model domain. These wells were simulated using the MODFLOW Well Package.

The pumping rates reported by EGGI (2003) were explicitly simulated. Wells MVD-4/5 were not being pumped during the current investigation. See Section 3 for details on simulated pumping rates. Table 2 summarizes pumping rates associated with wells MVD-4/5 in gallons per minute (gpm).

Table 2 Summary of Pumping Rates of Wells MVD-4/5

	Rates (gpm)		
Scenario Description	MVD-4	MVD-5	Total
Long-term average pumping rates	105.8	303.1	408.9
Rates used for period prior to shutdown on 4/28/2003	106.5	309.9	416.3
Rates used to simulate summer pumping conditions	157.5	467.5	625.0
During single-well phase of 2003 aquifer testing	0	660	660
Maximum combined monthly average pumping rate	219.6	556.5	776.1
Maximum monthly average rate per well (values not from same			
month)	219.6	572.6	792.2
During two-well phase of 2003 aquifer testing	216	660	876

2.6 Hydraulic Conductivity Field

Hydraulic conductivity zonation in the MVD-4/5 Model was derived through consideration of information from the following sources:

- Stratified drift aquifer mapping, which provided an overall extent of drift aquifer, saturated thickness, and transmissivity (Toppin, 1987, Plate 4)
- Stream terrace and alluvium mapping from surficial geology maps for the Merrimack South and Nashua North quadrangles (Koteff, 1976; Koteff and Stone, 2000), shown on Figure 2-3.
- A report on characterization and aquifer testing in the MVD well field (EGGI, 2003)
- Data collected during the current investigation.

The transmissivity zonation near the confluence of the Merrimack and Souhegan rivers as mapped by Toppin (1987) presented difficulties in preliminary model calibration, leading to extreme variations in heads in that area. These zonations were not used in the final model calibration.

Soil type data from the EGGI (2003) well logs and data collected during the current investigation were assembled in a solids model for interpolation throughout the MVD-4/5 Model grid. The Burmister soil classification method was used based on a request from the State of New Hampshire. The dominant soil type for each MVD-4/5 Model cell was determined with indicator kriging using the EVS software package (CTech, 2016). Soil types (lithologies) used in the EVS model and the MVD-4/5 Model are listed in Table 3.

Contiguous groups of MODFLOW cells with the same material type were assigned to zones with uniform material properties. If a given material property was present in multiple groups of cells in a layer, the zones were differentiated in order to allow the parameter values to vary if warranted by the calibration information (Section 3). Likewise, if a given material property was present in the active areas of multiple layers, the zones were differentiated. Zone numbers in the model are listed by layer in Table 3 and shown in plan view on Figure 2-11 and in cross section on Figure 2-12.

Figure 2-12 also shows the model layering, extent of active and inactive cells, and boundary conditions as described in Section 2.5. This cross section is along the row in the model containing well MVD-5.

Table 3 Material Property Zonation in the MVD-4/5 Model

Lithology	Associated Material Property Zone Numbers				
	Layer 1	Layer 2	Layer 3		
CLAY	NA ¹	1	Inactive ²		
SILT	2	15	Inactive		
FINE SAND	3,16	17,18	19,20		
FINE SAND WITH TRACE FINES	4,21,22	4,21,23	Inactive		
FINE SAND WITH LITTLE FINES	5,24,25	NA	NA		
FINE SAND WITH SOME FINES	6	26	27		
COARSE SAND	7	28	29		
COARSE SAND WITH TRACE FINES	NA	8	30		
COARSE SAND WITH LITTLE FINES	9	NA	NA		
COARSE SAND WITH GRAVEL	NA	10	31		
FINE SAND TO GRAVEL	11	32	33		
FINE SAND TO GRAVEL WITH TRACE FINES	12,34	35	Inactive		
FINE SAND TO GRAVEL WITH LITTLE FINES	NA	NA	NA		
GRAVEL	14	NA	NA		

¹NA – material type is not present in the indicated MVD-4/5 Model layer

²Inactive – material type occurs only in inactive cells in the indicated model layer

3.0 Flow Model Calibration

3.1 Parameters

Model parameters were represented as zones of uniform property values within the model domain, based on the distribution of material types from the EVS model as described in Section 2.7 and inputs related to groups of boundary cells. Parameters used in the model calibration include the following:

- horizontal hydraulic conductivity (Kx) for the zones shown in Figure 2-11,
- vertical anisotropy (defined in MODFLOW as horizontal hydraulic conductivity divided by vertical hydraulic conductivity) using the same zonation as for Kx,
- specific yield using the same zonation as for Kx,
- specific storage using the same zonation as for Kx,
- multipliers on flux rates from bedrock to the unconsolidated deposits and underflow into the model domain for the groups of cells shown in Figure 2-6,
- river-bed vertical hydraulic conductivity for the three groups of cells shown in layer 1 on
 Figure 2-6, and
- general head boundary conductance representing underflow out of the model domain (see Figure 2-6).

The model calibration included 116 adjustable parameters. Parameter names indicate the type of parameter (such as kx) and the zone number that it is applied to in updating MODFLOW input files during the calibration. Model inputs that were not be adjusted during the calibration include recharge rates, conductance of drain cells representing intermittent streams in the far field, and MVD well pumping rates.

3.2 Observations

The MVD-4/5 Model was calibrated to history-match responses to pumping of wells MVD-4/5 reported by EGGI (2003) and hydrologic data collected as part of the current site investigation. Calibration included transient simulations in order to capture the water-level responses in observation wells during the 2003 testing during the pre-test recovery phase, pumping phases, and post-test recovery phase (see Table 1).

Note that measurements were not made in the LDA monitoring wells and steady-state conditions were not reached at any time during the 2003 testing. In other words, drawdown, which is typically used in model calibration involving aquifer tests, could not be calculated. Wells MVD-4/5 cycled on an off on a daily basis prior to the shutdown period. Despite the shutdown period lasing lasting more than seven days, water levels were still rising when the constant-rate testing began (Figure 2-2). Pre-test conditions were simulated using the average pumping rate for Wells MVD-4/5 prior to the shutdown in a steady-state simulation. These average rates were estimated by adjusting the reported average rates for April 2003 (NHDES, 2016b) to account for the length of time the wells were idle prior to the start of the controlled testing. Following the steady-state stress period, four transient stress periods were used to simulate the shutdown period, pumping of pumping of well MVD 5 alone, pumping of wells MVD 4 and 5 together, and the recovery period (see Table 1).

The model was also calibrated to non-pumping conditions, as represented by measurements conducted as part of the current investigation, including measurements of water levels in the LDA monitoring wells. Groundwater elevation estimates derived from published USGS water table maps were used as calibration targets in the far field (far removed from the MVD wells). These far field observations were added to ensure that hydraulic gradients and flow directions between the far field and near field reasonably matched conditions documented in regional studies, and were created by interpolating the water table mapped by Toppin (1987, Plate 3) to a series of points distributed throughout the far field of the model.

Approximately 694 transient calibration targets from 15 wells were used along with 16 steady-state calibration targets. In addition, head changes in individual wells over short periods of time during the 2003 aquifer test were included as targets in order to better capture the transient responses of water levels in the wells to changes in pumping.

3.3 Calibration Methods

The calibration process was performed by using automated inverse optimization procedures available through PEST (Watermark Numerical Computing, 2016) and PEST_HP (Watermark Numerical Computing, 2017). PEST minimizes the calibration residuals in a least-squares manner (termed the "objective function") using a gradient-based numerical approach. Model parameter values are adjusted within ranges that are specified by the user to be representative of the materials that a given parameter represents. For example, zones representing fine sand in the Burmister system were allowed to vary in hydraulic conductivity from 1 to 30 m/day.

Regularization information is a constraint imposed on an inverse model without being based on measurements located where the constraint is applied, such as specifying that two horizontal hydraulic conductivity parameters be equal regardless of their current values. Parameter bounds were the only form of regularization information used in the model calibration for reasons discussed in the next paragraph.

The Burmister system classification system has limited applicability for estimating hydraulic conductivity; many of the soil types have such large fractions of fines (silt and clay) that the finer materials in the mixture will dictate the hydraulic conductivity regardless of the sizes of the coarser sands and gravel clasts in the mixture. For example, even a sample with trace fines may contain up to 10 percent fines and would have a relatively low hydraulic conductivity due to the resistance of flow caused by the high surface area of the fines (Barr, 2001). Another sample with trace fines may contain as little as 1 percent fines and, therefore, have a significantly higher hydraulic conductivity than the sample with 10 percent fines. Given the potential variability between samples with the same classification, regularization information indicating an expectation of equality of hydraulic conductivity between zones with same classification was not included in the calibration. Similar logic was applied to the other material property parameters.

3.4 Calibration Results

3.4.1 Comparisons of Measured and Modeled Values

Model calibration results are presented in time-series plot and map form, showing the comparison between measured (observed) and modeled (simulated) values for each calibration target. Figures 3-1 through 3-15 show hydraulic head time-series plots from the 2003 aquifer testing and equivalent simulated head values. Notes on the figures indicates cases in which the measured data were not used as calibration targets – such data from wells MVD-4/5 at time when a given well was being pumped, data from the temporary piezometers, in which no drawdown was detected (EGGI, 2003), and data from well 45-5A, which was influenced by river stage variations as well as pumping of wells MVD-4/5. The responses to the pumping test are matched very well by the model.

Figure 3-16 shows scatter plots of modeled versus measured hydraulic head values (blue symbols) and modeled versus measured head changes in individual wells over short periods of time during the 2003 aquifer test (orange symbols). Data falling on the line in this plot labeled "line of zero residuals" represent an exact fit of the modeled and observed values. The plots show no apparent bias and a tight clustering of values around the line of zero residuals.

Figure 3-17 shows contours of the simulated water table elevation with differences between measured and modeled hydraulic head values (residuals) posted by wells from which the measurements were taken. Negative residuals are produced in cases where the modeled heads were higher than the measured heads. The synoptic water level data are the most accurate of the data shown in Figure 3-17, therefore were given the highest weight. The aquifer profiling data and far field heads are less accurate estimates of the water table elevation, therefore larger residuals are acceptable for these observations. The use of a single vertical hydraulic conductivity parameter for the entire Merrimack River bed may have contributed to the modeled heads being lower than the estimated heads at AP08, AP08, and AP10. The observations of no drawdown in the piezometers by the river in the 2003 testing carried much more weight than the aquifer profiling head data. River stages measured on this date are also posted on Figure 3-17. These stages were used as model input, therefore they have no related residual value.

Fits to the synoptic water level data and aquifer profiling data used in the calibration are also summarized on Table 4 in the original measurement units. Fits to all of the observations used in the model calibration are presented in Attachment 1 using the modeling units of meters and days and the modeling datum of meters NVGD 29.

Figure 3-18 shows simulated groundwater elevations in layer 1 for the long-term average pumping scenario and the summer pumping condition scenario. The estimated capture zone for wells MVD-4/5 within the domain of the MVD-4/5 Model is shown for both scenarios. Note that the capture zones would extend west of Baboosic Brook; the model domain is truncated in that area. As noted above, the bedrock is not explicitly simulated in the MVD-4/5 Model, therefore flow paths of water in the bedrock that is captured by wells MVD-4/5 cannot be simulated.

Table 4 Summary of the Synoptic Water Level Data and Aquifer Profiling Data from the Model Calibration

	Measured	Modeled	
Well/Soil	head (ft	head (ft	Residual
boring	NAVD 88)	NAVD 88)	(ft)
LNG-MW-1	93.45	93.57	-0.12
LNG-MW-2	94.78	96.71	-1.93
LNG-MW-3	94.74	95.16	-0.42
LNG-MW-4*	93.19	93.57	-0.38
45-10	97.86	97.59	0.27
45-11	96.08	96.46	-0.38
45-1MW	99.05	99.96	-0.91
45-2A	98.74	98.62	0.12
45-4A	96.57	96.86	-0.29
45-6	98.51	98.26	0.25
45-7	98.95	98.96	-0.01
45-8	98.58	98.36	0.22
45-9	101.85	101.97	-0.12
AP-07	138.60	143.74	-5.14
AP-08	130.20	128.46	1.74
AP-09	127.10	122.24	4.86
AP-10	110.40	104.40	6.00

^{*}The observation from LNG-MW-4 was not used in the model calibration due to inconsistency with previous measurements, so is not shown on Figure 3-17.

3.4.2 Calibrated Parameter Values

Table 5 presents the calibration values for horizontal hydraulic conductivity. The values are listed for each soil type. If multiple zones represent the same soil type, multiple entries are listed. The geometric mean value for all zones representing a given soil type is listed, along the relative rank (highest to lowest mean value). The right-most column is the expected rank for each soil. In most cases, the order is as was expected – in other words, the parameter values are consistent with what would be expected for each soil type. Note that PEST works with as many significant digits as allowed by the user; the number of significant digits indicated in this table and other tables and attachments is not an indication of the accuracy of the parameter values.

Tables 6 through 8 present the calibrated parameter values for anisotropy, specific yield, and specific storage, respectively. Most stratified-drift aquifers contain many layers with large contrasts in hydraulic conductivities, therefore are hydraulically anisotropic. Anisotropy values ranging up to approximately 500

are supported by published values (Kontis, et al, 2004). Specific yield and specific storage values are within reported ranges for the modeled lithologies (Anderson and Woessner, 1992).

Table 9 presents the calibrated parameter values related to the groups of boundary cells shown in Figure 2-6. As noted in Section 2.5.4, the flux rate multiplier parameter for well cell zone 4 (named wellfac_4) was expected to be low. This parameter went to its lower bound during the model calibration. Parameter rivfac_1, representing vertical hydraulic conductivity of the Merrimack River bed hits its upper bound of 20 m/day, reflecting the observed high degree of hydraulic connection with the valley-fill aquifer.

Attachment 2 lists all parameters established fort the model calibration, their calibrated value, the lower and upper bounds applied during calibration, and whether the parameter value was varied during the calibration.

Table 5 Calibrated Horizontal Hydraulic Conductivities by Lithology

Lithology	Horizo	Horizontal hydraulic conductivity (m/day)					Geometric mean	Rank	Expected rank
CLAY	0.17						0.170	13	13
SILT	0.050	3.0					0.387	12	12
FINE SAND	30.0	30.0	15.4	30.0	1.0	30.0	15.24	7	8
FINE SAND WITH TRACE FINES	2.49	25.0	25.0	9.1			10.90	9	9
FINE SAND WITH LITTLE FINES	0.50	25.0	25.0				6.786	11	10
FINE SAND WITH SOME FINES	0.54	25.0	25.0				6.967	10	11
COARSE SAND	41.7	300.0	300.0				155.5	3	3
COARSE SAND WITH TRACE									
FINES	250.0	250.0					250.0	2	5
COARSE SAND WITH LITTLE									
FINES	20.0						20.0	6	6
COARSE SAND WITH GRAVEL	249.7	94.3					153.4	4	2
FINE SAND TO GRAVEL	5.00	76.1	150.0				38.49	5	4
FINE SAND TO GRAVEL WITH									
TRACE FINES	4.40	4.0	100.0				12.07	8	7
GRAVEL	500.0						500.0	1	1

Table 6 Calibrated Vertical Anisotropy by Lithology

Lithology	Vertical anisotropy (Kx/Kz, unitless)				s)	
CLAY	4.28					
SILT	11.62	1.00				
FINE SAND	6.48	1.00	1.00	1.67	49.97	1.00
FINE SAND WITH TRACE FINES	1.15	1.00	1.00	1.62		
FINE SAND WITH LITTLE FINES	16.29	1.00	3.29			
FINE SAND WITH SOME FINES	1.00	1.00	1.00			
COARSE SAND	1.00	15.31	2.19			
COARSE SAND WITH TRACE FINES	1.41	1.41				
COARSE SAND WITH LITTLE FINES	483.1					
COARSE SAND WITH GRAVEL	87.57	6.05				
FINE SAND TO GRAVEL	1.00	1.00	1.00			
FINE SAND TO GRAVEL WITH						
TRACE FINES	500.0	1.00	4.59			
GRAVEL	5.94					

Table 7 Calibrated Specific Yield by Lithology

Lithology	Specific yield (unitless)					
CLAY	0.005					
SILT	0.005	0.010				
FINE SAND	0.022	0.010	0.050	0.050	0.050	0.050
FINE SAND WITH TRACE FINES	0.010	0.060	0.300	0.040		
FINE SAND WITH LITTLE FINES	0.025	0.100	0.012			
FINE SAND WITH SOME FINES	0.286	0.250	0.250			
COARSE SAND	0.400	0.200	0.200			
COARSE SAND WITH TRACE FINES	0.150	0.150				
COARSE SAND WITH LITTLE FINES	0.300					
COARSE SAND WITH GRAVEL	0.080	0.080				
FINE SAND TO GRAVEL	0.010	0.070	0.070			
FINE SAND TO GRAVEL WITH						
TRACE FINES	0.300	0.063	0.060			
GRAVEL	0.202					

Table 8 Calibrated Specific Storage by Lithology

Lithology	Specific storage (1/m)					
CLAY	1.2E-3					
SILT	1.0E-3	8.6E-4				
FINE SAND	1.0E-3	1.0E-3	9.3E-5	4.4E-4	3.9E-5	8.8E-5
FINE SAND WITH TRACE FINES	1.0E-3	6.9E-4	1.0E-3	7.0E-3		
FINE SAND WITH LITTLE FINES	1.0E-3	1.0E-3	1.0E-3			
FINE SAND WITH SOME FINES	1.0E-3	8.5E-5	3.2E-5			
COARSE SAND	1.0E-3	1.0E-2	1.0E-2			
COARSE SAND WITH TRACE FINES	1.6E-4	1.6E-4				
COARSE SAND WITH LITTLE FINES	1.0E-3					
COARSE SAND WITH GRAVEL	1.0E-2	6.2E-3				
FINE SAND TO GRAVEL	1.0E-3	1.8E-4	6.8E-5			
FINE SAND TO GRAVEL WITH						
TRACE FINES	1.0E-3	1.0E-3	1.2E-3			
GRAVEL	1.0E-3					

Table 9 Calibrated Parameters Related to Boundary Cells

Parameter Name	Calibrated value	Description
wellfac_1	0.667	Lateral inflow multiplier in layer 1
wellfac_2	0.001	Lateral inflow multiplier in layer 1
wellfac_3	0.003	Lateral inflow multiplier in layer 1
wellfac_4	0.001	Lateral inflow multiplier in layer 1
wellfac_5	0.202	Lateral inflow multiplier in layer 2
wellfac_6	0.001	Lateral inflow multiplier in layer 2
wellfac_7	0.001	Lateral inflow multiplier in layer 2
wellfac_8	0.017	Lateral inflow multiplier in layer 2
wellfac_9	0.664	Lateral inflow multiplier in layer 3
wellfac_10	0.001	Lateral inflow multiplier in layer 3
wellfac_11	0.001	Lateral inflow multiplier in layer 3
wellfac_12	3.045	Lateral inflow multiplier in layer 3
rivfac_1	20.0	Vertical conductivity of the Merrimack River bed
rivfac_2	1.978	Vertical conductivity of Baboosic Brook bed near MVD-4/5
rivfac_3	20.0	Vertical conductivity of Baboosic Brook bed in the far field
ghbfac_1	2.259	Underflow conductance multiplier on Merrimack alluvium at the downstream end of the model domain

3.4.3 Parameter Sensitivities

The relative sensitivity of each parameter to the calibration targets is presented in order to quantify which parameters are most sensitive to and constrained by the available observations. Sensitivities are presented in a histogram chart for the most sensitive parameters (Figure 3-19) and in Attachment 3 for all parameters. The most sensitive parameter simulates flux into the northern end of the model domain in layer 3 (Zone 12 on Figure 2-6). That zone represents flow into the model domain as underflow in the unconsolidated deposits and flow from bedrock discharging toward the Merrimack River; as noted above, available data do not allow differentiation of flow from bedrock from underflow in this part of the model domain. Other parameters that have high sensitivities are hydraulic conductivity and anisotropy values for zones near wells MVD-4/5.

4.0 Flow Model Usage

4.1 Evaluation of the Model Water Balance and Sources of Water Pumped by MVD-4/5

A summary of the MVD-4/5 Model water balance is presented in Table 10. The scenario this represents is pumping of MVD-4/5 at their long term average rates, with the river stage as observed in the 2003 aquifer testing, and recharge rate used in the model calibration (21.1 inches/yr). Simulated flow rates are expressed in gpm and in cubic feet per second (cfs). Roughly half of the groundwater in this scenario originates from recharge and half from lateral inflow into the model domain; more than 80 percent of this lateral inflow is in the layers representing the bedrock and underflow in the valley-fill aquifer from north of the model domain. At the simulated pumping rates, a relatively small fraction of the groundwater originates from induced recharge from the Merrimack River. The predominant sink for groundwater is the Merrimack River and its tributaries in the model domain. Pumpage from wells MVD-4/5 accounts for 16 percent of the simulated groundwater outflow. Pumping of wells MVD-4/5 in this scenario and the summer pumping scenario described next are simulated to induce flow from outside the model domain through the GHB cells near the Merrimack River at the south end of the model domain. Detailed flow budgets for each group of boundary cells in this scenario is presented in Attachment 4.

The simulated sources of the water pumped from MVD-4/5 at long-term average pumping rates are listed in Table 11. Wells MVD-4/5 do not capture water from the Merrimack River in this scenario. The majority of the water pumped from wells MVD-4/5 entered the aquifer as recharge west of the well field. Roughly equal amounts originate as recharge in areas north of the well field and as groundwater discharged from the bedrock to the valley-fill aquifer.

Tables 12 and 13 summarize the water balance for the groundwater flow model and the water sources for wells MVD-4/5 under summer pumping conditions. In this scenario, 12 percent of the water comes from induced recharge from the Merrimack River. As with the previous scenario, the majority of the water entered the aquifer as recharge west of the well field and roughly equal amounts, but smaller fractions, originate as recharge in areas north of the well field and as groundwater discharged from the bedrock to the valley-fill aquifer. Detailed flow budgets for each group of boundary cells in this scenario is presented in Attachment 5.

Table 14 summarize the water balance for the groundwater flow model under conditions simulated for November 2016. In this case, wells MVD-4/5 were not pumping. This scenario has a greater amount of discharge to streams due primarily to the lower stage of the Merrimack River at the time. Note the simulated outflow from the model domain through the GHB cells at the south end of the model domain. Detailed flow budgets for each group of boundary cells in this scenario is presented in Attachment 6.

Preliminary modeling on a regional scale for the CM Report produces similar water balance numbers for the portion of the regional model represented by the MVD-4/5 Model.

Table 10 Groundwater Flow Model Water Balance for the Long-term Average MVD-4/5 Pumping Rate Scenario

Sources			Sinks			
	gpm	cfs		gpm	cfs	
Induced recharge from streams	138	0.31	Discharge to streams	2,141	4.77	
Recharge to the water table	1,203	2.68				
Lateral inflow			Lateral outflow			
Northern and western margins of						
layer 1	123	0.27				
GHBs representing underflow from			GHBs representing underflow			
the south induced by pumping	54	0.12	toward the south	0	0.00	
Eastern margin of layers 2 and 3						
(bedrock and underflow from the						
north)	1,031	2.30				
			Pumping at wells MVD-4/5	409	0.91	
Total in	2,549	5.68	Total out	2,549	5.68	

Table 11 MVD-4/5 Pumped Water Sources for the Long-term Average MVD-4/5 Pumping Rate Scenario

Source	Percent	Rate (gpm)
Induced flow from Baboosic Brook	1.7	7.0
Underflow below Baboosic Brook	0.06	0.26
Recharge west of the well field	51	209.4
Recharge north of the well field	24	98.0
Flow from bedrock	23	94.3
Induced flow from the Merrimack River	0	0
Total	100.0	408.9

Table 12 Groundwater Flow Model Water Balance for the Summer MVD-4/5 Pumping Rate Scenario

Sources			Sinks		
	gpm	cfs		gpm	cfs
Induced recharge from streams	217	0.48	Discharge to streams	2,003	4.46
Recharge to the water table	1,203	2.68			
Lateral inflow			Lateral outflow		
Northern and western margins of					
layer 1	123	0.27			
GHBs representing underflow from			GHBs representing underflow		
the south induced by pumping	54	0.12	toward the south	0	0.00
Eastern margin of layers 2 and 3					
(bedrock and underflow from the					
north)	1,031	2.30			
			Pumping at wells MVD-4/5	625	1.39
Total in	2,628	5.86	Total out	2,628	5.86

Table 13 MVD-4/5 Pumped Water Sources for the Summer MVD-4/5 Pumping Rate Scenario

Source	Percent	Rate (gpm)	
Induced flow from Baboosic Brook	0.5	3.4	
Underflow below Baboosic Brook	0.06	0.38	
Recharge west of the well field	52	322.5	
Recharge north of the well field	19	121.3	
Flow from bedrock	16	101.3	
Induced flow from the Merrimack River	12	76.1	
Total	100.0	625.0	

Table 14 Groundwater Flow Model Water Balance for the November 2016 Scenario (Wells MVD-4/5 not pumping)

Sources			Sinks		
	gpm	cfs		gpm	cfs
Induced recharge from streams	286	0.64	Discharge to streams	2,521	5.62
Recharge to the water table	1,203	2.68			
Lateral inflow			Lateral outflow		
Northern and western margins of					
layer 1	123	0.27			
GHBs representing underflow from			GHBs representing underflow		
the south	0	0.00	toward the south	121	0.27
Eastern margin of layers 2 and 3					
(bedrock and underflow from the					
north)	1,031	2.30			
			Pumpage	0	0.00
Total in	2,642	5.89	Total out	2,642	5.89

4.2 Quantification of Predictive Uncertainty

A prediction of interest regarding wells MVD-4/5 is the fraction of groundwater pumped from wells MVD-4/5 that flows beneath the Longa Disposal Area (LDA). This prediction is referred to as "lda_source" in the discussion below. The code FlowSource (Black and Foley, 2013) was used to quantify this value based on MVD-4/5 Model output for a simulation of pumping at rates representing summer conditions. The calibrated model produced a predicted value of 1.6 percent. The uncertainty in that prediction was then tested as described below.

Similar to weather forecasting models, groundwater models have uncertainty in the predictions for which the models are designed to evaluate. The sources of uncertainty include the reliability and representativeness of the data used in the model construction and calibration, the conceptual hydrogeologic model, the degree to which the calibration data constrains the prediction, and the numerical algorithms of the modeling codes. A predictive uncertainty evaluation was performed to determine the contributions of groundwater from various areas to the MVD wells under historical operating conditions within a 95 percent confidence range.

Predictive uncertainty was performed as follows. A statistically significant increase in the objective function value is calculated that represents the 95 percent confidence limit. Any parameter set that produces this increased objective function value is inferred to be from the same population that produced the minimum objective function. The range from the minimized to the maximized prediction value is the 95 percent confidence limit on the prediction.

Pareto uncertainty analysis was conducted using the PEST software package. Detailed descriptions of this method are presented in Watermark Numerical Computing (2016) and Moore et al. (2010). The Pareto front is defined for a multi-dimensional objective function as the surface over which resources have been efficiently allocated so it is impossible to improve one component of the objective function without diminishing another. Figure 4-1 provides a visual illustration of a two-dimensional Pareto Front. Notice, that along the curve it is not possible to simultaneously improve both components of the objective function; any improvement in one component will cause a loss in the other.

Therefore, predictive uncertainty is estimated by constructing a Pareto front for the Calibration and Prediction Objective Functions and using the curve to analyze how maximizing a prediction impacts the calibration. It is generally possible to maximize a prediction up to a point without incurring an unreasonable penalty in the accuracy of the calibration (i.e. the goodness of fit between observed conditions and model-simulated conditions). However, at some point additional attempts to increase the prediction tend to drive the calibration objective function up to an unreasonable level. In other words, the model begins to simulate conditions that are not adequately supported by the observations.

For this effort, a Pareto Front was constructed for the calibration objective function and a predictive objective function that maximizes the prediction *lda_source*. The results are presented in Figure 4-2. The gaps between groups of points in the curve are indicative of local minima that were encountered in analysis. These were mitigated for by performing three separate Pareto simulations and consolidating the results. It is interesting to note that most of the increase in the calibration objective function in the upper right portion of Figure 4-2 is due to the observation group named round3 – the synoptic water level measurements taken on November 23, 2016. Figure 4-3 presents the round3 component of the objective function for the same points presented in Figure 4-2. Technically, Figure 4-3 is not a Pareto Curve because the Pareto optimization was performed on the entire calibration objective function rather than just the round3 component, but it still provides useful information in that it shows the round3 observations provide the largest constraint as the *lda_source* predictions become large.

Deciding how far to extend the uncertainty bands using the Pareto front is not straight forward; it is very difficult, if not impossible, to develop accurate statistical models for the calibration error of environmental models because the error is typically dominated by structural errors that are not caused by random parameter variation rather than randomly-varying measurement errors. Doherty and Welter (2005) provide an in-depth discussion of the effects of structural error and Beven (2009; 2013) warns about the dangers of assuming all errors can be treated as random numbers. Doherty and Welter (2005) conclude that it is necessary to use professional judgment to evaluate the performance of environmental models and Beven (2009; 2013) introduces the concept of equifinality (the concept that many models of a system may be acceptably consistent with the available observations), which is based on a less formal concept of limits of acceptability rather than more formal statistical testing of a model hypothesis. Given these inherent limitations, the uncertainty bounds for this project were established by reviewing the calibration metrics and plots to determine an appropriate cut-off value for the calibration objective function.

The following equation is used with models in which far more observations are available than adjustable parameters to calculate an increase in the objective function (δ) beyond which the model is considered uncalibrated (Watermark Numerical Computing, 2005). This calculation is based on the minimized objective function value (Φ_{min}), number of observations and articles of prior information available to constrain the calibration (m), and the number of parameters allowed to vary in the calibration (n). The F-distribution is used with a specified confidence (α).

$$\delta = n \frac{\Phi_{min}}{m-n} F_{\alpha}(n, m-n)$$

Applying this equation to the calibration result, an objective function in the range of 125 to 130 approximates the 95 percent confidence level. The results in Figure 4-2 indicate that, at most, approximately 15 percent of the water pumped by wells MVD-4/5 under summer pumping conditions passes beneath the LDA in flowing to wells MVD-4/5. When pumping rates are lower (i.e. when summer watering demands are no longer a factor), the contribution of groundwater flow from under the landfill to wells MVD-4/5 is considerably less.

The Pareto method was not effective in finding the lower limit on the prediction. The lower limit may be as low as zero.

4.3 Long-term Simulation

The calibrated model was used to simulate historic pumping rates as reported by MVD using monthly stress periods representing January 1989 through February 2016. The simulation also reflects average monthly river stage for the Merrimack River (as extrapolated from Goffs Falls) and monthly variations in recharge (as calculated by SWB). These three elements constitute the primary hydrologic stresses that affect groundwater flow in the vicinity of the MVD well field. Figure 2-10 shows the variation of these model inputs throughout the simulation.

A solute tracer simulation was run to evaluate the influence of these long-term variations in river stage, recharge, and MVD-4/5 pumping rates on the amount of water pumped from MVD-4/5 that passes under the LDA. The simulation was run using MT3D-USGS (Bedekar, et al, 2016a and 2016b). MT3D-USGS uses flow and budget information from MODFLOW.

The solute tracer simulation consisted of assigning specified concentrations of 100 generic concentration units to model cells located in the footprint of the LDA in layers 1 to 3. This simulation can be thought of as a "numerical tracer test", conducted to evaluate in the model where water underneath the LDA flows to and how the flow directions and rates are affected by historical variations in pumping, recharge, and river stage.

Aside from the variations shown in Figure 2-10, the flow boundary conditions for the long-term simulation are those determined by the MVD-4/5 Model construction and calibration (Sections 2 and 3). The flow simulation is transient, with 326 month-long stress periods, each with four time steps. An

effective porosity of 0.20 was used. No decay, sorption, diffusion, or dispersion are simulated. MT3D-USGS's finite difference solver was used.

In this way, the simulated concentration at a given time and location in the model indicates the fraction of water that passed under the LDA prior to migrating to that location. This simulation is not intended to indicate the expected behavior of an actual solute in the flow system – the "solute" is a surrogate for advective groundwater flow.

Simulation results are shown on Figure 4-4, with the simulated fraction of water pumped from well MVD-5 that passed under the LDA plotted along with the model inputs that were presented on Figure 2-10. The percent of water that has passed under the LDA at the location of well MVD-5 is variable, but the results indicate that up to 3 percent of the water pumped by MVD-5 passed under the LDA. This is consistent with the model calibration result, from which the steady-state simulation of summer pumping conditions with average recharge rates and a river stage representing April 2003 conditions indicated 1.6 percent of the discharge from wells MVD-4/5 having passed under the LDA. The results also indicate that periods of lower pumping rates and other factors can reduce the amount of water produced that passed under the LDA to zero. The simulated capture zone of well MVD-5 encompasses that of well MVD-4, therefore the simulation indicates no water pumped from MVD-4 passed under the LDA.

5.0 Summary and Next Steps

As noted in Section 1, all groundwater flow models are a simplification of reality and have uncertainty related to their construction, their inputs, and, consequently, their outputs. Model fidelity reflects the degree to which a groundwater flow model is designed to resemble the physical hydrogeologic system it was developed to simulate (ASTM-D5981; ASTM, 2008). A model with relatively low computational demand was required based on the following considerations, therefore the MVD-4/5 Model was developed to the degree of a medium-fidelity model as defined in ASTM-D5981 (ASTM, 2008):

- The nature of the historical data available with which to calibrate the model. In particular, EGGI's (2003) large-scale pumping test using two, partially-penetrating wells with multiple observation wells, some located within a few feet of the pumping wells and completed at various depths within the aquifer.
- The nature of intended applications of the model, including transient simulation of monthly historic conditions from 1989 into 2016.

History-matching of the 2003 aquifer testing data from EGGI (2003) and the synoptic water level data collected during the current investigation indicate the calibrated model meets the definition of medium-fidelity model and the model is therefore a useful tool for evaluating groundwater flow to wells MVD-4/5.

An assessment was made of the uncertainty of the model prediction of the fraction of water withdrawn by wells MVD-4/5 under summer pumping conditions that passes under the Longa Disposal Area (LDA). This prediction ranges from less than 1.6 percent to approximately 15 percent.

A long-term simulation of pumping rate, recharge, and river stage variation was performed. Results from the long-term simulation, using only the calibrated model parameters, indicate that the prediction ranges from 0 to approximately 3 percent through time, depending primarily on the pumping rate of wells MVD-4/5.

It may be possible to reduce the uncertainty of the model prediction through:

- collection of additional data, such as monitoring of water level data, particularly in the LDA monitoring wells as wells MVD-4/5 are brought back online,
- installation, sampling, and monitoring of bedrock monitoring wells in to better constrain the discharge to the well field from bedrock, and
- refinement of the groundwater flow model.

However, it should be noted that unless wells MVD-4/5 are pumped at continuous rates such as those during the 2003 testing for a period of time exceeding 7 days, steady-state conditions will not be reached and estimation of the influence of pumping at the more distant monitoring wells may be difficult. Expansion of the model domain to achieve greater model fidelity would result in greater computational demand which may render some of the approaches applied in the current modeling, such as the long-term solute tracer simulation, impractical or impossible. Implementation of the higher degrees of model parameterization required to achieve greater model fidelity would introduce predictive analysis methods in which more subjectivity is involved in evaluating predictive uncertainty.

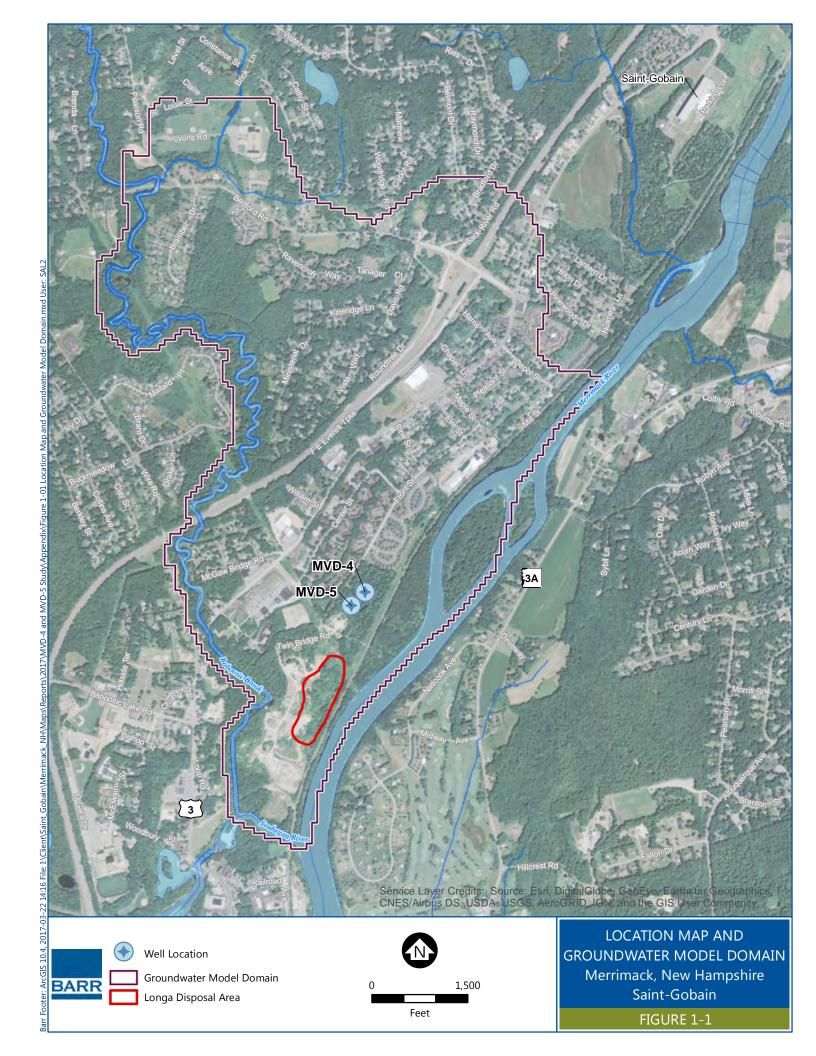
6.0 References

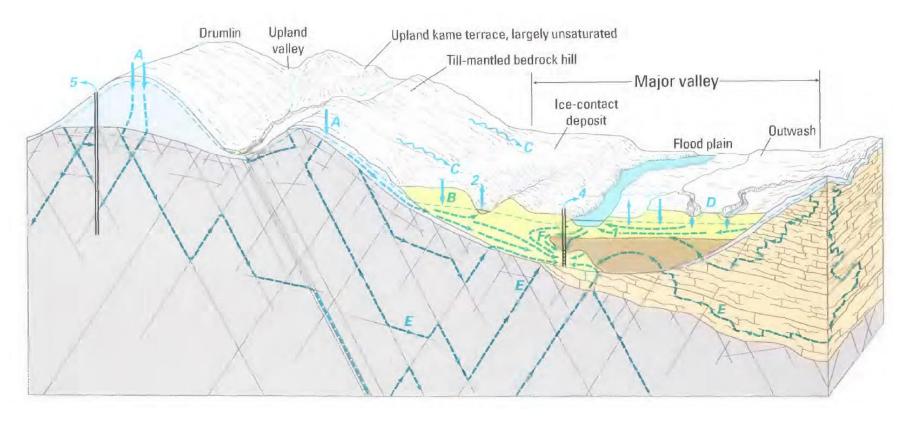
- Anderson, M.P. and W.W. Woessner, 1992. Applied Groundwater Modeling, Simulation of Flow and Advective Transport. Academic Press, Inc., New York, New York, 381 p.
- Anderson, M., W. Woessner, and R. Hunt. 2015. Applied Groundwater Modeling, 2nd Edition: Simulation of Flow and Advective Transport. Academic Press, 630 p.
- Aries Engineering, Inc., 1990. Technical Assistance, Yield House Site, Merrimack, New Hampshire. Prepared for J.D. McNiff Company, Gloucester, Massachusetts. January 1990.
- ASTM, 2006. D5718-13(2013) Standard Guide for Documenting a Ground-Water Flow Model Application. Book of Standards, Vol. 4.08.
- ASTM, 2008. D5981-96(2008). Standard Guide for Calibrating a Groundwater Flow Model Application. Note, as of March 2017, this standard has not been updated within eight years, therefore is qualified as withdrawn. This does not mean that the definitions in the document are no longer applicable.
- Ayotte, J.D., and K.W. Toppin, 1992. Geohydrology and water quality of stratified-drift aquifers in the middle Merrimack River basin, south-central New Hampshire. US Geological Survey Water-Resources Investigations Report 92-4192. Converted to GIS coverages by CSRC, UNH, 2000.
- Barr, D., 2001. Coefficient of Permeability Determined by Measurable Parameters. Ground Water, Volume 39, No. 3: 356-361.
- Barr Engineering Co. (Barr), 2017. Conceptual Site Model of PFOA Fate and Transport: Merrimack, New Hampshire, in preparation for Saint-Gobain Performance Plastics.
- Bedekar, V., Morway, E.D., Langevin, C.D., and Tonkin, M., 2016a, MT3D-USGS version 1: A U.S. Geological Survey release of MT3DMS updated with new and expanded transport capabilities for use with MODFLOW: U.S. Geological Survey Techniques and Methods 6-A53, 69 p., http://dx.doi.org/10.3133/tm6A53
- Bedekar, V., Morway, E.D., Langevin, C.D., and Tonkin, M., 2016b, MT3D-USGS version 1.0.0: Groundwater Solute Transport Simulator for MODFLOW: U.S. Geological Survey Software Release, 30 September 2016, http://dx.doi.org/10.5066/F75T3HKD
- Beven, K., 2009. Environmental Modeling An Uncertain Future? CRC Press, NY, NY. 310 p.
- Beven, K., 2013. Breakthroughs in Uncertainty Estimation. https://www.youtube.com/watch?v=dC8I9PD8V5A
- Black, A., and C. Foley, 2013. FlowSource: A program to efficiently delineate volumetric capture areas, pathways and source areas in groundwater models. MODFLOW and More 2013 Conference Proceedings.
- CDM, 2004. Merrimack River Watershed Assessment Study. Screening Level Model. Prepared for: New England District, U.S. Army Corps of Engineers. March, 2004.
- C Tech Development Corporation (CTech), 2016. Earth Volumetric Studio (EVS) Version 2016.12, released December 7, 2016. www.ctech.com.

- Degnan, J.R., Moore, R.B. and Mack, T.J., 2001. Geophysical investigations of well fields to characterize fractured-bedrock aquifers in southern New Hampshire (p. 54). US Department of the Interior, US Geological Survey.
- Doherty, J. and Welter, D., 2010, A short exploration of structural noise, Water Resources Research, 46, W05525, doi: 10.1029/2009WR008377.
- Emery & Garrett Groundwater, Inc., (EGGI) 2003. Establishment of the Source Water Protection Area, Merrimack Village District Wells MVD-4 and MVD-5, Merrimack, New Hampshire. December, 2003.
- Environmental Systems Research Institute, Inc. (ESRI), 2016. ArcGIS 10.4 for Desktop. Documentation accessed from http://desktop.arcgis.com/en/documentation/>.
- Federal Emergency Management Agency (FEMA), 2012. TERRAIN, Merrimack HUC 8 Watershed, Massachusetts and New Hampshire. Digital elevation raster. Obtained in 2016 from https://coast.noaa.gov/dataservices.
- Flynn, R.H. and G.D. Tasker. 2004. Generalized Estimates from Streamflow Data of Annual and Seasonal Ground-Water-Recharge Rates for Drainage Basins in New Hampshire. U.S. Geological Survey Scientific Investigation Report 2004-5019, 61 p.
- Haitjema, H. M. (1995). Analytic Element Modeling of Groundwater Flow. Academic Press, Inc. 394 p.
- Harbaugh, A.W., 1990. A computer program for calculating subregional water budgets using results from the U.S. Geological Survey modular three-dimensional ground-water flow model. U.S. Geological Survey Open-File Report 90-392. 46 pp.
- Hoyle, Tanner & Associates, 1989. Public Disposal Site Disclosure on the J. Longa and Sons Property, Merrimack, New Hampshire. Phase I Hydrogeological Investigation.
- Kontis, A.L., Randall, A.D. and Mazzaferro, D.L., 2004. Regional hydrology and simulation of flow of stratified-drift aquifers in the glaciated northeastern United States. USGS Professional Paper 1415. US Geological Survey. 156 p., 3 plates.
- Koteff, C., 1976. Surficial geologic map of the Nashua North quadrangle, Hillsborough and Rockingham Counties, New Hampshire. U.S. Geological Survey Geologic Quadrangle 1290, color, scale 1:24,000.
- Koteff, C. and Stone, B.D., 2000, Surficial geologic map of the Manchester South quadrangle, Hillsborough and Rockingham Counties, New Hampshire: U.S. Geological Survey, color, scale 1:24,000.
- Medalie, L. and Moore, R.B., 1995. Ground-water resources in New Hampshire; stratified-drift aquifers. US Geological Survey, Water-Resources Investigations Report 95-4100. 31 p.
- Moore, R.B., 2004. Quality of water in the fractured-bedrock aquifer of New Hampshire. US Department of the Interior, US Geological Survey. Scientific Investigations Report 2005-5093. 30 p.
- Moore, R.B., G.E. Schwartz, et al, 2002. Factors related to well yield in the fractured-bedrock aquifer of New Hampshire. US Geological Survey Professional Paper 1660. 51 p.
- Moore, C., Wöhling, T., and Doherty, J., 2010. Efficient regularization and uncertainty analysis using a global optimization methodology. Water Resources Research. Vol 46, W08527, doi: 10.1029/2009WR008627.
- NHDES, 2000. New Hampshire Bedrock Aquifer Resource Assessment. Environmental Fact Sheet. 4 p.

- NHDES, 2016a. New Hampshire Department of Environmental Services Water Well Inventory. GIS data obtained April 26, 2016.
- NHDES. 2016b. Merrimack Village District Water Use Reports, Retrieved from DES OneStop database at http://www4.des.state.nh.us/DESOnestop/BasicSearch.aspx
- NH GRANIT, New Hampshire's Statewide GIS Clearinghouse, 2016. URL: http://www.granit.unh.edu/. Accessed Inland Water Resources data, including aquifer boundaries, saturated thickness, transmissivity, and water table coverages, May 2016.
- Niswonger, R.G., Panday, S., and Ibaraki, M., 2011. MODFLOW-NWT, A Newton formulation for MODFLOW-2005. U.S. Geological Survey Techniques and Methods 6-A37, 44 p.
- Randall, A.D., Francis, R.M., Frimpter, M.H. and Emery, J.M., 1988. Region 19, Northeastern Appalachians. Hydrogeology. The Geological Society of North America, Boulder Colorado. 1988. p 177-187. 7 fig, 1 tab, 70 ref.
- Stekl, P.J., and S.M. Flanagan, 1991. Geohydrology and water quality of stratified-drift aquifers in the lower Merrimack and coastal river basins, southeastern New Hampshire. US Geological Survey Water-Resources Investigations Report 91-4025. Converted to GIS coverages by CSRC, UNH, 2000.
- Toppin, K.W., 1987. Hydrogeology of stratified-drift aquifers and water quality in the Nashua Regional Planning Commission area, south-central New Hampshire. US Geological Survey Water-Resources Investigations Report 86-4358. Converted to GIS coverages by CSRC, UNH, 2000.
- United States Geologic Survey (USGS), 2016a. National Hydrography Dataset (NHD). GIS coverages of water bodies obtained from http://nhd.usgs.gov.
- USGS, 2016b. Merrimack River at Goffs Falls. Data obtained from URL: http://waterdata.usgs.gov/nwis/uv?site_no=01092000
- Watermark Numerical Computing, 2005. PEST: Model-Independent Parameter Estimation. User Manual. 5th edition.
- Watermark Numerical Computing, 2016. PEST: Model-Independent Parameter Estimation. User Manual, Parts I and II. 6th edition. Software and manuals available for download from URL http://www.pesthomepage.org/Downloads.php
- Watermark Numerical Computing, 2017. PEST_HP, PEST for Highly Parallelized Computing Environments. February, 2017.
- Westenbroek, S.M., Kelson, V.A., Dripps, W.R., Hunt, R.J., and Bradbury, K.R., 2010, SWB—A modified Thornthwaite-Mather Soil-Water-Balance code for estimating groundwater recharge: U.S. Geological Survey Techniques and Methods 6-A31, 60 p.

Figures



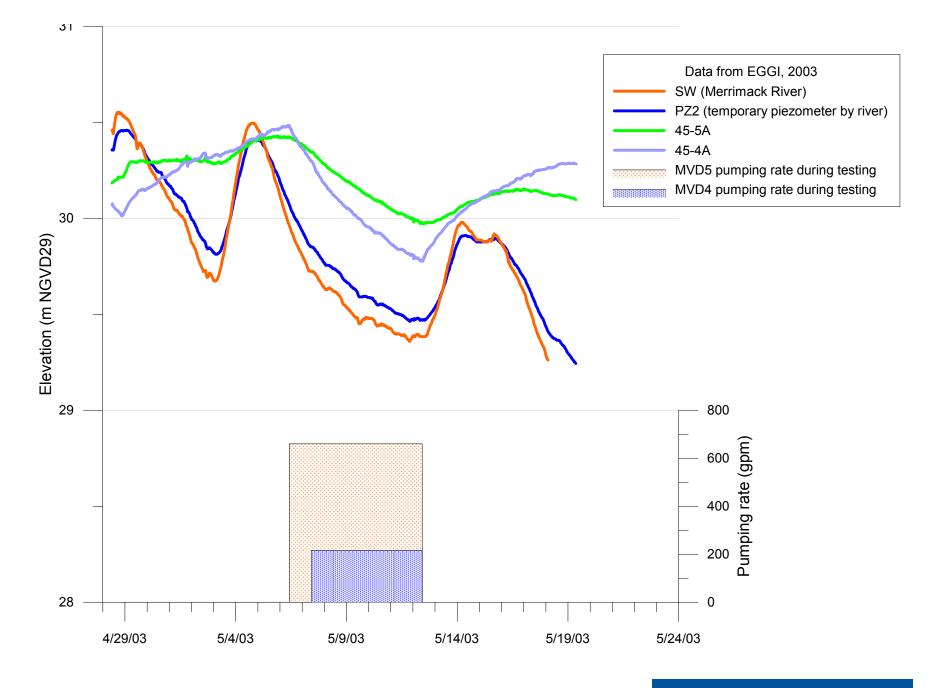


Groundwater sources

- A Infiltration of precipitation through till in uplands. B Precipitation on valley floor, which infiltrates to water table unless rejected
- C Runoff from adjacent till-covered hillsides at shallow depth through sandy till, through soil horizons, and/or as surface flow
- **D** Continuous natural seepage losses from small tributaries not incised to the water table. **E** Lateral and upward flow from deep circulation systems through bedrock. **F** Induced infiltration from rivers near large-capacity wells where the water table is lowered by pumping **Groundwater sinks**
- 1 Seepage to river. 2 Ground-water evapotranspiration where the water table is shallow. 3 Underflow downvalley through stratified drift (not shown). 4 Pumpage from wells screened in stratified drift. 5 Pumpage from bedrock wells

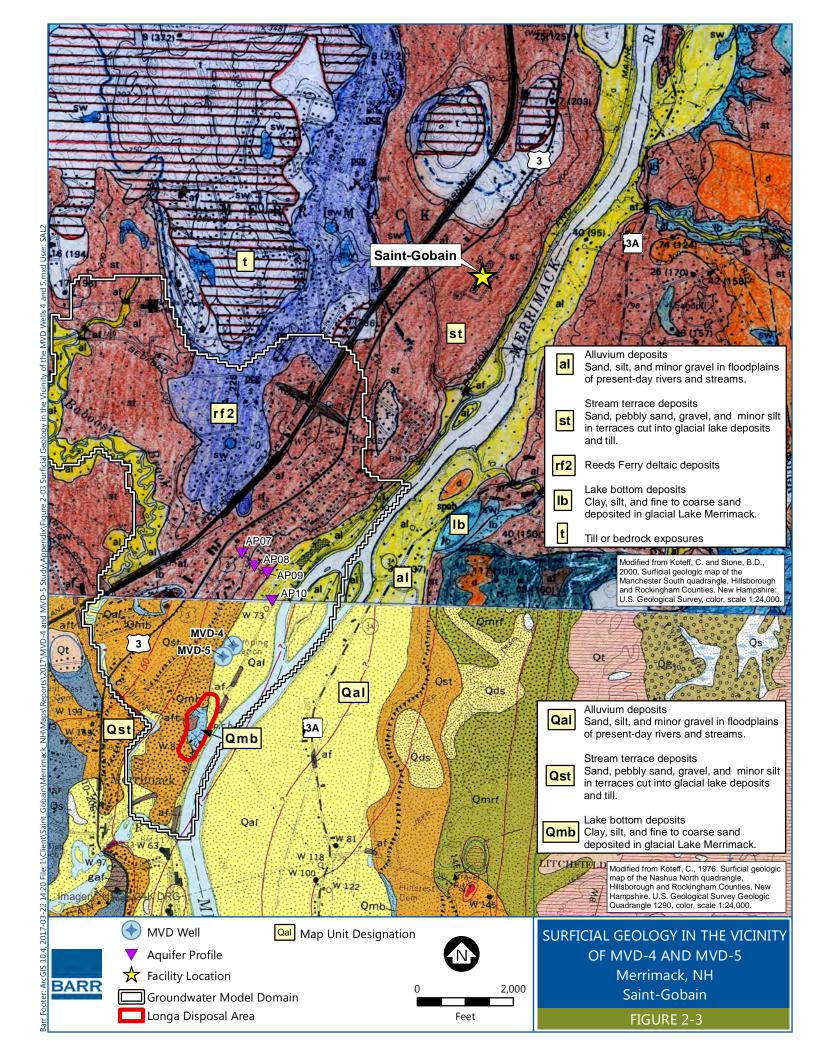
 Figure 2-1

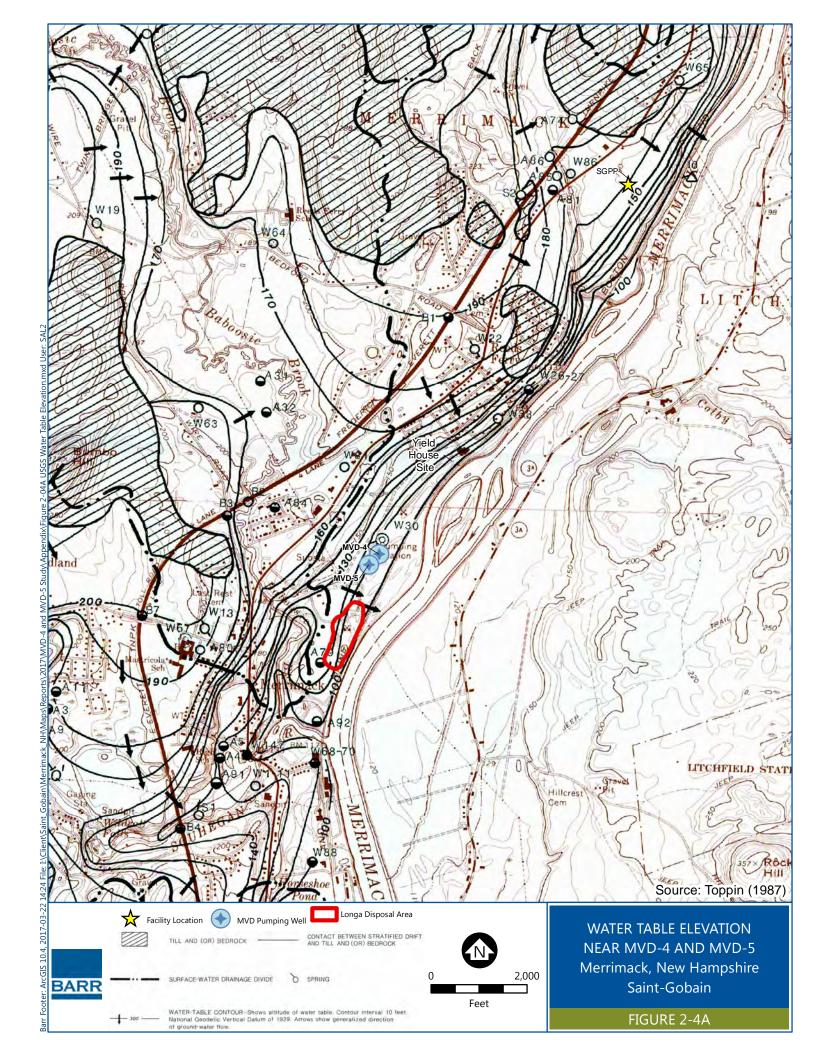
Block diagram of the conceptual hydrogeologic model in a valley-fill aquifer system (from Kontis, et al, 2004) Merrimack, NH Saint-Gobain

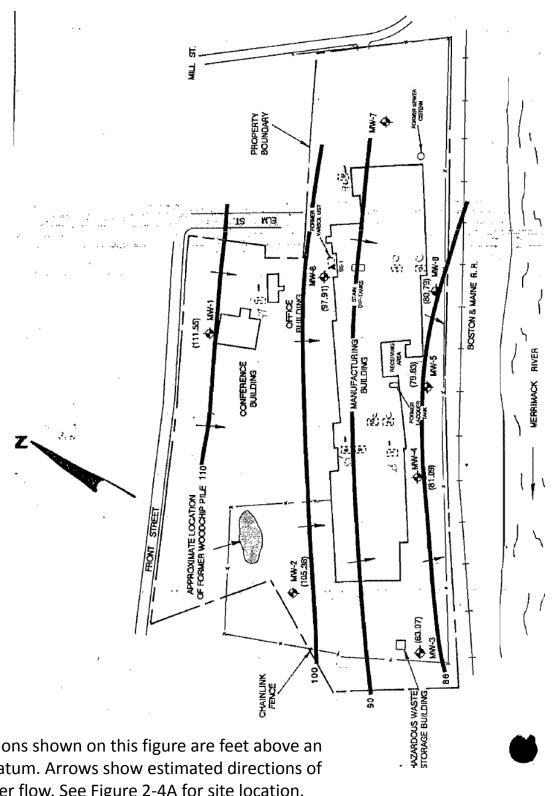




SELECTED HYDROGRAPHS FROM EGGI, 2003

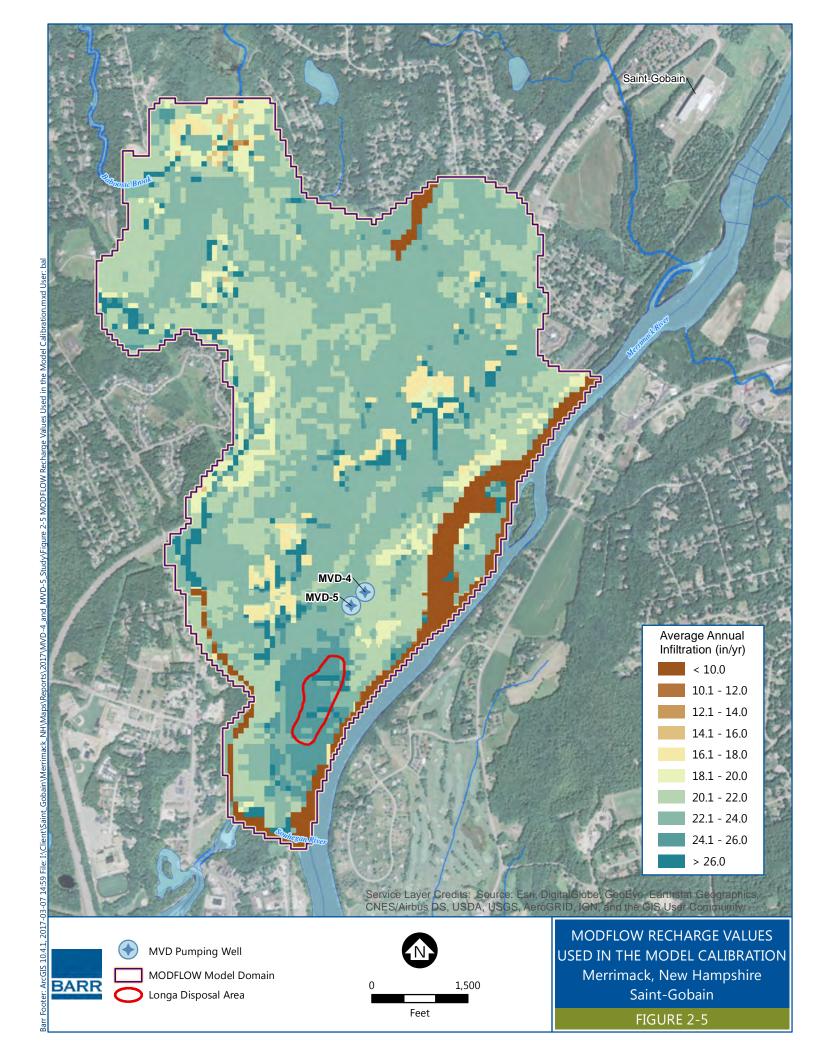


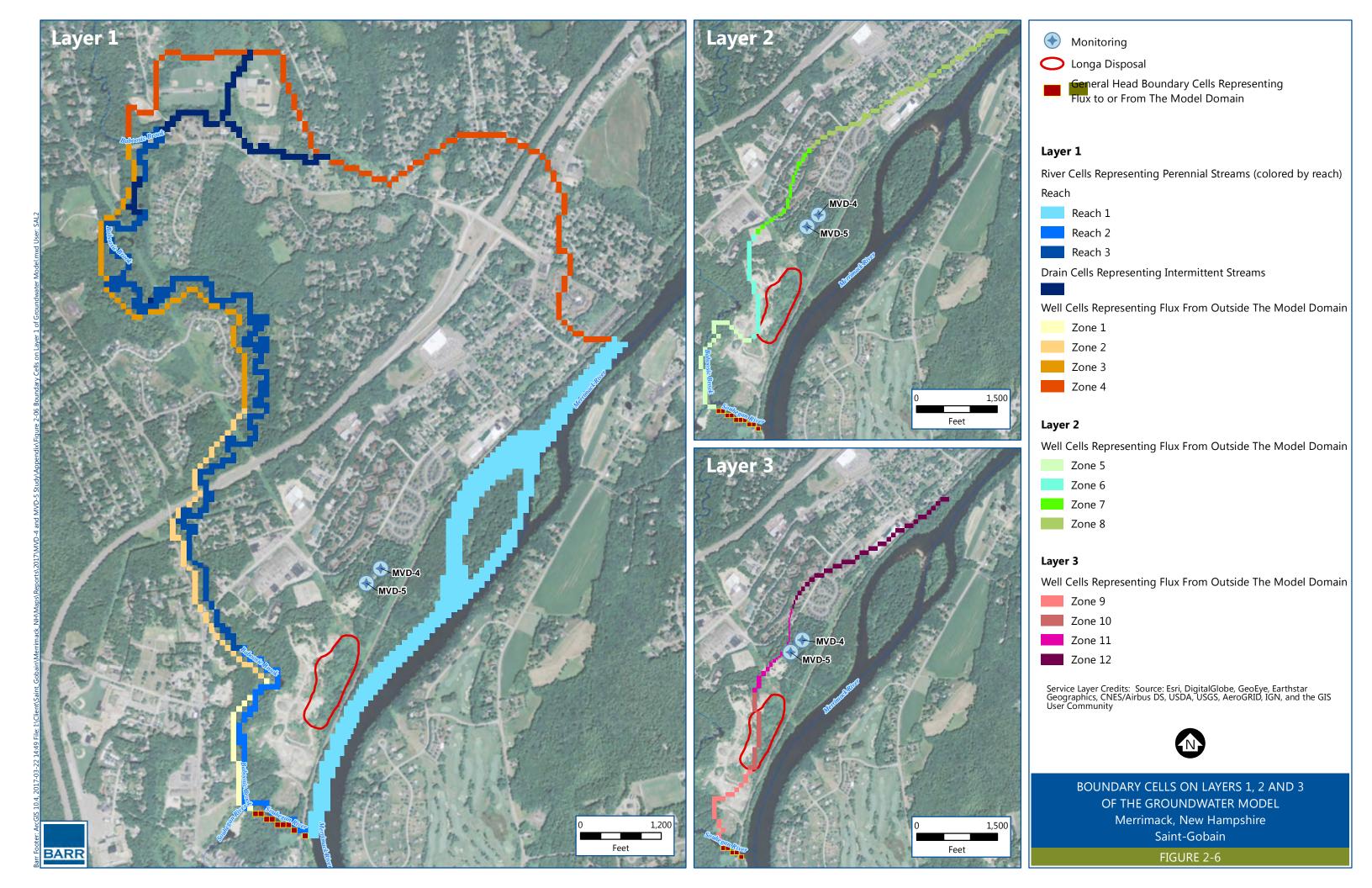




This elevations shown on this figure are feet above an arbitrary datum. Arrows show estimated directions of groundwater flow. See Figure 2-4A for site location.

Figure 2-4B Water table elevation map at the Yield House Site (from Aries Engineering, Inc., 1990) Merrimack, NH Saint-Gobain





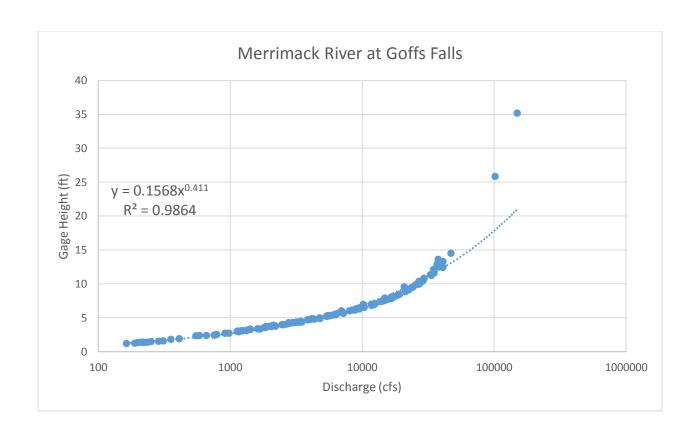


Figure 2-7
Rating Curve for the Merrimack River at
Goffs Falls
Merrimack, NH
Saint-Gobain

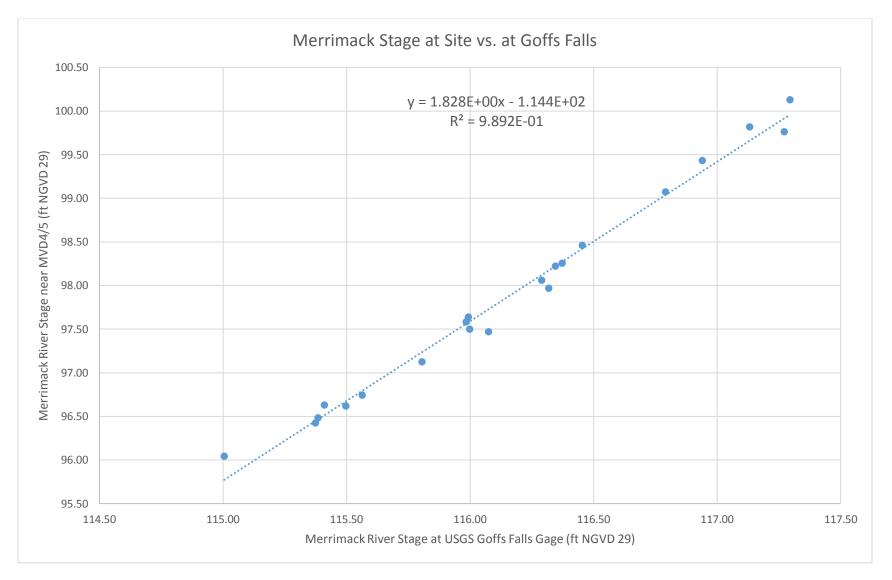
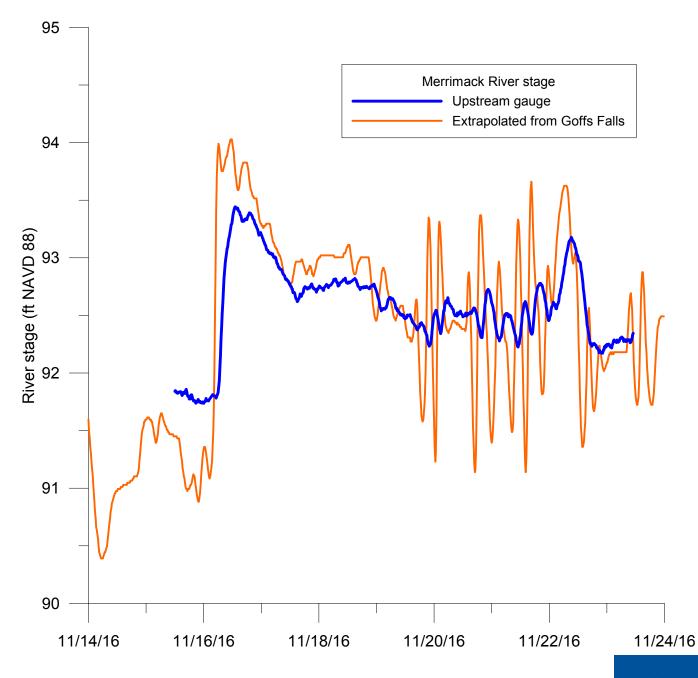
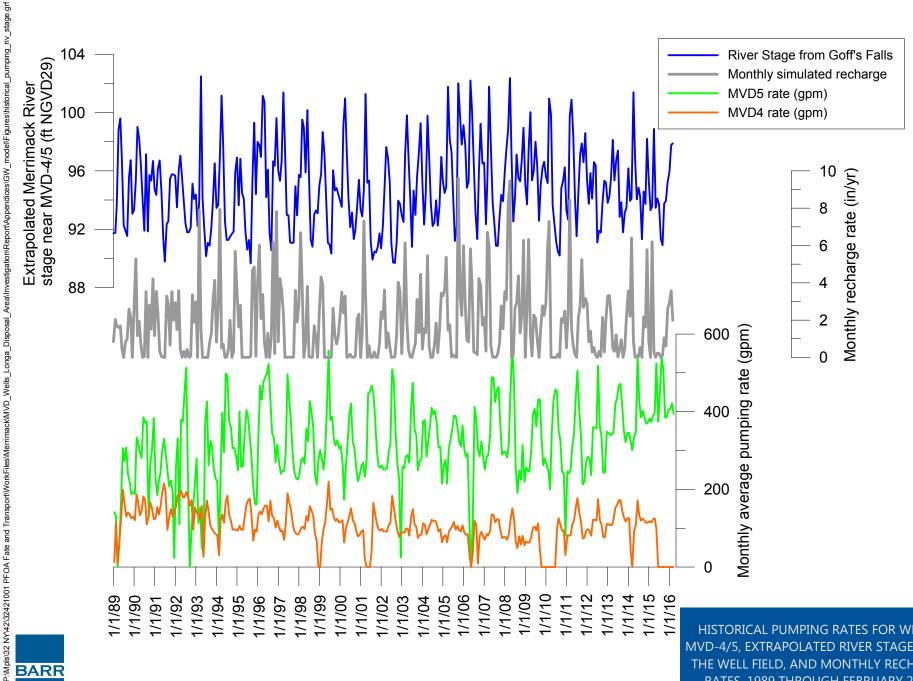


Figure 2-8
Scatter plot of estimated Merrimack River stage at MVD-4/5 vs. the stage at Goffs Falls
Merrimack, NH
Saint-Gobain



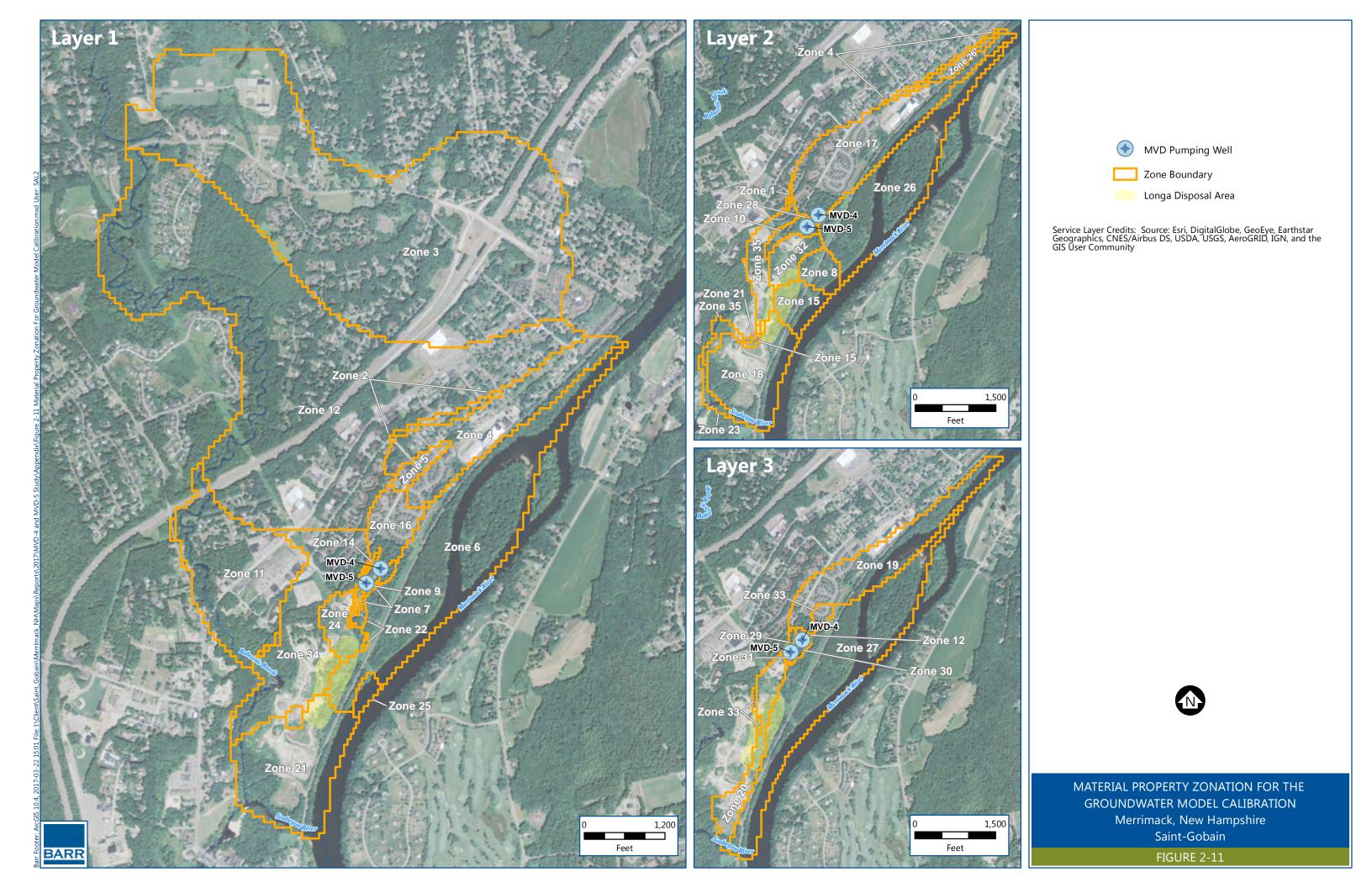


COMPARISON OF EXTRAPOLATED MERRIMACK RIVER STAGE WITH DATA FROM THE UPSTREAM GAUGE



BARR

HISTORICAL PUMPING RATES FOR WELLS THE WELL FIELD, AND MONTHLY RECHARGE RATES, 1989 THROUGH FEBRUARY 2016



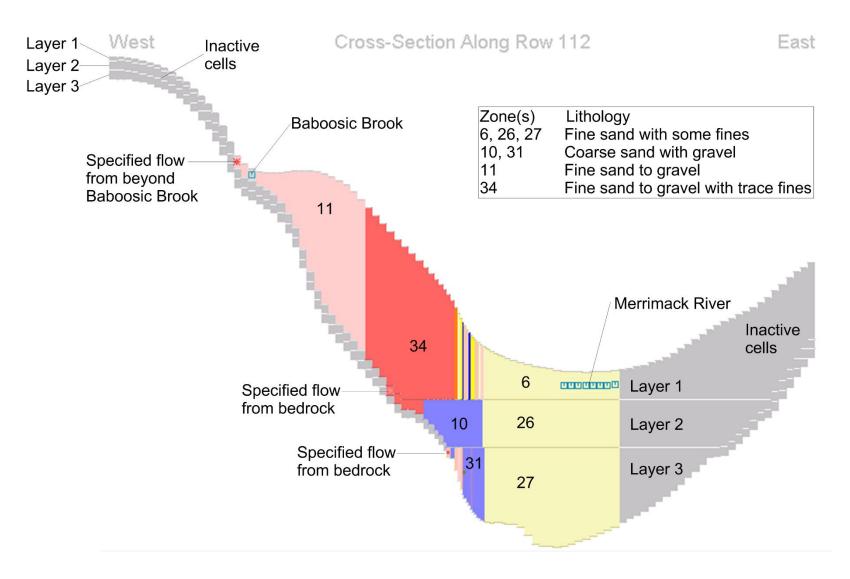
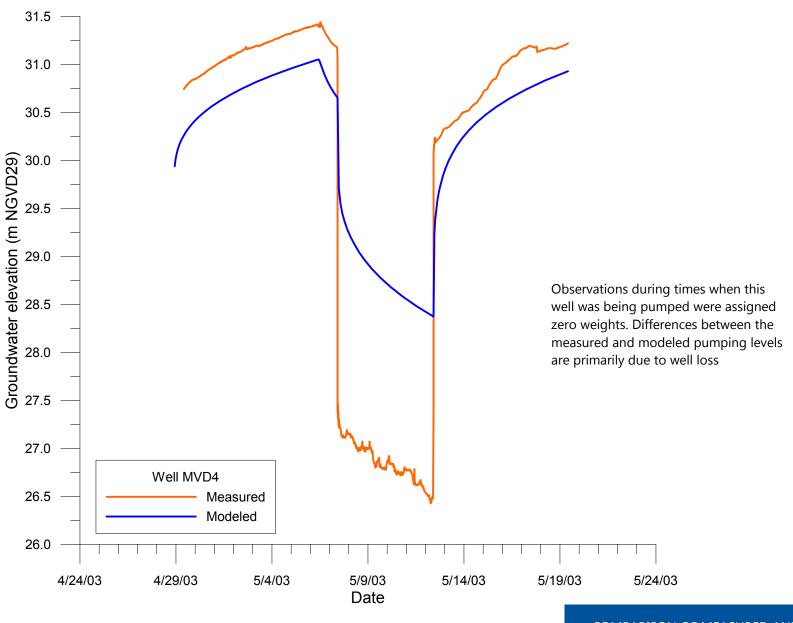
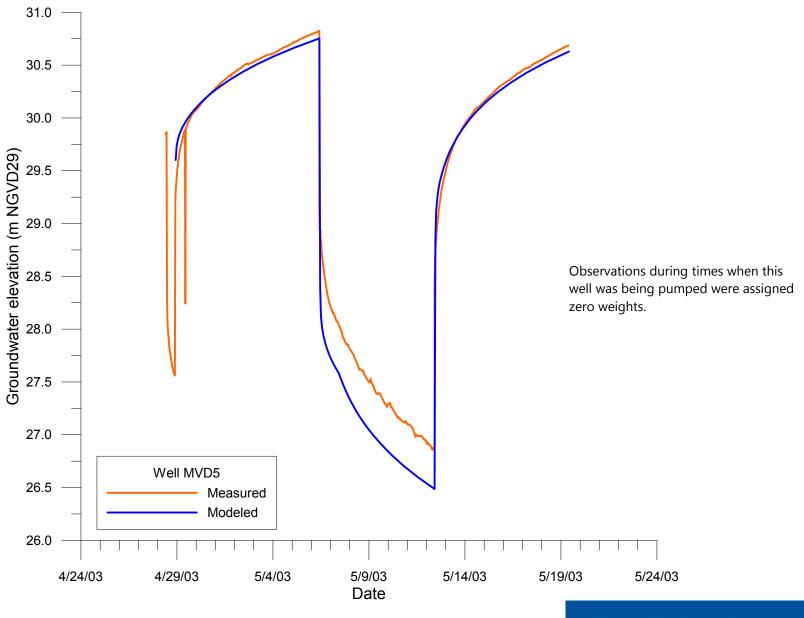


Figure 2-12
Cross section through the MVD-4/5 Model Showing the Layering, Boundary Conditions, and Lithologies Merrimack, NH
Saint-Gobain



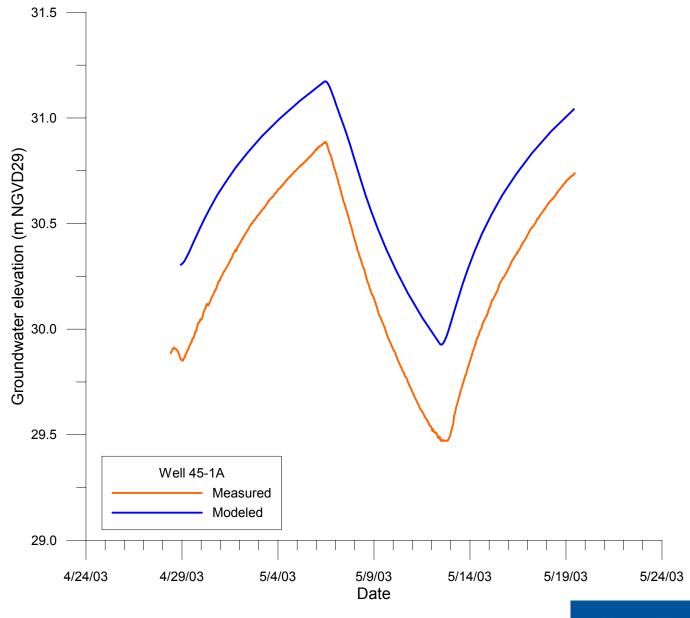


COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL MVD4 DURING THE 2003 AQUIFER TESTING

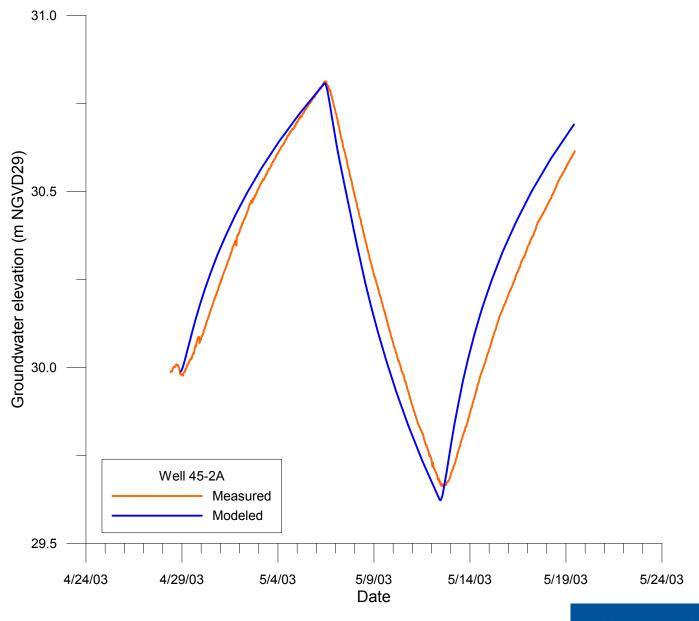




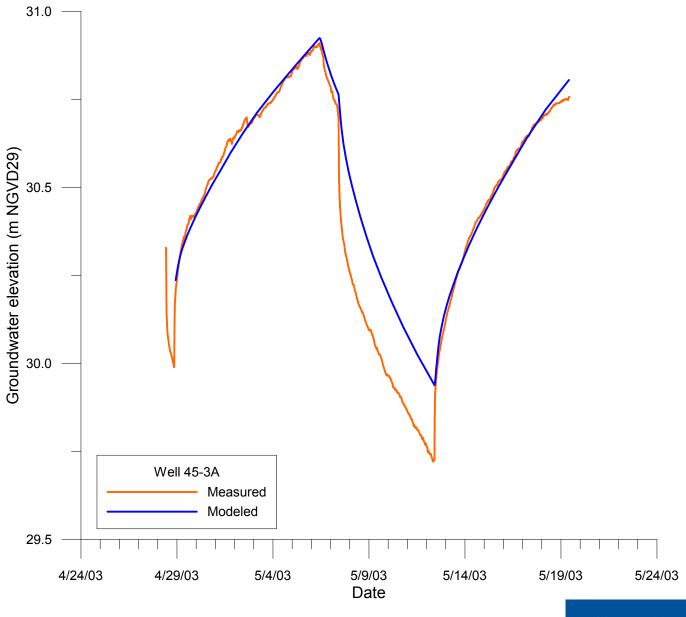
COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL MVD5 DURING THE 2003 AQUIFER TESTING



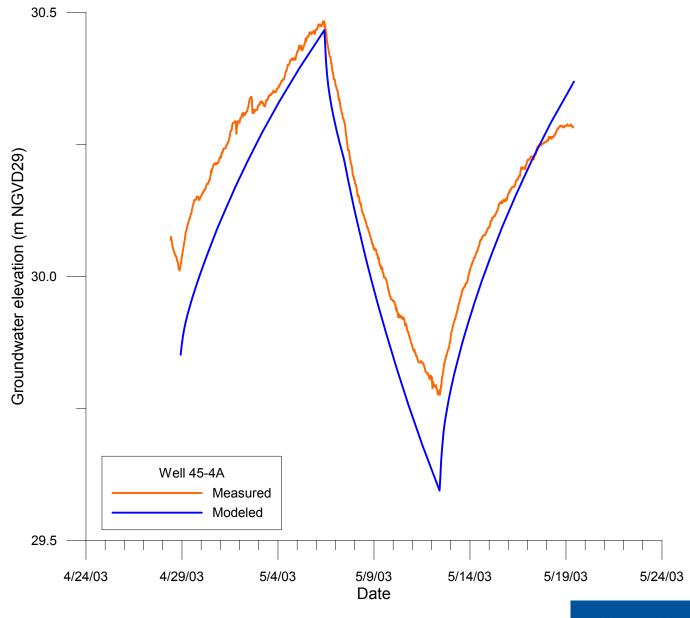
COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL 45-1A DURING THE 2003 AQUIFER TESTING



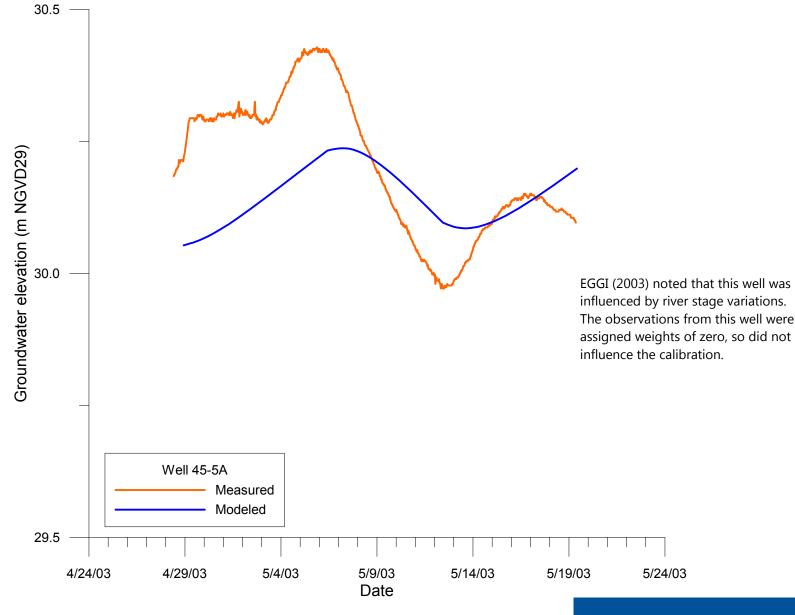
COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL 45-2A DURING THE 2003 AQUIFER TESTING



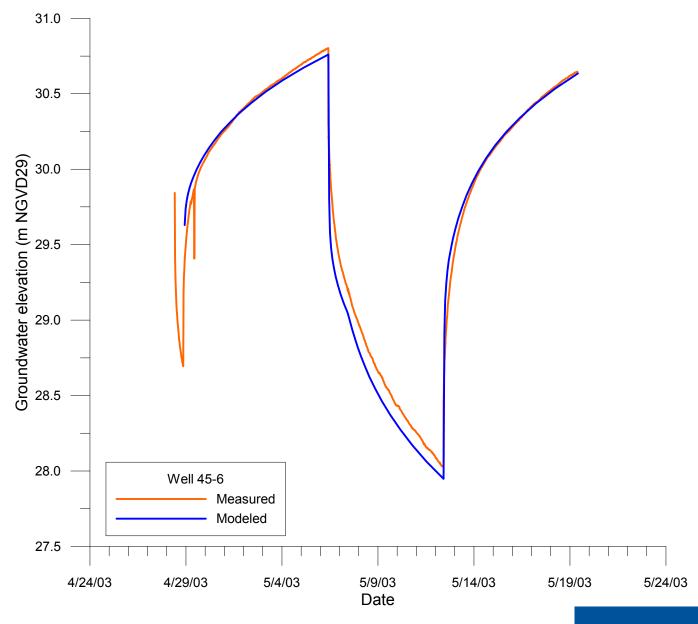
COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL 45-3A DURING THE 2003 AQUIFER TESTING



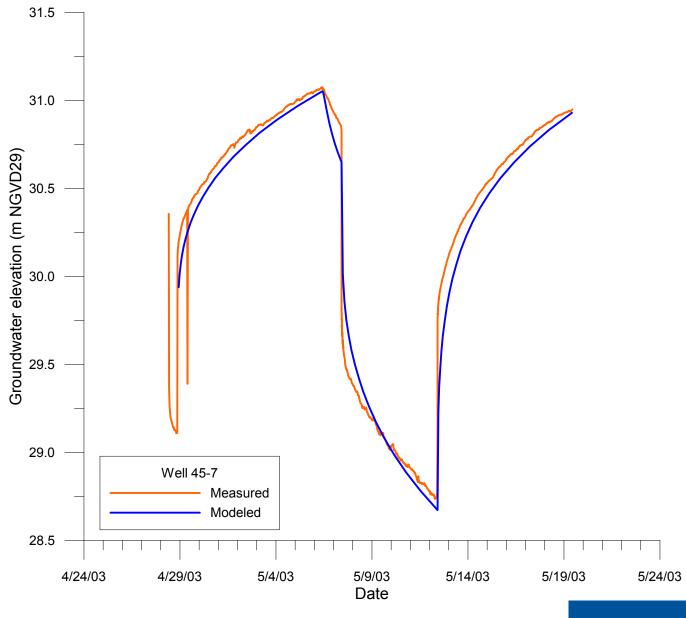
COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL 45-4A
DURING THE 2003 AQUIFER TESTING



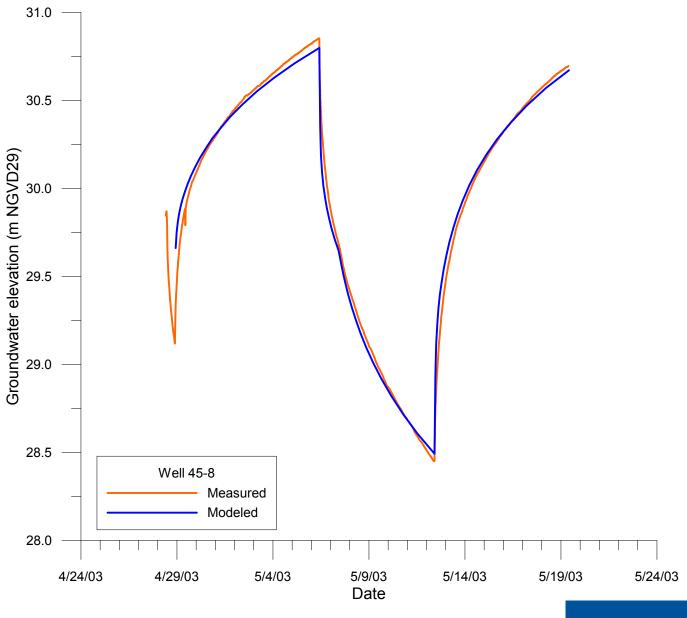
COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL 45-5A DURING THE 2003 AQUIFER TESTING



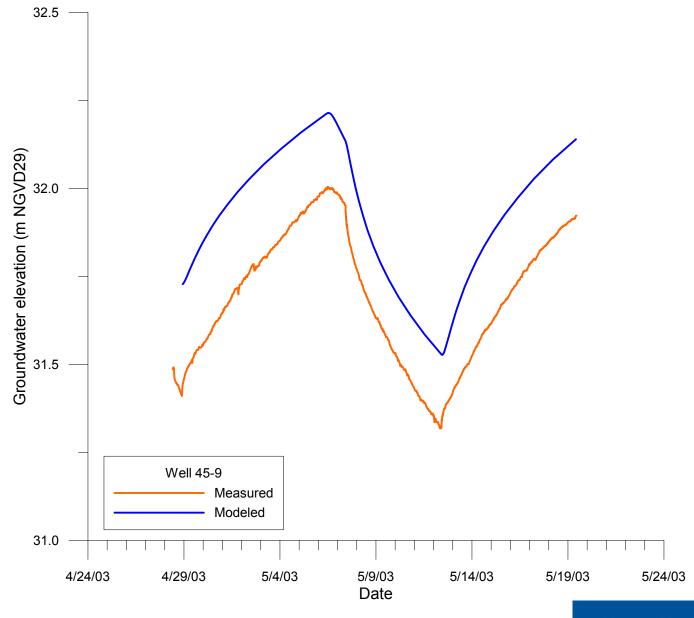




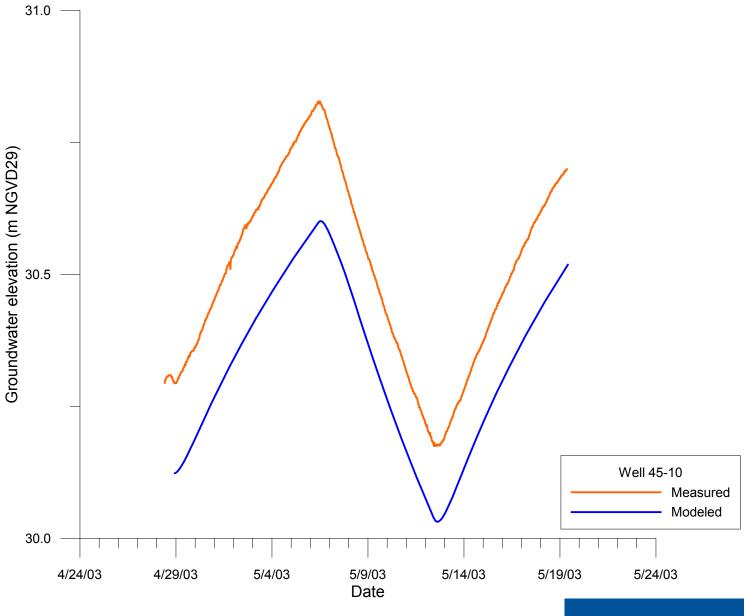
COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL 45-7
DURING THE 2003 AQUIFER TESTING



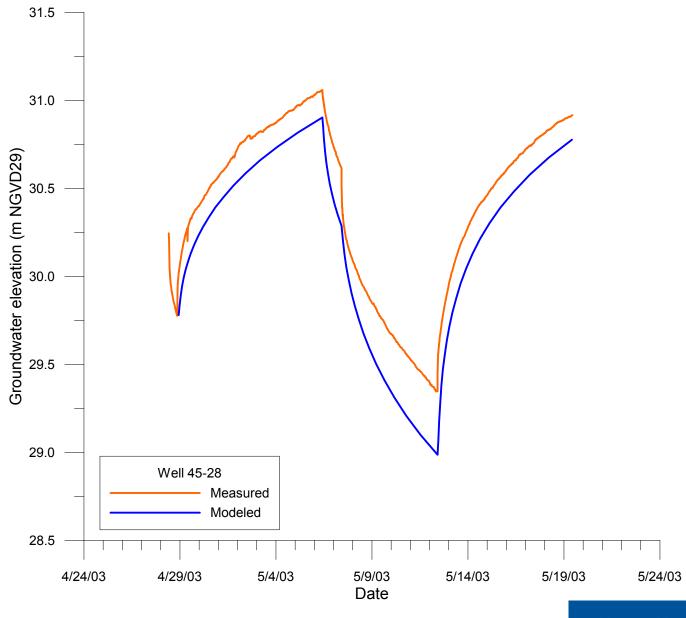




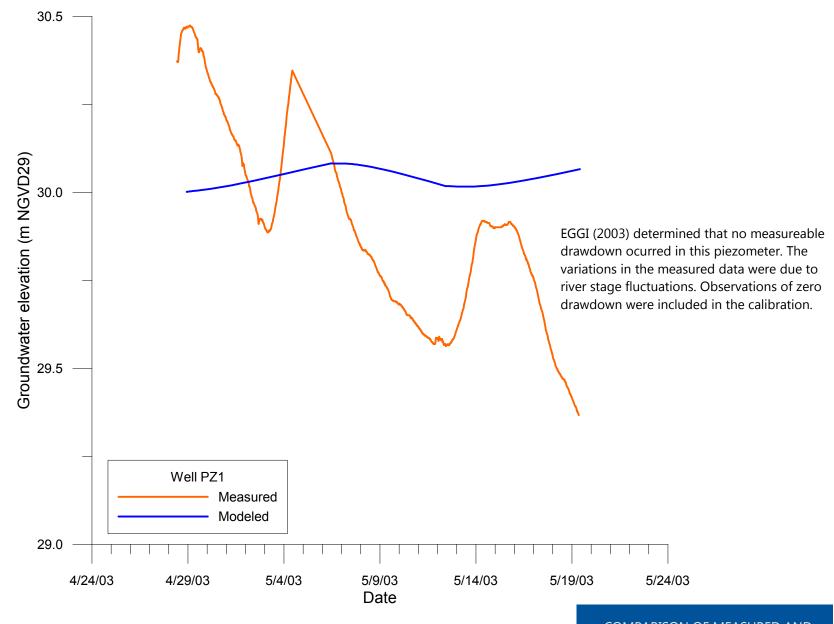
COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL 45-9
DURING THE 2003 AQUIFER TESTING





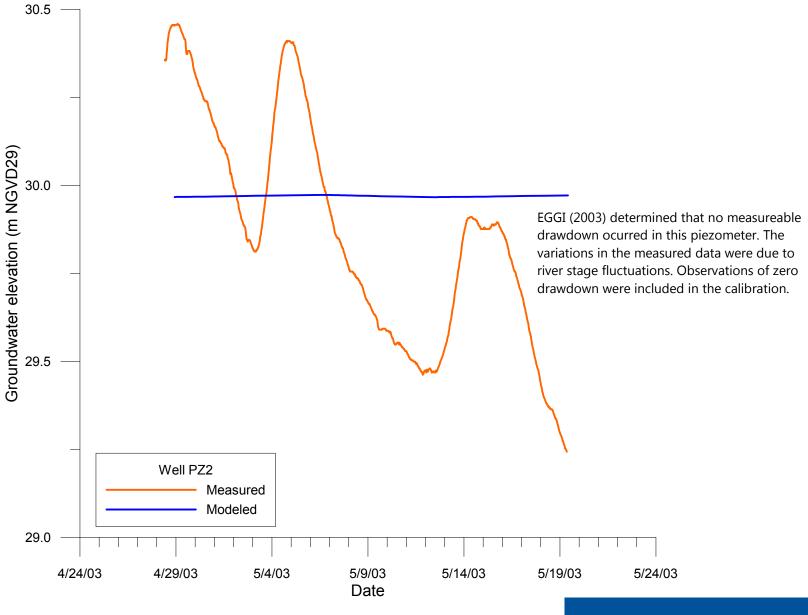


COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL 45-28
DURING THE 2003 AQUIFER TESTING



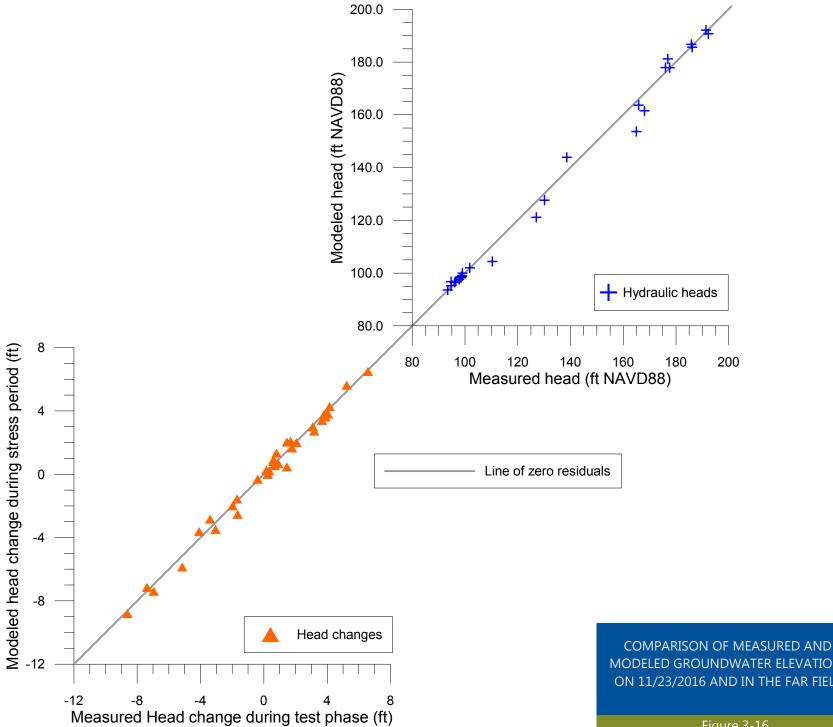


COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL PZ1 DURING THE 2003 AQUIFER TESTING





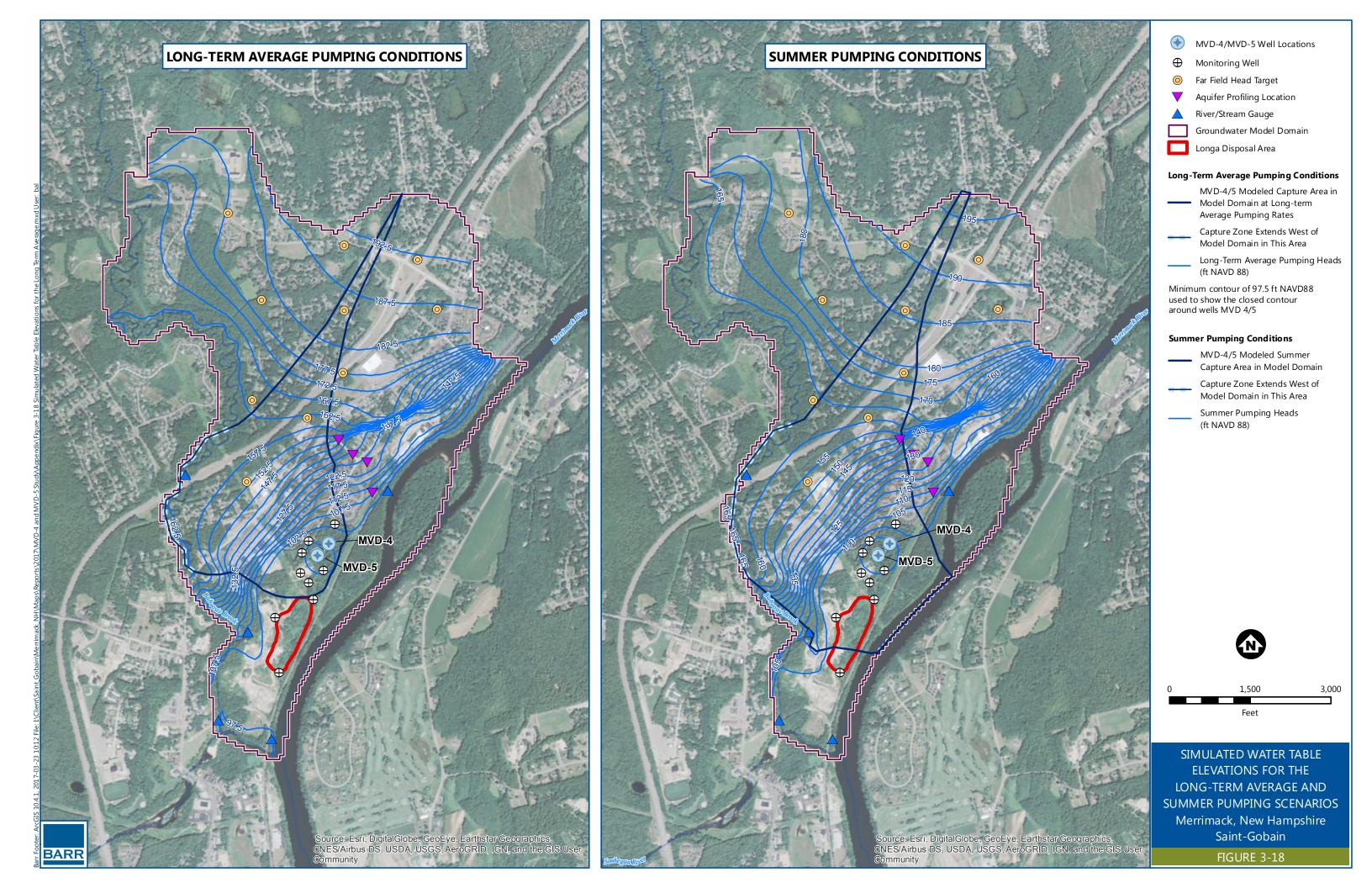
COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL PZ2 DURING THE 2003 AQUIFER TESTING





MODELED GROUNDWATER ELEVATIONS ON 11/23/2016 AND IN THE FAR FIELD

200



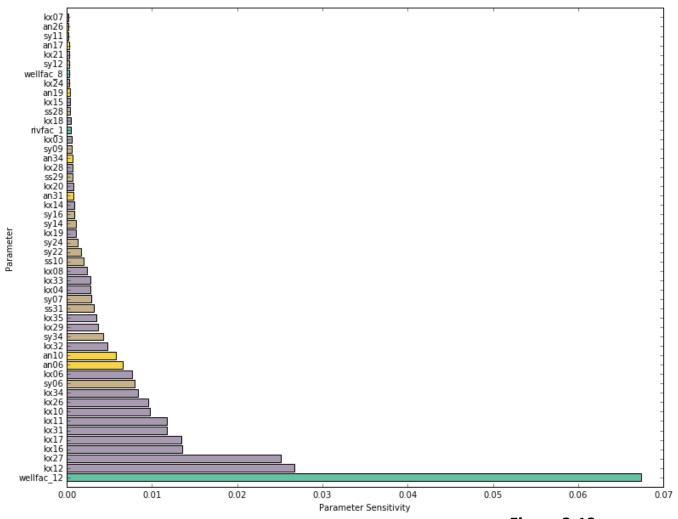


Figure 3-19
Summary of Parameter Sensitivities from the Model
Calibration
Merrimack, NH
Saint-Gobain

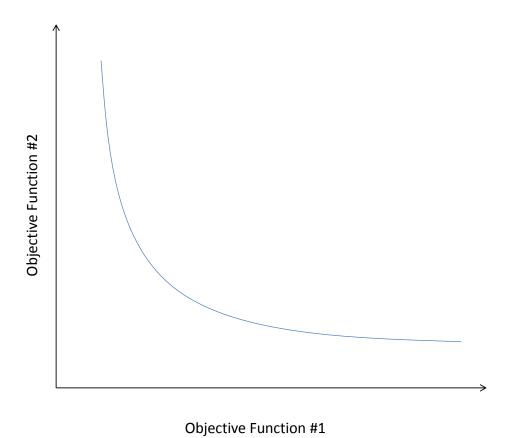


Figure 4-1
Idealized Pareto Front
Merrimack, NH
Saint-Gobain

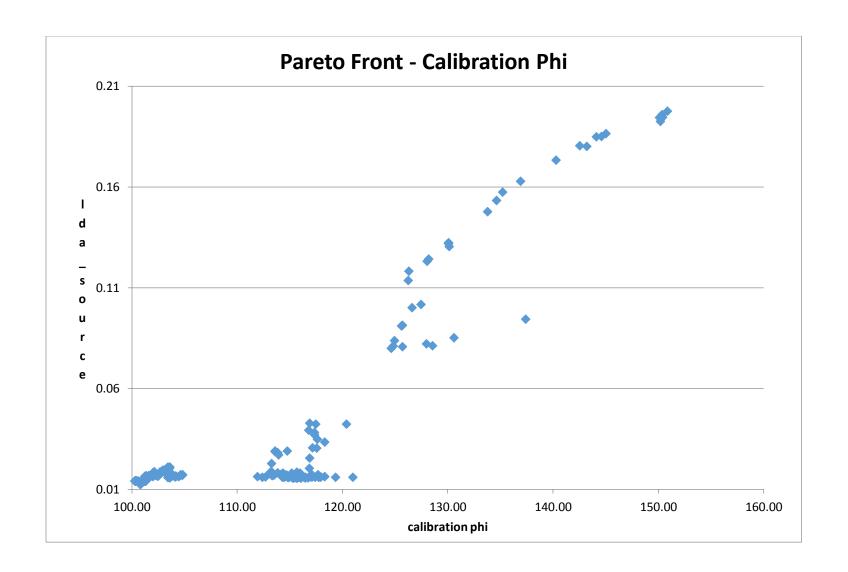


Figure 4-2
Pareto front for percentage of water pumped from MVD-4 and MVD-5 that originated under LDA
Merrimack, NH
Saint-Gobain

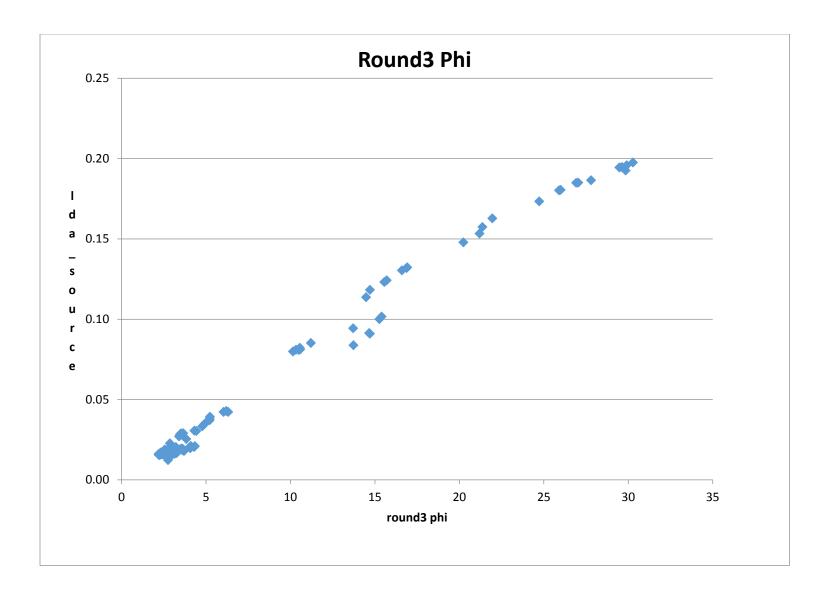
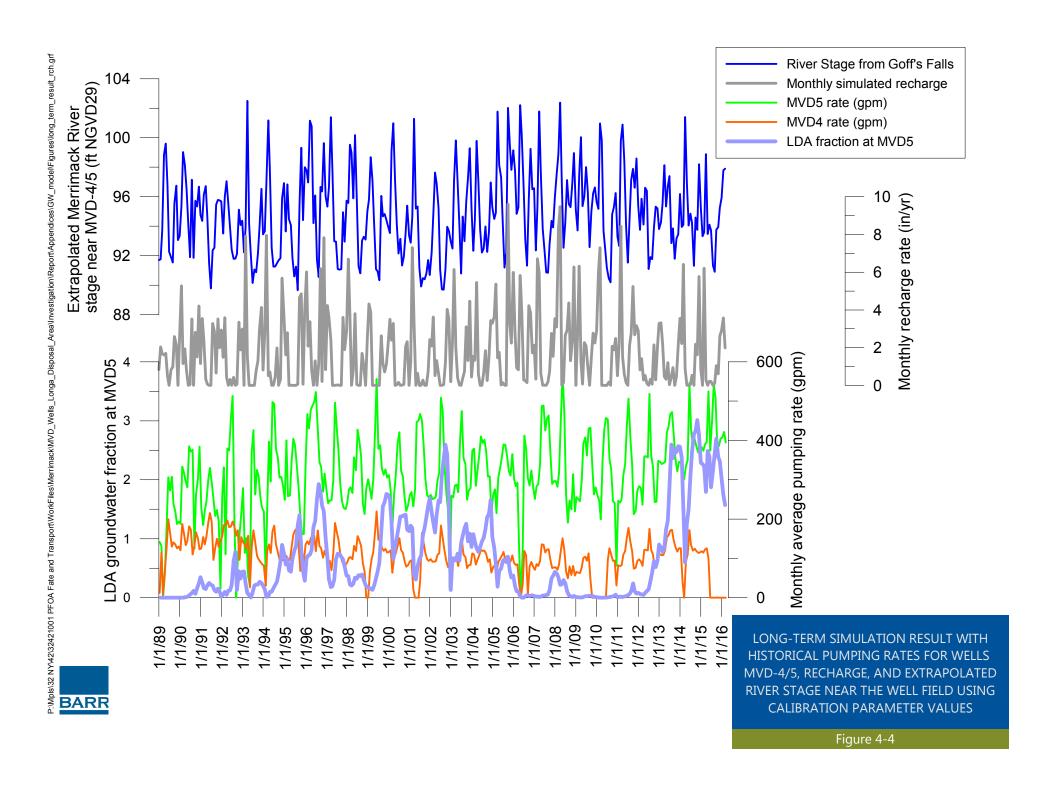


Figure 4-3
Round3 component of the calibration objective function
Merrimack, NH
Saint-Gobain



Attachment 1. Summary of observations used in the model calibration

Attachment 1.	Name	Group	Measured	Modelled	Residual	Weight
Observation		· -		r elevation data		vvcigiii
	1				· ·	2.2
lg1_r3	lg1_r3	round3	28.694	28.72948	-0.03548	2.3
lg2_r3	lg2_r3	round3	29.099	29.68768	-0.58868	2.3
lg3_r3	lg3_r3	round3	29.087	29.21355	-0.12655	2.3
mw10_r3	mw10_r3	round3	30.038	29.95492	0.08308	2.3
mw11_r3	mw11_r3	round3	29.495	29.60958	-0.11458	2.3
mw1mw_r3	mw1mw_r3	round3	30.4	30.67734	-0.27734	2.3
mw2a_r3	mw2a_r3	round3	30.306	30.26909	0.03691	2.3
mw4a_r3	mw4a_r3	round3	29.645	29.73338	-0.08838	2.3
mw6_r3	mw6_r3	round3	30.236	30.16053	0.07547	2.3
mw7_r3	mw7_r3	round3	30.37	30.37232	-0.00232	2.3
mw8_r3	mw8_r3	round3	30.257	30.19135	0.06565	2.3
mw9_r3	mw9_r3	round3	31.254	31.29155	-0.03755	2.3
ap07	ap07	profiling	42.455	44.05209	-1.59709	0.8
ap08	ap08	profiling	39.895	39.0985	0.7965	0.8
ap09	ap09	profiling	38.95	37.12554	1.82446	0.8
ap10	ap10	profiling	33.86	32.03168	1.82832	0.8
ff1	ff1	far_field	53.866	54.42661	-0.56061	1.8
ff2	ff2	far_field	58.82	58.33478	0.48522	1.8
ff3	ff3	far_field	58.542	58.75817	-0.21617	1.8
ff4	ff4	far_field	56.859	57.11157	-0.25257	1.8
ff5	ff5	far_field	56.955	56.76673	0.18827	1.8
ff6	ff6	far_field	54.157	55.41647	-1.25947	1.8
ff7	ff7	far_field	54.349	54.40462	-0.05562	1.8
ff8	ff8	far_field	50.754	50.07557	0.67843	1.8
ff9	ff9	far_field	51.452	49.43437	2.01763	1.8
ff10	ff10	far_field	50.51	47.034	3.476	1.8
Ground	lwater elevation	n data from	2003 aquifer	testing (EGGI, 2	2003; m NGVD 2	9)
mvd4_1	mvd4_1	test_data	30.742	29.93924	0.80276	0
mvd4_2	mvd4_2	test_data	30.742	30.01595	0.72605	0
mvd4_3	mvd4_3	test_data	30.742	30.0725	0.6695	0
mvd4_4	mvd4_4	test_data	30.742	30.12335	0.61865	0
mvd4_5	mvd4_5	test_data	30.742	30.17111	0.57089	0
mvd4_6	mvd4_6	test_data	30.742	30.21706	0.52494	0
mvd4_7	 mvd4_7	test_data	30.742	30.26234	0.47966	1
mvd4_8	 mvd4_8	test_data	30.784	30.30792	0.47608	1
mvd4_9	 mvd4_9	test_data	30.815	30.35451	0.46049	1
mvd4_10	 mvd4_10	test_data	30.843	30.40265	0.44035	1
			i			

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mvd4_11	mvd4_11	test_data	30.87	30.45271	0.41729	1
mvd4_12	mvd4_12	test_data	30.907	30.505	0.402	1
mvd4_13	mvd4_13	test_data	30.964	30.55988	0.40412	1
mvd4_14	mvd4_14	test_data	31.017	30.61783	0.39917	1
mvd4_15	mvd4_15	test_data	31.087	30.67945	0.40755	1
mvd4_16	mvd4_16	test_data	31.138	30.74503	0.39297	1
mvd4_17	mvd4_17	test_data	31.19	30.81474	0.37526	1
mvd4_18	mvd4_18	test_data	31.25	30.88851	0.36149	1
mvd4_19	mvd4_19	test_data	31.339	30.96701	0.37199	1
mvd4_20	mvd4_20	test_data	31.404	31.05057	0.35343	1
mvd4_21	mvd4_21	test_data	31.394	31.04403	0.34997	1
mvd4_22	mvd4_22	test_data	31.388	31.02406	0.36394	1
mvd4_23	mvd4_23	test_data	31.422	30.99248	0.42952	1
mvd4_24	mvd4_24	test_data	31.392	30.95322	0.43878	1
mvd4_25	mvd4_25	test_data	31.357	30.90945	0.44755	1
mvd4_26	mvd4_26	test_data	31.316	30.86284	0.45316	1
mvd4_27	mvd4_27	test_data	31.283	30.8139	0.4691	1
mvd4_28	mvd4_28	test_data	31.239	30.76252	0.47648	1
mvd4_29	mvd4_29	test_data	31.202	30.70843	0.49357	1
mvd4_30	mvd4_30	test_data	31.074	30.65144	0.42256	1
mvd4_31	mvd4_31	test_data	27.236	29.71194	-2.47594	0
mvd4_32	mvd4_32	test_data	27.203	29.55227	-2.34927	0
mvd4_33	mvd4_33	test_data	27.114	29.4455	-2.3315	0
mvd4_34	mvd4_34	test_data	27.117	29.35663	-2.23963	0
mvd4_35	mvd4_35	test_data	27.156	29.27533	-2.11933	0
mvd4_36	mvd4_36	test_data	27.117	29.19662	-2.07962	0
mvd4_37	mvd4_37	test_data	27.06	29.1178	-2.0578	0
mvd4_38	mvd4_38	test_data	27.004	29.03728	-2.03328	0
mvd4_39	mvd4_39	test_data	26.972	28.95403	-1.98203	0
mvd4_40	mvd4_40	test_data	26.962	28.86736	-1.90536	0
mvd4_41	mvd4_41	test_data	26.831	28.77728	-1.94628	0
mvd4_42	mvd4_42	test_data	26.84	28.68318	-1.84318	0
mvd4_43	mvd4_43	test_data	26.734	28.58454	-1.85054	0
mvd4_44	mvd4_44	test_data	26.616	28.48091	-1.86491	0
mvd4_45	mvd4_45	test_data	27.443	28.37207	-0.92907	0
mvd4_46	mvd4_46	test_data	30.172	29.22573	0.94627	0
mvd4_47	mvd4_47	test_data	30.231	29.3758	0.8552	0
mvd4_48	mvd4_48	test_data	30.197	29.48433	0.71267	0
mvd4_49	mvd4_49	test_data	30.213	29.58082	0.63218	0

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mvd4_50	mvd4_50	test_data	30.228	29.67002	0.55798	0
mvd4_51	mvd4_51	test_data	30.256	29.75399	0.50201	0
mvd4_52	mvd4_52	test_data	30.308	29.83454	0.47346	0
mvd4_53	mvd4_53	test_data	30.336	29.91332	0.42268	0
mvd4_54	mvd4_54	test_data	30.346	29.99154	0.35446	0
mvd4_55	mvd4_55	test_data	30.384	30.06994	0.31406	0
mvd4_56	mvd4_56	test_data	30.419	30.14886	0.27014	0
mvd4_57	mvd4_57	test_data	30.492	30.22842	0.26358	0
mvd4_58	mvd4_58	test_data	30.518	30.3089	0.2091	0
mvd4_59	mvd4_59	test_data	30.596	30.39035	0.20565	0
mvd4_60	mvd4_60	test_data	30.732	30.47323	0.25877	0
mvd4_61	mvd4_61	test_data	30.867	30.55804	0.30896	0
mvd4_62	mvd4_62	test_data	31.055	30.64553	0.40947	0
mvd4_63	mvd4_63	test_data	31.168	30.73666	0.43134	0
mvd4_64	mvd4_64	test_data	31.154	30.83097	0.32303	0
mvd4_65	mvd4_65	test_data	31.218	30.92756	0.29044	0
mvd5_1	mvd5_1	test_data	29.285	29.60058	-0.31558	1
mvd5_2	mvd5_2	test_data	29.43	29.73154	-0.30154	1
mvd5_3	mvd5_3	test_data	29.543	29.78982	-0.24682	1
mvd5_4	mvd5_4	test_data	29.645	29.83437	-0.18937	1
mvd5_5	mvd5_5	test_data	29.728	29.87465	-0.14665	1
mvd5_6	mvd5_6	test_data	29.804	29.91385	-0.10985	1
mvd5_7	mvd5_7	test_data	29.887	29.95366	-0.06666	1
mvd5_8	mvd5_8	test_data	29.945	29.99514	-0.05014	1
mvd5_9	mvd5_9	test_data	30.012	30.03892	-0.02692	1
mvd5_10	mvd5_10	test_data	30.065	30.08541	-0.02041	1
mvd5_11	mvd5_11	test_data	30.117	30.13489	-0.01789	1
mvd5_12	mvd5_12	test_data	30.184	30.18756	-0.00356	1
mvd5_13	mvd5_13	test_data	30.25	30.24363	0.00637	1
mvd5_14	mvd5_14	test_data	30.33	30.30334	0.02666	1
mvd5_15	mvd5_15	test_data	30.408	30.36708	0.04092	1
mvd5_16	mvd5_16	test_data	30.486	30.43517	0.05083	1
mvd5_17	mvd5_17	test_data	30.549	30.50788	0.04112	1
mvd5_18	mvd5_18	test_data	30.614	30.58517	0.02883	1
mvd5_19	mvd5_19	test_data	30.718	30.66716	0.05084	1
mvd5_20	mvd5_20	test_data	30.824	30.75409	0.06991	1
mvd5_21	mvd5_21	test_data	28.931	28.39142	0.53958	0
mvd5_22	mvd5_22	test_data	28.804	28.12196	0.68204	0
mvd5_23	mvd5_23	test_data	28.697	28.01485	0.68215	0

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mvd5_24	mvd5_24	test_data	28.592	27.94117	0.65083	0
mvd5_25	mvd5_25	test_data	28.482	27.87932	0.60268	0
mvd5_26	mvd5_26	test_data	28.371	27.82198	0.54902	0
mvd5_27	mvd5_27	test_data	28.268	27.76553	0.50247	0
mvd5_28	mvd5_28	test_data	28.189	27.70801	0.48099	0
mvd5_29	mvd5_29	test_data	28.126	27.64835	0.47765	0
mvd5_30	mvd5_30	test_data	28.045	27.586	0.459	0
mvd5_31	mvd5_31	test_data	28.018	27.55664	0.46136	0
mvd5_32	mvd5_32	test_data	27.98	27.51654	0.46346	0
mvd5_33	mvd5_33	test_data	27.914	27.46921	0.44479	0
mvd5_34	mvd5_34	test_data	27.869	27.41679	0.45221	0
mvd5_35	mvd5_35	test_data	27.836	27.35981	0.47619	0
mvd5_36	mvd5_36	test_data	27.783	27.29811	0.48489	0
mvd5_37	mvd5_37	test_data	27.706	27.23129	0.47471	0
mvd5_38	mvd5_38	test_data	27.618	27.159	0.459	0
mvd5_39	mvd5_39	test_data	27.539	27.08098	0.45802	0
mvd5_40	mvd5_40	test_data	27.462	26.99705	0.46495	0
mvd5_41	mvd5_41	test_data	27.361	26.90718	0.45382	0
mvd5_42	mvd5_42	test_data	27.264	26.81125	0.45275	0
mvd5_43	mvd5_43	test_data	27.119	26.70918	0.40982	0
mvd5_44	mvd5_44	test_data	26.993	26.60093	0.39207	0
mvd5_45	mvd5_45	test_data	26.88	26.48652	0.39348	0
mvd5_46	mvd5_46	test_data	28.706	28.84342	-0.13742	0
mvd5_47	mvd5_47	test_data	28.848	29.1206	-0.2726	0
mvd5_48	mvd5_48	test_data	28.984	29.2375	-0.2535	0
mvd5_49	mvd5_49	test_data	29.096	29.32285	-0.22685	0
mvd5_50	mvd5_50	test_data	29.212	29.39709	-0.18509	0
mvd5_51	mvd5_51	test_data	29.324	29.4668	-0.1428	0
mvd5_52	mvd5_52	test_data	29.424	29.53527	-0.11127	0
mvd5_53	mvd5_53	test_data	29.53	29.60452	-0.07452	0
mvd5_54	mvd5_54	test_data	29.632	29.67568	-0.04368	0
mvd5_55	mvd5_55	test_data	29.736	29.74924	-0.01324	0
mvd5_56	mvd5_56	test_data	29.825	29.82535	-0.00035	0
mvd5_57	mvd5_57	test_data	29.915	29.90394	0.01106	0
mvd5_58	mvd5_58	test_data	30.003	29.98498	0.01802	0
mvd5_59	mvd5_59	test_data	30.098	30.06842	0.02958	0
mvd5_60	mvd5_60	test_data	30.177	30.15433	0.02267	0
mvd5_61	mvd5_61	test_data	30.28	30.24285	0.03715	0
mvd5_62	mvd5_62	test_data	30.369	30.33425	0.03475	0

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mvd5_63	mvd5_63	test_data	30.473	30.42896	0.04404	0
mvd5_64	mvd5_64	test_data	30.574	30.52714	0.04686	0
mvd5_65	mvd5_65	test_data	30.687	30.6282	0.0588	0
mw10_1	mw10_1	test_data	30.294	30.12319	0.17081	1
mw10_2	mw10_2	test_data	30.294	30.1239	0.1701	1
mw10_3	mw10_3	test_data	30.297	30.12538	0.17162	1
mw10_4	mw10_4	test_data	30.303	30.12792	0.17508	1
mw10_5	mw10_5	test_data	30.309	30.13185	0.17715	1
mw10_6	mw10_6	test_data	30.315	30.13749	0.17751	1
mw10_7	mw10_7	test_data	30.325	30.14519	0.17981	1
mw10_8	mw10_8	test_data	30.334	30.15533	0.17867	1
mw10_9	mw10_9	test_data	30.347	30.16828	0.17872	1
mw10_10	mw10_10	test_data	30.358	30.18439	0.17361	1
mw10_11	mw10_11	test_data	30.376	30.20403	0.17197	1
mw10_12	mw10_12	test_data	30.408	30.22762	0.18038	1
mw10_13	mw10_13	test_data	30.439	30.25545	0.18355	1
mw10_14	mw10_14	test_data	30.478	30.28786	0.19014	1
mw10_15	mw10_15	test_data	30.523	30.32519	0.19781	1
mw10_16	mw10_16	test_data	30.574	30.36782	0.20618	1
mw10_17	mw10_17	test_data	30.62	30.41613	0.20387	1
mw10_18	mw10_18	test_data	30.675	30.47044	0.20456	1
mw10_19	mw10_19	test_data	30.746	30.53104	0.21496	1
mw10_20	mw10_20	test_data	30.827	30.59808	0.22892	1
mw10_21	mw10_21	test_data	30.827	30.59966	0.22734	1
mw10_22	mw10_22	test_data	30.827	30.60075	0.22625	1
mw10_23	mw10_23	test_data	30.822	30.6009	0.2211	1
mw10_24	mw10_24	test_data	30.818	30.59965	0.21835	1
mw10_25	mw10_25	test_data	30.812	30.59659	0.21541	1
mw10_26	mw10_26	test_data	30.802	30.5913	0.2107	1
mw10_27	mw10_27	test_data	30.788	30.58338	0.20462	1
mw10_28	mw10_28	test_data	30.771	30.57241	0.19859	1
mw10_29	mw10_29	test_data	30.75	30.55802	0.19198	1
mw10_30	mw10_30	test_data	30.724	30.53986	0.18414	1
mw10_31	mw10_31	test_data	30.72	30.53339	0.18661	1
mw10_32	mw10_32	test_data	30.708	30.52544	0.18256	1
mw10_33	mw10_33	test_data	30.696	30.51555	0.18045	1
mw10_34	mw10_34	test_data	30.678	30.50323	0.17477	1
mw10_35	mw10_35	test_data	30.661	30.48795	0.17305	1
mw10_36	mw10_36	test_data	30.641	30.46908	0.17192	1

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw10_37	mw10_37	test_data	30.614	30.44599	0.16801	1
mw10_38	mw10_38	test_data	30.584	30.41805	0.16595	1
mw10_39	mw10_39	test_data	30.549	30.38462	0.16438	1
mw10_40	mw10_40	test_data	30.509	30.34513	0.16387	1
mw10_41	mw10_41	test_data	30.462	30.29903	0.16297	1
mw10_42	mw10_42	test_data	30.404	30.24583	0.15817	1
mw10_43	mw10_43	test_data	30.341	30.18506	0.15594	1
mw10_44	mw10_44	test_data	30.267	30.11634	0.15066	1
mw10_45	mw10_45	test_data	30.181	30.03935	0.14165	1
mw10_46	mw10_46	test_data	30.178	30.03653	0.14147	1
mw10_47	mw10_47	test_data	30.175	30.03396	0.14104	1
mw10_48	mw10_48	test_data	30.176	30.03207	0.14393	1
mw10_49	mw10_49	test_data	30.177	30.0313	0.1457	1
mw10_50	mw10_50	test_data	30.178	30.03211	0.14589	1
mw10_51	mw10_51	test_data	30.178	30.035	0.143	1
mw10_52	mw10_52	test_data	30.184	30.04045	0.14355	1
mw10_53	mw10_53	test_data	30.197	30.04897	0.14803	1
mw10_54	mw10_54	test_data	30.21	30.06106	0.14894	1
mw10_55	mw10_55	test_data	30.229	30.07718	0.15182	1
mw10_56	mw10_56	test_data	30.251	30.09772	0.15328	1
mw10_57	mw10_57	test_data	30.271	30.123	0.148	1
mw10_58	mw10_58	test_data	30.306	30.15323	0.15277	1
mw10_59	mw10_59	test_data	30.345	30.18858	0.15642	1
mw10_60	mw10_60	test_data	30.382	30.22911	0.15289	1
mw10_61	mw10_61	test_data	30.438	30.27517	0.16283	1
mw10_62	mw10_62	test_data	30.494	30.32689	0.16711	1
mw10_63	mw10_63	test_data	30.561	30.3845	0.1765	1
mw10_64	mw10_64	test_data	30.632	30.44832	0.18368	1
mw10_65	mw10_65	test_data	30.699	30.51846	0.18054	1
mw1a_1	mw1a_1	test_data	29.859	30.30488	-0.44588	1
mw1a_2	mw1a_2	test_data	29.855	30.30712	-0.45212	1
mw1a_3	mw1a_3	test_data	29.852	30.31188	-0.45988	1
mw1a_4	mw1a_4	test_data	29.864	30.32008	-0.45608	1
mw1a_5	mw1a_5	test_data	29.881	30.33261	-0.45161	1
mw1a_6	mw1a_6	test_data	29.898	30.3502	-0.4522	1
mw1a_7	mw1a_7	test_data	29.925	30.37344	-0.44844	1
mw1a_8	mw1a_8	test_data	29.955	30.40263	-0.44763	1
mw1a_9	mw1a_9	test_data	29.99	30.43785	-0.44785	1
mw1a_10	mw1a_10	test_data	30.041	30.47901	-0.43801	1

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw1a_11	mw1a_11	test_data	30.093	30.52584	-0.43284	1
mw1a_12	mw1a_12	test_data	30.137	30.57804	-0.44104	1
mw1a_13	mw1a_13	test_data	30.21	30.6353	-0.4253	1
mw1a_14	mw1a_14	test_data	30.286	30.69742	-0.41142	1
mw1a_15	mw1a_15	test_data	30.376	30.76433	-0.38833	1
mw1a_16	mw1a_16	test_data	30.468	30.83607	-0.36807	1
mw1a_17	mw1a_17	test_data	30.561	30.91271	-0.35171	1
mw1a_18	mw1a_18	test_data	30.665	30.99422	-0.32922	1
mw1a_19	mw1a_19	test_data	30.77	31.08059	-0.31059	1
mw1a_20	mw1a_20	test_data	30.882	31.17179	-0.28979	1
mw1a_21	mw1a_21	test_data	30.885	31.17332	-0.28832	1
mw1a_22	mw1a_22	test_data	30.885	31.17261	-0.28761	1
mw1a_23	mw1a_23	test_data	30.875	31.16828	-0.29328	1
mw1a_24	mw1a_24	test_data	30.852	31.15909	-0.30709	1
mw1a_25	mw1a_25	test_data	30.832	31.14403	-0.31203	1
mw1a_26	mw1a_26	test_data	30.809	31.12236	-0.31336	1
mw1a_27	mw1a_27	test_data	30.768	31.09365	-0.32565	1
mw1a_28	mw1a_28	test_data	30.727	31.0578	-0.3308	1
mw1a_29	mw1a_29	test_data	30.675	31.01491	-0.33991	1
mw1a_30	mw1a_30	test_data	30.605	30.96525	-0.36025	1
mw1a_31	mw1a_31	test_data	30.588	30.94765	-0.35965	1
mw1a_32	mw1a_32	test_data	30.563	30.92562	-0.36262	1
mw1a_33	mw1a_33	test_data	30.531	30.89773	-0.36673	1
mw1a_34	mw1a_34	test_data	30.493	30.86264	-0.36964	1
mw1a_35	mw1a_35	test_data	30.442	30.8193	-0.3773	1
mw1a_36	mw1a_36	test_data	30.388	30.7671	-0.3791	1
mw1a_37	mw1a_37	test_data	30.331	30.70587	-0.37487	1
mw1a_38	mw1a_38	test_data	30.257	30.6358	-0.3788	1
mw1a_39	mw1a_39	test_data	30.173	30.55729	-0.38429	1
mw1a_40	mw1a_40	test_data	30.081	30.4708	-0.3898	1
mw1a_41	mw1a_41	test_data	29.982	30.37679	-0.39479	1
mw1a_42	mw1a_42	test_data	29.873	30.27565	-0.40265	1
mw1a_43	mw1a_43	test_data	29.748	30.16768	-0.41968	1
mw1a_44	mw1a_44	test_data	29.607	30.05313	-0.44613	1
mw1a_45	mw1a_45	test_data	29.486	29.93222	-0.44622	1
mw1a_46	mw1a_46	test_data	29.48	29.92833	-0.44833	1
mw1a_47	mw1a_47	test_data	29.474	29.92632	-0.45232	1
mw1a_48	mw1a_48	test_data	29.475	29.9278	-0.4528	1
mw1a_49	mw1a_49	test_data	29.471	29.93435	-0.46335	1

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw1a_50	mw1a_50	test_data	29.471	29.9475	-0.4765	1
mw1a_51	mw1a_51	test_data	29.471	29.96864	-0.49764	1
mw1a_52	mw1a_52	test_data	29.481	29.99878	-0.51778	1
mw1a_53	mw1a_53	test_data	29.521	30.03848	-0.51748	1
mw1a_54	mw1a_54	test_data	29.596	30.08778	-0.49178	1
mw1a_55	mw1a_55	test_data	29.664	30.14624	-0.48224	1
mw1a_56	mw1a_56	test_data	29.738	30.21302	-0.47502	1
mw1a_57	mw1a_57	test_data	29.82	30.28707	-0.46707	1
mw1a_58	mw1a_58	test_data	29.917	30.36724	-0.45024	1
mw1a_59	mw1a_59	test_data	30.017	30.4525	-0.4355	1
mw1a_60	mw1a_60	test_data	30.127	30.54202	-0.41502	1
mw1a_61	mw1a_61	test_data	30.24	30.63524	-0.39524	1
mw1a_62	mw1a_62	test_data	30.351	30.73188	-0.38088	1
mw1a_63	mw1a_63	test_data	30.482	30.83192	-0.34992	1
mw1a_64	mw1a_64	test_data	30.61	30.93531	-0.32531	1
mw1a_65	mw1a_65	test_data	30.733	31.04173	-0.30873	1
mw28_1	mw28_1	test_data	30.015	29.78023	0.23477	1
mw28_2	mw28_2	test_data	30.058	29.83724	0.22076	1
mw28_3	mw28_3	test_data	30.097	29.89216	0.20484	1
mw28_4	mw28_4	test_data	30.147	29.94296	0.20404	1
mw28_5	mw28_5	test_data	30.192	29.99065	0.20135	1
mw28_6	mw28_6	test_data	30.239	30.03672	0.20228	1
mw28_7	mw28_7	test_data	30.263	30.0825	0.1805	1
mw28_8	mw28_8	test_data	30.33	30.12903	0.20097	1
mw28_9	mw28_9	test_data	30.362	30.17703	0.18497	1
mw28_10	mw28_10	test_data	30.395	30.22699	0.16801	1
mw28_11	mw28_11	test_data	30.434	30.27922	0.15478	1
mw28_12	mw28_12	test_data	30.493	30.33399	0.15901	1
mw28_13	mw28_13	test_data	30.546	30.39156	0.15444	1
mw28_14	mw28_14	test_data	30.603	30.45231	0.15069	1
mw28_15	mw28_15	test_data	30.682	30.5167	0.1653	1
mw28_16	mw28_16	test_data	30.779	30.58512	0.19388	1
mw28_17	mw28_17	test_data	30.821	30.65782	0.16318	1
mw28_18	mw28_18	test_data	30.878	30.73476	0.14324	1
mw28_19	mw28_19	test_data	30.971	30.81624	0.15476	1
mw28_20	mw28_20	test_data	31.059	30.90262	0.15638	1
mw28_21	mw28_21	test_data	31.009	30.84835	0.16065	1
mw28_22	mw28_22	test_data	30.974	30.77765	0.19635	1
mw28_23	mw28_23	test_data	30.937	30.70886	0.22814	1

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw28_24	mw28_24	test_data	30.899	30.64507	0.25393	1
mw28_25	mw28_25	test_data	30.859	30.58517	0.27383	1
mw28_26	mw28_26	test_data	30.817	30.52727	0.28973	1
mw28_27	mw28_27	test_data	30.768	30.46957	0.29843	1
mw28_28	mw28_28	test_data	30.722	30.41074	0.31126	1
mw28_29	mw28_29	test_data	30.671	30.34989	0.32111	1
mw28_30	mw28_30	test_data	30.614	30.28651	0.32749	1
mw28_31	mw28_31	test_data	30.34	30.20871	0.13129	1
mw28_32	mw28_32	test_data	30.266	30.12735	0.13865	1
mw28_33	mw28_33	test_data	30.208	30.05137	0.15663	1
mw28_34	mw28_34	test_data	30.158	29.97848	0.17952	1
mw28_35	mw28_35	test_data	30.109	29.90603	0.20297	1
mw28_36	mw28_36	test_data	30.061	29.83217	0.22883	1
mw28_37	mw28_37	test_data	30.005	29.75565	0.24935	1
mw28_38	mw28_38	test_data	29.941	29.67566	0.26534	1
mw28_39	mw28_39	test_data	29.878	29.5916	0.2864	1
mw28_40	mw28_40	test_data	29.814	29.50306	0.31094	1
mw28_41	mw28_41	test_data	29.736	29.40995	0.32605	1
mw28_42	mw28_42	test_data	29.651	29.31196	0.33904	1
mw28_43	mw28_43	test_data	29.56	29.2088	0.3512	1
mw28_44	mw28_44	test_data	29.459	29.10023	0.35877	1
mw28_45	mw28_45	test_data	29.346	28.98612	0.35988	1
mw28_46	mw28_46	test_data	29.566	29.06891	0.49709	1
mw28_47	mw28_47	test_data	29.619	29.17796	0.44104	1
mw28_48	mw28_48	test_data	29.671	29.28375	0.38725	1
mw28_49	mw28_49	test_data	29.724	29.38072	0.34328	1
mw28_50	mw28_50	test_data	29.781	29.46996	0.31104	1
mw28_51	mw28_51	test_data	29.838	29.55391	0.28409	1
mw28_52	mw28_52	test_data	29.898	29.63496	0.26304	1
mw28_53	mw28_53	test_data	29.97	29.71502	0.25498	1
mw28_54	mw28_54	test_data	30.036	29.79532	0.24068	1
mw28_55	mw28_55	test_data	30.109	29.87654	0.23246	1
mw28_56	mw28_56	test_data	30.184	29.95891	0.22509	1
mw28_57	mw28_57	test_data	30.252	30.04247	0.20953	1
mw28_58	mw28_58	test_data	30.335	30.12728	0.20772	1
mw28_59	mw28_59	test_data	30.412	30.21337	0.19863	1
mw28_60	mw28_60	test_data	30.482	30.30101	0.18099	1
mw28_61	mw28_61	test_data	30.564	30.39052	0.17348	1
mw28_62	mw28_62	test_data	30.653	30.48243	0.17057	1

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw28_63	mw28_63	test_data	30.741	30.57746	0.16354	1
mw28_64	mw28_64	test_data	30.834	30.67562	0.15838	1
mw28_65	mw28_65	test_data	30.916	30.7762	0.1398	1
mw2a_1	mw2a_1	test_data	29.98	29.9877	-0.0077	1
mw2a_2	mw2a_2	test_data	29.98	29.99193	-0.01193	1
mw2a_3	mw2a_3	test_data	29.977	30.00003	-0.02303	1
mw2a_4	mw2a_4	test_data	29.986	30.01242	-0.02642	1
mw2a_5	mw2a_5	test_data	29.995	30.02921	-0.03421	1
mw2a_6	mw2a_6	test_data	30.008	30.05045	-0.04245	1
mw2a_7	mw2a_7	test_data	30.02	30.0761	-0.0561	1
mw2a_8	mw2a_8	test_data	30.037	30.10613	-0.06913	1
mw2a_9	mw2a_9	test_data	30.06	30.14045	-0.08045	1
mw2a_10	mw2a_10	test_data	30.072	30.17898	-0.10698	1
mw2a_11	mw2a_11	test_data	30.111	30.22164	-0.11064	1
mw2a_12	mw2a_12	test_data	30.161	30.26839	-0.10739	1
mw2a_13	mw2a_13	test_data	30.217	30.31925	-0.10225	1
mw2a_14	mw2a_14	test_data	30.283	30.37433	-0.09133	1
mw2a_15	mw2a_15	test_data	30.359	30.43386	-0.07486	1
mw2a_16	mw2a_16	test_data	30.443	30.49809	-0.05509	1
mw2a_17	mw2a_17	test_data	30.528	30.56735	-0.03935	1
mw2a_18	mw2a_18	test_data	30.614	30.64178	-0.02778	1
mw2a_19	mw2a_19	test_data	30.707	30.72153	-0.01453	1
mw2a_20	mw2a_20	test_data	30.809	30.80672	0.00228	1
mw2a_21	mw2a_21	test_data	30.812	30.80679	0.00521	1
mw2a_22	mw2a_22	test_data	30.812	30.80188	0.01012	1
mw2a_23	mw2a_23	test_data	30.804	30.7903	0.0137	1
mw2a_24	mw2a_24	test_data	30.797	30.77165	0.02535	1
mw2a_25	mw2a_25	test_data	30.787	30.74614	0.04086	1
mw2a_26	mw2a_26	test_data	30.771	30.7142	0.0568	1
mw2a_27	mw2a_27	test_data	30.743	30.67632	0.06668	1
mw2a_28	mw2a_28	test_data	30.715	30.63296	0.08204	1
mw2a_29	mw2a_29	test_data	30.672	30.58463	0.08737	1
mw2a_30	mw2a_30	test_data	30.623	30.53176	0.09124	1
mw2a_31	mw2a_31	test_data	30.61	30.51362	0.09638	1
mw2a_32	mw2a_32	test_data	30.591	30.49181	0.09919	1
mw2a_33	mw2a_33	test_data	30.565	30.46527	0.09973	1
mw2a_34	mw2a_34	test_data	30.538	30.43308	0.10492	1
mw2a_35	mw2a_35	test_data	30.502	30.39457	0.10743	1
mw2a_36	mw2a_36	test_data	30.465	30.34932	0.11568	1

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw2a_37	mw2a_37	test_data	30.419	30.29709	0.12191	1
mw2a_38	mw2a_38	test_data	30.358	30.23781	0.12019	1
mw2a_39	mw2a_39	test_data	30.293	30.17146	0.12154	1
mw2a_40	mw2a_40	test_data	30.223	30.09805	0.12495	1
mw2a_41	mw2a_41	test_data	30.139	30.01759	0.12141	1
mw2a_42	mw2a_42	test_data	30.041	29.93007	0.11093	1
mw2a_43	mw2a_43	test_data	29.932	29.83544	0.09656	1
mw2a_44	mw2a_44	test_data	29.812	29.73365	0.07835	1
mw2a_45	mw2a_45	test_data	29.678	29.6247	0.0533	1
mw2a_46	mw2a_46	test_data	29.672	29.62251	0.04949	1
mw2a_47	mw2a_47	test_data	29.666	29.62488	0.04112	1
mw2a_48	mw2a_48	test_data	29.666	29.63375	0.03225	1
mw2a_49	mw2a_49	test_data	29.665	29.64991	0.01509	1
mw2a_50	mw2a_50	test_data	29.666	29.67354	-0.00754	1
mw2a_51	mw2a_51	test_data	29.672	29.70451	-0.03251	1
mw2a_52	mw2a_52	test_data	29.679	29.7426	-0.0636	1
mw2a_53	mw2a_53	test_data	29.702	29.78742	-0.08542	1
mw2a_54	mw2a_54	test_data	29.725	29.83849	-0.11349	1
mw2a_55	mw2a_55	test_data	29.76	29.89526	-0.13526	1
mw2a_56	mw2a_56	test_data	29.805	29.95712	-0.15212	1
mw2a_57	mw2a_57	test_data	29.85	30.02351	-0.17351	1
mw2a_58	mw2a_58	test_data	29.914	30.09394	-0.17994	1
mw2a_59	mw2a_59	test_data	29.991	30.16805	-0.17705	1
mw2a_60	mw2a_60	test_data	30.071	30.24571	-0.17471	1
mw2a_61	mw2a_61	test_data	30.164	30.32691	-0.16291	1
mw2a_62	mw2a_62	test_data	30.26	30.41176	-0.15176	1
mw2a_63	mw2a_63	test_data	30.369	30.50053	-0.13153	1
mw2a_64	mw2a_64	test_data	30.482	30.59341	-0.11141	1
mw2a_65	mw2a_65	test_data	30.608	30.6903	-0.0823	1
mw3a_1	mw3a_1	test_data	30.203	30.23629	-0.03329	1
mw3a_2	mw3a_2	test_data	30.231	30.25331	-0.02231	1
mw3a_3	mw3a_3	test_data	30.256	30.27215	-0.01615	1
mw3a_4	mw3a_4	test_data	30.287	30.29097	-0.00397	1
mw3a_5	mw3a_5	test_data	30.317	30.30939	0.00761	1
mw3a_6	mw3a_6	test_data	30.343	30.32774	0.01526	1
mw3a_7	mw3a_7	test_data	30.359	30.34666	0.01234	1
mw3a_8	mw3a_8	test_data	30.394	30.36683	0.02717	1
mw3a_9	mw3a_9	test_data	30.41	30.38889	0.02111	1
mw3a_10	mw3a_10	test_data	30.422	30.41355	0.00845	1

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw3a_11	mw3a_11	test_data	30.453	30.4413	0.0117	1
mw3a_12	mw3a_12	test_data	30.492	30.4727	0.0193	1
mw3a_13	mw3a_13	test_data	30.528	30.50846	0.01954	1
mw3a_14	mw3a_14	test_data	30.574	30.54958	0.02442	1
mw3a_15	mw3a_15	test_data	30.637	30.59789	0.03911	1
mw3a_16	mw3a_16	test_data	30.672	30.65235	0.01965	1
mw3a_17	mw3a_17	test_data	30.706	30.71149	-0.00549	1
mw3a_18	mw3a_18	test_data	30.753	30.77419	-0.02119	1
mw3a_19	mw3a_19	test_data	30.839	30.8436	-0.0046	1
mw3a_20	mw3a_20	test_data	30.91	30.92381	-0.01381	1
mw3a_21	mw3a_21	test_data	30.901	30.92283	-0.02183	1
mw3a_22	mw3a_22	test_data	30.895	30.91657	-0.02157	1
mw3a_23	mw3a_23	test_data	30.884	30.90565	-0.02165	1
mw3a_24	mw3a_24	test_data	30.87	30.89147	-0.02147	1
mw3a_25	mw3a_25	test_data	30.832	30.87497	-0.04297	1
mw3a_26	mw3a_26	test_data	30.813	30.85672	-0.04372	1
mw3a_27	mw3a_27	test_data	30.797	30.83679	-0.03979	1
mw3a_28	mw3a_28	test_data	30.77	30.81491	-0.04491	1
mw3a_29	mw3a_29	test_data	30.745	30.79063	-0.04563	1
mw3a_30	mw3a_30	test_data	30.696	30.7635	-0.0675	1
mw3a_31	mw3a_31	test_data	30.456	30.7191	-0.2631	1
mw3a_32	mw3a_32	test_data	30.392	30.66931	-0.27731	1
mw3a_33	mw3a_33	test_data	30.348	30.62542	-0.27742	1
mw3a_34	mw3a_34	test_data	30.31	30.5854	-0.2754	1
mw3a_35	mw3a_35	test_data	30.274	30.54634	-0.27234	1
mw3a_36	mw3a_36	test_data	30.239	30.50597	-0.26697	1
mw3a_37	mw3a_37	test_data	30.2	30.46254	-0.26254	1
mw3a_38	mw3a_38	test_data	30.157	30.41487	-0.25787	1
mw3a_39	mw3a_39	test_data	30.113	30.36205	-0.24905	1
mw3a_40	mw3a_40	test_data	30.074	30.30404	-0.23004	1
mw3a_41	mw3a_41	test_data	30.014	30.2432	-0.2292	1
mw3a_42	mw3a_42	test_data	29.95	30.17672	-0.22672	1
mw3a_43	mw3a_43	test_data	29.887	30.10383	-0.21683	1
mw3a_44	mw3a_44	test_data	29.812	30.02423	-0.21223	1
mw3a_45	mw3a_45	test_data	29.724	29.93785	-0.21385	1
mw3a_46	mw3a_46	test_data	29.919	29.95471	-0.03571	1
mw3a_47	mw3a_47	test_data	29.956	29.98342	-0.02742	1
mw3a_48	mw3a_48	test_data	29.985	30.01569	-0.03069	1
mw3a_49	mw3a_49	test_data	30.011	30.04747	-0.03647	1

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw3a_50	mw3a_50	test_data	30.04	30.07748	-0.03748	1
mw3a_51	mw3a_51	test_data	30.068	30.1059	-0.0379	1
mw3a_52	mw3a_52	test_data	30.094	30.13361	-0.03961	1
mw3a_53	mw3a_53	test_data	30.131	30.16169	-0.03069	1
mw3a_54	mw3a_54	test_data	30.166	30.19115	-0.02515	1
mw3a_55	mw3a_55	test_data	30.207	30.22284	-0.01584	1
mw3a_56	mw3a_56	test_data	30.257	30.25744	-0.00044	1
mw3a_57	mw3a_57	test_data	30.298	30.29556	0.00244	1
mw3a_58	mw3a_58	test_data	30.358	30.33819	0.01981	1
mw3a_59	mw3a_59	test_data	30.406	30.38527	0.02073	1
mw3a_60	mw3a_60	test_data	30.453	30.43783	0.01517	1
mw3a_61	mw3a_61	test_data	30.51	30.49639	0.01361	1
mw3a_62	mw3a_62	test_data	30.57	30.56249	0.00751	1
mw3a_63	mw3a_63	test_data	30.645	30.6395	0.0055	1
mw3a_64	mw3a_64	test_data	30.708	30.72172	-0.01372	1
mw3a_65	mw3a_65	test_data	30.757	30.80493	-0.04793	1
mw4a_1	mw4a_1	test_data	30.022	29.85142	0.17058	1
mw4a_2	mw4a_2	test_data	30.035	29.86862	0.16638	1
mw4a_3	mw4a_3	test_data	30.046	29.88437	0.16163	1
mw4a_4	mw4a_4	test_data	30.063	29.8989	0.1641	1
mw4a_5	mw4a_5	test_data	30.082	29.91314	0.16886	1
mw4a_6	mw4a_6	test_data	30.096	29.92791	0.16809	1
mw4a_7	mw4a_7	test_data	30.111	29.94385	0.16715	1
mw4a_8	mw4a_8	test_data	30.132	29.9615	0.1705	1
mw4a_9	mw4a_9	test_data	30.145	29.9813	0.1637	1
mw4a_10	mw4a_10	test_data	30.148	30.0037	0.1443	1
mw4a_11	mw4a_11	test_data	30.163	30.02915	0.13385	1
mw4a_12	mw4a_12	test_data	30.191	30.05807	0.13293	1
mw4a_13	mw4a_13	test_data	30.215	30.09089	0.12411	1
mw4a_14	mw4a_14	test_data	30.243	30.1281	0.1149	1
mw4a_15	mw4a_15	test_data	30.293	30.17024	0.12276	1
mw4a_16	mw4a_16	test_data	30.318	30.21775	0.10025	1
mw4a_17	mw4a_17	test_data	30.329	30.27118	0.05782	1
mw4a_18	mw4a_18	test_data	30.36	30.3303	0.0297	1
mw4a_19	mw4a_19	test_data	30.433	30.39533	0.03767	1
mw4a_20	mw4a_20	test_data	30.483	30.46633	0.01667	1
mw4a_21	mw4a_21	test_data	30.471	30.43908	0.03192	1
mw4a_22	mw4a_22	test_data	30.462	30.40816	0.05384	1
mw4a_23	mw4a_23	test_data	30.445	30.38172	0.06328	1

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw4a_24	mw4a_24	test_data	30.431	30.35937	0.07163	1
mw4a_25	mw4a_25	test_data	30.417	30.33909	0.07791	1
mw4a_26	mw4a_26	test_data	30.401	30.31924	0.08176	1
mw4a_27	mw4a_27	test_data	30.374	30.29865	0.07535	1
mw4a_28	mw4a_28	test_data	30.356	30.2765	0.0795	1
mw4a_29	mw4a_29	test_data	30.331	30.2522	0.0788	1
mw4a_30	mw4a_30	test_data	30.297	30.22521	0.07179	1
mw4a_31	mw4a_31	test_data	30.287	30.21386	0.07314	1
mw4a_32	mw4a_32	test_data	30.262	30.19869	0.06331	1
mw4a_33	mw4a_33	test_data	30.239	30.18028	0.05872	1
mw4a_34	mw4a_34	test_data	30.216	30.15891	0.05709	1
mw4a_35	mw4a_35	test_data	30.19	30.13438	0.05562	1
mw4a_36	mw4a_36	test_data	30.166	30.10624	0.05976	1
mw4a_37	mw4a_37	test_data	30.139	30.07388	0.06512	1
mw4a_38	mw4a_38	test_data	30.105	30.03672	0.06828	1
mw4a_39	mw4a_39	test_data	30.069	29.99409	0.07491	1
mw4a_40	mw4a_40	test_data	30.034	29.94539	0.08861	1
mw4a_41	mw4a_41	test_data	29.992	29.89012	0.10188	1
mw4a_42	mw4a_42	test_data	29.94	29.82774	0.11226	1
mw4a_43	mw4a_43	test_data	29.895	29.7578	0.1372	1
mw4a_44	mw4a_44	test_data	29.837	29.68004	0.15696	1
mw4a_45	mw4a_45	test_data	29.779	29.59435	0.18465	1
mw4a_46	mw4a_46	test_data	29.785	29.62023	0.16477	1
mw4a_47	mw4a_47	test_data	29.794	29.65098	0.14302	1
mw4a_48	mw4a_48	test_data	29.809	29.67837	0.13063	1
mw4a_49	mw4a_49	test_data	29.823	29.70229	0.12071	1
mw4a_50	mw4a_50	test_data	29.839	29.72428	0.11472	1
mw4a_51	mw4a_51	test_data	29.852	29.74574	0.10626	1
mw4a_52	mw4a_52	test_data	29.865	29.76779	0.09721	1
mw4a_53	mw4a_53	test_data	29.894	29.79123	0.10277	1
mw4a_54	mw4a_54	test_data	29.917	29.81674	0.10026	1
mw4a_55	mw4a_55	test_data	29.943	29.84486	0.09814	1
mw4a_56	mw4a_56	test_data	29.974	29.87606	0.09794	1
mw4a_57	mw4a_57	test_data	29.996	29.91082	0.08518	1
mw4a_58	mw4a_58	test_data	30.035	29.94959	0.08541	1
mw4a_59	mw4a_59	test_data	30.074	29.99283	0.08117	1
mw4a_60	mw4a_60	test_data	30.105	30.04098	0.06402	1
mw4a_61	mw4a_61	test_data	30.14	30.0945	0.0455	1
mw4a_62	mw4a_62	test_data	30.18	30.15377	0.02623	1

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw4a_63	mw4a_63	test_data	30.227	30.2192	0.0078	1
mw4a_64	mw4a_64	test_data	30.263	30.29112	-0.02812	1
mw4a_65	mw4a_65	test_data	30.282	30.3687	-0.0867	1
mw5a_1	mw5a_1	test_data	30.217	30.05315	0.16385	0
mw5a_2	mw5a_2	test_data	30.228	30.05365	0.17435	0
mw5a_3	mw5a_3	test_data	30.241	30.05424	0.18676	0
mw5a_4	mw5a_4	test_data	30.262	30.05493	0.20707	0
mw5a_5	mw5a_5	test_data	30.286	30.05577	0.23023	0
mw5a_6	mw5a_6	test_data	30.294	30.05683	0.23717	0
mw5a_7	mw5a_7	test_data	30.294	30.0582	0.2358	0
mw5a_8	mw5a_8	test_data	30.293	30.06	0.233	0
mw5a_9	mw5a_9	test_data	30.297	30.06241	0.23459	0
mw5a_10	mw5a_10	test_data	30.294	30.06564	0.22836	0
mw5a_11	mw5a_11	test_data	30.291	30.06997	0.22103	0
mw5a_12	mw5a_12	test_data	30.288	30.07572	0.21228	0
mw5a_13	mw5a_13	test_data	30.302	30.08331	0.21869	0
mw5a_14	mw5a_14	test_data	30.3	30.09317	0.20683	0
mw5a_15	mw5a_15	test_data	30.323	30.10588	0.21712	0
mw5a_16	mw5a_16	test_data	30.297	30.12197	0.17503	0
mw5a_17	mw5a_17	test_data	30.288	30.14227	0.14573	0
mw5a_18	mw5a_18	test_data	30.339	30.16705	0.17195	0
mw5a_19	mw5a_19	test_data	30.415	30.19702	0.21798	0
mw5a_20	mw5a_20	test_data	30.422	30.23235	0.18965	0
mw5a_21	mw5a_21	test_data	30.422	30.23283	0.18917	0
mw5a_22	mw5a_22	test_data	30.419	30.23316	0.18584	0
mw5a_23	mw5a_23	test_data	30.414	30.23357	0.18043	0
mw5a_24	mw5a_24	test_data	30.41	30.23412	0.17588	0
mw5a_25	mw5a_25	test_data	30.406	30.23478	0.17122	0
mw5a_26	mw5a_26	test_data	30.4	30.2355	0.1645	0
mw5a_27	mw5a_27	test_data	30.386	30.23619	0.14981	0
mw5a_28	mw5a_28	test_data	30.379	30.23674	0.14226	0
mw5a_29	mw5a_29	test_data	30.363	30.23698	0.12602	0
mw5a_30	mw5a_30	test_data	30.343	30.2367	0.1063	0
mw5a_31	mw5a_31	test_data	30.343	30.23645	0.10655	0
mw5a_32	mw5a_32	test_data	30.33	30.23594	0.09406	0
mw5a_33	mw5a_33	test_data	30.318	30.23513	0.08287	0
mw5a_34	mw5a_34	test_data	30.303	30.23392	0.06908	0
mw5a_35	mw5a_35	test_data	30.288	30.23215	0.05585	0
mw5a_36	mw5a_36	test_data	30.27	30.22963	0.04037	0

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw5a_37	mw5a_37	test_data	30.251	30.22605	0.02495	0
mw5a_38	mw5a_38	test_data	30.23	30.22106	0.00894	0
mw5a_39	mw5a_39	test_data	30.205	30.21418	-0.00918	0
mw5a_40	mw5a_40	test_data	30.178	30.20484	-0.02684	0
mw5a_41	mw5a_41	test_data	30.145	30.19238	-0.04738	0
mw5a_42	mw5a_42	test_data	30.105	30.1761	-0.0711	0
mw5a_43	mw5a_43	test_data	30.065	30.15521	-0.09021	0
mw5a_44	mw5a_44	test_data	30.023	30.12895	-0.10595	0
mw5a_45	mw5a_45	test_data	29.977	30.09657	-0.11957	0
mw5a_46	mw5a_46	test_data	29.971	30.09584	-0.12484	0
mw5a_47	mw5a_47	test_data	29.971	30.09519	-0.12419	0
mw5a_48	mw5a_48	test_data	29.975	30.09441	-0.11941	0
mw5a_49	mw5a_49	test_data	29.976	30.09342	-0.11742	0
mw5a_50	mw5a_50	test_data	29.977	30.09224	-0.11524	0
mw5a_51	mw5a_51	test_data	29.977	30.09089	-0.11389	0
mw5a_52	mw5a_52	test_data	29.978	30.08943	-0.11143	0
mw5a_53	mw5a_53	test_data	29.988	30.08797	-0.09997	0
mw5a_54	mw5a_54	test_data	29.992	30.08664	-0.09464	0
mw5a_55	mw5a_55	test_data	30.005	30.08566	-0.08066	0
mw5a_56	mw5a_56	test_data	30.02	30.08532	-0.06532	0
mw5a_57	mw5a_57	test_data	30.033	30.08597	-0.05297	0
mw5a_58	mw5a_58	test_data	30.063	30.08807	-0.02507	0
mw5a_59	mw5a_59	test_data	30.087	30.09218	-0.00518	0
mw5a_60	mw5a_60	test_data	30.104	30.09892	0.00508	0
mw5a_61	mw5a_61	test_data	30.127	30.10898	0.01802	0
mw5a_62	mw5a_62	test_data	30.142	30.1232	0.0188	0
mw5a_63	mw5a_63	test_data	30.145	30.14233	0.00267	0
mw5a_64	mw5a_64	test_data	30.12	30.16727	-0.04727	0
mw5a_65	mw5a_65	test_data	30.096	30.19843	-0.10243	0
mw6_1	mw6_1	test_data	29.384	29.62999	-0.24599	1
mw6_2	mw6_2	test_data	29.486	29.73803	-0.25203	1
mw6_3	mw6_3	test_data	29.569	29.7942	-0.2252	1
mw6_4	mw6_4	test_data	29.656	29.8381	-0.1821	1
mw6_5	mw6_5	test_data	29.738	29.87814	-0.14014	1
mw6_6	mw6_6	test_data	29.786	29.91737	-0.13137	1
mw6_7	mw6_7	test_data	29.865	29.95734	-0.09234	1
mw6_8	mw6_8	test_data	29.929	29.99906	-0.07006	1
mw6_9	mw6_9	test_data	29.996	30.04314	-0.04714	1
mw6_10	mw6_10	test_data	30.05	30.08994	-0.03994	1

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw6_11	mw6_11	test_data	30.114	30.13973	-0.02573	1
mw6_12	mw6_12	test_data	30.167	30.19269	-0.02569	1
mw6_13	mw6_13	test_data	30.232	30.24902	-0.01702	1
mw6_14	mw6_14	test_data	30.293	30.30898	-0.01598	1
mw6_15	mw6_15	test_data	30.382	30.37292	0.00908	1
mw6_16	mw6_16	test_data	30.456	30.44116	0.01484	1
mw6_17	mw6_17	test_data	30.528	30.51401	0.01399	1
mw6_18	mw6_18	test_data	30.608	30.59142	0.01658	1
mw6_19	mw6_19	test_data	30.706	30.67351	0.03249	1
mw6_20	mw6_20	test_data	30.803	30.76053	0.04247	1
mw6_21	mw6_21	test_data	30.126	29.80122	0.32478	1
mw6_22	mw6_22	test_data	29.992	29.58181	0.41019	1
mw6_23	mw6_23	test_data	29.879	29.47889	0.40011	1
mw6_24	mw6_24	test_data	29.772	29.40624	0.36576	1
mw6_25	mw6_25	test_data	29.66	29.34466	0.31534	1
mw6_26	mw6_26	test_data	29.56	29.28721	0.27279	1
mw6_27	mw6_27	test_data	29.461	29.23044	0.23056	1
mw6_28	mw6_28	test_data	29.372	29.17248	0.19952	1
mw6_29	mw6_29	test_data	29.291	29.11234	0.17866	1
mw6_30	mw6_30	test_data	29.206	29.04949	0.15651	1
mw6_31	mw6_31	test_data	29.179	29.02042	0.15858	1
mw6_32	mw6_32	test_data	29.141	28.98082	0.16018	1
mw6_33	mw6_33	test_data	29.089	28.93386	0.15514	1
mw6_34	mw6_34	test_data	29.045	28.88154	0.16346	1
mw6_35	mw6_35	test_data	28.998	28.82447	0.17353	1
mw6_36	mw6_36	test_data	28.938	28.76252	0.17548	1
mw6_37	mw6_37	test_data	28.865	28.69538	0.16962	1
mw6_38	mw6_38	test_data	28.782	28.62273	0.15927	1
mw6_39	mw6_39	test_data	28.693	28.54435	0.14865	1
mw6_40	mw6_40	test_data	28.618	28.46007	0.15793	1
mw6_41	mw6_41	test_data	28.511	28.36987	0.14113	1
mw6_42	mw6_42	test_data	28.407	28.27364	0.13336	1
mw6_43	mw6_43	test_data	28.285	28.17131	0.11369	1
mw6_44	mw6_44	test_data	28.155	28.06281	0.09219	1
mw6_45	mw6_45	test_data	28.02	27.9482	0.0718	1
mw6_46	mw6_46	test_data	28.669	28.90297	-0.23397	1
mw6_47	mw6_47	test_data	28.812	29.12856	-0.31656	1
mw6_48	mw6_48	test_data	28.94	29.24063	-0.30063	1
mw6_49	mw6_49	test_data	29.056	29.32441	-0.26841	1

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw6_50	mw6_50	test_data	29.17	29.398	-0.228	1
mw6_51	mw6_51	test_data	29.276	29.46759	-0.19159	1
mw6_52	mw6_52	test_data	29.381	29.5363	-0.1553	1
mw6_53	mw6_53	test_data	29.484	29.60602	-0.12202	1
mw6_54	mw6_54	test_data	29.586	29.67776	-0.09176	1
mw6_55	mw6_55	test_data	29.682	29.75196	-0.06996	1
mw6_56	mw6_56	test_data	29.781	29.8287	-0.0477	1
mw6_57	mw6_57	test_data	29.875	29.90788	-0.03288	1
mw6_58	mw6_58	test_data	29.972	29.98947	-0.01747	1
mw6_59	mw6_59	test_data	30.064	30.07338	-0.00938	1
mw6_60	mw6_60	test_data	30.147	30.1597	-0.0127	1
mw6_61	mw6_61	test_data	30.239	30.24857	-0.00957	1
mw6_62	mw6_62	test_data	30.333	30.34024	-0.00724	1
mw6_63	mw6_63	test_data	30.442	30.43515	0.00685	1
mw6_64	mw6_64	test_data	30.547	30.53347	0.01353	1
mw6_65	mw6_65	test_data	30.647	30.63466	0.01234	1
mw7_1	mw7_1	test_data	30.196	29.9386	0.2574	1
mw7_2	mw7_2	test_data	30.228	30.01356	0.21444	1
mw7_3	mw7_3	test_data	30.26	30.06978	0.19022	1
mw7_4	mw7_4	test_data	30.298	30.12052	0.17748	1
mw7_5	mw7_5	test_data	30.329	30.16832	0.16068	1
mw7_6	mw7_6	test_data	30.352	30.21446	0.13754	1
mw7_7	mw7_7	test_data	30.212	30.26005	-0.04805	1
mw7_8	mw7_8	test_data	30.415	30.30598	0.10902	1
mw7_9	mw7_9	test_data	30.451	30.35297	0.09803	1
mw7_10	mw7_10	test_data	30.481	30.40153	0.07947	1
mw7_11	mw7_11	test_data	30.523	30.45198	0.07102	1
mw7_12	mw7_12	test_data	30.574	30.50464	0.06936	1
mw7_13	mw7_13	test_data	30.626	30.55988	0.06612	1
mw7_14	mw7_14	test_data	30.683	30.61812	0.06488	1
mw7_15	mw7_15	test_data	30.75	30.68	0.07	1
mw7_16	mw7_16	test_data	30.809	30.74581	0.06319	1
mw7_17	mw7_17	test_data	30.861	30.81573	0.04527	1
mw7_18	mw7_18	test_data	30.921	30.8897	0.0313	1
mw7_19	mw7_19	test_data	31.003	30.96837	0.03463	1
mw7_20	mw7_20	test_data	31.074	31.05205	0.02195	1
mw7_21	mw7_21	test_data	31.065	31.04502	0.01998	1
mw7_22	mw7_22	test_data	31.056	31.02429	0.03171	1
mw7_23	mw7_23	test_data	31.04	30.99202	0.04798	1

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw7_24	mw7_24	test_data	31.026	30.95226	0.07374	1
mw7_25	mw7_25	test_data	31.01	30.90809	0.10191	1
mw7_26	mw7_26	test_data	30.986	30.8611	0.1249	1
mw7_27	mw7_27	test_data	30.95	30.81174	0.13826	1
mw7_28	mw7_28	test_data	30.923	30.7599	0.1631	1
mw7_29	mw7_29	test_data	30.892	30.70532	0.18668	1
mw7_30	mw7_30	test_data	30.831	30.6478	0.1832	1
mw7_31	mw7_31	test_data	29.615	30.01308	-0.39808	1
mw7_32	mw7_32	test_data	29.537	29.85665	-0.31965	1
mw7_33	mw7_33	test_data	29.471	29.75065	-0.27965	1
mw7_34	mw7_34	test_data	29.429	29.66186	-0.23286	1
mw7_35	mw7_35	test_data	29.401	29.58025	-0.17925	1
mw7_36	mw7_36	test_data	29.361	29.50106	-0.14006	1
mw7_37	mw7_37	test_data	29.322	29.42169	-0.09969	1
mw7_38	mw7_38	test_data	29.255	29.34062	-0.08562	1
mw7_39	mw7_39	test_data	29.199	29.25684	-0.05784	1
mw7_40	mw7_40	test_data	29.158	29.16967	-0.01167	1
mw7_41	mw7_41	test_data	29.086	29.07909	0.00691	1
mw7_42	mw7_42	test_data	29.017	28.98451	0.03249	1
mw7_43	mw7_43	test_data	28.924	28.8854	0.0386	1
mw7_44	mw7_44	test_data	28.826	28.78135	0.04465	1
mw7_45	mw7_45	test_data	29.121	28.67209	0.44891	1
mw7_46	mw7_46	test_data	29.84	29.22355	0.61645	1
mw7_47	mw7_47	test_data	29.886	29.36992	0.51608	1
mw7_48	mw7_48	test_data	29.926	29.47777	0.44823	1
mw7_49	mw7_49	test_data	29.961	29.57397	0.38703	1
mw7_50	mw7_50	test_data	29.996	29.6632	0.3328	1
mw7_51	mw7_51	test_data	30.036	29.74748	0.28852	1
mw7_52	mw7_52	test_data	30.083	29.82858	0.25442	1
mw7_53	mw7_53	test_data	30.133	29.90806	0.22494	1
mw7_54	mw7_54	test_data	30.178	29.98706	0.19094	1
mw7_55	mw7_55	test_data	30.235	30.06627	0.16873	1
mw7_56	mw7_56	test_data	30.294	30.14598	0.14802	1
mw7_57	mw7_57	test_data	30.35	30.2263	0.1237	1
mw7_58	mw7_58	test_data	30.402	30.30746	0.09454	1
mw7_59	mw7_59	test_data	30.479	30.38954	0.08946	1
mw7_60	mw7_60	test_data	30.544	30.47296	0.07104	1
mw7_61	mw7_61	test_data	30.627	30.55824	0.06876	1
mw7_62	mw7_62	test_data	30.708	30.64611	0.06189	1

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw7_63	mw7_63	test_data	30.793	30.73753	0.05547	1
mw7_64	mw7_64	test_data	30.876	30.83209	0.04391	1
mw7_65	mw7_65	test_data	30.946	30.92891	0.01709	1
mw8_1	mw8_1	test_data	29.324	29.66107	-0.33707	1
mw8_2	mw8_2	test_data	29.448	29.75003	-0.30203	1
mw8_3	mw8_3	test_data	29.546	29.80665	-0.26065	1
mw8_4	mw8_4	test_data	29.642	29.8536	-0.2116	1
mw8_5	mw8_5	test_data	29.725	29.89687	-0.17187	1
mw8_6	mw8_6	test_data	29.804	29.93902	-0.13502	1
mw8_7	mw8_7	test_data	29.881	29.98159	-0.10059	1
mw8_8	mw8_8	test_data	29.945	30.02557	-0.08057	1
mw8_9	mw8_9	test_data	30.015	30.07163	-0.05663	1
mw8_10	mw8_10	test_data	30.072	30.12015	-0.04815	1
mw8_11	mw8_11	test_data	30.136	30.17141	-0.03541	1
mw8_12	mw8_12	test_data	30.206	30.22563	-0.01963	1
mw8_13	mw8_13	test_data	30.272	30.28302	-0.01102	1
mw8_14	mw8_14	test_data	30.345	30.34385	0.00115	1
mw8_15	mw8_15	test_data	30.42	30.40852	0.01148	1
mw8_16	mw8_16	test_data	30.501	30.47738	0.02362	1
mw8_17	mw8_17	test_data	30.577	30.55072	0.02628	1
mw8_18	mw8_18	test_data	30.657	30.62849	0.02851	1
mw8_19	mw8_19	test_data	30.755	30.71087	0.04413	1
mw8_20	mw8_20	test_data	30.852	30.79812	0.05388	1
mw8_21	mw8_21	test_data	30.556	30.35832	0.19768	1
mw8_22	mw8_22	test_data	30.431	30.18664	0.24436	1
mw8_23	mw8_23	test_data	30.319	30.08908	0.22992	1
mw8_24	mw8_24	test_data	30.223	30.01533	0.20767	1
mw8_25	mw8_25	test_data	30.123	29.9514	0.1716	1
mw8_26	mw8_26	test_data	30.03	29.89155	0.13845	1
mw8_27	mw8_27	test_data	29.936	29.83261	0.10339	1
mw8_28	mw8_28	test_data	29.852	29.77273	0.07927	1
mw8_29	mw8_29	test_data	29.77	29.71089	0.05911	1
mw8_30	mw8_30	test_data	29.688	29.64652	0.04148	1
mw8_31	mw8_31	test_data	29.654	29.61119	0.04281	1
mw8_32	mw8_32	test_data	29.608	29.56375	0.04425	1
mw8_33	mw8_33	test_data	29.552	29.5098	0.0422	1
mw8_34	mw8_34	test_data	29.497	29.45162	0.04538	1
mw8_35	mw8_35	test_data	29.442	29.3896	0.0524	1
mw8_36	mw8_36	test_data	29.382	29.32343	0.05857	1

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw8_37	mw8_37	test_data	29.313	29.25267	0.06033	1
mw8_38	mw8_38	test_data	29.227	29.17692	0.05008	1
mw8_39	mw8_39	test_data	29.143	29.0959	0.0471	1
mw8_40	mw8_40	test_data	29.056	29.00939	0.04661	1
mw8_41	mw8_41	test_data	28.952	28.91735	0.03465	1
mw8_42	mw8_42	test_data	28.843	28.81965	0.02335	1
mw8_43	mw8_43	test_data	28.722	28.71615	0.00585	1
mw8_44	mw8_44	test_data	28.589	28.60676	-0.01776	1
mw8_45	mw8_45	test_data	28.45	28.49146	-0.04146	1
mw8_46	mw8_46	test_data	28.712	28.93117	-0.21917	1
mw8_47	mw8_47	test_data	28.845	29.11333	-0.26833	1
mw8_48	mw8_48	test_data	28.959	29.22539	-0.26639	1
mw8_49	mw8_49	test_data	29.069	29.31517	-0.24617	1
mw8_50	mw8_50	test_data	29.18	29.39533	-0.21533	1
mw8_51	mw8_51	test_data	29.288	29.47097	-0.18297	1
mw8_52	mw8_52	test_data	29.396	29.54506	-0.14906	1
mw8_53	mw8_53	test_data	29.5	29.6195	-0.1195	1
mw8_54	mw8_54	test_data	29.595	29.69536	-0.10036	1
mw8_55	mw8_55	test_data	29.697	29.77315	-0.07615	1
mw8_56	mw8_56	test_data	29.802	29.85299	-0.05099	1
mw8_57	mw8_57	test_data	29.887	29.93485	-0.04785	1
mw8_58	mw8_58	test_data	29.982	30.01868	-0.03668	1
mw8_59	mw8_59	test_data	30.08	30.10442	-0.02442	1
mw8_60	mw8_60	test_data	30.174	30.19223	-0.01823	1
mw8_61	mw8_61	test_data	30.273	30.28228	-0.00928	1
mw8_62	mw8_62	test_data	30.375	30.3749	0.0001	1
mw8_63	mw8_63	test_data	30.483	30.47063	0.01237	1
mw8_64	mw8_64	test_data	30.595	30.56961	0.02539	1
mw8_65	mw8_65	test_data	30.696	30.67126	0.02474	1
mw9_1	mw9_1	test_data	31.441	31.72803	-0.28703	1
mw9_2	mw9_2	test_data	31.455	31.73098	-0.27598	1
mw9_3	mw9_3	test_data	31.467	31.73638	-0.26938	1
mw9_4	mw9_4	test_data	31.48	31.74429	-0.26429	1
mw9_5	mw9_5	test_data	31.49	31.75471	-0.26471	1
mw9_6	mw9_6	test_data	31.501	31.76761	-0.26661	1
mw9_7	mw9_7	test_data	31.513	31.78292	-0.26992	1
mw9_8	mw9_8	test_data	31.531	31.80055	-0.26955	1
mw9_9	mw9_9	test_data	31.541	31.82045	-0.27945	1
mw9_10	mw9_10	test_data	31.55	31.84264	-0.29264	1

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw9_11	mw9_11	test_data	31.571	31.86708	-0.29608	1
mw9_12	mw9_12	test_data	31.603	31.89386	-0.29086	1
mw9_13	mw9_13	test_data	31.632	31.92302	-0.29102	1
mw9_14	mw9_14	test_data	31.67	31.95483	-0.28483	1
mw9_15	mw9_15	test_data	31.717	31.98963	-0.27263	1
mw9_16	mw9_16	test_data	31.763	32.02734	-0.26434	1
mw9_17	mw9_17	test_data	31.803	32.06821	-0.26521	1
mw9_18	mw9_18	test_data	31.857	32.11259	-0.25559	1
mw9_19	mw9_19	test_data	31.928	32.16052	-0.23252	1
mw9_20	mw9_20	test_data	32.001	32.21162	-0.21062	1
mw9_21	mw9_21	test_data	32.001	32.21302	-0.21202	1
mw9_22	mw9_22	test_data	32.004	32.21413	-0.21013	1
mw9_23	mw9_23	test_data	32.001	32.21421	-0.21321	1
mw9_24	mw9_24	test_data	32.001	32.21236	-0.21136	1
mw9_25	mw9_25	test_data	32	32.20783	-0.20783	1
mw9_26	mw9_26	test_data	31.996	32.20009	-0.20409	1
mw9_27	mw9_27	test_data	31.986	32.18887	-0.20287	1
mw9_28	mw9_28	test_data	31.983	32.1741	-0.1911	1
mw9_29	mw9_29	test_data	31.969	32.15583	-0.18683	1
mw9_30	mw9_30	test_data	31.952	32.13428	-0.18228	1
mw9_31	mw9_31	test_data	31.897	32.12109	-0.22409	1
mw9_32	mw9_32	test_data	31.862	32.09946	-0.23746	1
mw9_33	mw9_33	test_data	31.836	32.07123	-0.23523	1
mw9_34	mw9_34	test_data	31.81	32.03847	-0.22847	1
mw9_35	mw9_35	test_data	31.782	32.00248	-0.22048	1
mw9_36	mw9_36	test_data	31.754	31.96423	-0.21023	1
mw9_37	mw9_37	test_data	31.724	31.92387	-0.19987	1
mw9_38	mw9_38	test_data	31.687	31.88154	-0.19454	1
mw9_39	mw9_39	test_data	31.649	31.83711	-0.18811	1
mw9_40	mw9_40	test_data	31.613	31.79052	-0.17752	1
mw9_41	mw9_41	test_data	31.568	31.74248	-0.17448	1
mw9_42	mw9_42	test_data	31.513	31.69256	-0.17956	1
mw9_43	mw9_43	test_data	31.455	31.6404	-0.1854	1
mw9_44	mw9_44	test_data	31.391	31.58562	-0.19462	1
mw9_45	mw9_45	test_data	31.321	31.52764	-0.20664	1
mw9_46	mw9_46	test_data	31.352	31.52688	-0.17488	1
mw9_47	mw9_47	test_data	31.361	31.52918	-0.16818	1
mw9_48	mw9_48	test_data	31.373	31.53543	-0.16243	1
mw9_49	mw9_49	test_data	31.38	31.54576	-0.16576	1

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
mw9_50	mw9_50	test_data	31.389	31.56011	-0.17111	1
mw9_51	mw9_51	test_data	31.397	31.57834	-0.18134	1
mw9_52	mw9_52	test_data	31.407	31.60027	-0.19327	1
mw9_53	mw9_53	test_data	31.427	31.62567	-0.19867	1
mw9_54	mw9_54	test_data	31.443	31.65421	-0.21121	1
mw9_55	mw9_55	test_data	31.464	31.68556	-0.22156	1
mw9_56	mw9_56	test_data	31.489	31.7194	-0.2304	1
mw9_57	mw9_57	test_data	31.511	31.75551	-0.24451	1
mw9_58	mw9_58	test_data	31.55	31.79454	-0.24454	1
mw9_59	mw9_59	test_data	31.593	31.83534	-0.24234	1
mw9_60	mw9_60	test_data	31.626	31.87867	-0.25267	1
mw9_61	mw9_61	test_data	31.678	31.92465	-0.24665	1
mw9_62	mw9_62	test_data	31.736	31.97373	-0.23773	1
mw9_63	mw9_63	test_data	31.799	32.02629	-0.22729	1
mw9_64	mw9_64	test_data	31.86	32.0817	-0.2217	1
mw9_65	mw9_65	test_data	31.922	32.13976	-0.21776	1
pz1_1	pz1_1	test_data	30.47	30.00152	0.46848	0
pz1_2	pz1_2	test_data	30.468	30.00184	0.46616	0
pz1_3	pz1_3	test_data	30.471	30.00224	0.46876	0
pz1_4	pz1_4	test_data	30.473	30.0027	0.4703	0
pz1_5	pz1_5	test_data	30.47	30.00321	0.46679	0
pz1_6	pz1_6	test_data	30.459	30.00381	0.45519	0
pz1_7	pz1_7	test_data	30.44	30.00453	0.43547	0
pz1_8	pz1_8	test_data	30.399	30.00544	0.39356	0
pz1_9	pz1_9	test_data	30.401	30.00659	0.39441	0
pz1_10	pz1_10	test_data	30.355	30.00807	0.34693	0
pz1_11	pz1_11	test_data	30.312	30.01003	0.30197	0
pz1_12	pz1_12	test_data	30.278	30.01256	0.26544	0
pz1_13	pz1_13	test_data	30.228	30.01587	0.21213	0
pz1_14	pz1_14	test_data	30.166	30.02012	0.14588	0
pz1_15	pz1_15	test_data	30.101	30.02568	0.07532	0
pz1_16	pz1_16	test_data	29.971	30.0327	-0.0617	0
pz1_17	pz1_17	test_data	29.886	30.04191	-0.15591	0
pz1_18	pz1_18	test_data	30.169	30.05286	0.11614	0
pz1_19	pz1_19	test_data	30.266	30.06628	0.19972	0
pz1_20	pz1_20	test_data	30.116	30.0819	0.0341	0
pz1_21	pz1_21	test_data	30.111	30.08215	0.02885	0
pz1_22	pz1_22	test_data	30.102	30.08215	0.01985	0
pz1_23	pz1_23	test_data	30.091	30.08204	0.00896	0

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
pz1_24	pz1_24	test_data	30.075	30.08194	-0.00694	0
pz1_25	pz1_25	test_data	30.057	30.08189	-0.02489	0
pz1_26	pz1_26	test_data	30.039	30.08187	-0.04287	0
pz1_27	pz1_27	test_data	30.018	30.08183	-0.06383	0
pz1_28	pz1_28	test_data	29.992	30.08175	-0.08975	0
pz1_29	pz1_29	test_data	29.959	30.08153	-0.12253	0
pz1_30	pz1_30	test_data	29.925	30.08114	-0.15614	0
pz1_31	pz1_31	test_data	29.921	30.08089	-0.15989	0
pz1_32	pz1_32	test_data	29.906	30.08043	-0.17443	0
pz1_33	pz1_33	test_data	29.892	30.07976	-0.18776	0
pz1_34	pz1_34	test_data	29.873	30.0789	-0.2059	0
pz1_35	pz1_35	test_data	29.855	30.0778	-0.2228	0
pz1_36	pz1_36	test_data	29.837	30.07637	-0.23937	0
pz1_37	pz1_37	test_data	29.831	30.07448	-0.24348	0
pz1_38	pz1_38	test_data	29.816	30.07202	-0.25602	0
pz1_39	pz1_39	test_data	29.778	30.06877	-0.29077	0
pz1_40	pz1_40	test_data	29.742	30.06449	-0.32249	0
pz1_41	pz1_41	test_data	29.694	30.05894	-0.36494	0
pz1_42	pz1_42	test_data	29.675	30.05185	-0.37685	0
pz1_43	pz1_43	test_data	29.633	30.04286	-0.40986	0
pz1_44	pz1_44	test_data	29.587	30.0317	-0.4447	0
pz1_45	pz1_45	test_data	29.569	30.01795	-0.44895	0
pz1_46	pz1_46	test_data	29.565	30.01768	-0.45268	0
pz1_47	pz1_47	test_data	29.566	30.01763	-0.45163	0
pz1_48	pz1_48	test_data	29.567	30.01762	-0.45062	0
pz1_49	pz1_49	test_data	29.568	30.01755	-0.44955	0
pz1_50	pz1_50	test_data	29.573	30.0174	-0.4444	0
pz1_51	pz1_51	test_data	29.581	30.01715	-0.43615	0
pz1_52	pz1_52	test_data	29.594	30.01685	-0.42285	0
pz1_53	pz1_53	test_data	29.616	30.01653	-0.40053	0
pz1_54	pz1_54	test_data	29.64	30.01625	-0.37625	0
pz1_55	pz1_55	test_data	29.682	30.01609	-0.33409	0
pz1_56	pz1_56	test_data	29.747	30.01614	-0.26914	0
pz1_57	pz1_57	test_data	29.836	30.01655	-0.18055	0
pz1_58	pz1_58	test_data	29.91	30.01751	-0.10751	0
pz1_59	pz1_59	test_data	29.913	30.01926	-0.10626	0
pz1_60	pz1_60	test_data	29.901	30.02208	-0.12108	0
pz1_61	pz1_61	test_data	29.914	30.02632	-0.11232	0
pz1_62	pz1_62	test_data	29.845	30.03242	-0.18742	0

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
pz1_63	pz1_63	test_data	29.709	30.04076	-0.33176	0
pz1_64	pz1_64	test_data	29.499	30.05196	-0.55296	0
pz1_65	pz1_65	test_data	29.367	30.06591	-0.69891	0
pz2_1	pz2_1	test_data	30.455	29.96689	0.48811	0
pz2_2	pz2_2	test_data	30.456	29.96692	0.48908	0
pz2_3	pz2_3	test_data	30.456	29.96696	0.48904	0
pz2_4	pz2_4	test_data	30.456	29.96701	0.48899	0
pz2_5	pz2_5	test_data	30.452	29.96708	0.48492	0
pz2_6	pz2_6	test_data	30.437	29.96715	0.46985	0
pz2_7	pz2_7	test_data	30.419	29.96723	0.45177	0
pz2_8	pz2_8	test_data	30.374	29.96732	0.40668	0
pz2_9	pz2_9	test_data	30.379	29.96744	0.41156	0
pz2_10	pz2_10	test_data	30.328	29.96758	0.36042	0
pz2_11	pz2_11	test_data	30.282	29.96776	0.31424	0
pz2_12	pz2_12	test_data	30.242	29.96798	0.27402	0
pz2_13	pz2_13	test_data	30.194	29.96825	0.22575	0
pz2_14	pz2_14	test_data	30.126	29.96859	0.15741	0
pz2_15	pz2_15	test_data	30.052	29.96903	0.08297	0
pz2_16	pz2_16	test_data	29.904	29.96958	-0.06558	0
pz2_17	pz2_17	test_data	29.812	29.9703	-0.1583	0
pz2_18	pz2_18	test_data	30.162	29.97104	0.19096	0
pz2_19	pz2_19	test_data	30.4	29.97187	0.42813	0
pz2_20	pz2_20	test_data	30.072	29.97283	0.09917	0
pz2_21	pz2_21	test_data	30.06	29.97285	0.08715	0
pz2_22	pz2_22	test_data	30.044	29.97285	0.07115	0
pz2_23	pz2_23	test_data	30.031	29.97283	0.05817	0
pz2_24	pz2_24	test_data	30.014	29.97279	0.04121	0
pz2_25	pz2_25	test_data	29.996	29.97273	0.02327	0
pz2_26	pz2_26	test_data	29.981	29.97267	0.00833	0
pz2_27	pz2_27	test_data	29.954	29.97258	-0.01858	0
pz2_28	pz2_28	test_data	29.922	29.97249	-0.05049	0
pz2_29	pz2_29	test_data	29.883	29.97237	-0.08937	0
pz2_30	pz2_30	test_data	29.852	29.97223	-0.12023	0
pz2_31	pz2_31	test_data	29.848	29.97215	-0.12415	0
pz2_32	pz2_32	test_data	29.837	29.97202	-0.13502	0
pz2_33	pz2_33	test_data	29.822	29.97185	-0.14985	0
pz2_34	pz2_34	test_data	29.803	29.97166	-0.16866	0
pz2_35	pz2_35	test_data	29.777	29.97146	-0.19446	0
pz2_36	pz2_36	test_data	29.755	29.97122	-0.21622	0

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
pz2_37	pz2_37	test_data	29.748	29.97096	-0.22296	0
pz2_38	pz2_38	test_data	29.727	29.97065	-0.24365	0
pz2_39	pz2_39	test_data	29.683	29.97028	-0.28728	0
pz2_40	pz2_40	test_data	29.644	29.96985	-0.32585	0
pz2_41	pz2_41	test_data	29.59	29.96939	-0.37939	0
pz2_42	pz2_42	test_data	29.584	29.96885	-0.38485	0
pz2_43	pz2_43	test_data	29.541	29.96823	-0.42723	0
pz2_44	pz2_44	test_data	29.493	29.96749	-0.47449	0
pz2_45	pz2_45	test_data	29.471	29.96661	-0.49561	0
pz2_46	pz2_46	test_data	29.47	29.9666	-0.4966	0
pz2_47	pz2_47	test_data	29.471	29.9666	-0.4956	0
pz2_48	pz2_48	test_data	29.472	29.96663	-0.49463	0
pz2_49	pz2_49	test_data	29.476	29.96667	-0.49067	0
pz2_50	pz2_50	test_data	29.487	29.96672	-0.47972	0
pz2_51	pz2_51	test_data	29.502	29.96677	-0.46477	0
pz2_52	pz2_52	test_data	29.518	29.96682	-0.44882	0
pz2_53	pz2_53	test_data	29.543	29.96688	-0.42388	0
pz2_54	pz2_54	test_data	29.579	29.96694	-0.38794	0
pz2_55	pz2_55	test_data	29.642	29.96703	-0.32503	0
pz2_56	pz2_56	test_data	29.726	29.96713	-0.24113	0
pz2_57	pz2_57	test_data	29.833	29.96727	-0.13427	0
pz2_58	pz2_58	test_data	29.907	29.96746	-0.06046	0
pz2_59	pz2_59	test_data	29.901	29.96771	-0.06671	0
pz2_60	pz2_60	test_data	29.876	29.96803	-0.09203	0
pz2_61	pz2_61	test_data	29.893	29.96844	-0.07544	0
pz2_62	pz2_62	test_data	29.799	29.96898	-0.16998	0
pz2_63	pz2_63	test_data	29.639	29.96969	-0.33069	0
pz2_64	pz2_64	test_data	29.391	29.97062	-0.57962	0
pz2_65	pz2_65	test_data	29.243	29.97158	-0.72858	0
Observations	of no drawdo			-	sed on the 200	3 aquifer
. 4 .11.20	1	testing (EGGI, 2003; ı	meters)		
pz1_ddn20	pz1_ddn20	piezo_ddn	0	0.080542408	0.080542408	8.5
pz1_ddn30	pz1_ddn30	piezo_ddn	0	0.079782039	0.079782039	8.5
pz1_ddn45	pz1_ddn45	piezo_ddn	0	- 0.016589822	0.016589822	8.5
pz1_ddn65	pz1_ddn65	piezo_ddn	0	-0.0645549	0.0645549	8.5
pz2_ddn20	pz2_ddn20	piezo_ddn	0	0.005953684	0.005953684	8.5

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
pz2_ddn30	pz2_ddn30	piezo_ddn	0	-0.00535323	0.00535323	8.5
pz2_ddn45		-			-	
	pz2_ddn45	piezo_ddn	0	0.000265448	0.000265448	8.5
pz2_ddn65				-		
	pz2_ddn65	piezo_ddn	0	0.004699036	0.004699036	8.5
		_		er testing (EGGI		
mw10_chg1	mw10_chg1	head_chg	0.103	0.05822	0.04478	5.5
mw10_chg2	mw10_chg2	head_chg	0.543	0.50051	0.04249	5.5
mw10_chg3	mw10_chg3	head_chg	-0.518	-0.47911	-0.03889	5.5
mw1a_chg1	mw1a_chg1	head_chg	0.277	0.20654	0.07046	5.5
mw1a_chg2	mw1a_chg2	head_chg	1.119	1.03303	0.08597	5.5
mw1a_chg3	mw1a_chg3	head_chg	-1.247	-1.10951	-0.13749	5.5
mw28_chg1	mw28_chg1	head_chg	0.445	0.61611	-0.17111	5.5
mw28_chg2	mw28_chg2	head_chg	1.268	1.30039	-0.03239	5.5
mw28_chg3	mw28_chg3	head_chg	-1.57	-1.79008	0.22008	5.5
mw2a_chg1	mw2a_chg1	head_chg	0.186	0.27496	-0.08896	5.5
mw2a_chg2	mw2a_chg2	head_chg	0.945	0.90706	0.03794	5.5
mw2a_chg3	mw2a_chg3	head_chg	-0.93	-1.0656	0.1356	5.5
mw3a_chg1	mw3a_chg1	head_chg	0.214	0.16031	0.05369	5.5
mw3a_chg2	mw3a_chg2	head_chg	0.972	0.82565	0.14635	5.5
mw3a_chg3	mw3a_chg3	head_chg	-1.033	-0.86708	-0.16592	5.5
mw4a_chg1	mw4a_chg1	head_chg	0.186	0.24112	-0.05512	5.5
mw4a_chg2	mw4a_chg2	head_chg	0.518	0.63086	-0.11286	5.5
mw4a_chg3	mw4a_chg3	head_chg	-0.503	-0.77435	0.27135	5.5
mw5a_chg1	mw5a_chg1	head_chg	0.079	-0.00435	0.08335	0
mw5a_chg2	mw5a_chg2	head_chg	0.445	0.14013	0.30487	5.5
mw5a_chg3	mw5a_chg3	head_chg	-0.119	-0.10186	-0.01714	0
mw6_chg1	mw6_chg1	head_chg	1.597	1.71104	-0.11404	5.5
mw6_chg2	mw6_chg2	head_chg	1.186	1.10129	0.08471	5.5
mw6_chg3	mw6_chg3	head_chg	-2.627	-2.68646	0.05946	5.5
mw7_chg1	mw7_chg1	head_chg	0.243	0.40425	-0.16125	5.5
mw7_chg2	mw7_chg2	head_chg	2.005	1.97571	0.02929	5.5
mw7_chg3	mw7_chg3	head_chg	-2.12	-2.25682	0.13682	5.5
mw8_chg1	mw8_chg1	head_chg	1.164	1.1516	0.0124	5.5
mw8_chg2	mw8_chg2	head_chg	1.238	1.15506	0.08294	5.5
mw8_chg3	mw8_chg3	head_chg	-2.246	-2.1798	-0.0662	5.5
mw9_chg1	mw9_chg1	head_chg	0.049	0.07734	-0.02834	5.5
mw9_chg2	mw9_chg2	head_chg	0.631	0.60664	0.02436	5.5
mw9_chg3	mw9_chg3	head_chg	-0.601	-0.61212	0.01112	5.5

Attachment 2

Attachment 2. Summary of parameters used in the model calibration

Attachment 2. Summary of parameters used in the model calibration						
Parameter Name	Calibrated value	Lower bound	Upper bound	Varied during calibration		
kx01	0.17006559	0.01	2	Yes		
kx02	0.05	0.05	3	Yes		
kx03	30	1	30	Yes		
kx04	2.4948572	0.5	25	Yes		
kx05	0.5	0.5	25	Yes		
kx06	0.54102912	0.5	25	Yes		
kx07	41.738724	40	300	Yes		
kx08	250	35	250	Yes		
kx09	20	20	200	Yes		
kx10	249.65207	50	400	Yes		
kx11	5	5	150	Yes		
kx12	4.4013092	4	100	Yes		
kx14	500	100	500	Yes		
kx15	3	0.05	3	Yes		
kx16	30	1	30	Yes		
kx17	15.440079	1	30	Yes		
kx18	30	1	30	Yes		
kx19	1	1	30	Yes		
kx20	30	1	30	Yes		
kx21	25	0.5	25	Yes		
kx22	25	0.5	25	Yes		
kx23	9.0514213	0.5	25	Yes		
kx24	25	0.5	25	Yes		
kx25	25	0.5	25	Yes		
kx26	25	0.5	25	Yes		
kx27	25	0.5	25	Yes		
kx28	300	40	300	Yes		
kx29	300	40	300	Yes		
kx30	250	35	250	Yes		
kx31	94.303615	50	400	Yes		
kx32	76.055789	5	150	Yes		
kx33	150	5	150	Yes		
kx34	4	4	100	Yes		
kx35	100	4	100	Yes		
an01	4.2768444	1	500	Yes		
an02	11.618031	1	500	Yes		

Attachment 2. Summary of parameters used in the model calibration

Parameter Name	Calibrated value	Lower bound	Upper bound	Varied during calibration
an03	6.4816919	1	500	Yes
an04	1.1478189	1	500	Yes
an05	16.290973	1	500	Yes
an06	1	1	500	Yes
an07	1	1	500	Yes
an08	1.4137544	1	500	Yes
an09	483.10652	1	500	Yes
an10	87.573908	1	500	Yes
an11	1	1	500	Yes
an12	500	1	500	Yes
an14	5.9366177	1	500	Yes
an15	1	1	500	Yes
an16	1	1	500	Yes
an17	1	1	500	Yes
an18	1.6747169	1	500	Yes
an19	49.972135	1	500	Yes
an20	1	1	500	Yes
an21	1	1	500	Yes
an22	1	1	500	Yes
an23	1.6154713	1	500	Yes
an24	1	1	500	Yes
an25	3.285047	1	500	Yes
an26	1	1	500	Yes
an27	1	1	500	Yes
an28	15.309766	1	500	Yes
an29	2.1853413	1	500	Yes
an30	1.4137544	1	500	Yes
an31	6.0485743	1	500	Yes
an32	1	1	500	Yes
an33	1	1	500	Yes
an34	1	1	500	Yes
an35	4.5871998	1	500	Yes
ss01	0.001158549	0.00001	0.01	Yes
ss02	0.001	0.00001	0.01	No
ss03	0.001	0.00001	0.01	No
ss04	0.001	0.00001	0.01	No
ss05	0.001	0.00001	0.01	No

Attachment 2. Summary of parameters used in the model calibration

Parameter Name	Calibrated value	Lower bound	Upper bound	Varied during calibration
ss06	0.001	0.00001	0.01	No
ss07	0.001	0.00001	0.01	No
ss08	0.00015776	0.00001	0.01	Yes
ss09	0.001	0.00001	0.01	No
ss10	0.01	0.00001	0.01	Yes
ss11	0.001	0.00001	0.01	No
ss12	0.001	0.00001	0.01	No
ss14	0.001	0.00001	0.01	No
ss15	0.000864721	0.00001	0.01	Yes
ss16	0.001	0.00001	0.01	No
ss17	9.32887E-05	0.00001	0.01	Yes
ss18	0.000437911	0.00001	0.01	Yes
ss19	3.92376E-05	0.00001	0.01	Yes
ss20	8.75911E-05	0.00001	0.01	Yes
ss21	0.000687307	0.00001	0.01	Yes
ss22	0.001	0.00001	0.01	No
ss23	0.007043403	0.00001	0.01	Yes
ss24	0.001	0.00001	0.01	No
ss25	0.001	0.00001	0.01	No
ss26	8.47164E-05	0.00001	0.01	Yes
ss27	3.24989E-05	0.00001	0.01	Yes
ss28	0.01	0.00001	0.01	Yes
ss29	0.01	0.00001	0.01	Yes
ss30	0.00015776	0.00001	0.01	Yes
ss31	0.006198607	0.00001	0.01	Yes
ss32	0.000184937	0.00001	0.01	Yes
ss33	6.77171E-05	0.00001	0.01	Yes
ss34	0.001	0.00001	0.01	No
ss35	0.001194538	0.00001	0.01	Yes
sy01	0.005	0.001	0.1	No
sy02	0.004985494	0.001	0.2	Yes
sy03	0.022495405	0.01	0.3	Yes
sy04	0.01	0.01	0.3	Yes
sy05	0.024813649	0.01	0.3	Yes
sy06	0.2857731	0.01	0.3	Yes
sy07	0.4	0.01	0.4	Yes
sy08	0.15	0.01	0.35	No

Attachment 2. Summary of parameters used in the model calibration

Parameter Name	Calibrated value	Lower bound	Upper bound	Varied during calibration
sy09	0.3	0.01	0.3	Yes
sy10	0.08	0.01	0.4	No
sy11	0.01	0.01	0.3	Yes
sy12	0.3	0.01	0.3	Yes
sy14	0.20179611	0.01	0.4	Yes
sy15	0.01	0.001	0.2	No
sy16	0.010483002	0.01	0.3	Yes
sy17	0.05	0.01	0.3	No
sy18	0.05	0.01	0.3	No
sy19	0.05	0.01	0.3	No
sy20	0.05	0.01	0.3	No
sy21	0.059779339	0.01	0.3	Yes
sy22	0.3	0.01	0.3	Yes
sy23	0.04	0.01	0.3	No
sy24	0.099803259	0.01	0.3	Yes
sy25	0.011616285	0.01	0.3	Yes
sy26	0.25	0.01	0.3	No
sy27	0.25	0.01	0.3	No
sy28	0.2	0.01	0.4	No
sy29	0.2	0.01	0.4	No
sy30	0.15	0.01	0.35	No
sy31	0.08	0.01	0.4	No
sy32	0.07	0.01	0.3	No
sy33	0.07	0.01	0.3	No
sy34	0.062826406	0.01	0.3	Yes
sy35	0.06	0.01	0.3	No
wellfac_1	0.667131235	0.001	20	Yes
wellfac_2	0.001	0.001	20	Yes
wellfac_3	0.002759891	0.001	20	Yes
wellfac_4	0.001	0.001	20	Yes
wellfac_5	0.201858417	0.001	20	Yes
wellfac_6	0.001	0.001	20	Yes
wellfac_7	0.001160328	0.001	20	Yes
wellfac_8	0.017117304	0.001	20	Yes
wellfac_9	0.664279982	0.001	20	Yes
wellfac_10	0.001386801	0.001	20	Yes
wellfac_11	0.00112613	0.001	20	Yes

Attachment 2. Summary of parameters used in the model calibration

Parameter Name	Calibrated value	Lower bound	Upper bound	Varied during calibration
wellfac_12	3.044832694	0.001	20	Yes
rivfac_1	20	0.0001	20	Yes
rivfac_2	1.97828576	0.0001	20	Yes
rivfac_3	20	0.0001	20	Yes
ghbfac_1	2.25926476	0.0001	20	Yes

Attachment 3. Parameter sensitivity summary

Parameter Name	Parameter Group	Sensitivity	Rank	Lithology/Description			
Horizontal hydraulic conductivity parameters by zone (see Figure 2-10)							
kx01	kx	1.71E-05	94	CLAY			
kx02	kx	3.56E-03	27	SILT			
kx03	kx	2.45E-02	4	FINE SAND			
kx04	kx	1.17E-02	10	FINE SAND WITH TRACE FINES			
kx05	kx	7.30E-04	42	FINE SAND WITH LITTLE FINES			
kx06	kx	9.74E-03	15	FINE SAND WITH SOME FINES			
kx07	kx	3.80E-04	48	COARSE SAND			
kx08	kx	6.92E-03	19	COARSE SAND WITH TRACE FINES			
kx09	kx	9.52E-05	66	COARSE SAND WITH LITTLE FINES			
kx10	kx	1.78E-02	7	COARSE SAND WITH GRAVEL			
kx11	kx	1.13E-02	11	FINE SAND TO GRAVEL			
kx12	kx	7.38E-02	1	FINE SAND TO GRAVEL WITH TRACE FINES			
kx14	kx	7.87E-04	40	GRAVEL			
kx15	kx	6.45E-04	43	SILT			
kx16	kx	1.32E-02	9	FINE SAND			
kx17	kx	2.19E-02	5	FINE SAND			
kx18	kx	1.02E-03	36	FINE SAND			
kx19	kx	1.35E-03	32	FINE SAND			
kx20	kx	1.50E-03	31	FINE SAND			
kx21	kx	2.82E-04	53	FINE SAND WITH TRACE FINES			
kx22	kx	2.74E-04	54	FINE SAND WITH TRACE FINES			
kx23	kx	9.61E-06	103	FINE SAND WITH TRACE FINES			
kx24	kx	6.15E-04	45	FINE SAND WITH LITTLE FINES			
kx25	kx	4.89E-05	75	FINE SAND WITH LITTLE FINES			
kx26	kx	1.11E-02	12	FINE SAND WITH SOME FINES			
kx27	kx	2.97E-02	3	FINE SAND WITH SOME FINES			
kx28	kx	8.09E-04	39	COARSE SAND			
kx29	kx	5.33E-03	21	COARSE SAND			
kx31	kx	2.19E-02	6	COARSE SAND WITH TRACE FINES			
kx32	kx	1.05E-02	13	COARSE SAND WITH GRAVEL			
kx33	kx	4.34E-03	24	FINE SAND TO GRAVEL			
kx34	kx	8.41E-03	18	FINE SAND TO GRAVEL			
kx35	kx	3.80E-03	26	FINE SAND TO GRAVEL WITH TRACE FINES			
Vertical anisotropy parameters by zone (see Figure 2-10)							
an01	kz	3.48E-06	110	CLAY			

Attachment 3. Parameter sensitivity summary

Parameter	Parameter	Sensitivity	Rank	Lithology/Description
Name	Group			
an02	kz	9.14E-06	104	SILT
an03	kz	6.87E-06	106	FINE SAND
an04	kz	5.39E-04	47	FINE SAND WITH TRACE FINES
an05	kz	1.32E-04	61	FINE SAND WITH LITTLE FINES
an06	kz	8.64E-03	17	FINE SAND WITH SOME FINES
an07	kz	1.50E-04	60	COARSE SAND
an08	kz	3.94E-05	79	COARSE SAND WITH TRACE FINES
an09	kz	1.48E-05	99	COARSE SAND WITH LITTLE FINES
an10	kz	9.56E-03	16	COARSE SAND WITH GRAVEL
an11	kz	2.08E-05	92	FINE SAND TO GRAVEL
an12	kz	6.33E-05	71	FINE SAND TO GRAVEL WITH TRACE FINES
an14	kz	1.50E-05	97	GRAVEL
an15	kz	2.47E-04	56	SILT
an16	kz	7.38E-05	68	FINE SAND
an17	kz	3.62E-04	49	FINE SAND
an18	kz	4.14E-05	78	FINE SAND
an19	kz	6.43E-04	44	FINE SAND
an20	kz	2.33E-05	91	FINE SAND
an21	kz	2.98E-05	87	FINE SAND WITH TRACE FINES
an22	kz	1.09E-04	63	FINE SAND WITH TRACE FINES
an23	kz	5.63E-06	107	FINE SAND WITH TRACE FINES
an24	kz	1.07E-04	64	FINE SAND WITH LITTLE FINES
an25	kz	2.84E-05	88	FINE SAND WITH LITTLE FINES
an26	kz	2.24E-04	57	FINE SAND WITH SOME FINES
an27	kz	1.82E-04	59	FINE SAND WITH SOME FINES
an28	kz	2.49E-04	55	COARSE SAND
an29	kz	6.51E-05	69	COARSE SAND
an31	kz	1.29E-03	34	COARSE SAND WITH GRAVEL
an32	kz	5.67E-05	72	FINE SAND TO GRAVEL
an33	kz	4.77E-05	76	FINE SAND TO GRAVEL
an34	kz	1.00E-03	37	FINE SAND TO GRAVEL WITH TRACE FINES
an35	kz	4.45E-06	109	FINE SAND TO GRAVEL WITH TRACE FINES
	Speci	fic storage pa	aramete	ers by zone (see Figure 2-10)
ss01	stor	4.88E-06	108	CLAY
ss08	stor	1.48E-05	98	COARSE SAND WITH TRACE FINES
ss10	stor	4.52E-03	23	COARSE SAND WITH GRAVEL
ss15	stor	1.04E-05	101	SILT

Attachment 3. Parameter sensitivity summary

Parameter Name	Parameter Group	Sensitivity	Rank	Lithology/Description	
ss17	stor	9.85E-05	65	FINE SAND	
ss18	stor	3.60E-07	113	FINE SAND	
ss19	stor	8.94E-05	67	FINE SAND	
ss20	stor	1.57E-05	95	FINE SAND	
ss21	stor	3.60E-07	112	FINE SAND WITH TRACE FINES	
ss23	stor	0.00E+00	115	FINE SAND WITH TRACE FINES	
ss26	stor	3.53E-05	82	FINE SAND WITH SOME FINES	
ss27	stor	3.08E-05	85	FINE SAND WITH SOME FINES	
ss28	stor	7.50E-04	41	COARSE SAND	
ss29	stor	1.15E-03	35	COARSE SAND	
ss31	stor	4.86E-03	22	COARSE SAND WITH GRAVEL	
ss32	stor	5.15E-05	74	FINE SAND TO GRAVEL	
ss33	stor	1.96E-05	93	FINE SAND TO GRAVEL	
ss35	stor	6.41E-05	70	FINE SAND TO GRAVEL WITH TRACE FINES	
Specific yield parameters by zone (see Figure 2-10)					
sy02	stor	7.58E-06	105	SILT	
sy03	stor	9.68E-06	102	FINE SAND	
sy04	stor	2.50E-05	90	FINE SAND WITH TRACE FINES	
sy05	stor	3.29E-05	84	FINE SAND WITH LITTLE FINES	
sy06	stor	1.67E-02	8	FINE SAND WITH SOME FINES	
sy07	stor	6.72E-03	20	COARSE SAND	
sy09	stor	1.34E-03	33	COARSE SAND WITH LITTLE FINES	
sy11	stor	3.37E-04	50	FINE SAND TO GRAVEL	
sy12	stor	3.19E-04	51	FINE SAND TO GRAVEL WITH TRACE FINES	
sy14	stor	2.00E-03	29	GRAVEL	
sy16	stor	1.78E-03	30	FINE SAND	
sy21	stor	3.12E-06	111	FINE SAND WITH TRACE FINES	
sy22	stor	4.11E-03	25	FINE SAND WITH TRACE FINES	
sy24	stor	2.74E-03	28	FINE SAND WITH LITTLE FINES	
sy25	stor	1.52E-09	114	FINE SAND WITH LITTLE FINES	
sy34	stor	9.95E-03	14	FINE SAND TO GRAVEL WITH TRACE FINES	
	Othe	r parameters	by lay	er and zone (see Figure 2-6)	
wellfac_1	welfac	1.17E-05	100	Lateral inflow multiplier in layer 1	
wellfac_2	welfac	3.50E-05	83	Lateral inflow multiplier in layer 1	
wellfac_3	welfac	3.08E-05	86	Lateral inflow multiplier in layer 1	
wellfac_4	welfac	1.92E-04	58	Lateral inflow multiplier in layer 1	
wellfac_5	welfac	1.13E-04	62	Lateral inflow multiplier in layer 2	

Attachment 3. Parameter sensitivity summary

Parameter	Parameter	Sensitivity	Rank	Lithology/Description
Name	Group			
wellfac_6	welfac	3.73E-05	81	Lateral inflow multiplier in layer 2
wellfac_7	welfac	5.65E-05	73	Lateral inflow multiplier in layer 2
wellfac_8	welfac	3.18E-04	52	Lateral inflow multiplier in layer 2
wellfac_9	welfac	9.61E-04	38	Lateral inflow multiplier in layer 3
wellfac_10	welfac	2.79E-05	89	Lateral inflow multiplier in layer 3
wellfac_11	welfac	3.92E-05	80	Lateral inflow multiplier in layer 3
wellfac_12	welfac	6.63E-02	2	Lateral inflow multiplier in layer 3
rivfac_1				Vertical hydraulic conductivity of the
	welfac	5.78E-04	46	Merrimack River bed
rivfac_2				Vertical hydraulic conductivity of Baboosic
	welfac	1.57E-05	96	Brook bed near MVD-4/5
rivfac_3				Vertical hydraulic conductivity of Baboosic
	welfac	4.31E-05	77	Brook bed in the far field
ghbfac_1				Underflow conductance multiplier on
				Merrimack alluvium at the downstream end of
	welfac	<1.52E-09	115	the model domain

Attachment 4

Attachment 4. Boundary cell budget summaries for the long-term-average conditions scenario (see Figure 2-6 for boundary cell map)

Definition		Direction ¹	m³/day	gpm	cfs
WEL zone 1	1	In	653.82	119.94	0.267238
WEL zone 2	1	In	2.27	0.417	0.000929
WEL zone 3	1	In	7.87	1.444	0.003216
WEL zone 4	1	In	6.06	1.111	0.002476
WEL zone 5	2	In	260.78	47.840	0.106588
WEL zone 6	2	In	1.05	0.193	0.00043
WEL zone 7	2	In	0.78	0.144	0.000321
WEL zone 8	2	In	34.65	6.357	0.014163
WEL zone 9	3	In	562.25	103.15	0.22981
WEL zone 10	3	In	1.13	0.207	0.00046
WEL zone 11	3	In	0.54	0.098	0.000219
WEL zone 12	3	In	4757.09	872.70	1.944388
Wells MVD-4/5	3	Out	2229.01	408.92	0.911073
RIV reach 1	1	In	547.46	100.43	0.223766
RIV reach 1	1	Out	6948.30	1274.69	2.84001
Net into aquifer ²			-6400.84	-1174.25	-2.61624
RIV reach 2	1	In	21.09	3.869	0.008621
RIV reach 2	1	Out	2362.63	433.431	0.965687
Net into aquifer			-2341.54	-429.561	-0.95707
RIV reach 3	1	In	186.15	34.149	0.076084
RIV reach 3	1	Out	2045.73	375.296	0.836162
Net into aquifer			-1859.59	-341.147	-0.76008
All other cells					
DRN cells	1	Out	311.31	57.111	0.127245
GHB cells all layers	1,2,3	ln	297.01	54.488	0.1214

¹Direction: in means into the aquifer, out means out of the aquifer. These values are expressed as positive, regardless of direction.

²Net flow values for the indicated river reaches use the MODFLOW convention of negative values meaning flow out of the aquifer and positive values meaning flow into the aquifer.

Attachment 5

Attachment 5. Boundary cell budget summaries for the summer pumping conditions scenario (see Figure 2-6 for boundary cell map)

Definition	Layer	Direction ¹	m³/day	gpm	cfs
WEL zone 1	1	In	653.82	119.94	0.267238
WEL zone 2	1	In	2.27	0.417	0.000929
WEL zone 3	1	In	7.87	1.444	0.003216
WEL zone 4	1	In	6.06	1.111	0.002476
WEL zone 5	2	In	260.78	47.840	0.106588
WEL zone 6	2	In	1.05	0.193	0.00043
WEL zone 7	2	In	0.78	0.144	0.000321
WEL zone 8	2	In	34.65	6.357	0.014163
WEL zone 9	3	In	562.25	103.15	0.22981
WEL zone 10	3	In	1.13	0.207	0.00046
WEL zone 11	3	In	0.54	0.098	0.000219
WEL zone 12	3	In	4757.09	872.70	1.944388
Wells MVD-4/5	3	Out	3406.87	625.00	1.392506
RIV reach 1	1	In	972.42	178.39	0.397463
RIV reach 1	1	Out	6206.16	1138.54	2.536674
Net into aquifer ²			-5233.74	-960.14	-2.13921
RIV reach 2	1	In	21.25	3.898	0.008685
RIV reach 2	1	Out	2359.95	432.940	0.964594
Net into aquifer			-2338.71	-429.042	-0.95591
RIV reach 3	1	In	190.07	34.869	0.077688
RIV reach 3	1	Out	2042.01	374.612	0.83464
Net into aquifer			-1851.94	-339.744	-0.75695
All other cells					
DRN cells	1	Out	311.00	57.055	0.127118
GHB cells all		In			
layers	1,2,3	""	297.03	54.491	0.121406

¹Direction: in means into the aquifer, out means out of the aquifer. These values are expressed as positive, regardless of direction.

²Net flow values for the indicated river reaches use the MODFLOW convention of negative values meaning flow out of the aquifer and positive values meaning flow into the aquifer.

Attachment 6

Attachment 6. Boundary cell budget summaries for the November 23, 2016 conditions scenario (see Figure 2-6 for boundary cell map)

2010 0011410115 500				γ σσ	
Definition	Layer	Direction ¹	m³/day	gpm	cfs
WEL zone 1	1	In	653.82	119.94	0.267238
WEL zone 2	1	In	2.27	0.417	0.000929
WEL zone 3	1	In	7.87	1.444	0.003216
WEL zone 4	1	In	6.06	1.111	0.002476
WEL zone 5	2	In	260.78	47.840	0.106588
WEL zone 6	2	In	1.05	0.193	0.00043
WEL zone 7	2	In	0.78	0.144	0.000321
WEL zone 8	2	In	34.65	6.357	0.014163
WEL zone 9	3	In	562.25	103.15	0.22981
WEL zone 10	3	In	1.13	0.207	0.00046
WEL zone 11	3	In	0.54	0.098	0.000219
WEL zone 12	3	In	4757.09	872.70	1.944388
Wells MVD-4/5	3	Out	0.00	0.00	0
RIV reach 1	1	In	0.00	0.00	0
RIV reach 1	1	Out	10552.01	1935.80	4.312971
Net into aquifer ²			-10552.01	-1935.80	-4.31297
RIV reach 2	1	In	1368.78	251.106	0.559467
RIV reach 2	1	Out	852.49	156.391	0.348441
Net into aquifer			516.29	94.715	0.211026
RIV reach 3	1	In	190.19	34.891	0.077738
RIV reach 3	1	Out	2031.40	372.665	0.830301
Net into aquifer			-1841.20	-337.774	-0.75256
All other cells					
DRN cells	1	Out	308.72	56.636	0.126185
GHB cells all		Out			
layers	1,2,3	Out	659.59	121.004	0.269599

¹Direction: in means into the aquifer, out means out of the aquifer. These values are expressed as positive, regardless of direction.

²Net flow values for the indicated river reaches use the MODFLOW convention of negative values meaning flow out of the aquifer and positive values meaning flow into the aquifer.

Appendix D

Field Documentation

Well and Stream Sampling Logs Well Development Logs Sample Chains of Custody Shipping Manifests: MVD-4/5 Discharge Water Some of the field logs in this appendix include slightly altered location identifiers for the study locations. Table D-1 shows the study locations and location identifies used in the field logs in this appendix.

Table D-1

Study Locations and Field Documentation Identifiers
Wells MVD-4/5 Investigation

Study Location	Field Documentation Location Identifiers
AP01	AP-01, AP01
AP02	AP02
AP03	AP03
AP04	AP04
AP08	AP08
AP09	AP09
45-1MW	1MW
45-1A	MW 45-1A, MER-MW-45-1A
45-2A	45-2A, MW-45-2A
45-3A	45-3A
45-4A	MW-45-4A, 45-4A
45-5A	MER-45-5A, MW-45-5A, Mer-45-5a
45-6	MER 45-6, MW-45-6, MER-45-6
45-7	MW45-7, MW-45-7
45-8	MER-45-8
45-9	45-9
45-10	MER-45-10, MER45-10
45-11	MER45-11
45-28	MER45-28, MW-45-28, 45-28
MW-1	LNG MW-1, LNG-MW1
MW-2	LNG MW-2, LNG-2
MW-3	LNG MW-3, LNG-MW-3
MW-4	LNG-MW-4
MVD-4	MVD-4
MVD-5	MVD-5
SWUp_Merrimack	Upstream Merrimack
SWDn_Merrimack	Merrimack Downstream
SWUp_Baboosic	Upstream Baboosic
SWMid_Baboosic	Mid Baboosic
SWDn_Baboosic	Baboosic Downstream

DATE: 11/7/16	PROJECT NO: 16.6/26
SAMPLING PERSONNEL: Janeth Dyner	PROJECT NAME: SGPP-Merimack
Justin Georghall	PROJECT LOCATION: Merr mack INN
SAMPLING LOCATION: Merri would Downstrum	
S62-SWDn Mer - 16/107	
SAMPLE COLLECTION TIME: 1515	
DEPTH OF STREAM AT SAMPLING POINT: 1.95 ft	k-
WIDTH OF STREAM: 6300 ft.	
STREAM VELOCITY: Low	
WATER LEVEL AT MEASURING POINT: 2.14 A.	
OBSERVATIONS: COLOR CLEAR SHEEN NO NE OTHER 2249 AV ORP 30	, ODOR NONE, TURBIDITY O.89 NTU
FIELD PARAMETERS: ph 20 4.90 TEMPERATURE 7.9°C CONDUCTIVITY 0.115 OTHER 224.9 AV C	asjon (Specific Confetationice
NOTES: Depth to water 2.14 ft. from	m top of pipe

DATE: 11/07/16	PROJECT NO: 16.6/26
SAMPLING PERSONNEL: Jenedlig Dipport	PROJECT NAME: SEPP-MERRIALK
-562-8WDn BAB-16407 Justin Compbell	PROJECT LOCATION: Merr mouk , NH
SAMPLING LOCATION: Babasic Dewnstrum	
562-SWDn BAB-161107	
SAMPLE COLLECTION TIME: 1540	
DEPTH OF STREAM AT SAMPLING POINT: 0.9 F	
WIDTH OF STREAM: < 30 ft.	
STREAM VELOCITY: Mederate	
WATER LEVEL AT MEASURING POINT: 3.824	aberetif pipe
OBSERVATIONS: COLOR (COLOR), SHEEN NENE , OTHER	ODOR NOW C 36 NTU
FIELD PARAMETERS: pH 6.36 TEMPERATURE 70°C CONDUCTIVITY 0.387 AI	5/cm (SPO) spectic undustrance 1500= 8.96 Mg/L
NOTES: water level at surveyed lathe was O.	19 H.

DATE: 11/2/16	PROJECT NO: 16.6/26
SAMPLING PERSONNEL: Jonathan Dippert	PROJECT NAME: SEPP- Mon mack
Justin Campbell	PROJECT LOCATION: Merrowack, NH
SAMPLING LOCATION: Mid Beboosie	
SG2-SWMidBab -161107	
SAMPLE COLLECTION TIME: 16:30	
DEPTH OF STREAM AT SAMPLING POINT: 1.12 ft.	
WIDTH OF STREAM: ~ 75 ft.	
STREAM VELOCITY: Low to moderate	
WATER LEVEL AT MEASURING POINT: 1.85 ft.	
OBSERVATIONS: COLOR_51.ght yellow tint , SHEEN_NONE , OTHER_	TURBIDITY 0.29 NTH
FIELD PARAMETERS: pH 6.55 TEMPERATURE 6.8°C CONDUCTIVITY 0.391 M OTHER 029 = 203.7 MV	S/cm (specific conductance) 1; Do=10.24
NOTES: Field Deplicate Collected at	this location.

DAILY CALIBRATION RECORD

DITIE! OF LIDITITION THEOORE	·
PROJECT: SGPP - Michael Street	CTM PROJECT NO.:
OCATION: HOOSICK Falls, NY MEMMULL, NH	DATE:

EQUIPMENT TIME (Make, Model, and Serial #)	STANDARD (Concentration)	METER READING	CALIBRATED or BUMP TEST	CALIBRATED BY
La Motte 2020We - 18247 12:30 - FAO 1463 YST Quito 4M FAOO878 12:45 - ST Quito 4M FAOO878 12:45 - ST Quito 4M FAOO416 13:00 - YST 4M Pro Plus FAOC373 13:45	DO 100% 24 4, 7, 10 Cond. 7,0 m/m ORP 220 mV DO 100% 24 4, 7, 10 Cond. 7.0 ORR 220 DO 100% 24 4, 7, 10 ORR 220 DO 100% 24 4, 7, 10 ORR 220 DO 100%	-0.00, 1.33 9.98 0.00, 0.98, 9.99 -0.44 1.01, 10.04 104.1 3.96, 6.97, 9.92 200, 0 104.4 4.26, 7.17, 10.21 -103.0 -100, 7.11, 10.21 -103.0 -100, 7.11, 10.21 -103.0	Calibrated	RECORRERENTAL

C.T. MALE ASSOCIATES			1,050000		
		DAILY CALIBRATIO	N RECORD		10 10101
	_	SGPP - Mecaffrey Street		- K 1 1	6.6126 1.4756
	LOCATION: H	toosiok Falls, NY Merrin	Mack NH	DATE:	1116
EQUIPMENT (Make, Model, and Serial #)	TIME	STANDARD (Concentration)	METER_ READING	CALIBRATED or BUMP TEST	CALIBRATED BY
La Motte 2020 We 18247	1430	UM 0.010 0.100.0	0.01,1.21,10.2	- Bump	+c
-FA01463			0.06,1.17,10.5	1	1
YST Quatro 4 M PRO0878 1	645 I	00 100 % 0H 4,7,10	4.05,7.2,10.1	Bump	LC
	1 0	RP 220 mV	7.17		
YSI Quatro 4M PADO416	70S D	00 100%	101	Bump	LC
	P (2)	nd 20 µS/cm H 4 7,10	4.02,7.1,4.98		
YST QUARO HMPRO 0823	1770	220 mV	226	Bump	16
151 CCCC 11-11-10 CS/S	1 (4	nd 7.0 µS/cm	6.5		
	0	RP 220mV	3.98,7.02,10.13	2	
		•			

DATE: 11/8/16	PROJECT NO: 16.6M6
SAMPLING PERSONNEL: Inthe Digget	
Justin Campbell	PROJECT LOCATION: Mersimuk, NH
SAMPLING LOCATION: Upstrum Babousie	
562 - SNUpBab -161108	
SAMPLE COLLECTION TIME: 0910	
DEPTH OF STREAM AT SAMPLING POINT: 1.17 f	€.
WIDTH OF STREAM: "35 ft.	
STREAM VELOCITY: Very slow	
WATER LEVEL AT MEASURING POINT: 2.70 ft.	
OBSERVATIONS: COLOR Clear	, ODOR None
OTHER_	TURBIDITY 0.70 NTU
FIELD PARAMETERS: ph 7.82	
TEMPERATURE 5.7°C	ASKM; 444.6 Cond. 15/cm
OTHER ORP : 162.1	nV DO: 9.04 mg/L
	51
NOTES: Colleged Ms/ns D of	this location.

DATE: 11/8/16	PROJECT NO: 16.6126
SAMPLING PERSONNEL: Jonathan Dippert	PROJECT NAME: SGPP- Merrimack
Justin Campbell	PROJECT LOCATION: Merrimick, NH
SAMPLING LOCATION: Upstress Messimack	
SG2-SWUP Merr - 161108	
SAMPLE COLLECTION TIME: 1910 /030	
DEPTH OF STREAM AT SAMPLING POINT: 1.17	1.29 ft
WIDTH OF STREAM: *35 fe	
STREAM VELOCITY: Vory slow mode	rafe
WATER LEVEL AT MEASURING POINT: 2.70 4	2.69 A
6	
OBSERVATIONS: COLOR CLEAR CLAR SHEEN NOTHER OTHER FIELD PARAMETERS: PH T.82	7.21 SU
CONDUCTIVITY 0.705 SPC	
OTHER ORP: 162.1 mt	
NOTES: Conductivity: 128.4 ms/cm ORP: 155.0 av DO:	(Spec. Cond & 0.193 m5/cm) 9.71 mg/L
Dater Level @ surveyed la	the : 0,48 ft

DATE: 11-08-2016	PROJECT NAME: SGPP- Merringack		
PROJECT NO.: 16.6126	PROJECT LOCATION: Mertimack NH		
SAMPLING PERSONNEL: Justin Cumphe !			
MONITORING WELL ID#: 45-4A	NOTES TAKEN BY: 3C		
DEPTH TO WATER: 32.90 FROM: Top of pipe	BAILER ID:		
DEPTH TO BOTTOM: 44.8 FROM: Top of pipe	BAILER: NEW DISPOSABLE		
WATER COLUMN HEIGHT: 21.70	BAILER: STAINLESS STEELOTHER		
WELL CASING DIAMETER WELL VOLUME: GALLONS	CONVERSION FACTORS LINEAR FEET TO GALLONS 1" = 0.041 GALLONS		
VOLUMES PURGED: 6.0 GALLONS	PURGE METHOD: purishalling pump		
TIME STARTED: ;	TIME FINISHED: 12:35		
OBSERVATIONS: COLOR Slightly blendy ;	ODOR IRON SMEIL		
SHEEN NONE ;	TURBIDITY \$16		
WATER RECOVERY HEIGHT: 23.01;	RECOVERY TIME IN MINUTES: 55		
FIELD PARAMETERS: pH 6.09	TEMPERATURE /0.9		
CONDUCTIVITY 568.2	OTHER ORP 27.2 WV		
SAMPLE COLLECTION TIME: 12:35	DO = 6,78 mg/L		
NOTES: Tubing 84 at 42.	1 Feet		

DATE: 11-03-2016	PROJECT NAME: SGPP-MER PROJECT LOCATION: Mercinal NA		
PROJECT NO.: 16.6126			
SAMPLING PERSONNEL: Justin Campbell			
MONITORING WELL ID#: 145-9 DEPTH TO WATER: 27.15 FROM: 57.00 DEPTH TO BOTTOM: 82.90 FROM:	NOTES TAKEN BY: BAILER ID: BAILER: NEW DISPOSABLE		
WATER COLUMN HEIGHT: 55.75	BAILER: STAINLESS STEELOTHER		
WELL CASING DIAMETER WELL VOLUME: GALLONS VOLUMES PURGED: 4,5 GALLONS	CONVERSION FACTORS LINEAR FEET TO GALLONS 1" = 0.041 GALLONS		
TIME STARTED: \5 00 ;	TIME FINISHED: 1545		
OBSERVATIONS: COLOR CLEAR ; SHEEN NONE ; OTHER	ODOR NONE TURBIDITY 0.29		
WATER RECOVERY HEIGHT: 37/6;; FIELD PARAMETERS: pH 5.39, CONDUCTIVITY 496,5,	RECOVERY TIME IN MINUTES: 45 TEMPERATURE 10,7 OTHER 0x p=0,23.1 NV Do = 7.36 m/m		
NOTES: Tubing 8th @ 56 feet			

DATE: 11/8/2016	PROJECT LOCATION:		
PROJECT NO.: 16.6126			
SAMPLING PERSONNEL: Lavene Camera			
MONITORING WELL ID#: MER-45-8 DEPTH TO WATER: 23.83 FROM: DEPTH TO BOTTOM: 68.67 FROM: WATER COLUMN HEIGHT: 44.84	NOTES TAKEN BY: L. CAMERON BAILER ID: BAILER: NEW DISPOSABLE BAILER: STAINLESS STEEL OTHER		
WELL CASING DIAMETER WELL VOLUME: GALLONS VOLUMES PURGED: 3.0 GALLONS TIME STARTED: ;	CONVERSION FACTORS LINEAR FEET TO GALLONS 1" = 0.041 GALLONS 3" = 0.38 GALLONS 1.25" = 0.064 GALLONS 4" = 0.66 GALLONS 2" = 0.16 GALLONS 6" = 1.47 GALLONS PURGE METHOD: PAYASTALLOS TIME FINISHED: 1045		
OBSERVATIONS: COLOR (Lear ; SHEEN NONE ; OTHER	ODOR nune TURBIDITY 4.65		
WATER RECOVERY HEIGHT: FIELD PARAMETERS: pH 5.56 CONDUCTIVITY (NS) 852 SAMPLE COLLECTION TIME: 1030 NOTES: Tubing 84 2 56	RECOVERY TIME IN MINUTES: TEMPERATURE 10.3°C OTHER DO(mg/L) 4.02 ORP(mV) 241,7		

DATE: 8 20 6	PROJECT NAME: SEPP-Mern Mack	
PROJECT NO.: 16.6126	PROJECT LOCATION:	
SAMPLING PERSONNEL: Larene Camera		
MONITORING WELL ID#: MEQ45-6 DEPTH TO WATER: 25.05 FROM: DEPTH TO BOTTOM: 71.92 FROM: WATER COLUMN HEIGHT: 46.87	NOTES TAKEN BY: L_CAMGAM BAILER ID: BAILER: NEW DISPOSABLE BAILER: STAINLESS STEEL OTHER	
WELL CASING DIAMETER WELL VOLUME: 2.0 GALLONS VOLUMES PURGED: GALLONS TIME STARTED: 1330;	CONVERSION FACTORS LINEAR FEET TO GALLONS 1" = 0.041 GALLONS 1.25" = 0.064 GALLONS 4" = 0.66 GALLONS 2" = 0.16 GALLONS 6" = 1.47 GALLONS PURGE METHOD: Parastain Purge TIME FINISHED: 145	
OBSERVATIONS: COLOR CLEAR ; SHEEN; OTHER;	ODOR TURBIDITY 3.51	
WATER RECOVERY HEIGHT: ; FIELD PARAMETERS: pH	RECOVERY TIME IN MINUTES: TEMPERATURE [2.3] OTHER DO(mg/L) 3.60 ORP(mV) 231.9	

DATE: 11/8/2016	PROJECT NAME: SOPP-Memmac
PROJECT NO.: 16.6126	PROJECT LOCATION:
SAMPLING PERSONNEL: 2 yan Hubbard	
MONITORING WELL ID#: MW45-7 DEPTH TO WATER: 19.69 ft FROM: TPVC DEPTH TO BOTTOM: 76.25 ft FROM: TPVC	NOTES TAKEN BY: L-HADOARA BAILER ID: N/A BAILER: NEW DISPOSABLE
WATER COLUMN HEIGHT: 55.56 ft	BAILER: STAINLESS STEEL N/A OTHER
WELL CASING DIAMETER WELL VOLUME: GALLONS	CONVERSION FACTORS LINEAR FEET TO GALLONS 1" = 0.041 GALLONS
VOLUMES PURGED: Q.O GALLONS	PURGE METHOD: Panstallic Rump
TIME STARTED: 1520;	TIME FINISHED: 1610
OBSERVATIONS: COLOR CLEAR ; SHEEN ; OTHER	ODOR TURBIDITY 7.73 NTU
WATER RECOVERY HEIGHT: ft_;	RECOVERY TIME IN MINUTES: m
FIELD PARAMETERS: pH 5.98 SU, CONDUCTIVITY 588 µS, SAMPLE COLLECTION TIME: 1620 NOTES: TUDING SET @ 65.5'	OTHER DO (mg/L) 5.1 OVER (mV) 175.
TUDING SET & UD-5	



DAILY CALIBRATION RECORD

PROJECT:	SGPP -	McCaffrey Street	
			,

CTM PROJECT NO.: 14.4756

LOCATION: Hoosick Falls, NY Memmack, MH

DATE:

EQUIPMENT (Make, Model, and Serial #)	TIME	STANDARD (Concentration)	METER READING	CALIBRATED or BUMP TEST	CALIBRATED BY
LaMate F400438	7:15	Turbidty 0,1,10	2.13, 1.01 9.92	Culibrate	LC
La Matte FA 01436		a state	00/109 7197	Nº 81	LC
YSI PEPlus FAMOSTS		DO 100 7046	100-1 %	XX- A1	RH
		PH 4,7,10	3,94, 7.01, 10.10	10.1	2H_
		cond 7.00 ms/cm	6.93 45/Em _	R- 44	2+1
		02P 220 MV	218.4 mV	0.15	-KH
YST QUELO 4M 80 78		DO 100%	92.2	98-1981	LC
		PH 4,710	3.99, 6.97, 10.02	15 69	LC
		Cond floo morem	639 7.18 Wem	1) W	LC LC
		ORP 230 MV	2200 mV	1777 1 4.40	LC
La Mette FA 18247		Turbidity 0,1,10	-0.01, 1.04, 9.71	and the	JC
XSI and 414 FA 30416		PH 4,7,9	4.00, 6, 94, 10,01	N 99	JC
		Do 2	98.4	144 Sec.	20
		cond 7,00 us/con	90 0H	E 16.11	Te-
	-	ORP 220NV	218.6	46.76	Je

C.T. MALE ASSOCIATES DAILY CALIBRATION RECORD PROJECT: SGPP - McCaffrey Street CTM PROJECT NO.: 14.4756 LOCATION: Hoosiek Falls, NY Memmack, NH DATE: 11/8/16 CALIBRATED CALIBRATED METER **EQUIPMENT** TIME STANDARD READING or BUMP TEST BY (Make, Model, and Serial #) (Concentration) BUMP LaMore PADO438 1200 0-10,1-2,10.06 Turbidity 0,1,10 Lamore DA01436 DUMBOUM OLLIO 1210 YST PROPUS PRODUCTS BUM 1215 DO 100-12 4.05,7.1.10.02 and 7.00 MS/cm 02P220mV YSI QUANO FROOR 78 00 100% 101.2 Bump 1230 100 220 mV YSI GUAYO PROMYIL Bump 4.1,7.02,10.11 7.00 ms./cm 220m

DATE: 11-09-2016	PROJECT NAME: SEPP-MER LLMGCK PROJECT LOCATION: Merrimack, NH		
PROJECT NO.: 16.6126			
SAMPLING PERSONNEL: Justin (ample)			
MONITORING WELL ID#: 45-3A	NOTES TAKEN BY: JC		
DEPTH TO WATER: 2296 FROM: Top Metal pipe kus	BAILER ID:		
DEPTH TO BOTTOM: * 31.95 FROM:	BAILER: NEW DISPOSABLE		
WATER COLUMN HEIGHT: 8.99	BAILER: STAINLESS STEEL		
	OTHER		
WELL CASING DIAMETER WELL VOLUME: GALLONS VOLUMES PURGED: GALLONS TIME STARTED: ;	CONVERSION FACTORS LINEAR FEET TO GALLONS 1" = 0.041 GALLONS 3" = 0.38 GALLONS 1.25" = 0.064 GALLONS 4" = 0.66 GALLONS 2" = 0.16 GALLONS 6" = 1.47 GALLONS PURGE METHOD: TIME FINISHED: 1016		
	ODOR IRON		
OTHER Small dark particles fleeting	in notes		
WATER RECOVERY HEIGHT: 23-50;	RECOVERY TIME IN MINUTES: 55		
FIELD PARAMETERS: pH 6.67	TEMPERATURE 10,4		
CONDUCTIVITY 547,	OTHER 08 P = -125.6		
SAMPLE COLLECTION TIME: 10:15	Da = 0.84 mg/L		
NOTES: *Water level meter stopped at 48.48-	fect, Petential blockage here and		
The state of the s			

DATE: 11-09-2016	PROJECT LOCATION: Merrimack, NH			
PROJECT NO.: 16, 6126				
SAMPLING PERSONNEL: Justin Campbell				
MONITORING WELL ID#: 14W	NOTES TAKEN BY: JC			
DEPTH TO WATER: 45.35 FROM:	BAILER ID:			
DEPTH TO BOTTOM: FROM:	BAILER: NEW DISPOSABLE			
WATER COLUMN HEIGHT:	BAILER: STAINLESS STEEL			
	OTHER			
WELL CASING DIAMETER WELL VOLUME: GALLONS VOLUMES PURGED: GALLONS TIME STARTED: 1445;	CONVERSION FACTORS LINEAR FEET TO GALLONS 1" = 0.041 GALLONS 1.25" = 0.064 GALLONS 4" = 0.66 GALLONS 2" = 0.16 GALLONS 6" = 1.47 GALLONS PURGE METHOD: Blader Pump TIME FINISHED: 1550			
OBSERVATIONS: COLOR Rust orange SHEEN None OTHER	; ODOR Slight sulfur si			
WATER RECOVERY HEIGHT: FIELD PARAMETERS: pH 5.68 CONDUCTIVITY 1220 SAMPLE COLLECTION TIME: \ 550	; RECOVERY TIME IN MINUTES: 65 , TEMPERATURE 11.1 OTHER DO(mg/L) 1.92 OPP(mV) 34.1			

DATE: 11916	PROJECT NAME: SGPP-MEMMAC			
PROJECT NO.: 16.0126	PROJECT LOCATION:			
SAMPLING PERSONNEL: 2 HUDOAY				
MONITORING WELL ID#: LNG-MW-4 DEPTH TO WATER: 25.42 ft FROM: TPVC	NOTES TAKEN BY: R HUBBARD BAILER ID: N/A			
DEPTH TO BOTTOM: 40.03 ft FROM: TPVC WATER COLUMN HEIGHT: 14.61 ft	BAILER: NEW DISPOSABLE BAILER: STAINLESS STEEL N/A OTHER			
WELL CASING DIAMETER WELL VOLUME: GALLONS	CONVERSION FACTORS LINEAR FEET TO GALLONS 1" = 0.041 GALLONS 3" = 0.38 GALLONS 1.25" = 0.064 GALLONS 4" = 0.66 GALLONS 2" = 0.16 GALLONS 6" = 1.47 GALLONS			
VOLUMES PURGED: 1.75 GALLONS	PURGE METHOD: Parastaltic Pum			
TIME STARTED: 1530;	TIME FINISHED: 1620			
OBSERVATIONS: COLOR; SHEEN; OTHER;	ODOR TURBIDITY 9.86 NTU			
WATER RECOVERY HEIGHT:	RECOVERY TIME IN MINUTES: m TEMPERATURE 11.3 °C OTHER OD (mg/e) 0.4 ORP (mv) -26.8			
NOTES: Thing Set @ 30'				

DATE: 11/9/16 PROJECT NO.: 16/6/12/6				PROJECT NAME: SGPP-Mem MOCK				
				PROJECT LOCATION:				
SAMPLING PERSO	NNEL: L.	CAMERON	1					
MONITORING WEI	LID#:	MER-45-	SA	NOTES TAKEN	BY: L. CAMERON			
DEPTH TO WATER	26.29	ft FROM:	TPVC	BAILER ID: N	/ A			
DEPTH TO BOTTOM	M: 52.99	ft FROM:	TPVC	BAILER: NE	BAILER: NEW DISPOSABLE BAILER: STAINLESS STEEL N/A			
WATER COLUMN I	HEIGHT:	26.69	ft	BAILER: ST.				
				OT	THER			
WELL CASING DIA	METER		CONVERSION FACTORS LINEAR FEET TO GALLONS 1" = 0.041 GALLONS 3" = 0.38 GALLONS 1.25" = 0.064 GALLONS 4" = 0.66 GALLONS					
WELL VOLUME: GALLONS			2" = 0.16 GALLONS 6" = 1.47 GALLONS					
VOLUMES PURGEI):	G	SALLONS	PURGE METHO	DD: Parastaltic Pump			
TIME STARTED:		1320	;	TIME FINISHEI	0: 1430			
OBSERVATIONS:	COLOR _	clear	;	ODOR	none			
	SHEEN _ OTHER _	none	· ;	TURBIDITY	21.2 NTU			
WATER RECOVERY	HEIGHT:		ft_;	RECOVERY TIM	ME IN MINUTES: mi			
FIELD PARAMETER	RS: pH	6.0	3 SU,	TEMPERATURI	e 9.7 °c			
	CONDU	CTIVITY	842 µs.	OTHE	ER 00 (mg/e) 4.09			
SAMPLE COLLECTI								

DATE: 11/9/16	PROJECT NAME: SCOP Menima	
PROJECT NO.: 164126	PROJECT LOCATION:	
SAMPLING PERSONNEL: L. CAMERON		
MONITORING WELL ID#: M6245-28 DEPTH TO WATER: 19.58 ft FROM: TPVC DEPTH TO BOTTOM: 52.46ft FROM: TPVC	NOTES TAKEN BY: L CAMERON BAILER ID: N/A BAILER: NEW DISPOSABLE	
WATER COLUMN HEIGHT: 32-88 ft WELL CASING DIAMETER WELL VOLUME: GALLONS	OTHER CONVERSION FACTORS LINEAR FEET TO GALLON 1" = 0.041 GALLONS 3" = 0.38 GALLO 1.25" = 0.064 GALLONS 4" = 0.66 GALLO 2" = 0.16 GALLONS 6" = 1.47 GALLO	
VOLUMES PURGED: 6.0 GALLONS	PURGEMETHOD: Bradder PUMP	
TIME STARTED: 1445 ;	TIME FINISHED: 1550	
OBSERVATIONS: COLOR Sugary claudy ; SHEEN NOVE ; OTHER	ODOR Signt suttine smet	
WATER RECOVERY HEIGHT: ft_;	RECOVERY TIME IN MINUTES: m	
FIELD PARAMETERS: pH 6.89 SU, CONDUCTIVITY 644 µs,	TEMPERATURE 10.4 °C OTHER ODD [mV] -251.3	
NOTES: 1550	120 (mg/z) 0.30	
NOTES:		

	PROJEC	T: SGPP - McCaffrey Street	CTM P	ROJECT NO.:	16.6126
	LOCATIO	N: Hoosick Falls, NY Memmack, NH		DATE:	9/11/6
EQUIPMENT (Make, Model, and Serial #)	TIME	STANDARD (Concentration)	METER READING	CALIBRATED or BUMP TEST	CALIBRATED BY
La Motte FA01463	0740	Turbiday 61,10	0.04, 1.01, 10.05	(a).	50
La Metic FA02438	27:45	*4 VA	-0.01, 0.78, 7.79		
YSI Gods 4M FACO 873	0745	DO 1/2	167.3 %		
		PH 4,79910	4.75 4.10 9.99		
		Cond F.OU misson	759 m3cm		
		ORF 220 mV	2206 mV		
La Mitte 18247	0755	Turada, 0,1,10	3.02, 1.03, 7.98		
15I Qual 4M FACOYIL	0755	DO %	79.6		
7		PH 4,7,10	3.73 7.01,10.18		
		OCP 220, W	216,5		-
	-	Cond 7:00 MS/cm	7.01 MV		
XBI P. P. S FOR0393	8:05	DU%	103.4 %		
	-	PH 4, 7, 10	4.11, 7.61,10.05		
		Cond 7.00 MS/cm	6 96	-	
		ORP 220 MV	218.1	V	1

DATE: 11/10/246	PROJECT LOCATION:		
PROJECT NO.: 16.6126			
SAMPLING PERSONNEL: Lavene Carrer			
MONITORING WELL ID#: LNGMW-1 DEPTH TO WATER: 22.35 FROM: TPVC DEPTH TO BOTTOM: 31.57 FROM: WATER COLUMN HEIGHT: 42.35 9.22	NOTES TAKEN BY: L CAMERON BAILER ID: BAILER: NEW DISPOSABLE BAILER: STAINLESS STEEL OTHER		
WELL CASING DIAMETER WELL VOLUME: GALLONS VOLUMES PURGED: 5 GALLONS TIME STARTED: ()20 ;	CONVERSION FACTORS LINEAR FEET TO GALLONS 1" = 0.041 GALLONS 3" = 0.38 GALLONS 1.25" = 0.064 GALLONS 4" = 0.66 GALLONS 6" = 1.47 GALLONS PURGE METHOD: parastatic parastat		
OBSERVATIONS: COLOR (LOC); SHEEN NOW ; OTHER	ODOR SUMUR SCENT TURBIDITY 1.04		
WATER RECOVERY HEIGHT: ; FIELD PARAMETERS: pH 6.01 , CONDUCTIVITY 377.1 , SAMPLE COLLECTION TIME: 1105 NOTES: 74009 Set C 38.5 '	RECOVERY TIME IN MINUTES: TEMPERATURE 12.3°C OTHER DO (mg/L) 5.45 OFP (mv) 177.6		

DATE:	PROJECT NAME: SGPP-MEMMACK			
PROJECT NO.: 16.6126	PROJECT LOCATION:			
SAMPLING PERSONNEL: L. CAMERON				
MONITORING WELL ID#: MOR-45-10 DEPTH TO WATER: 18.69 ft FROM: TOP OF THE PROPERTY OF THE PROP	NOTES TAKEN BY: L CAMERON BAILER ID: N/A BAILER: NEW DISPOSABLE BAILER: STAINLESS STEEL N/A OTHER			
WELL CASING DIAMETER WELL VOLUME: GALLONS VOLUMES PURGED: GALLONS TIME STARTED: ;	CONVERSION FACTORS LINEAR FEET TO GALLONS 1" = 0.041 GALLONS			
OBSERVATIONS: COLOR CLAR ;	ODOR none			
SHEEN NOW ;	TURBIDITY 1.85 NTU			
WATER RECOVERY HEIGHT: ft ;	RECOVERY TIME IN MINUTES: m			
FIELD PARAMETERS: pH 5.70 SU ,	TEMPERATURE 1.7 °C			
CONDUCTIVITY 974 µS , SAMPLE COLLECTION TIME:				
NOTES: MS/MSD taken Here. TUDING Set C. 45'				

DATE: 11-10-2016	PROJECT NAME: S6-Merr-mack PROJECT LOCATION: Merripack, NA		
PROJECT NO.: 16,6126			
SAMPLING PERSONNEL: Just in Camphell		1	
MONITORING WELL ID#: 45-24	NOTES TAKEN BY	e: Jo	
DEPTH TO WATER: 45-65 FROM: Jop mate	CUSING BAILER ID:		
DEPTH TO BOTTOM:	V	DISPOSABLE	
WATER COLUMN HEIGHT: 6.13	BAILER: STAIN	ILESS STEEL	
	OTHE	R	
WELL CASING DIAMETER WELL VOLUME: GALLONS	1" = 0.041 GALLONS	S LINEAR FEET TO GALLONS 3" = 0.38 GALLONS NS 4" = 0.66 GALLONS 6" = 1.47 GALLONS	
VOLUMES PURGED: 3.5 GALLONS	PURGE METHOD	Bladder Pump	
TIME STARTED: 1530	; TIME FINISHED:	1	
OBSERVATIONS: COLOR Stight crosse yellow total to		light enerce/sulfur smill	
WATER RECOVERY HEIGHT:	; RECOVERY TIME	IN MINUTES:	
FIELD PARAMETERS: pH 5.82	, TEMPERATURE	10.3	
1020			
SAMPLE COLLECTION TIME: [415	_	00 (mg/e) 7.12 020 (mV) 120.8	
NOTES:			

DATE: 11/10/16	PROJECT NAME: SOPP-MEMMUCK
PROJECT NO.: 16-6126	PROJECT LOCATION:
SAMPLING PERSONNEL PLANTE TI	ustin campbell
MONITORING WELL ID#: LNG MW-3	NOTES TAKEN BY:
DEPTH TO WATER: 45 FROM: TPVC	BAILER ID: N/A
DEPTH TO BOTTOM: 40-46t FROM: TPVC	BAILER: NEW DISPOSABLE
WATER COLUMN HEIGHT: 13.0 ft	BAILER: STAINLESS STEEL N/A
	OTHER
WELL CASING DIAMETER WELL VOLUME: GALLONS	CONVERSION FACTORS LINEAR FEET TO GALLONS $1'' = 0.041 \text{ GALLONS} \qquad 3'' = 0.38 \text{ GALLONS}$ $1.25'' = 0.064 \text{ GALLONS} \qquad 4'' = 0.66 \text{ GALLONS}$ $2'' = 0.16 \text{ GALLONS} \qquad 6'' = 1.47 \text{ GALLONS}$
VOLUMES PURGED: 3.0 GALLONS	PURGE METHOD: Bladder DUMP
TIME STARTED: 1230	; TIME FINISHED: \3\5
OBSERVATIONS: COLOR (1000) SHEEN NOTE OTHER	; ODOR
WATER RECOVERY HEIGHT: ft	; RECOVERY TIME IN MINUTES: mi
FIELD PARAMETERS: pH (0.0) SU	J, TEMPERATURE 9.8 °C
CONDUCTIVITY 627 µS	OTHER <u>00(mgle)</u> 5.71
SAMPLE COLLECTION TIME: 1315	OFF (MV) 241.2

	PROJE	CT: SGPP - McCaffrey Street	CTM F	ROJECT NO.:	14.4756
图图图	LOCATIO	ON: Hoosick Falls, NY		DATE:	110/16
EQUIPMENT (Make, Model, and Serial #)	TIME	STANDARD (Concentration)	METER_ READING	CALIBRATED or BUMP TEST	CALIBRATED BY
FACOSTS FACOSTS	0910 0910	DO 100% OPP 220mV PH 4,7,10 COMB 7-00mS DO 100% PH 4,7,10 OPP 220mV PH 4,7,10 OPP 220mV PH 47,10 OPP 220mV	99.0% 218.7 4.18,7.17,9.98 7.08 99.6 387693,10.01 227.3 6.84 97.8 219.7 4.90,7.10,10,69	Cal.	LC PH

DATE: 11-11-2016	PROJECT NAME: 56-Mestimack		
PROJECT NO.: 16.6126	PROJECT LOCATION: Merromack, NH		
SAMPLING PERSONNEL: Just a Campbell			
MONITORING WELL ID#: LNG MW-2	NOTES TAKEN BY:		
DEPTH TO WATER: 28-21 FROM: Top WC pipe	BAILER ID:		
DEPTH TO BOTTOM: 40.85 FROM:	BAILER: NEW DISPOSABLE		
WATER COLUMN HEIGHT: 12.64	BAILER: STAINLESS STEEL		
	OTHER		
	1		
OTHER			
WATER RECOVERY HEIGHT:;	RECOVERY TIME IN MINUTES:		
FIELD PARAMETERS: pH 5.84 ,	TEMPERATURE 9.9°C		
CONDUCTIVITY 236.5	OTHER DO (mg/L) 8.78		
SAMPLE COLLECTION TIME: 1050	OFP (mV) 202.0		
NOTES: water has some fine particles floating is	fi e		

Groundwater Services Field Log

DATE: 11 11 2016		PROJECT NAME: SGPP-Mernimac			
PROJECT NO.: 16.6126	PROJECT LOCATION:				
SAMPLING PERSONNEL: LC,JC					
MONITORING WELL ID#: MERYS-11 DEPTH TO WATER: 32.93 FROM: Top PVC	_	NOTES TAKEN BY: LCAMERAN BAILER ID:			
WATER COLUMN HEIGHT: 31-69	_	BAILER: NEW DISPOSABLE BAILER: STAINLESS STEEL OTHER			
WELL CASING DIAMETER WELL VOLUME: GALLONS		CONVERSION FACTORS LINEAR FEET TO GALLONS 1" = 0.041 GALLONS			
VOLUMES PURGED: GALLONS		PURGE METHOD: Badder Pump			
TIME STARTED: //25	;	TIME FINISHED: 1205			
OBSERVATIONS: COLORSHEENOTHER	_; _;	ODOR TURBIDITY			
WATER RECOVERY HEIGHT: FIELD PARAMETERS: pH CONDUCTIVITY	_; _;	RECOVERY TIME IN MINUTES: TEMPERATURE OTHER			
SAMPLE COLLECTION TIME: 1205 NOTES:	_				

C.T. MALE ASSOCIATES		DAILY CALIBRATION	ON RECORD		
	PROJE	ECT: SGPP AMCONTROLL	CTN	PROJECT NO.:	4.4750 16.6126
	LOCAT	ION: Hoosiek Falls, NY Mem	mach	DATE: 11/11	/16
EQUIPMENT (Make, Model, and Serial #)	TIME	STANDARD (Concentration)	METER READING	CALIBRATED or BUMP TEST	CALIBRATED BY
YSTQuam, PPO 0878	0900	00 100 %	234.4	Cal.	1 <u>C</u>
La Motte. FA GO 438	0900	COOL 7.00 MS	4.62,7.2,10.1 7.10 0.01,10.9,10.02	cat. brote	Jo
DLA MOHE 18247	1000	Turbaity 0, 1, 12	0.06,	- Cat.	
		*	-5'-		
		-		_	
	-		*		
			- 4		

C.T. MALE ASSOCIATES 50 Century Hill Drive Latham, NY 12110

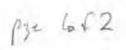
IOB 16.6,	126		
SHEET NO.	/	OF _	/
CALCULATED BY:	30 /RH	DATE:	11/14/16
CHECKED BY:	,	DATE:	
SCALE			

Conductivity (1/2) 366/ 5.75 5.62 5.58 5.44 Conductivity (1/2) 367,8 407.4 410.5 409.5 408.8 Temp (C) 10.8 10.7 10.6 10.5 10.5 ORP (mV) 17/9 173.1 17.3.7 182.0 184.0 DO (mg/L) 4/16 4.23 5.14 5.12 4.77 Turbidity (NTU) 5/60 1.92 1.90 0.87 0.43 Sp. (onductance (1/2)) /503.4 561.5 566.2 565.7 564.7 Sample Time: 43.00 13.35 13.45 13.55 14.05	MVD-4	6	D) Time	10,0	20.0	
Conductivity (2) 36-18 407.4 410.5 409.5 408.8 Temp (C) 10.8 10.7 10.6 10.5 10.5 ORP (nV) 17.9 17.5.1 17.3.7 182.0 184.0 DO (m9/L) 4/16 4.23 5.14 5.12 4.77 Turbodity (NTU) 5/60 1.92 17.90 0.87 0.47 Sp. (onduction (1/2/10) 5/03.4 561.15 566.2 565.7 564.7 Sample Time: 43-66-15-35 13:35 13:45 Sample ID: 5/52 - MVD4-00-16114 10-16114 20-161114 30-161114 Flow Rate - 10:30-1000 minute Duplicate at 13:45 MND-5 O.O 10.O 20.O 30.O 30.O 16114 Flow Rate - 10:31-100 10.7 10.8 10.9 10.9 10.9 10.9 10.9 10.9 10.9 10.9		0.0 9		10.0	30.0	30.0
Temp (C) 10.8 10.7 10.6 10.5 10.5 0RP (mV) 17.49 173.1 173.7 182.0 184.0 190 (mg/L) 4/6 4/32 5.14 5.12 4.77 Turbidity (NTU) 5/60 1.92 1.90 0.87 0.45 5.66.2 565.7 564.7 564.7 566.2 565.7 564.7 564.7 566.2 565.7 564.7 564.7 566.2 565.7 564.7 564.7 566.2 565.7 564.7 564.7 566.2 565.7 564.7 564.7 566.2 565.7 564.7 564.7 566.2 565.7 564.7 566.2 565.7 564.7 564.7 566.2 565.7 564.7 564.7 566.2 565.7 564.7 566.2 565.7 564.7 566.2 565.7 564.7 566.2 565.7 564.7 566.2 565.7 564.7 566.2 565.7 564.7 566.2 565.7 564.7 566.2 565.7 564.7 566.2 565.7 564.7 566.2 565.7 564.7 566.2 565.7 564.7 566.2 565.7 566.2 565.7 566.2 565.7 566.2 565.7 566.2 565.7 566.2 565.7 566.2 565.7 566.2 565.7 566.2 565.7 566.2	pH	5.66/	-			5.64
ORP (mV) DO (m9/L) 4/6 4/27 5.14 5.12 4.77 Turbidity (NTU) School 1.92 1.90 O.87 O.47 Sp. Conductorize (12m) Sample Time: 13.05 MND+5 Contractority (12m) Flow Rate Are 3.0 to 23.5 minute Duplicate at 13.45 MND+5 Contractority (12m) Temp (C) ORD (mV) 180.2 LB3.3 LB3.3 Turbidity (NTU) 10.15 1.48 O.20 Sample Time: 15.30	Conductivity (29)	3678	407.4	410.5	409.5	
ORP (mV) DO (m9/L) 4/6 4/27 5.14 5.12 4.77 Turbidity (NTU) School 1.92 1.90 O.87 O.47 Sp. Conductorize (12m) Sample Time: 13.05 MND+5 Contractority (12m) Flow Rate Are 3.0 to 23.5 minute Duplicate at 13.45 MND+5 Contractority (12m) Temp (C) ORD (mV) 180.2 LB3.3 LB3.3 Turbidity (NTU) 10.15 1.48 O.20 Sample Time: 15.30	Temp(C)	10.8	10.7	The same of the sa		10.5
Turbidity (NTU) 5/60 1.92 1.90 0.37 0.45 Sp. Conductance (12m) 503.4 561.5 566.2 565.7 564.7 Sample Time: 43 0.1335 13:35 13:45 12:55 14.05 Sample ID: SC2 - MVD4-00-16114 10-16114 20-16114 30-16114 Flow Rate 2007 1005 minute Duplicate at 13:45 MVD-5 O.O 10.0 20.0 30.0 pH 5.78 5.69 5.74 5.66 Conductanty (12m) 452.4 409.0 459.3 460.1 Temp (C) 10.7 10.7 10.9 ORD (mV) 180.2 163.2 172.2 DO (mg/L) 6.36 5.51 5.43 4.83 Turbidity (NTU) 10.15 1.48 0.23 0.19 Sq. Conductance (12m) 628.8 562.1 630.1 Sample Time: 15:30 15:40 15:50 16:00 Sample ID: SC2-MVD5-00-16114 10-16114 20-16114 30-16114 Flow Rate 382 gallons per minute	ORP (mV)	17/9		17.3.7		184.0
Sp. Conductance (12m) 503.4 5661.5 566.2 565.7 564.7 Sample Time: +2 - 15:35 13:35 13:45 13:55 14.05 Sample ID: SC2 - MVD4-00-16/114 10-16/114 20-16/114 30-16/114 Flow Rate - 15:30 10.0 20.0 30.0 pH	DO (mg/L)	4/6	14.23	5.14		4-77
Sample Time: 13:00 13:35 3:45 13:55 4:05 Sample ID: SC2-MVD4-00-16/114 10-16/114 20-16/114 30-16/114 Flow Rate Address/minute Duplicate at 13:45 MND-5 Time 0.0 10.0 20.0 30.0 pH 5.78 5.69 5.74 5.66 Conductivity (1/20) 452.4 409.0 459.3 460.1 Temp (C) 10.7 10.7 10.8 10.9 ORD (mV) 180.2 112.8 177.2 DO (mV) 6.36 5.51 5.43 4.83 Turboidty (NTU) 10.15 1.48 0.23 0.19 Sp (ondutance (1/20) 6.28.8 562.1 630.7 630.1 Sample Time: 15:30 15:40 15:50 16.00 Sample ID: SG2-MVD5-00-16/114 10-16/114 20-16/114 30-16/114 Flow Rate 382 gallons per minute	Turbidity (NTU)	5/60	1.92	1,90		0.43
Sample ID SG2 - MVD4-00-161114 10-161114 20-161114 30-161114 Flow Rate - 200 1000 200 30.0 pH	Sp. Conductance (12/m)	1503.4	5615	566.2	5 65.7	564.7
Sample ID: SC2-MVD4-00-16114 10-161114 1 20-161114 30-161114 Flow Rate Attonions minute Duplicate at 13.45 MWD-5 Time O.O 10.0 20.0 30.0 pH Contuctivity (14m) 452.4 409.0 459.3 460.1 Temp (C) 10.7 10.7 10.9 ORD (mV) 180.2 169.2 172.8 177.2 DO (myl) 6.36 5.51 5.43 4.83 Turbidity (NTU) 10.15 1.48 0.23 0.19 Sp (ondubria (14m) 628.8 562.1 630.7 630.1 Sample Time: 15.30 15:40 15:50 16.00 Sample ID: SG2-MUD5-00-161114 10-161114 20-161114 Flow Rate 382 gallons per minute	Sample Time:	13:00 13:0	55 13:35	13:45	13:55	14.05
MVD-5 Time 0.0 10.0 20.0 30.0 pH 5.78 5.69 5.74 5.66 contractivity (12km) 452.4 409.0 459.3 460.1 Temp (C) 10.7 10.7 10.4 10.9 ORD (mV) 180.2 169.2 172.8 177.2 DO (m2k) 6.36 5.51 5.43 4.83 Turbidity (NTU) 10.15 1.48 0.23 0.19 Sp (ondutance (12km) 628.8 562.1 630.7 630.1 Sample Time: 15.30 15.40 15.50 16.00 Sample ID: SG2-MVD5-00-161114 10-161114 20-161114 Flow Rate 382 gallons per minute	Sample ID:50	Jan - Pc	4-00-16114	10-161114	1 20-16111	1 30-16114
MVD-5 Time 0.0 10.0 20.0 30.0 pH 5.78 5.69 5.74 5.66 contractivity (12km) 452.4 409.0 459.3 460.1 Temp (C) 10.7 10.7 10.4 10.9 ORD (mV) 180.2 169.2 172.8 177.2 DO (m2k) 6.36 5.51 5.43 4.83 Turbidity (NTU) 10.15 1.48 0.23 0.19 Sp (ondutance (12km) 628.8 562.1 630.7 630.1 Sample Time: 15.30 15.40 15.50 16.00 Sample ID: SG2-MVD5-00-161114 10-161114 20-161114 Flow Rate 382 gallons per minute	Flow Rate -	gallons/minut	e			
MVD-5 MVD-5 Mode 10.0 20.0 30.0	vo	140 997	D.	uplicate at	13.45	
Constructiontry (U4cm) 452.4 409.0 459.3 460.1 Temp (C) 10.7 10.7 10.8 10.9 ORD (mV) 180.2 168.2 172.8 177.2 DD (myl) 6.36 5.51 5.43 4.83 Turbidity (NTU) 10.15 1.48 0.23 0.19 Sp (ondubring (Van) 628.8 562.1 630.7 630.1 Sample Time: 15.30 15:40 15:50 16:00 Sample ID: SG2-MUD5-00-161114 10-161114 20-161114 Flow Rate 382 gallons per minute	MVD-5	Time 0.0	10.0	20.0	30.0	
Conductivity (4/201) 452.4 Hoq. 0 459.3 460.1 Temp (C) 10.7 10.7 10.8 10.9 ORP (mV) 180.2 169.2 172.8 177.2 DO (myl) 6.36 5.51 5.43 4.83 Turbidity (NTU) 10.15 1.48 0.23 0.19 Sp (ondutance (4/20) 628.8 562.1 630.7 630.1 Sample Time: 15:30 5:40 15:50 16:00 Sample ID: SG2-MVD5-00-161114 10-161114 20-161114 Flow Rate 382 gallons per minute	Ha	1578	15.69			
Temp. (C) 10.7 10.7 10.8 10.9 ORD (my) 180.2 168.2 172.3 177.2 DD (my) 6.36 5.51 5.43 4.83 Turbidity (NTU) 10.15 1.48 0.23 0.19 Sp (ondutance (VXm) 628.8 562.1 630.7 630.1 Sample Time: 15.30 15:40 15:50 16.00 Sample ID: SG2-MUD5-00-161114 10-161114 20-161114 Flow Rate 382 gallons per minute	Conductivity (U4)	A CONTRACTOR OF THE PARTY OF TH				
OKP (ml) 1001a (68.2 172.8 171.2 DD (mg/L) 6.36 5.51 5.43 4.83 Turbidity (NTU) 10.15 1.48 0.23 0.19 Sp. (ondutance (VKm) 628.8 562.1 630.7 630.1 Sample Time: 15.30 15:40 15:50 16.00 Sample ID: 562-MVD5-00-161114 10-161114 20-161114 Flow Rate 382 gallows per minute		10.7		10.8		
DO (mg/L) 6.36 5.51 5.43 4.83 Turbidity (Ntu) 10.15 1.48 0.23 0.19 Sp (ondutance (VKm) 628.8 562.1 630.7 630.1 Sample Time: 15:30 15:40 15:50 16.00 Sample ID: SG2-MVD5-00-161114 10-161114 20-161114 Flow Rate 382 gallows per minute	ORP (mV)	180.9	168.2	172.8	177.2	
Turbidity (NTU) 10.15 1.48 0.23 0.19 Sp. (ondutance (VKm) 628.8 562.1 630.7 630.1 Sample Time: 15:30 15:40 15:50 16:00 Sample ID: SG2-MUD5-00-161114 10-161114 20-161114 Flow Rate 382 gallows per minute	DO (mg/L)	6.36			4.83	
Sp (ondutance (Van) 628.8 562.1 630.7 630.1 Sample Time: 15:30 15:40 15:50 16:00 Sample ID: 562-MVD5-00-161114 10-161114 20-161114 30-161114 Flow Rate 382 gallons per minute	Turbidity (NTU)	10.15	1.48		0.19	
Sample Time: 15:30 15:40 15:50 16:00 Sample ID: 562-MVD5-00-161114 10-161114 20-161114 30-161114 Flow Rate 382 gallows per minute	Sp Conductance (Val	0 628.8	3 562.1	630.7		
Sample ID: 562-MVD5-00-161114 10-161114 20-161114 30-161114 Flow Rate 382 gallons per minute						
Sample ID: 562-MVD5-00-161114 10-161114 20-161114 30-161114 Flow Rate 382 gallons per minute	Sample Time:	15:30				00
Flow Rate 382 gallons per minute	Sample ID:	SG2-MUD5	-00-161114	10-161114/2	0-161114 3	0-161114
	Flow Rate	382 a	allons per	minute		
MS/MSD at 16:00						
		MS	MSD at	16:00		



Client: 54P	Well: 45-91 45-411
Site: Marineck Long	Date: 1/10/2017
Project Number: 57471007.01	Sample Time! 1103
SAMPLING PERSONNEL	
Sample Collection By: 515 Other Present:	NA Sampling Order:
The state of the s	ding water present?
Barr lock? YES NO REMEDIED / / Is CO	ncrete pad in good repair? YES NO NA REMEDIED
Label on well? YES NO REMEDIED STORMS IS CO	otective casing locked and in good repair? YES NO NA REMEDIED
The state of the s	ner cap in place and properly sealing well?
Notes:	
STATIC WATER LEVEL Ca	ising diameter: \(\sqrt{\sq}}}}}}}}} \end{\sqrt{\sq}}}}}}}}} \end{\sqrt{\sq}}}}}}}}} \end{\sqrt{\sq}}}}}}}}} \end{\sqnt{\sqnt{\sqnt{\sqrt{\sq}}}}}}}} \end{\sqnt{\sqnt{\sqnt{\sqrt{\sqnt{\sqrt{\sqrt{\sq}}}}}}}} \end{\sqnt{\sqnt{\sqnt{\sqnt{\sqnt{\sqrt{\sqrt{\sq}}}}}}}} \sqnt{\sqnt{\sqnt{\
	ater Depth: 67+ 1* well: 155 mL
	ell Volume: 2° well: 617 mL
Total depth verified? YES NO	4" well: 2.47 L
HISTORIC EVENTS Total	Volume
Date Total Depth Water Level Drawdown Pumping Rate St	abilization Time Purged Purged Dry?
	
WELL PURGING	Pumping Start Time: 10 4/
Water Level Drawdown Pumping Rate Appearance/Odor	Pumping Stop Time: 1133
Time (feet) (feet) (ml/min)	Total Depth: 46
1026 40,0 6.0 - V. Sandalvi	Screen Length: /Fr
	Depth to Top of Screen: 45
	Depth to Screen Midpoint: 45,5
	Notes: purged dry foun
	sampled - walting
	purp hy hand
WELL STABILIZATION	
Water Level Drawdown Pumping Rate Temp Sp	ec Conductance Diss Oxy pH ORP Turbidity
Time (feet) (feet) (ml/min) (°C)	(mS/cm) (mg/l) (S.U.) (mV) (NTU)
	.068 7.73 5.53 %.7 OR
147 - 95 1	867 7.04 5.96 39 B OR
	001 101 3116 110 -11
	+/- 10% +/- 10%
Stabilization Criteria:	+/- 3% +/- 0.1 Units +/- 10 mV or ≤ 5
Total Volume Purged (L):	ge Water Disposal:
	al Stabilization Time: Total Drawdown:
Appearance: Cloudy Brown Odor: None	Duplicate Collected?:
NO./BOTTLES: SIZE: TYPE: FILTERED:	PRESERVATIVE: PARAMETER:
0 10	lone, HCI, HNO3, NaOH, H2SO4
	A L
	Ione HCI, HNO3, NaOH, H2SO4
	one, non intrody reach. recor
III glass plastic yes no	lone, (HCI HNO3, NaOH, H2SO4
	long, HCI, HNO3, NaOH, H2SO4 _ Chloride Swiller
mt glass plastic yes no	lone) HCI, HNO3, NaOH, H2SO4
	lone, HCI, HNO3, NaOH, H2SO4
FINAL INSPECTION	A .
Barr lock in place? YES NO NA Repairs needed? YES	NO Tubing added? YES NO
Well cap secured? YES NO NA Bolts needed? YES	
Well cover bolled snugly? YES NO NA	Well cap replaced? YES NO





Client: SGPP	Well: 1801 55-26
Site: Merrimach Longa	Date:
Project Number: 32 42 (ppl.0)	Sample Time: /42
SAMPLING PERSONNEL Sample Collection By: 575 Other Present:	JA Sampling Order: 2
MICHEOTICAL	ing water present? Sampling Order:
	crete pad in good repair?
	tective casing locked and in good repair?
Is reference mark visible? YES NO REMEDIED Is inner Notes:	er cap in place and properly sealing well?
1000	
STATIC WATER LEVEL Cas	les discretes 1 -
0-0	ter Depth: 18, 2 1° well: 155 mL
The state of the s	ter Depth: 15 mL 1" well: 155 mL 1" well: 157 mL 2" well: 617 mL
Total depth verified? YES (NO)	4' well: 2.47 L
HISTORIC EVENTS Total	Volume
Date Total Depth Water Level Drawdown Pumping Rate Sta	bilization Time Purged Purged Dry?
WELL BURGING	
WELL PURGING	Pumping Start Time:
Water Level Drawdown Pumping Rate Appearance/Odor	Pumping Stop Time: 14/37
Time (feet) (ml/min)	None Total Depth: 56 Screen Length: 154
1230 3/20	
	Depth to Top of Screen: 55
	Depth to Screen Midpoint: 55.5
	Notes:
	wateria pump
	by hand
WELL STABILIZATION	
Water Level Drawdown Pumping Rate Temp Spe	c Conductance Diss Oxy pH ORP Turbidity
Time (feet) (feet) (ml/min) (°C)	(mS/cm) (mg/l) (S.U.) 0-(mV) (NTU)
1310 - 96 0	625 553 6.00 S.3 OR
$\frac{(3)}{(3)}$ $\frac{79}{(3)}$ 0.	629 3.91 6.09 40.0 DR
1766 1.2 0.	739 U.D. 6.12 49.3 OB
1319 6.7 0	869 5.86 6.20 49.6 OR
1921 Pringe	641 5 80 A 22 1M7 MA
	041 04
D. J. (/-)	618 5.30 6.23 449 OR
	600 5.15 6.29 383 BR
	637 414 6.87453 751 00
	638 3.76 6.35 13,1 OR
1511 93 0	617 246 647 000 00
	+/- 3% +/- 10% +/- 0.1 Units +/- 10 mV +/- 10%
Stabilization Criteria:	or ≤ 0.5
	e Water Disposal: Prum
SAMPLE COLLECTION Sample Time: Total	Stabilization Time:Total Drawdown:
Appearance: Odor:	Duplicate Collected?:
NO./BOTTLES: SIZE: TYPE: FILTERED:	PRESERVATIVE: PARAMETER:
and reference about the same and	ine, HCI, HNO3, NaOH, H2SO4
See Plant	ine, HCI, HNO3, NaOH, H2SO4
1	ne, HCI, HNO3, NaOH, H2SO4
	ne, HCI, HNO3, NaOH, H2SO4
mt glass plastic yes no No	ne, HCI, HNO3, NaOH, H2SO4
ml glass plastic yes no No	ine, HCI, HN03, NaOH, H2SO4
the state of the s	ne, HCl, HNO3, NaOH, H2SO4
FINAL INSPECTION	
Barr lock in place? YES NO NA Repairs needed? YES Well cap secured? YES NO NA Bolts needed? YES	NO Tubing added? YES NO Lock replaced? YES NO
Well cover bolted shugly? YES NO NA	Well cap replaced? YES NO



page ZofZ

Client:	ShPF					Well:		55-56	
Site: /	Nermonal	LONA				Date:	1/10/	2017	
Project Nu	ımber:	2421001	.01			Sample Tim	e:/	1421	
SAMPLING	PERSON	IEL			107.57			0	
Sample Col	ection By:	STS		Other Present:	NA		Sampling Ord	ter: Z	
INSPECTI	NO				Standing water present?			YES NO	REMEDIED
Barr lock?		YES NO REM	EDIED		Is concrete pad in good re	repair?		YES NO NA	REMEDIED
Label on well?			EDIED		Is protective casing locke			YES NO NA	REMEDIED
Is reference ma Notes:	irk visible?	YES NO REM	EDIED		Is inner cap in place and	properly sealing well	?	YES NO NA	REMEDIED
Notes.			1 5	1					
			100	Page 1					
STATIC W	ATER LEVE	L	1		Casing diameter: _			Volume of water per foo	t
Depth to Wa	ter:	_ \	-		Water Depth:			1" well: 155 mL	
Total Depth:					Well Volume:			2" well: 617 mL	
Total depth v	erified? YES	NO NO						4" well: 2.47 L	
HISTORIC	EVENTS		Total			Volume			
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry	?	
	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -				7 May 100 May				
				-/-					
				/					
			-/					*	
WELL PUR	RGING		-				Pumping Star	t Time	
WEEL O	Water Level	Drawdown	Dimeios Boto	A ====================================	4		Pumping Stor		37
Time				Appearance/O	401				2/
Time	(feet)	(feet)	(ml/min)				Total Depth:		
		/-					Screen Lengt		-
	-/							of Screen:	
	-/-	_	_					en Midpoint:	
	-	_					Notes:	ALLANG MAN	20
								1	
	-						Ly	hand have	
DAIFLL OTA	DII IZATION								
WELL STA	BILIZATION					2000 2000			
1	Water Level		Pumping Rate	J.E.	Spec Conductance	Diss Oxy	pH	ORP	Turbidity
Time	(feet)	(feet)	(ml/min)	9(3)	(mS/cm)	(mg/l)	(S.U.)	(mV)	(NTU)
135/					0.627	6.5	435	3/4	-EK
1400		-	-	9.9	0.661	6.14	0.35	50.1	-
1409			-	90	06299	6.89	4.30	64.0	-
14116		_	_		0.6 31	6.26 €	7.60	14.2	-
1400	_		_	99	0633	7.14	6.6	71-8	1
1416				3.9	0.679	1.20	624	76.6	-
1415		-	_	0,5	0.630	6.73	624	10.0	4
14/8		-		301	0.625	6.74	6.76	6901	4
		3							
-									
		Stabilization Cr	iteria:		+/- 3%	+/- 10%	+/- 0.1 Units	+/- 10 mV	+/- 10%
-	age of the second	Old Made of G	no.			or ≤ 0.5			or ≤ 5
Total Volume	Andrew Arter			17751	Purge Water Dispos				
SAMPLE	OLLECTIO	N	Sample Time		Total Stabilization Ti	me:	Total Drawdo		
Appearance:	Clauda	mound		Odor: N	200	Duplicate Collec	ted?:/V	فأ	
NO./BOTTLES	SIZE:	TYPE:	FILTERED		PRESERV		DE	PARAMETER:	
- 4		glass plastic	yes (no			NaOH, H2SO4	PFC	4	
	250 ml	glass plastic	yes no		0	NaOH, H2SO4	Alla	717	
2	250 ml	glass plastic	yes no		None, HCI, HNOS,	NaOH, H2SO4	Meha	15	
3	_440_mt	glass plastic	yes no		None, HO, HNO3,	NaOH, H2SO4	JOC.	5	
	40 ml	glass plastic	yes no		None HCI, HNO3,	NaOH, H2SO4		04	
-	mi	glass plastic	yes no		None HCI, HNO3,	NaOH, H2SO4	NO2	asN	
	40 mt	glass plastic	yes no/		None, HCI, HNO3,	NaOH, (H2SO4)	1/00		
FINAL INS					A			_	
Barr lock in place		YES NO NA		Repairs needed?	YES NO MA		Tubing added?	YES NO ACA)
Well cap secure Well cover bolte		YES NO NA		Bolts needed?	YES NO NA		Lock replaced? Well cap replace	d? YES NO	
soral build	377	110 110					Job .chiace		



	SUPP	-				Well:	MPOI		10.7=
Site:/M						Date:	65-664	4 4	11/2017
Project Nun	nber: <u>32</u>	72/001.0	10			Sample Tin	ne:	4	1.54
SAMPLING	PERSONN	EL						2	
Sample Collec	ction By: 5	73		Other Present:	NA		Sampling Order:		
INSPECTIO	N				Standing water present?			YES NO WA	REMEDIED
Barr lock?		YES NO REME	EDIED 6		is concrete pad in good re	epair?		YES NO NA	REMEDIED
Label on well?		YES NO REME	EDIED /V/	f)	Is protective casing locke	ed and in good repair	17	YES NO NA	REMEDIED
Is reference mark	visible?	YES NO REME	EDIED	/	Is inner cap in place and	properly sealing we	11?	YES NO NA	REMEDIED
Notes:									
STATIC WA	TEDIEVE				Casina diameter	15			
					Casing diameter: _	30.1		olume of water per fool	
Depth to Wate		_			Water Depth:			1" well: 155 mL	
Total Depth:	66 lt	- ~			Well Volume:	10.5L	_	2" well: 617 mL	
Total depth ver	ified? YES	(NO)						4" well: 2.47 L	
HISTORIC E	VENTS		Total			Volume			
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?		- 1
		1,1 3000 000,100					1 7 3 7 7 7 7 7 7		
				-					
				-					
			_	-		_	_		
MARTIN STATE	NING.						700 100 100 100 100 100 100 100 100 100	21/1710/2	
WELL PURG	JING						Pumping Start T	CO 0	_
	Water Level	Drawdown	Pumping Rate	e Appearance/O	dor		Pumping Stop T		
Time	(feet)	(feet)	(ml/min)	0)			Total Depth:	66	
0528	35,9	_		Cland	n. NONE		Screen Length:	164	
					1		Depth to Top of	Screen: 45	
							Depth to Screen		5
	_								
						-	Notes:	- word	TABLE
		-					1 46	Part	100
							wodarry	punged liza	1.1
							purp	5	androl
WELL STAE	BILIZATION	1					7		
	Water Level	Drawdown	Pumping Rate	Temp	Spec Conductance	Diss Oxy	pH	ORP	Turbidity
Time	(feet)	(feet)	(ml/min)	(°C)_	(mS/cm)_	(mg/l) .	(S.U.)	(mV)	(NTU)
0000	1,0	4		95	0.95	496	5.58	297	OR
02117		-	-	9.7	10.005	424	5-69	BAU	OR
- 10 /11				91	285	434	~77	-122	40
00 90				0 0	1130	477	3.81	733	000
00 70				38	0.86	1115	_	156	010
0851	_				0 86	412	and the second s	74,0	013
08 54				90	0.86	4.00	587	720	OR
0867		-	-	8.9	0.86	4.01	5.89	72,5	6R
0100	_		_	80	0.86	345	5.90	732	OR
				-19					
						-			
			-			_	-		
_		-				-			-
							-		
		Stabilization Cr	iteria:		+/- 3%	+/- 10%	+/- 0.1 Units	+/- 10 mV	+/- 10%
		_			D W	or≤0.5	M		or≤5
Total Volume P					Purge Water Dispos				
SAMPLE CO	DLLECTIO	N	Sample Time		Total Stabilization Ti	me:	_Total Drawdown:	_	
Appearance:	Slink	Clark. P	Decreased	Odor: /	Loc	Duplicate Colle	ected?: Up		
	-	1 110	Turbid.t	The second secon			1.00		
NO./BOTTLES:	SIZE	TYPE:	FILTERED:	1	PRESERV	ATIVE:		PARAMETER:	
2	250 ml	glass plastic	yes no		None, HCI, HNO3,	NaOH, H2SO4	PFC	5	
1	2.500 ml	glass plastic	yes no			NaOH, H2SO4	Alleal	inita	
2	250 m	65	- ×		12	NaOH, H2SO4	Market	10.11	lah
3	40 mi	glass plastic	yes no				VIDE	1 211654	Man
2	110	glass) plastic	yes no			NaOH, H2SO4			
4	40 ml	glass plastic	yes no		None, HCI, HNO3,	NaOH, H2SO4		04	
	40 mi	glass plastic	yes no		None, HCI, HNO3,	NaOH, H2SO4	POS	as N	
	40 mt	glass plastic	yes no		None, HCI, HNO3,	NaOH H2SO4	ND2	THE PARTY NAMED IN	
FINAL INSP	ECTION	0			^				
Barr lock in place	?	YES NO NA		Repairs needed?	YES NO HA		Tubing added?	YES NO	3
Well cap secured		YES NO NA)	Bolts needed?	YES NO (NA		Lock replaced?	YES NO	
Well cover bolted	snugly?	YES NO NA					Well cap replaced?	YES NO	



	SUPP					Well:	APOL		
	estimact		1			Date: 1/11		-76 H	
Project Nu	The second liverage and the se	42 10010				Sample Tin	ne:	57	
	PERSON	and the same of th			.7.4			4	
	ection By: 5	13		Other Present:			Sampling Order	1	3
NSPECTIO	N		0	1	Standing water present?			YES NO	REMEDIED
Barr lock?			MA.)	Is concrete pad in good re		-2	YES NO NA	REMEDIED
Label on well? Is reference man	rk visinla?		EDIED //		Is protective casing locker is inner cap in place and p			YES NO NA	REMEDIED
Notes:	IN VISIONS:	TES NO NEW	CONED O		is miler cap in place and p	Jopeny scaling we	H.C.	100	REMEDIELI
NIANTEN									
STATIC W	ATER LEVE	L			Casing diameter:	1.5		folume of water per for	ot:
Depth to Wat	er: 41-1				Water Depth:	34.01		1" well: 155 mt.	
Total Depth:	76				Well Volume:	12.14		2" well: 617 mL	
otal depth ve	erified? YES	(NO)						4" well: 2.47 L	
HISTORIC			Total			Volume			
Date	Total Depth	Water Level	The state of the s	Pumping Rate	Stabilization Time	Purged	Purged Dry?		
vate	Total Depti	Water Level	Diawoowii	r dinping trate	Stabilization Time	ruigeo	r diged biy:		
							-		
				-			-		
							_		
MELL DUD	CINC						Domester Dress	lane la Ta	
WELL PUR		Land Control of the Control		and the same of th			Pumping Start T	0	
	Water Level	Drawdown	Pumping Rate	Appearance/O	dor		Pumping Stop T	ATT 8	4
Time	(feet)	(feet)	(ml/min)		/		Total Depth:	16	
1000	41.1	_		V Cland	Brown Non	L.	Screen Length:	187	
							Depth to Top of	Screen: 75	
1000		_	-	Cloud-	Drank h	lone	Depth to Screen	Midpoint: 7	5.5
HETT					3		Notes:		· L. low
1105		-	-	Clark 1	scan IV	one	2	FEL DUM	sed nerve
170.3	-	-		-010.127	3	6110	3.50	5 -2-1-1	1.00
							/	512011	sed helore
WELL STA	DII IZATIOI	VI.		_					577
VELL STA	BILIZATION		7						
	Water Level	Drawdown	Pumping Rate		Spec Conductance	Diss Oxy	pH	ORP	Turbidity
Time	(feet)	(feet)	(ml/min)	(°C)	(mS/cm)	(mg/l)	(S.U.)	(mV)	(NTU)
11 as						-			
1175				9.6	088	5.25	6.20	33.0	3796
1126				94	0.38	4.32	6 26	381	2786
1101		-	-	6.6	0.89	3.05	6.2	33.8	3295
1134		-		93	0.88	2.79	6.27	34.7	23799
1137			-	10	0.89	2.88	4 23	299	94-24
1140			-	8 0	0.00	2.24	775	761	19/
11/13				0 0	100	271	7 24	39.0	2 200
1147		-	_	0.6	0 00	2.75	1 22	39.0	3088
1176		-		1.1	0.01	1.10	4.65	29.4	3496
				0					
		Stabilization C	riteria:		+/- 3%	+/- 10%	+/- 0.1 Units	+/- 10 mV	+/- 10%
		_	*			or ≤ 0.5	^		or ≤ 5
otal Volume	Purged (L):				Purge Water Disposa	al:	Prum		
SAMPLE C	OLLECTIO	N	Sample Time:	1151	Total Stabilization Tir	me:	_ Total Drawdown		
Appearance:	VI	March - Bi	normon	Odor:/	line	Duplicate Colle	ected?: 1/2		
ррошинос	- 4	- may	1	7	1111	Duplicate Gold	7.00		
NO./BOTTLES:	SIZE:	TYPE:	FILTERED:		PRESERVA	ATIVE:		PARAMETER:	
2	250 m	glass plastic	yes (no		None HCI, HNO3,	NaOH, H2SO4	PFCS		
1	7.50 ml		yes no			NaOH, H2SO4	Alkalin	12	
2	250 ml		in			NaOH, H2SO4	Mela	16 11.11	
2	40 ml	glass plastic	yes no		0 -1			- FITH	
7		glass plastic	yes no		_	NaOH, H2SO4	- UDE	a 6-	
1	40 ml	glass plastic	yes no		2005	NaOH, H2SO4	To I	04	
	40 ml	glass plastic	yes no			NaOH, H2SO4	Wo.	05 N	
-	40 mi	glass plastic	yes no		None, HCI, HNO3,	NaOH H2SO4	NOn	or a -	
FINAL INSI	PECTION	0			0			100	
Barr lock in plac		YES NO NA		Repairs needed?	YES NO		Tubing added?	YES NO A	1
Well cap secure	d?	YES NO NA	1	Bolts needed?	YES NO NA		Lock replaced?	YES NO (///	/



Page 12/2

100 (100 to 100	SGPP					Well:A	P-01 79-	804	
	lerrimoe)	L Lowis	An L			Date: 79		1/7017	
Project Nur SAMPLING	STATE OF TAXABLE PARKS OF TAXABLE PARKS.	142 100	#Q1			Sample Tim	ie: 152		
Sample Colle			1	Other Present:	None		Sampling Order	. 5	
INSPECTIO					Standing water present?		Company of the	YES NO MA	REMEDIED
Barr lock?			PEDIED NUMBER)	Is concrete pad in good re			YES NO NA	REMEDIED
Label on well? Is reference mark	k vielble?		HEDIED /	/	is protective casing locker is inner cap in place and p			YES NO NA	REMEDIED
Notes:	K VISIDIET.	YES NO RIM	NEDIEG .		is writer cap in place and j	properly sealing wei		TES NO SAM	REMEDIED
35067665									
STATIC WA	TER LEVE	L			Casing diameter:	1.50		/olume of water per foot	
Depth to Water	er: 62				Water Depth:	17,01		1" well: 155 mL	
Total Depth:	80				Well Volume:	2.41		2" well; 617 mL	
Total depth ver	rifled? YES	(NO)			2 Component Constitution of the Constitution o			4" well: 2.47 L	
HISTORIC I	EVENTS		Total			Volume			
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?		
								× 210	
								6	
							-	1	
WELL PUR	GING						Pumping Start 7	ime: /1 =	27
WELLFOR	Water Level	Drawdown	Pumping Rate	Annearance/O	dor		Pumping Start T	100	H
Time	(feet)	(feet)	(ml/min)	Appearance/O	doi		Total Depth:	Qn	
125%	62.1	(reet)	(marian)	V.Cloud	hear no	Ar.	Screen Length:	ICL	
1200	0-1		_	- 1000	7 10 401		Depth to Top of		
		-					Depth to Screen		5
			-				Notes:		20
		-					6/	Balen 03	cr n
		-	-				0.0	Baled as	Referre.
								DU MIN	Tabil on on
WELL STA	BILIZATION	V							
	Water Level	Drawdown	Pumping Rate	Temp	Spec Conductance	Diss Oxy	pH	ORP	Turbidity
Time	(feet)	(feet)	(ml/min)	(°C)	(mS/cm)	(mg/!)	(S.U.)	(mV)	(NTU)
1409		_		11.8	0.88	478	7:27	135.1	
1417			_	110	0.87	4.514	5-85	123.5	
1415	_			11.3	0.87	4.62	589	1170	
1478	_	-		11.0	087	4.72	5.92	1100	
14(2)		-		11.3	0.87	4,76	5.92	106.7	
1424			_	11.1	0.87	4.59	5.90	1027	
1427		_		11.1	0.87	4.43	5.43	997	
1430	-			10.8	0.87	4.)7	0100	76.8	
1433	-	-	_	11.3	087	4.38	5.99	940	
1476	-	_	-	10.9	0,87	3,87	5,99	900	
				-	11/	A :	7		
				-60	11/ 00	ag c	-		-
		Stabilization C	riteria:		+/- 3%	+7- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5
Total Volume F	Purned (I):				Purge Water Disposa	1	um		01 5 3
SAMPLE CO		N	Sample Time:		Total Stabilization Tir		Total Drawdown	r.	100
Appearance:			Compie yime	Odor:	TOLD CLOCKED IN	Duplicate Colle			
rippodranoc					Y	Dupinoate Conc	0.001,		
NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	ru Days	PRESERVA	ATIVE:		PARAMETER:	
	m	glass plastic	yes no	See May	None, HCI, HNO3,	NaOH, H2SO4			
	mi	glass plastic	yes no	-	None, HCI, HNO3,				
	mi	glass plastic	yes no		None, HCI, HNO3,				
-	mi	glass plastic	yes no			NaOH, H2SO4	-		
	mt	glass plastic	yes no			NaOH, H2SO4	-		
	mi	glass plastic	yes no			NaOH, H2SO4			
EINAL INCO	m m	glass plastic	yes no		None, HCI, HNO3,	NaOH, H2SO4			
FINAL INSP Barr lock in place		YES NO NA		Repairs needed?	YES NO		Tubing added?	YES NO	
Well cap secured	17	YES NO NA		Bolts needed?	YES NO NA		Lock replaced?	yes Na	



page lofz

0114	1.00					W. II.	10 01 -	0-11	
Client:	SAPP							-Bolt	
Site:	Merrimac					Date:	VI1/2017		
Project Nu	mber:	2421001	01			Sample Tin	ne:15	72	
SAMPLING	PERSON	IEL						VI	
Sample Col	ection By:			Other Present:			Sampling Order	A5 -	
INSPECTION	Married Co., Springer, Spr				Standing water present?			VES NO BY A	REMEDIED
Barr lock?	-	YES NO REI	NEDIED (Is concrete pad in good re	enair?		YES NO NA	REMEDIED
Label on well?			MEDIED / NA		Is protective casing locke		n	YES NO NA	REMEDIED
is reference ma	ark visible?		MEDIED / 19		Is inner cap in place and	THE PARTY OF THE PARTY OF THE PARTY.		YES NO NA	REMEDIED
Notes:									
(Cost)									
	-								
STATIC W	ATER LEVE	L			Casing diameter:	1,5%		faiume of water per foot	
Depth to Wa	ter:				Water Depth:			1" well: 155 mL	
Total Depth:	a 0.				Well Volume:			2" well: 617 mL	
					vveii voidille.		_		
THE RESERVE THE PARTY NAMED IN	erified? YES	(NO)	-					4" well: 2.47 L	
HISTORIC			Total			Volume			
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?		
4									
WELL PUR	RGING					1	Pumping Start T	ime:	
	Water Level	Drawdown	Pumping Rate	Appearance/Od	for Seeplyc	- 1)	Pumping Stop T	ime:	
Time	(feet)	(feet)	(ml/min)		1 1		Total Depth:		
1.4.70000	*****	*15-5*				/			
		-	/					200	
		-/-						Screen:	_
		/	_				Depth to Screen	Midpoint:	_
							Notes:		
		-							
WELL STA	BILIZATION	u .							
WELLSIA	-		1		ALC: ALSO DESTRUCTION	4 70 1		2.0	
	Water Level	Drawdown	Pumping Rate	Temp	Spec Conductance	Diss Oxy	pH	ORP	Turbidity
Time	(feet)	(feet)	(ml/min)	(°C)	(mS/cm)	(mg/l)	(S.U.)	(mV)	(NTU)
1447			-	10.5	0.66	6-10	509	75.5	
1451) ~		-	111	0.88	507	6.13	546	
1449				10 9	1266	6 124	aln	650	
1/1/-1				1115	2 8 6	8.83	9/100	775	-
1-1-7				11:2	0.59	0.107	4.01	15.1	
1501			_		687	6.41	6 04	11,8	
1604			-	10 8	0.38	6.24	6.01	771	
150	7 -	540	-	106	680	6.4	607	66.0	
1516			-	102	088	6.7.8	7 17	1.1.2	
1)					0.00	1.00	4 4	100.7	-
	-	_					. —		-
						_			
_									
		CI-EW-W	dr. de.		. (70/	+/- 10%	M 0 4 H-24-	-1 -0 -11	+/- 10%
		Stabilization C	ntena:		+/- 3%	or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	or ≤ 5
Total Volume	Purged (L):	-			Purge Water Disposa	al:	um		
	OLLECTIO	N	Sample Time		Total Stabilization Tir		Total Drawdown	_	
	1 61 1		Cample Time		/	Marie Control Control	,		
Appearance:	V-C Dud	4 prove		Odor:/V	DAL	Duplicate Colle	ected?: No		
No destructiva de discoverador.		/			Name of the last o	Name of the State			
NO./BOTTLES		TYPE:	FILTERED:		PRESERVA	ATIVE:	N.	PARAMETER:	
	250 mi	glass plastic	yes no		None HCI, HNO3,	NaOH, H2SO4	ptcs	,	
1	250 mi	glass plastic	yes (ho		None, HCI, HNO3,	NaOH, H2SO4	Alfalin	1-3	
2	250 ml	glass plastic	yes (fo		None HCI, HNOS.	NaOH, H2SO4	Melal	1.6.140	
2	MA		100				V0/.	1	
9		glass plastic	yes (o)			NaOH, H2SO4	(1- (1	-	
- F	40 ml	glass' plastic	yes no		><	NaOH, H2SO4	4/0	4	
	_40 ml	glass plastic	yes no		None HCI, HNO3,	NaOH, H2SO4	101	ASN	
- 1 -	40 mi	glass plastic	yes no		None, HCI, HNO3,	NaOH, (H2SO4)	NO,	977	
FINAL INS	PECTION	0			0				
Barr lock in place	THE RESERVE OF THE PARTY OF THE	VES NO NA	1	Repairs needed?	YES NO MA		Tubing added?	YES NO	
Well cap secure		YES NO NA)	Bolts needed?	YES NO NA		Lock replaced?	YES NO ///	1
Well cover bolte	d snugly?	YES NO NA					Well cap replaced?	YES NO	



Client:						Well:	11/02 2	4-7514	
Site: _ /	errmele	Longo				Date:	1/12/12	217	
Project Nu	mber:	242700	101			Sample Tim	e:	137	
	PERSONN	IEL							
Sample Colle	ection By:	212		Other Present:	Work		Sampling Order	6-	
INSPECTIO			_		Standing water present?			YES NO INTE	REMEDIED
Barr lock?		YES NO REM	EDIED /	-	Is concrete pad in good re	epair?		YES NO NA	REMEDIED
Label on well?			EDIED (N/A		Is protective casing locke		?	YES NO NA	REMEDIED
Is reference ma	rk visible?	YES NO REM	EDIED	/	Is inner cap in place and	properly sealing well	?	YES NO NA	REMEDIED
Notes:									
STATIC W	ATER LEVE	1			Casing diameter:	15 inch		the state of the	
	70.77					2 01	· '	olume of water per foo	1.707
Depth to Wat	110	014			Water Depth:	200	-0	1" well: 155 mL	4
Total Depth: _		-7			Well Volume:	696mL	_	2" well: 617 mL	
Total depth ve		(NO)						4" well: 2.47 L	
HISTORIC	EVENTS		Total			Volume			
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?		
WELL PUR	GING						Pumping Start T	ime: 044	-4
	Water Level	Drawdown	Dumning Det	Appearance/O	dor		Pumping Stop T		
-				a Appearance/Or	dor				
Time	(feet)	(feet)	(ml/min)	01.2.	Sporte Nor		Total Depth:	25	-
0.12.7	-=	-	150	Cloudy E	2101/12	~	Screen Length:	164	_
0950			150	L10-10-	Brank No		Depth to Top of	Screen: 44	-/
0959			110	Clanty	Sty Claron Mo	inc	Depth to Screen		, 2
1001	Service	-	110	SAA			Notes: Pur		v.L
				100			L. Pare	stock iliza	d 100
		-						DE	nistal+ E
				_			P\$7163	1	18217
WELL STA	BILIZATION	V							
	Water Level	Drawdown	Pumping Rate	Temp	Spec Conductance	Diss Oxy	pH	ORP	Turbidity
Time									THE PROPERTY AND ADDRESS.
Time 3	(feet)	(feet)	(ml/min)	16 7	(mS/cm)	8.40	(S.U.)	(VmV)	(NTU)
1017	-		110	1	0.171			1111 6	159
10/6			110	10.4	0.151	7.8%	5.91	11400	7.37
1019			110	10.4	0.152	1.71	5.93	124.	413
1022	_	_	110	9.9	0.155	1.50	5.92	1150	535
1025	_	-	10	9.8	0.156	7.69	1.92	111.5	3.88
1078		-	110	9.9	0.156	7.29	5.92	107.9	4.79
1031		-	110	9.7	0.157	7.31	5.97	107.	3.94
1054			110	97	0 153	7 71	5.92	106.10	276
10 - 1			_110_	-1./	0.130	14.11	2.16	10011	
	-								
		_							
							-		
							-		1-11/2007
		Stabilization C	riteria:		+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10%
T-1111-1		4.3			D W. t Di		Sound		or ≤ 5
Total Volume	The second second second		-	1.0 44	Purge Water Disposi	1.0	San San Area - Inches		
SAMPLE	OLLECTIO		Sample Time	1037	Total Stabilization Ti	me: 43nin	Total Drawdown		
Appearance:	Clean			Odor:/	Vand	Duplicate Colle	cted?:		
		1.2.2			40				
NO./BOTTLES:	SIZE:	TYPE:	FILTERED:		PRESERV		YFC	PARAMETER:	
-5	250 m		yes no			NaOH, H2SO4	201	1 1	
1	250 ml	glass plastic	yes no		None, HCI, HNO3.	NaOH, H2SO4	Allva	livity	
	250 ml	glass plastic	yes no		None, HCI, HNO3	NaOH, H2SO4	Mela	5	
3	40 mi	glass plastic	yes no		None, HC, HNO3,	NaOH, H2SO4	VOC:		
2	40 m	glass plastic	yes na		20	NaOH, H2SO4	CI- 50	H-	
	40 mi	glass plastic	yes no		None HCI, HNO3,	The same of the sa	Non	4- 11	
	4p ml	glass plastic				NaOH, H2SO4	1/2	NO W	
FINAL INSI	Committee of the Commit	glass/ plasuc	yes \no/		Note, Hot, HNO3,	Hauri, Heady	F.V.V.1	_	
Barr lock in place		YES NO NA		Repairs needed?	YES NO AA		Tubing added?	YES NO	-
Well cap secure		YES NO NA		Bolts needed?	YES NO NA		Lock replaced?	VES NO NA)
Well cover bolter		YES NO NA					Well cap replaced?	YES NO	



Client:						Well:	4605 3A	5-30 1/243	5 At
	terrimack	Durya	e (Date:	1/12/201		
Project No	and the same of th	2421001.	0			Sample Tim	ie: 17	12	
	G PERSONI	-		20010200-5				780	
Sample Co	WHAT WENT WATER TO SEE	3/7		Other Present:	The second second		Sampling Order:	7. 70	-
INSPECTI	ON	Carlo Carlo Carlo			Standing water present?			YES NO	REMEDIED
Barr lock? Label on well?			EDIED MAD		Is concrete pad in good re is protective casing locked		2	YES NO NA	REMEDIED
Is reference m	ark visible?		EDIED		Is inner cap in place and p			YES NO NO	REMEDIED
Notes:						The state of the s			
CTATIC IA	ATER LEVE	1			Carian diameter	1.5			
					Casing diameter: _	1284		olume of water per foot	
Depth to Wa		1			Water Depth:	-	-	1" well: 155 mL	1.77
Total Depth:		230			Well Volume:	4.2 %	_	2" well: 617 ml.	
Total depth v		(NO)						4" well. 2,47 L	
HISTORIC			Total			Volume	100		
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?		
WELL PU	RGING						Pumping Start T		
	Water Level	Drawdown	Pumping Rate	Appearance/O	dor		Pumping Stop T		0
Time	(feet)	(feet)	(ml/min)			1	Total Depth:	35	
1132		-	250	Clarke 0	rown /	lare	Screen Length:	167	
1149		-	750	Clear	No	r. f	Depth to Top of		
							Depth to Screen		5
		*							
	-						- 45	T Briger	Samore
				-			+ t L .	L parged	rabille
		-					STANGE	1.1001 130	Bang
WELL ST	ABILIZATION	V V							
WELL OIL			Dumping Date	Toma	Cana Candustanas	Dies Own	nti	ORP	Turbidity
Time	Water Level		Pumping Rate		Spec Conductance	Diss Oxy	pH		
1155	(feet)	(feet)	(ml/min) 250	10.4	(mS/cm) 0.87	(mg/l)	(S.U.)	(mV)	(NTU)
- Commission			250		0.87		9.95	105.8	10.3
1158		-		10.5		7.75	5.94	112.0	14.1
N 150		-	250	10.5	0.87	7.75	5.94	115.6	12.9
1201			250	10.5	0.87	7.65		117.8	11.2
1207			250	10.4	0.87	7.70	5.95	11701	11.8
1210			250	10.4	0.87	763	5.95	1/8.8	10.4
						_			
		-							
									. Idaa ii
		Stabilization Cr	itarin		+/- 3%	+/- 10%	+/- 0.1 Units	+/- 10 mV	+/- 10%
			ndia.		11- 376	or ≤ 0.5	Tr- U. I Units	TI- TO INV	or ≤ 5
Total Volume	Purged (L):	8.3L		Control of the last of the las	Purge Water Disposa	The second secon	mark		
SAMPLE	COLLECTIO	N	Sample Time	1212	Total Stabilization Tir	me: 43min	Total Drawdown		
Appearance:	Clear	-		Odor: N	Pone.	Duplicate Colle	cted?: N -		
- PP-Salemon									
NO./BOTTLES		TYPE:	FILTERED:		PRESERVA	ATIVE:		PARAMETER:	
202	250 ml	glass plastio	yes no		None, HCI, HNO3,	NaOH, H2SO4	PFC3		
250	269 ml	glass plastic	yes no		Norte, HCI, HNO3,	NaOH, H2SO4	Alkal	inita	
2500	250ml	glass plastic	yes no		None, HCI, HNO3	NaOH, H2SO4	Meta	15/	
1	the same of the sa		yes no		None, HCD HNO3.		VOCO		
1	40 ml		yes no		None HCI, HNO3,	NaOH, H2SO4	1-6	2-	
1	40 ml				None HCI, HNO3,	Mary Control	Nos	100	
i	40 m	No.	yes no			NaOH, H2SO4	NO	31/	
EINAL INC	PECTION	glass plastic	yes \ no /		None, HCI, HNO3,	HBUTT HZSUN	1.42		
Barr lock in pla		YES NO NA		Repairs needed?	YES NO MA		Tubing added?	YES NO	
Well cap secu		YES NO NA NA		Bolts needed?	YES NO (NA)		Lock replaced?	YES NO NA	
Well cover bolt		YES NO MA		277 SPEU			Well cap replaced?	YES NO	



Client: SGPP			Well: APOL GULFFT				
Site: Mestinge) Lon	1001.01		Date: Sample Time	1/12/2017			
Project Number: 3242 SAMPLING PERSONNEL	1001.01		Sample Till	11778			
Sample Collection By: 515	Other Present	: NA		Sampling Order:	8 0		
INSPECTION	T Cure i resent	Standing water present?			es No AA	REMEDIED	
AND DESCRIPTION OF THE PARTY OF	NO REMEDIED	Is concrete pad in good re	pair?		ES NO NA	REMEDIED	
Label on well? YES	NO REMEDIED NIA	Is protective casing locked		Y	ES NO NA	REMEDIED	
Is reference mark visible? YES	NO REMEDIED	Is inner cap in place and p	eroperly sealing well?	V	ES NO NA	REMEDIED	
Notes:							
STATIC WATER LEVEL		Casing diameter:	1.3 Inoch	Vol	ume of water per foot:		
Depth to Water: 23 47		Water Depth:	22 04		1" well: 155 mL		
Total Depth: 45		Well Volume:	7.64		2" well: 617 mL		
Total depth verified? YES NO	5	Troil Foldino.		4	well: 2.47 L		
HISTORIC EVENTS	Total		Volume				
		e Stabilization Time	Purged	Purged Dry?			
Pate Total Depth Trate	Level Diamonii Famping Note	5 Otdomzation Time	raiges	t diged biy:			
WELL PURGING				Pumping Start Tin	ne: 12 U	3	
	vdown Pumping Rate Appearance/C	Odor THL P	WIR	Pumping Stop Tin	. 1 0		
	eet) (ml/min)		W. M	Total Depth:	45		
12 S Z	- 250 V.Cland	dy None			114		
1256 -	250 Mod	Clardy None		Screen Length: Depth to Top of S	creen: 44		
1310	250 51.1	Clardy Nov.		The second secon	24.7	-	
1310 -		Clauding PV Blan	-	Depth to Screen M	Aidpoint: 44.	2	
				Notes:	sile pary	0	
				100	1 /		
MELL STADILIZATION							
WELL STABILIZATION				200		and the second	
	down Pumping Rate Temp	Spec Conductance	Diss Oxy	рН	ORP	Turbidity	
- 1 (1)	eet) (ml/min) (°C)	(mS/cm)	(mg/l)	(S.U.)	(mV)	(NTU)	
1318	250 10.6	0.83	670	6.03	728	63	
1321 -	250 105	0.85	7,90	6.01	96.7	81	
1374	750 10.6	0.65	1,12	5.99	97.2	1166	
1327	250 10.5	0.85	170	5.98	1055	873	
1330 -	250 10.5	0.85	1.35	5.99	107.7	91.4	
1333 ~ -	250 10.5	0 85	797	5.98	110.4	70.60	
1336	250 106	0.85	7.85	5.97	110.	54.6	
1334	250 10.5	0.84	8.03	5.98	111.2	61.9	
342	250 10.5	0.84	8,40	5.97	1135	523	
1345	250 10.4	0.84	90.41	5.94	116.7	51.3	
1245	250 119.5	0.64	8,5	5.96	118,0	49.8	
Stabili	zation Criteria:	+/- 3%	+/- 10%	+/- 0.1 Units	+/- 10 mV	+/- 10%	
			or≤ 0.5	0	17- 10 1110	or≤5	
	41	Purge Water Disposa	- New -	Drum			
SAMPLE COLLECTION	Sample Time: 1548	Total Stabilization Tin	ne: 65 min	Total Drawdown:_	_		
Appearance: Slight Clund	Odor: _/	Porc	Duplicate Collec	ted?: No			
Ü	/				Significant area		
0 1	PE: FILTERED:	PRESERVA		PEC	PARAMETER:		
	plastic yes no		NaOH, H2SO4	TECS			
	plastic yes no	None, HCI, HNO3,	NaOH, H2SO4	Alkalini	7		
	plastic yes no	None, HCI, HNO3	NaOH, H2SO4	Mchals	/		
3 40 ml glass	plastic yes no	None, HCI, HNO3,	NaOH, H2SO4	VOE:	5		
2 40 ml glass	plastic yes no	None, HCI, HNO3,	NaOH, H2SO4	C1-5	24"		
40 mt glass	plastic yes no	None HCI, HNO3,	NaOH, H2SO4	NO3	as Al		
40 ml glass	plastic yes no	Territory .	NaOH H2SO4	NO			
FINAL INSPECTION		0					
	NO NA Repairs needed?				YES NO		
Well cap secured? VES Well cover holted shunly? VES	NO NA Bolts needed?	YES NO NA			VES NO		



Site: Mentiwack Longo		Well: AFPL 512-55 FF Date: 1//3/7017				
Project Number: 3242 Pa	00.01		Sample Tin			
Sample Collection By:	Other Prese	nt: NA		Sampling Order	55 N 101	7
NSPECTION Barr lock? Label on well? Label on well? VES NO Notes: Autobal 1 5 5 5 6	REMEDIED REMEDIED REMEDIED	Standing water present? Is concrete pad in good re Is protective casing locker Is inner cap in place and p	d and in good repai	n	YES NO NA NA YES NO YES NO YES NO YES	REMEDIED REMEDIED REMEDIED REMEDIED
STATIC WATER LEVEL	T al	Casing diameter:	1.5	477 V	folume of water per foc	t-
Depth to Water: 22, 9 A Total Depth: 55 Total depth verified? YES NO	Train 11	Water Depth: Well Volume:	32.1 179.1	5.42	1" well: 155 mL 2" well: 617 mL	
HISTORIC EVENTS Date Total Depth Water Lev	Total /el Drawdown Pumping Ra	te Stabilization Time	Volume Purged	Purged Dry?	presson	asty mis a nods at Ren vol
WELL PURGING		MIM W	111	Pumping Start T	ime: 080	ž
Water Level Drawdow (feet) (feet) (7 8 1 7	(ml/min) Salad		fore	Pumping Stop T Total Depth: Screen Length: Depth to Top of Depth to Screen Notes:	5-5 14-5 Screen: 5-9	
WELL STABILIZATION	T		_	_		1.1
Water Level Drawdow (feet) O 9 0 9 O 9 12	m Pumping Rate Temp (ml/min) (°C) 200 9.1 200 9.5	Spec Conductance (mS/cm) (mS/c	Diss Oxy (mg/l) 6 . 3 2 6 . 3 2	pH (S.U.) 6.10 6.09 0.07	ORP (mV) 77.0 79.1 8 3.4	Turbidity (NTU) 40,4 58,0 30,3
Stabilizatio Fotal Volume Purged (L): 660 1	n Criteria:	+/- 3% Purge Water Dispose	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5
SAMPLE COLLECTION	Sample Time: DAIS	Total Stabilization Tir	-			
Appearance: C\-ar	Odor:	More	Duplicate Colle	cted?: No		_
NO./BOTTLES: SIZE: TYPE: 7 250 ml glass plas 1 250 ml glass plas 2 ml glass plas 1 ml glass plas 2 ml glass plas 1 ml glass plas	titie yes no no stic yes no no stic yes no no stic yes no	None, HCI, HNO3, None, HCI, HNO3, None, HCI, HNO3, None, HCI, HNO3, None, HCI, HNO3,	NaOH, H2SO4 NaOH, H2SO4 NaOH, H2SO4	Alkalin Melal Vocs USO NOS NOS	57	
Well cap secured? YES NO	Repairs needed?	d? YES NO NA		Tubing added? Lock replaced? Well cap replaced?	YES NO WAT	



Site: Marimack Longa Project Number: 32 42100101		Date: 1//3/2017 Sample Time: 12.44				
SAMPLING PERSONNEL Sample Collection By:	Other Present: JA		15 X0X10			
Barr lock? abel on well? s reference mark visible? YES NO REMEDIED YES NO REMEDIED Notes:	Standing water present? Is concrete pad in good re Is protective casing locked Is inner cap in place and p	d and in good repair?	YES NO NA REMEDIED YES NO NA REMEDIED REMEDIED REMEDIED REMEDIED			
Depth to Water: 23 fr otal Depth: 6 NO	Casing diameter: Water Depth: Well Volume:	72 1,280 %	/olume of water per foot: 1" well: 155 mL 2" well: 617 mL 4" well: 2.47 L			
The state of the s	otal rdown Pumping Rate Stabilization Time	Volume Purged Purged Dry?				
WELL PURGING	MITHU	Pumping Start T	10,00			
Time (feet) (feet) (ml/	min) Clard & Brown	Pumping Stop T Total Depth: Screen Length: Depth to Top of Depth to Screen Notes:	65			
VELL STABILIZATION						
Time (feet) (feet) (ml/	min) (*C) (mS/cm) 7.3 (10) 7.6 (11)	Diss Oxy pH (mg/l) (S.U.) (-24	ORP Turbidity 5 (mV) (NTU) 52.7 2916 55.9 3/42			
Stabilization Criteria:	+/- 3% Purge Water Disposa	+/- 10% or ≤ 0.5 +/- 0.1 Units	+/- 10 mV +/- 10% or ≤ 5			
SAMPLE COLLECTION Sample	e Time: 1244 Total Stabilization Tir	ne: 15- Total Drawdown				
Appearance: V. Claud School Sc	no None HCI, HNO3, no None, HO, HNO3, None HCI, HNO3, no None, HO, HNO3, None HCI, HNO3.	NaOH, H2SO4 PCS NaOH, H2SO4 MLAL NaOH, H2SO4 DOCS NaOH, H2SO4 NAOH, H2SO4 NAOH, H2SO4 NAOH, H2SO4 NAOH, H2SO4 NAOH, H2SO4	PARAMETER:			
Barr lock in place? YES NO NA Well cap secured? YES NO NA Well cover bolted snugly? YES NO NA	Repairs needed? YES NO NA NA	Tubing added? Lock replaced? Well cap replaced?	YES NO VES NO			



	SGPP					Well: 4703 66-65 FF				
	Merrimach				Date: VI6/17					
Project No	STATE OF THE PARTY OF THE PARTY.	2421001	01_			Sample Tim	ie: 1422			
	G PERSON							11		
Sample Col	CANCEL PROPERTY OF THE PERSON NAMED IN	N-I		Other Present:	NA		Sampling Order	110		
INSPECTI	ON		0		Standing water present?			YES NO MA	REMEDIED	
Barr lock?			EDIED ALL		is concrete pad in good re			VES NO NA	REMEDIED	
Label on well?	4.1.01.0		EDIED //	/	Is protective casing locke			YES NO NA	REMEDIED	
Is reference ma	ark visible?	YES NO REN	REDIED		Is inner cap in place and	properly sealing wel	ir.	YES NO NA	REMEDIED	
140(85.										
STATIC W	ATER LEVE	iL .			Casing diameter: _	15		folume of water per foot		
Depth to Wa	ter: 241	94			Water Depth:	45		1" well 155 mL		
Total Depth:	69 FF	70			Well Volume:	114		2" well: 617 mL		
Total depth v		S (NO)			1150100100001			4" well: 2.47 L		
HISTORIC			Total			Volume				
	A STATE OF THE STA	Water Level		Dumping Pate	Stabilization Time		Purged Dry?			
Date	Total Depth	Water Level	Drawdown	Fullipling Kate	Stabilization Time	Purged	Fulged Diyi			
	-						-			
-			=======================================				_			
			-	-						
									- 111	
WELL PU					MILMI	11	Pumping Start T		47	
	Water Level	Drawdown	Pumping Rate	e Appearance/O	dor My	- 11	Pumping Stop T	ime://	R	
Time	(feet)	(feet)	(ml/min)	Sec. 1	" IL WH	_	Total Depth:	69 D-		
1214	24.0	_	150	Slant	Closely John	Nanc	Screen Length:	ict		
1745	-	-	50	V. Clara	Brunn /		Depth to Top of	Screen: 68	C+	
	Shil	chid 1	DWat		/		Depth to Screen	7.0	-04	
1335		-		V. Clust	de Brown	Nore			7	
				- V Clurk	7 13 14 14 1	merc	Notes:	32		
	_			-						
	. —	-					Ma	Verra Pun	φ	
WELLST	ABILIZATION	M				_	0 0	terror 1		
WELL 317	No. 1977			-	00	2:		opp	T 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
12.00	Water Level	Drawdown	Pumping Rate		Spec Conductance	Diss Oxy	рН	ORP	Turbidity	
Time	(feet)	(feet)	(ml/min)	(°C)	(mS/cm)	(mg/l)	(S.U.)	(mV)	(NTU)	
1341				4.4	0-567	388	624	15-7		
1320				9.5	0.580	4,50	6.66	38.1		
1355	_		_	9.3	0.530	7.86	6.20	43.5		
1356	-			9.2	0 578	5.17	6.18	49.9		
1359	-	_	-	9.4	0.575	5.21	6.17	6/.1	~	
1304	-	-		92	6-4912	5,17	6.15	57.3	_	
1400		-	-	20.60	1,579	5.00	617	51.5	~	
14/0	-	-	-	85	1575	5.12	115	65.9		
1413	-		_	00	0 577	F 70	112	76.9		
1416		_	-	81	2 579	538	1	73.0		
14/9				9.2	0.576	+ 9-T	0.1	75.5		
1-11-7				7.2		5-61	-6.11	6-7-19	-	
	-					47.4007			1/ 100/	
		Stabilization C	riteria:		+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5	
Total Volume	Purged (I.)	> 11L			Purge Water Dispos		Dram		00	
	COLLECTIO		Sample Time	100000000000000000000000000000000000000	Total Stabilization Ti	1000	Total Drawdown	. —		
	The second secon		Jampie Time		Total Stabilization 11			*		
Appearance:	dowen	-		Odor:	low	Duplicate Colle	cted?:		_	
NO./BOTTLES	SIZE:	TYPE:	FILTERED:		PRESERV	ATIVE		PARAMETER:		
2	250 ml		-				PFC >	/ FILSTINE FERS		
1	250 ml		yes no			NaOH, H2SO4	ALLS	W.		
- 1			yes (no		~	NaOH, H2SO4	Alkalm			
- 6	250 ml	-	yes no		None, HCI, ANO3		Metale		-	
3	40 ml	glass plastic	yes (no)			NaOH, H2SO4	JOCS	4.01		
4	_40 ml	glass plastic	yes (no)		None, HCI, HNO3,	NaOH, H2SO4	Chlande	Sul hate		
	10 ml	glass plastic	yes no		None, HCI, HNO3,	NaOH, H2SO4	NO	951/		
	40 ml	glass plastic	yes (no)		None, HCI, HNO3,	NaOH, H2SO4	6622	03/0		
FINAL INS	PECTION									
Barr lock in pla		YES NO NA	1	Repairs needed?	YES NO (U)		Tubing added?	YES NO ALL)	
Well cap secur		YES NO NA	1	Bolts needed?	YES NO NA		Lock replaced?	YES NO	/	
Well cover bolte	su snugly (YES NO NA			-		Well cap replaced?	YES NO		



Site: SLPP				Well:	1/78/2017	7-18	
	1001.01			Sample Tim	e: 16 155	3	
SAMPLING PERSONNEL			as it			17	
Sample Collection By: 57		Other Present:	NA		Sampling Order:	160	
INSPECTION			Standing water present?			YES NO POR	REMEDIED
Barr lock? VE	ALL.)	is concrete pad in good re			ES NO NA	REMEDIED
Label on well?			Is protective casing locke	이번 그렇게 되는 경우로 가는 이렇게 했다.		ES NO NA	REMEDIED
Is reference mark visible? YES Notes:	NO REMEDIED		Is inner cap in place and p	properly sealing well		ES NO NA	REMEDIED
Notes.						_	
STATIC WATER LEVEL			Casing diameter: _	1.5	Vo	lume of water per foot	
Depth to Water: 24.1 Dk			Water Depth:	39ft	4	1" well: 155 mL	
Total Depth: 24			Well Volume:	650 mL		2" well: 817 mL	
Total depth verified? YES	NG;					"well: 2,47 L	
HISTORIC EVENTS	Total			Volume			
Date Total Depth W	ater Level Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?		
Total Dapat	and more contraction	. uniping rises	Ctabilitation 11110	, argou	, argue bry		
		-		-	-		
WELL PURGING					Pumping Start Tir	me: 153	0
	inudous Duncies Date	Annon	dor			1/2	7
	rawdown Pumping Rate	Appearance/O	dor		Pumping Stop Tir	0.0	1
Time (feet)	(feet) (ml/min)	11 1	NI NI		Total Depth:	101	_
1532 -	- 200	Clard-	Krown NV.	200	Screen Length: _	ict	_
		/			Depth to Top of S	creen: 27	
					Depth to Screen I	Midpoint: 27	5
					Notes: (12 1)		
					1 3		-
WELL STABILIZATION							
	rawdown Pumping Rate	Temp	Spec Conductance	Diss Oxy	pH	ORP	Turbidity
	지정보다 경기 가게 하는 것이 없다면 하는데 없다.				1.000		
Time (feet)	(feet) (ml/min)	(°C)	(mS/cm)	5.68	(S.U.)	(mV)	(NTU)
		8.6	0.070	2.00	(0.0)		17.4
1541 -	- 200	8.8	0.068	70	5,06	122.8	13.2
1544 -	- 200	8.8	0.067	5.88	5.80	1398	14.5
1547 -	- 200	27	6066	5.75	5.79	143.1	159
1550 -	- 200	0 -1	0.066	583	5.73	149.4	11.49
		-10-1	01.000	0.00			-1.71
				-			-
		_			-		-
							-
							-
					-		
				-	-		
						3	
Sta	bilization Criteria:		+/- 3%	+/- 10%	+/- 0.1 Units	+/- 10 mV	+/- 10%
FILLING BURNEY B	.12		D Water Diagram	or≤0.5	nam		or ≤ 5
	The second secon		Purge Water Disposa	The same of the sa	The second second	_	
SAMPLE COLLECTION	Sample Time:		Total Stabilization Tir		_Total Drawdown:_		
Appearance: Otear		Odor:^	lone	Duplicate Colle	cted?:_ No		
NO POTTI ES. SIZE.	TYPE: FILTERED:		PRESERVA	ATIVE-		PARAMETER:	
NO./BOTTLES: SIZE:	0 0				PFCI	PARAMETER:	
	lass plastic yes ho			NaOH, H2SO4		-1	
	lass plastic yes no			NaOH, H2SO4	Alkalia	17	
250 ml gi	lass plastic yes no		None, HCI, HNO3	NaOH, H2SO4	Michals		
2 40 ml (g	ass plastic yes no		None, HCD HNO3,	NaOH, H2SO4	VOCS		
2 40 m 0	ass plastic yes no		None, HCI, HNO3,	NaOH, H2SO4	CI 50	4	
1 /20	ass plastic yes ho		1	NaOH, H2SO4	NO.		
21.0	asi plastic yes no		None, HCI, HNO3,	1	No.	WN	
FINAL INSPECTION					The state of		
Barr lock in place? YES	NO NA	Repairs needed?	YES NO MA		Tubing added?	YES NO NO)
Well cap secured?	NO (NA)	Bolts needed?	YES NO NA		Lock replaced?	YES NO NA	



Client:	3400					2012 VARIANT A TOTAL TO SERVICE AND A SERVIC		-351+	
Street Street Avenue Avenue	Mean mad	K Longo	_				17 2017	-	
Project N		24121001.0				Sample Tin	ne:		
	IG PERSON				***			14	
	ollection By:	T		Other Present:	NA		Sampling Order	120	
INSPECT	ION		1		Standing water present?			YES NO PIA	REMEDIED
Barr lock?			MEDIED /		Is concrete pad in good re	STAN STAN BOUNDED TO SERVICE	2.	YES NO NA	REMEDIED
Label on well'			MEDIED (NA)		Is protective casing locker			VES NO NA	REMEDIED
Is reference n Notes:	nark visible?	VES NO REI	MEDIED		Is inner cap in place and p	properly sealing we	es c	YES NO NA	REMEDIED
Notes.									
STATIC V	VATER LEVE	L			Casing diameter:	1.5		olume of water per foo	ŧ
Depth to W	ater: 23.1		•		Water Depth:	11.90	of	1" well: 155 mL	
Total Depth:	~				Well Volume:	21		2" well: 617 mL	
Total depth	A STATE OF THE PARTY OF THE PAR	S NO			TYCH VOIGHIG.		_	4' well. 2,47 L	
	EVENTS		Total			Volume		4 Well, 2,47 L	
70 - 17 - 1	CANAL TOWN STATE		-		~				
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?		
							_		
WELL PU	RGING				1177		Pumping Start T		
	Water Level	Drawdown	Pumping Rate	e Appearance/O	dor 1///		Pumping Stop T	4. 6.	3
Time	(feet)						Total Depth:		-
0900	(leet)	(feet)	(ml/min)	V-Cloud	Brown Hore				
0.100				V-Coup	1		Screen Length:		TT.
		_					Depth to Top of		- A1
							Depth to Screen	Midpoint: 34	54
							Notes:		
WELL ST	ABILIZATIO	N							
	Water Level	Drawdown	Pumping Rate	e Temp	Spec Conductance	Diss Oxy	pH	ORP	Turbidity
Time									
Time	(feet)	(feet)	(ml/min)	(°C)	(mS/cm)	(mg/l) 5-30	(S.U.)	(mV)	934
0907				7.0	0.404	5.36	6.02	89.3	
0910		_	360	6 8	0.404		6.03	942	361
0913		_	350	8.8	0.404	5.30	605	960	923
	-			-		-		_	
	-		-						-
									4
		Stabilization C	ritorio		+/- 3%	+/- 10%	+/- 0.1 Units	+/- 10 mV	+/- 10%
			mena.		TI- 370	or ≤ 0.5		77- 10 thv	or ≤ 5
CONTRACTOR DESIGNATION OF THE PARTY OF THE P	e Purged (L):	4.12			Purge Water Disposa	and the same of th	Drum		
SAMPLE	COLLECTIO	N	Sample Time	0917	Total Stabilization Tir	me: 10 min	_ Total Drawdown		
Appearance	Charle	Chaids		Odor:/	lone	Duplicate Colle	ected?:	YES !	FD01
		1							
NO./BOTTLE	1 -	TYPE:	FILTERED:		PRESERVA	ATIVE:	ne	PARAMETER:	
6	250 m	glass plastic	yes (o)		(None) HCI, HNO3,	NaOH, H2SO4	PFCS		
	250 ml		yes no		None, HCI, HNO3,	NaOH, H2SO4	AlVali	vily	
7	250 ml		yes (no)			NaOH, H2SO4	Mehalo	1	
2	40 ml	0	~				VOCS		
2			yes (no			NaOH, H2SO4	C) 50	U~.	
-	40 m	200	yes (no)		9	NaOH, H2SO4	NOS	- 1	
	40 ml		yes no			NaOH, H2SO4	7.7	SAS N	
	40 ml	glass plastic	yes (no)		None, HCI, HNO3,	NaOH, H2SO4	1302		
FINAL INS	SPECTION			V=	0				
Barr lock in pl		YES NO NA		Repairs needed?	YES NO (H F)		Tubing added?	YES NO	
Well cap secu Well cover bot		YES NO NA		Bolts needed?	YES NO NA		Lock replaced? Well cap replaced?	YES NO	/
TER POVEL DOL	red anudity r	TEO NO INA					rven vah replaced r	LEG NO	



Client: 54PP			Well:	71404	44-45 47	
Site: McMmade Longa	-		Date:	1/17/2017 e: 100	77	
Project Number: 3242(00) 01			Sample Tim	e: [D	16	
SAMPLING PERSONNEL	March 2017 VV	NA		re tours are	nil .	
Sample Collection By:	Other Present:			Sampling Order:		
NSPECTION		Standing water present?	224		YES NO NA	REMEDIED
Barr lock? YES NO REMEDIED Label on well? YES NO REMEDIED	11.01	Is concrete pad in good re Is protective casing locker			YES NO NA	REMEDIED
Is reference mark visible? YES NO REMEDIED		Is inner cap in place and p			YES NO NA	REMEDIED
Notes:						
TATIO WATER LEVEL			7.		# 1 may 1 ma	
STATIC WATER LEVEL		Casing diameter:	22 fx	V.	olume of water per fool	
Depth to Water: 25 0		Water Depth:	The second secon		1" well: 155 mL	
otal Depth: 45		Well Volume:	3.76	_3	2" well: 617 mL	
otal depth verified? YES NO					4" well: 2.47 L	
HISTORIC EVENTS	otal		Volume			
Date Total Depth Water Level Drav	vdown Pumping Rate	Stabilization Time	Purged	Purged Dry?		
14-15 20 20 20 30 30 30 30 30 30 30 30 30 30 30 30 30	Parameter Company of the Company of					
VELL PURGING		W		Pumping Start Ti	me: 1018	
	ng Rate Appearance/Od	for WIIII		Pumping Stop Ti		
	/min)			Total Depth:	45 OF	
1021 — — 32	5 61.1	N	Toold	Screen Length:	1.72	
1030 - 32	5 SI-phi Cla		Jak	Screen Length:	40 0	T
10 30	3 St-ght Cia	AD 7 F	A3V	Depth to Top of S	Screen: 17 \$	-14 -14
				Depth to Screen	Midpoint: 44	2 1-6
				Notes:		
VELL STABILIZATION						
Water Level Drawdown Pumpi	ng Rate Temp	Spec Conductance	Diss Oxy	pH	ORP	Turbidity
Time (feet) (feet) (ml	(°C)	(mS/cm)	(mg/l)	(S.U.)	(mV)	(NTU)
10-0	25 9.3	0.700	6.17	610	79.7	106.2
1038 32	5 93	0701	6.22	6.08	852	786
1041 2"		0.700	6.33	6.07	90.4	79.9
1044 37	25 9.1	0.702	6. 27	6.07	917	131
				-	11.0	6-1
						A
						-
				-	_	
			-			
				-		
						-
Stabilization Criteria:		+/- 3%	+/- 10%	+/- 0.1 Units	+/- 10 mV	+/- 10%
111		Duran Mata- Dia-	or ≤ 0.5	m		or≤5
otal volume i digod (E).		Purge Water Disposa	ALL DESCRIPTION OF THE PERSON			
	e Time: 1046	Total Stabilization Tir	ne: zemin	Total Drawdown:		
ppearance: Char /Slat Gundy	Odor:	4	Duplicate Collec	ited?: MS	MED	
		800000000		/		
1 1 200	ERED:	PRESERVA		PFCS	PARAMETER:	
6 2.00 ml glass plastic yes	69	(NaOH, H2SO4	477	1	
250 ml glass plastic) yes	60	None HCI, HNO3,	NaOH, H2SO4	Alkalin:	7	
250 ml glass plastic yes	60	None, HCI, (HNO3)	NaOH, H2SO4	metals)	
9 40 ml glass plastic yes	(ng)	None, HCD HNO3.	NaOH, H2SO4	VOCS		
2 40 ml glass plastic yes	no	None, HCI, HNO3,	NaOH, H2SO4	C1-50	4-	
1 40 mt (glass) plastic yes	100	4	NaOH, H2SO4	103	-141	
10 ml glass) plastic yes	100		NaOH, H2SO4	W02	2017	
INAL INSPECTION			-	1		
arr lock in place? YES NO NA	Repairs needed?	YES NO (NA)		Tubing added?	YES NO	
Vell cap secured? YES NO (NA.)	Bolts needed?	YES NO NA		Lock replaced?	YES NO NA)
Well cover bolted snugly? YES NO NA				Well cap replaced?	YES NO	



Client:	58 3 GI	00				Well: _ /	P04 54	-53 Rt	
Site: /	Merrimoele	Louis				Date:	V17/2017		
Project N		24210010				Sample Tin	ne: 1 720	4	
	G PERSONN								
Sample Co	llection By: 🦠	13		Other Present:	NA		Sampling Order	15 0	
INSPECT			-		Standing water present?			YES NO /VA	REMEDIED
Barr lock?		YES NO REM	EDIED /		Is concrete pad in good re	epair?		YES NO NA	REMEDIED
Label on well?			EDIED NI		Is protective casing locke		12	YES NO NA	REMEDIED
Is reference m	ark visible?	YES NO REM	EDIED T		Is inner cap in place and	properly sealing we	11.5	YES NO NA	REMEDIED
Notes:									
STATIC W	VATER LEVE	1			Casing diameter:	15		alume of water per foo	
						309			
Depth to Wa		_			Water Depth:			1" well 155 mL	
Total Depth:		-0			Well Volume:	5.2L	_	2" well: 617 mL	
Total depth v		(O)						4" well: 2.47 L	
HISTORIC	EVENTS		Total			Volume			
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?		
WELL PU	RGING						Pumping Start T	ime: //3	4
	Water Level	Drawdown	Pumping Rate	Annearance/O	gor 4th 1th	.1	Pumping Stop T		21217
Time			(ml/min)	Appearanceron			Total Depth:	55	1-12:1
1138	(feet)	(feet)	325	Mad n	rown No			144	-
		_		Cloudy D	round 1 di	PC	Screen Length:		_
1150			375	Cltar	Mar	46	Depth to Top of		-
							Depth to Screen	Midpoint: 34	5
		-					Notes:		
				-					
7									- 4
WELL ST	ABILIZATION	V							
	Water Level	Drawdown	Pumping Rate	Temp	Spec Conductance	Diss Oxy	pH	ORP	Turbidity
Time	(feet)	(feet)	(ml/min)	(°C)	(mS/cm)	(mg/l)	(S.U.)	(mV)	(NTU)
1156	(iddi)	-	325	10.4	1.13	8 31	5.92	115.7	600
1/59			325	10.3	113	813	5.91		133
				10.3	1.13		5.89	116.1	
1202			325	10-7	1.13	7.76	2.89	118,7	120_
		-							
				-					
		-				_	-		
		-				+/- 10%	1.00		+/- 10%
		Stabilization C	riteria:		+/- 3%	or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	or ≤ 5
Total Volume	e Purged (L):	7.2L			Purge Water Dispos	al:	Drum		
The second second	COLLECTIO	N	Sample Time		Total Stabilization Ti	OLD A WITH BUILDING	Total Drawdown	_	
			Comple Time	1.			- A1		
Appearance:	Slight (104017		Odor: No	746	Duplicate Colle	ected?: IVO		-
NO./BOTTLES	S: SIZE:	TYPE:	FILTERED:		PRESERV	ATIVE:		PARAMETER:	
7	250 mi	glass plastic)	yes (fo)		1.00	NaOH, H2SO4	PFCS		
1	250 mi	glass plastic	~		\checkmark	NaOH, H2SO4	7.71	nila	
2	250 ml		1		~		Medal	7	
2	H.o.	glass plastic	yes (no)		None.) HCI, HNO3		1/1005		
2	1 -1-	glass plastic	yes no		None, HCD HNO3,			A 2100	-
6	10 ml	glass) plastic	yes no		~	NaOH, H2SO4	A 84 A	24	
-	<u>40</u> _m	glass plastic	yes no		None, HCI, HNO3,		NAS	85 N	-
	40 ml	glass plastic	yes no		None, HCI, HNO3,	NaOH, H2SO4	102	1,00	
	SPECTION				0				8
Barr lock in pla		YES NO NA		Repairs needed?	YES NO		Tubing added?	YES NO WA)
Well cap secu Well cover bolt		YES NO NA		Bolts needed?	YES NO NA		Lock replaced? Well cap replaced?	YES NO	



Other Present: Standing water present? Is concrete pad in good repails protective casing locked ar	Sampling Order	17
Standing water present? Is concrete pad in good repail Is protective casing locked an		
Is concrete pad in good repail Is protective casing locked an	ir?	YES NO /// REMEDIED
	400 C C C C C C C C C C C C C C C C C C	YES NO NA REMEDIED YES NO NA REMEDIED YES NO NA REMEDIED
Casing diameter: Water Depth: Well Volume:	82	/olume of water per foot: 1" well: 155 mL 2" well: 617 mL 4" well: 2.47 L
Pumping Rate Stabilization Time	Purged Purged Dry?	
	Dumping Clark 7	- 18 C2
Clardy None Clardy None None	Pumping Stop T Total Depth: Screen Length; Depth to Top of	ine:/437 65 1\$\bar{\bar{\bar{\bar{\bar{\bar{\bar{\ba
Temp Spec Conductance (°C) (mS/cm) 9.9 1.15 7.8 1.14	Diss Oxy pH (mg/l) (S.U.) 7 4 4 5.97 7 42 5.96 7.47 5.95 7.50 5.96	ORP Turbidity (mV) (NTU) 196 727 121.3 86.5 122.9 78.3 124.9 84.2
+/- 3% Purge Water Disposal:	+/- 10% +/- 0.1 Units or ≤ 0.5	+/- 10 mV
Odor:	Uplicate Collected?: W/E: IOH, H2SO4	PARAMETER:
all	Water Depth:	Water Depth: 40 M Well Volume: C 8 Well Volume: C 8 Pumping Rate Stabilization Time Purged Purged Dry? Pumping Start T (Screen Length: Depth to Top of Depth to Screen Notes: *** *** *** *** *** ** ** **



	o hype					Well: A	POH 750	MEX	
	ent incal					Date:	1/13/2017	15	
Project Nun		421001.01				Sample Tin	ne! 084	13	
SAMPLING					1.1			17	
Sample Colle		1.2		Other Present:			Sampling Order	740	
INSPECTIO Barr lock?	N	YES NO REM	EDIED A		Standing water present? Is concrete pad in good re	Salama Salama		YES NO NA	REMEDIED
Label on well?			EDIED (///		Is protective casing locked		1?	YES NO NA	REMEDIED
Is reference mark	visible?		EDIED		is inner cap in place and p	시간 사람이 있는 것 같아. 아이를 받는다면 했다.		YES NO NA	REMEDIED
Notes:									
STATIC WA	TER LEVE	L			Casing diameter:	1.5	A	folume of water per foo	ti
Depth to Wate	r: 24.1				Water Depth:	50,0		1" well: 155 mt.	
Total Depth:	75				Well Volume:	8.5L		2" well: 617 mL	
Total depth ver	ified? YES	S NO			TREAD THAT I			4" well: 2.47 L	
HISTORIC E			Total			Volume			
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?		
400					2.000				
WELL PUR	SING				14, 4400	4/14 .	Pumping Start T	ime: _@ラゟ	73
	Water Level	Drawdown	Pumping Rate	Appearance/O	dor Ney THRL	LAN !	Pumping Stop T	ime: 085	/
Time	(feet)	(feet)	(ml/min)				Total Depth:		
0811	-	-	800	Clear	Non	-	Screen Length:		
0219	_	-	300	Clank	Brown A	oric	Depth to Top of	and the second of	
-				/			Depth to Screen		5
							Notes:		_
WELL STAE	BILIZATION	V							
	Water Level	Drawdown	Pumping Rate	Temp	Spec Conductance	Diss Oxy	pH	ORP	Turbidity
Time	(feet)	(feet)	(ml/min)	(°C)	(mS/cm)	(mg/l)	(S.U.)	(mV)	(NTU)
0833	_		300	8.8	1.16	635	5.41	80.6	200
179 6	-		300	8.8	11/8	6.39	5.95	236	151
0339	_	-	300	8,9	1.18	6.93	5.88	2/2	145
									-
		Chabillantina C	de de		+/- 3%	+/- 10%	+/- 0.1 Units	+/- 10 mV	+/- 10%
		Stabilization C	ntena:		+/- 3%	or ≤ 0.5	+/- U. I Units	+/- 10 mV	or ≤ 5
Total Volume F					Purge Water Disposa	THE RESERVE AND ADDRESS OF THE PERSON NAMED IN	rum		
SAMPLE CO	DLLECTIO	N	Sample Time	0383	Total Stabilization Tir	me: 50 min	_Total Drawdown		
Appearance:	Clear			Odor: H	w.	Duplicate Colle	ected?: No		
								Kara-Tr	
NO./BOTTLES:	SIZE:	TYPE:	FILTERED:		PRESERVA		PEA.	PARAMETER:	
-	250 ml	glass plastic	yes no			NaOH, H2SO4	0.11	-1	
1	290 ml	glass plastic	yes no		None, HCI, HNO3,	NaOH, H2SO4	- Alkal	nily	
-	750 ml	glass plastic	yes no		None, HCI, HNO3	NaOH, H2SO4	Metal	9/	
2	40 ml	glass plastic	yes no		None, ACI HNO3,	NaOH, H2SO4	VOC		
6	40 ml	glass plastic	yes no		None, HCI, HNO3,	NaOH, H2SO4	-	04	
	40 ml	glass plastic	yes no		None HCI, HNO3,	The state of the s	No:	3 34 11	
	40 ml	glass plastic	yes (no		None, HCI, HNO3,	NaOH H2SO4	NAZ	- AV	
FINAL INSP				Tages and appropriate and a second	0		A MARINA CONTRACTOR OF THE PARTY OF THE PART	-	
Barr tock in place Well cap secured		YES NO NA		Repairs needed? Bolts needed?	YES NO NA		Tubing added? Lock replaced?	YES NO A	N .
Well cover bolted	souply?	YES NO NA		Dotta Necded !	TOO THE THE		Well can replaced?	VES NO	/



	SLEC	1				Well:	2004	DITE OL	1/18/2n-	
	err mark	242101	Al.			Date: 83.5 - 84.5 Pt 1/18 Sample Time: 105.2				
Project Nu	PERSONN		01			Sample Till	103			
Sample Coll		571		Other Present:	NA		Sampling Order	18 0		
INSPECTION	ACCUPATION AND ADDRESS OF THE PARTY OF THE P	212		Other Fresent.	Standing water present?		Sampling Order.	YES NO WA	REMEDIED	
Barr lock?	314	YES NO REM	IEDIED A		Is concrete pad in good re	epair?		YES NO NA	REMEDIED	
Label on well?			EDIED NA)	Is protective casing locke		1?	YES NO NA	REMEDIED	
Is reference ma	rk visible?	YES NO REM	MEDIED (Is inner cap in place and	properly sealing wel	13	YES NO NA	REMEDIED	
Notes:										
100										
STATIC W	ATER LEVE	1	f		Casing diameter:	1.5	, v	folume of water per foot		
	- P.	A				Ph 21	5.5			
Depth to Wa	M . 1 4-				Water Depth:	7.611		1" well: 155 mL		
Total Depth:		- 2			Well Volume:	3(1)	-	2" well: 617 mL		
Total depth ve		S NO				- 37.7		4" well. 2.47 L		
HISTORIC			Total			Volume				
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?			
						-				
							_			
WELL PUF	RGING						Pumping Start T		8	
	Water Level	Drawdown	Pumping Rate	e Appearance/O	dor		Pumping Stop T	ime: NR		
Time	(feet)	(feet)	(ml/min)	7 10 10 10 10 10 10 10 10 10 10 10 10 10			Total Depth:			
1000	1	()					Screen Length:	. 01		
							The state of the s	Screen: 815		
								Midpoint: 84		
	-			_						
				_			Notes: Salwy	led using		
		_					1.01	olidusins ema pamp		
							000.4	san port		
WELL STA	BILIZATION	N .							1000	
	Water Level	Drawdown	Pumping Rate	e Temp	Spec Conductance	Diss Oxy	pH	ORP	Turbidity	
Time	(feet)	(feet)	(ml/min)	(°C)	(mS/cm)	(mg/l)	(S.U.)	(mV)	(NTU)	
(08.	3	_		22	0.29	1193	424	23.9	NR	
1046	-		-	8.6	0.79	1.62	6.13	26.2		
1049	-	-	-	97	6.77	2.20	6.20	463	-1-1	
1052	-	_		27	1077	2 22	6.12	541		
1055	-		-	70	0 78	2.76	015	665		
1002			-	-/	0,00		4,0	20,0		
-		-	-	-		-			-	
	-	_		-						
	-								-	
		_				-				
						-				
									-	
		Stabilization C	riteria:		+/- 3%	+/- 10%	+/- 0.1 Units	+/- 10 mV	+/- 10%	
		25.1L				or ≤ 0.5	Λ		or ≤ 5	
Total Volume					Purge Water Dispos		Drum			
SAMPLE (OLLECTIO	N	Sample Time	1051	Total Stabilization Ti	ime: Mmin	_Total Drawdown	-		
Appearance:	Chand	of Orsali	aran	Odor: _ N	ave	Duplicate Colle	ected?: No			
		/	1							
NO./BOTTLES	SIZE:	TYPE:	FILTERED:		PRESERV		dra	PARAMETER:		
6	250 ml	glass plastic	yes no		None, HCI, HNO3,	NaOH, H2SO4	PFCS	- /		
	250 ml	glass plastic	yes no		None HCI, HNO3,	NaOH, H2SO4	Alkalin	ity		
4	250 ml	glass plastic	yes (no)		None, HCI, HNO3,	NaOH, H2SO4	Metal	5/		
3	40 ml	glass plastic	yes no			NaOH, H2SO4	VOCs			
2	40 ml	glass plastic	yes no			NaOH, H2SO4	C1- S11	4-		
1	40 ml	glass plastic	yes no		75	NaOH, H2SO4	N03			
1	40 m	glass plastic	yes no			NaOH, H2SO4	102	NO 10		
FINAL INS		Minary I hidault	yes 110/		1010, 1101, 11100,	1.4011,7112004)				
Barr lock in pla		YES NO NA	1	Repairs needed?	YES NO MA		Tubing added?	YES NO		
Well cap secur		YES NO NA		Bolts needed?	YES NO (NA)		Lock replaced?	YES NO NA		
Well cover bolte		VES NO NA		The second second second			Well cap replaced?	YES NO		



Client:						Well:		7-58 Ft	
	ensimade	-Lange				Date:	y19/2017		
Project Nu	THE RESERVE OF THE PARTY OF THE	2421001.01				Sample Tir	ne. 1004		
-	PERSON				ita			19 ~	
Sample Coll	CHARLEST TO SAN	27.2		Other Present:	NA		Sampling Order		1
INSPECTION	ON		-		Standing water present?			YES NO VA	REMEDIED
Barr lock?			(EDIED (SA)		Is concrete pad in good re		728	YES NO NA	REMEDIED
Label on well? Is reference ma	ed salethie 2		NEDIED (NA)		Is protective casing locked			YES NO NA	REMEDIED
Notes:	irk visible f	VES NO REM	REDIED		Is inner cap in place and p	properly sealing we	41.5	YES NO NA	REMEDIED
1101001									
STATIC W	ATER LEVE	1			Casing diameter:	1.5		olume of water per fool	
Depth to Wa	2012	200			Water Depth:	36.2	_ '		4
The second of th	-					01	-	1" well: 155 mL	
Total Depth:	-	- 00			Well Volume:	44		2" well; 617 mL	
Total depth ve		S (NO)						4" well: 2.47 L	
HISTORIC	EVENTS		Total			Volume			
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?		
			-						
	_								
WELL PUF	RGING				און און ני		Pumping Start T	ime: 09	47
	Water Level	Drawdown	Pumpino Rate	Appearance/O	gor ist ist		Pumping Stop T	1.4	/3
Time	(feet)	(feet)	(ml/min)	, ippedicines, e			Total Depth:	-0	**
09 39	(icci)	(icci)	450	Slant 0	Janda 1	Jorc .		5 1	
0121		-	125	21.5/11	1	10.6	Screen Length:	A.m.	
							Depth to Top of		-
							Depth to Screen	Midpoint: 57/	5,111
	_						Notes: Purgo	1 EL hetner	stabilizat
							repo	here	- 6
							1,000	7.	
WELL STA	BILIZATIO			-		D: 0	210		- 1140
-	Water Level	Drawdown	Pumping Rate		Spec Conductance	Diss Oxy	рН	ORP	Turbidity
Olime	(feet)	(feet)	(ml/min)	(°C)	(mS/cm)	(mg/l)	(S.U.)	(mV)	(NTU)
Ulla			425	10.5	0.493	7.30	5.67	148.3	152
0955	_		425	10	0.492	6.94	5.6B	150.3	52.5
0958	-	-	425	10.	0,489	6.99	5.66	159.2	19.6
1001	-	-	425	10.2	0489	701	5.65	158,9	14.6
								-	
	-					-		-	
			-				7		
		_		_		_			-
									7-1-1
	===	-		-					
		Ci-Lillit- C	Sec Codes		1.000	+/- 10%	71 A 11 11 11	11.40	+/- 10%
		Stabilization Co	riteria:		+/- 3%	or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	or ≤ 5
Total Volume	Purged (L):	987			Purge Water Disposa	d:	100M		
SAMPLE C	OLLECTIO	N	Sample Time:	1004	Total Stabilization Tin	ne: 27 min	Total Drawdown:		
Appearance:	Cler he	10014412	5	Odor: N	^	Duplicate Colle	ected?: M5/M	50	
7, 30, 31, 50,	7	1		7.7.			7		
NO./BOTTLES:		TYPE:	FILTERED:		PRESERVA	TIVE:	A-	PARAMETER:	
6	250 mi	glass plastic	yes no		None, HCI, HNO3,	NaOH, H2SO4	- FFC5		
	250 ml	glass plastic	yes no		None HCI, HNO3.	NaOH, H2SO4	Alkalin	ika	
1	250 ml	glass plastic	yes no		_	NaOH, H2SO4	Melala		
9	40 ml	glass plastic	100			NaOH, H2SO4	1065		
2	-10		yes no			A CONTRACTOR OF THE PROPERTY O		.41(=	
5		glass) plastic	yes no		-	NaOH, H2SO4	The second secon	W4-	
	40 ml	glass plastic	yes no			NaOH, H2SO4	N03	25 N	
	40 ml	glass) plastic	yes (no)		None, HCI, HNO3,	NaOH, (H2SO4)	NO7	1.00	
FINAL INS		-	7		0			-	
Barr lock in place		YES NO NA	1	Repairs needed?	YES NO (NA)		Tubing added?	YES NO CO	1
Well cap secure Well cover bolte		YES NO NA		Bolts needed?	YES NO NA		Lock replaced? Well cap replaced?	YES NO WAY	/



Project Nur	ntimade	42120101				Well: Date: Sample Tin	#108 6 1/19/2017 10: 1208	7-68 14	
SAMPLING				0# 5	MA		S	20 0	
Sample Colle	CONTRACTOR OF THE PERSON NAMED IN CONTRA	STS	- 6	Other Present:	Standing water present?		Sampling Order:	VES NO WA	REMEDIED
Barr lock? Label on well? Is reference mark Notes:	visible?	YES NO REM	EDIED (IEDIED		is concrete pad in good re is protective casing locker is inner cap in place and p	d and in good repair	n ·	YES NO NA NA NA YES NO NA	REMEDIED REMEDIED REMEDIED
STATIC WA Depth to Wate Total Depth: _ Total depth ver	r: <u>4.0.6</u> 6.8 ified? YES				Casing diameter: Water Depth: Well Volume:	46.2 N 7.7	76	I' well: 155 mL 2" well: 617 mL 4" well: 247 L	
Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?		
WELL PUR	CING	=					Pumping Start Ti	me:	9.1
Time 3 b	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Oi		MI force	Pumping Start II Pumping Stop Til Total Depth: Screen Length: _ Depth to Top of S Depth to Screen Notes:	me: NR 68 164 Screen: 67	
Time 17.0s (203	BILIZATION Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C) (v, 0 9.4	Spec Conductance (mS/cm) 0.545 0.595	Diss Oxy (mg/l) 5.91 5.90	pH (S.U.) 5.7/ 5.77	ORP (mV) 138.44 134.2 1139.6	Turbidity (NTU) 22.2
Total Volume F	urged (L):	Stabilization C	riteria:	1000	+/- 3% Purge Water Disposa		+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5
SAMPLE CO	DLLECTIO	N	Sample Time:		Total Stabilization Tir		_ Total Drawdown:	EDA	12
Appearance:	Size: 250 ml 250 ml 250 ml 40 ml 40 ml 40 ml	TYPE: glass plastic glass plastic glass plastic glass plastic glass plastic glass plastic	FILTERED: yes no yes no yes no yes no yes no yes no	Odor:/\(\text{\text{\$\sigma}}\)	None, HCI, HNO3, None, HCI, HNO3, None, HCI, HNO3,	NaOH, H2SO4 NaOH, H2SO4 NaOH, H2SO4 NaOH, H2SO4 NaOH, H2SO4 NaOH, H2SO4	PFC3 AlValinit Mobal 3 VOC3 CIT SU47 MO3 MO3	7	
Barr lock in place Well cap secured	?	YES NO NA		Repairs needed? Bolts needed?	YES NO NA		Tubing added? Lock replaced?	YES NO M)



Client: Site:	ShPP Merrinade	Louis	-			Well:	1/14/2017	784		1
Project Nu	ımber:	32421001	2)			Sample Tim				
CHARLES AND DRIVE THE PARTY.	G PERSONN							01		1
Sample Col	lection By:	STS		Other Present	NA		Sampling Order	21 1	9	
INSPECTI	ON		1 500		Standing water present?			YES NO N	REMEDIED	7
Barr lock?		YES NO RE	MEDIED A		Is concrete pad in good r	repair?		YES NO NA	REMEDIED	1
Label on well?	-4-4-14-7		MEDIED (WIN)		Is protective casing locke			YES NO NA	REMEDIED	1
Is reference ma	ark visible?	YES NO RE	MEDIED		Is inner cap in place and	properly sealing well	r	YES NO CHA	REMEDIED	1
rvotes.										1
		-								1
	ATER LEVE	Di.			Casing diameter: _	1.5		olume of water per fo	oot:	П
Depth to Wa		Et.			Water Depth:	57.9		1" well: 155 mL		
Total Depth:		- 6			Well Volume:	9.62	_	2" well: 617 mL		1
Total depth v	No. of London, St. Co., St. Co	(NO)						4" welt: 2.47 L		4
HISTORIC	EVENTS	_	Total			Volume				
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?			
										П
		_								ш
WELL PUI	CINC						Dumaia - Ctart T		80	-
WELL PUI		The state of the s	1	W viv. on manager	MIMI	MIM	Pumping Start T	15.		п
	Water Level	Drawdown		Appearance/C	dor	- 1	Pumping Stop T		40	1
Time	(feet)	(feet)	(ml/min)	0 1	, N.	ONC.	Total Depth:	78		1
1347			350	Stor a	71		Screen Length:			1
1415			350	Stratt	dear Wi	10	Depth to Top of	Screen:	7	1
				4.			Depth to Screen	Midpoint: 7	2.5	1
							Notes:			
			_							
										1
										4
WELLSTA	BILIZATION									
	Water Level	Drawdown	Pumping Rate		Spec Conductance		pH	ORP	Turbidity	1
Time	(feet)	(feet)	(ml/min)	(°C)	(mS/cm)	(mg/l)	(S.U.)	(mV)	(NTU)	1
1422		_	350	9.6	0.613	Lars	3.00	120.5	347	
1965		_	370	4.8	0.015	6.32	5.79	137.9	27.1	1
1428	_	-	300	9.8	0.612	6.26	5.76	139.3	2013	
1431	_	-	350	9.8	0,613	6-23	5.75	140.5	245 3	25
							1			1
	V									1
										1
										1
										1
										1
										1
		Stabilization C	riteria:		+/- 3%	+/- 10%	+/- 0.1 Units	+/- 10 mV	+/- 10%	1
T-1-11/-1	D	12.8L			D	or ≤ 0.5	Drum		or ≤ 5	1
Total Volume	The same of the sa		lo	0155	Purge Water Dispos					4
	OLLECTIO		Sample Time:		Total Stabilization Ti		Total Drawdown			1
Appearance:	Tyle	W TOOLEY	6-1	Odor:	Valle	Duplicate Colle	cted?: No			1
NO./BOTTLES	: SIZE:	TYPE:	FILTERED:		PRESERV	ATIVE:		PARAMETER:		1
2	250 ml	glass plastic	yes no		None, HCI, HNO3,		PFCS			1
1	250 mi	glass (plastic)			None HCI, HNO3,		11/2-1	ailm		
	2-50 ml	1	yes no		0		Melal	6		
2	tion	glass plastic	yes no		3	NaOH, H2SO4	1100	-		
2	b.a.	glass plastic	yes no		-	NaOH, H2SO4	1000	Salle		1
- for	40 ml	glass plastic	yes no			NaOH, H2SO4	2 - 10	504		
	40 ml	glass plastic	yes no			NaOH, H2SO4	NO 3	25 N		
CINIAL INC	HO mi	glass plastic	yes ho/		None, HCI, HNO3.	NaOH, (H2SO4)	Noz			1
FINAL INS	11.100.200.10.200.4	were we	1	Danales assistant	YES NO (N/)		Tubing polds in	New	1	
Barr lock in pla Well cap secur		YES NO NA	/	Repairs needed? Bolts needed?	YES NO (NA)		Tubing added? Lock replaced?	YES NO W	/	
Mark	4		/				14/-1/ 40		/	



	SUPP- 11	herrimade				Well: 1200 12 81-1821					
	terr, mack	60000				Date:	1/20/2017	-			
Project Nu		52 421001.	01			Sample Tin	ne: 0918				
	PERSON				2.4			22 _			
Sample Coll	tageth the second	575		Other Present:			Sampling Order				
Barr lock?	NC	VEC NO DOM	0		Standing water present?	annie?		YES NO NA	REMEDIED		
Label on well?			EDIED (WK)		Is concrete pad in good re Is protective casing locked		ir?	VES NO NA	REMEDIED		
Is reference ma	rk visible?		EDIED		Is inner cap in place and p			YES NO NA	REMEDIED		
Notes:											
STATIC W	ATER LEVE	=1			Casing diameter:	1.5 me	E- To	foliume of water per foo			
Depth to Wa	177 75				The second secon	67.1	<u>~</u>				
and the second second	20	-				1).24	-	1" well: 155 mL			
Total Depth:	DZ	S (NO)			Well Volume:	11.25	-	2° well: 617 mL			
Total depth vi		S / NO	Total	_		Values		4" well: 2.47 L			
		347 4 4 4	Total			Volume					
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?				
	-						-				
	-		-								
		-	-								
Lauren	0000								01		
WELL PUF	RGING		in and		ALIN AM	Liberia	Pumping Start T	- 4 -			
	Water Level	Drawdown		e Appearance/O	dor ILL IM	HILL	Pumping Stop T		6		
Time	(feet)	(feet)	(ml/min)	01 1		M.	Total Depth:	82			
0838		-	425	Cloudy	Gray Won	- 1	Screen Length:				
0904	_		310	Clandy	hre, Work		Depth to Top of	Screen: 31			
				/	/		Depth to Screen	Midpoint: 81	5		
							Notes:		-		
							7,57,5771				
WELL STA	BILIZATIO	N						_			
	Water Level		Pumping Rate	e Temp	Spec Conductance	Diss Oxy	pH	ORP	Turbidity		
Time	(feet)		(ml/min)		(mS/cm)	100	(S.U.)	(mV)	(NTU)		
0010	(reet)	(feet)	310	(°C)	(ma/cm)	(mg/l) 4.59	6.07	46.5	21		
03.2			310	9.0	0.71	HE	1 00	50.5	952		
00016		-		1100	200	1126	4.06		13 2		
0916			310	47	211	4,50	11.03	55.4	12,2		
						:					
							1				
			_					1			
		Stabilization C	riteria:		+/- 3%	+/- 10%	+/- 0.1 Units	+/- 10 mV	+/- 10%		
Service Control of the Control of th		and the second	illeria.			or ≤ 0.5			or ≤ 5		
Total Volume	AND DESCRIPTION OF THE PERSON	11.5			Purge Water Disposa) www				
SAMPLE C	OLLECTIO	N	Sample Time	0918	Total Stabilization Tir	me: 47min	_ Total Drawdown	1-			
Appearance:	Slunber	loudy ha	17	Odor: N	one	Duplicate Colle	ected?:/V	73			
	2.1.		1								
NO BOTTLES		TYPE:	FILTERED:		PRESERVA		Dea.	PARAMETER:			
6	250 ml		yes no		None, HCI, HNO3,	NaOH, H2SO4	PECS	7			
	250 m	glass plastic	yes no		None, HCI, HNO3,	NaOH, H2SO4	Alkalip	1			
- 6	250 ml	glass plastic	yes no		None, HCI, HNO3,	NaOH, H2SO4	Mehal	9			
3	40 ml	glass plastic	yes no		None, HCF HNO3,	NaOH, H2SO4	JOCS				
2	40 ml	glass plastic	yes no		None HCI, HNO3,	NaOH, H2SO4	6-1-	504-			
	40 m	glass) plastic	yes (ng)		Nonel HCI, HNO3,	NaOH, H2SO4	NO:	anN			
- 1	40 ml		yes (no)		None, HCI, HNO3,		NOZ				
FINAL INS	PECTION	6			A						
Barr lock in place	e?	YES NO NA		Repairs needed?	YES NO MA		Tubing added?	YES NO			
Well cap secure		YES NO NA		Bolts needed?	YES NO NA		Lock replaced?	YES NOWA			
Well cover bolte	u snugly !	YES NO NA					Well cap replaced?	YES NO			



Client:	SAPP					Well:/	101 11-7	Section 1			
Site:/		Langa				Date:	1/20/20				
Project No	ABILIZATION Water Level Drawdown (feet) (fe					Sample Time: 1724					
SAMPLIN	G PERSONN	NEL						00			
Sample Col	llection By:	575		Other Present	NA		Sampling Order	23			
INSPECTI	A COLUMN TWO IS NOT THE OWNER.				Standing water present?			YES NO DIA	REMEDIED		
Barr lock?		YES NO REV	EDIED O		Is concrete pad in good re	epair?		YES NO NA	REMEDIED		
Label on well?		YES NO REM	EDIED (V)		Is protective casing locke		n	YES NO NA	REMEDIED		
ls reference m	ark visible?	YES NO REM	EDIED		Is inner cap in place and	properly sealing wel	17	YES NO NA	REMEDIED		
Notes:											
STATIC W	ATER I EVE	1			Casing diameter:	15inch		foliume of water per foo			
	-	-			A SECTION ASSESSMENT OF THE PARTY OF THE PAR	1.6 FL			C		
Depth to Wa						^	_	1" well: 155 mL			
The second secon					Well Volume:	2 Colo un	-	2" well: 617 mL			
		S NO)						4" well: 2.47 L			
HISTORIC	EVENTS		Total			Volume					
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?				
		-	-								
		-									
WELL BILL	PCINC	_					Pumping Start T	ime: 115	Q		
WELLFO					av=			C April	2		
	Water Level	Drawdown		Appearance/O	dor		Pumping Stop T		2		
Time		(feet)	(ml/min)	24 4 3			Total Depth:		_		
1210	10,4		_	Charly 16	Prom None		Screen Length:	124	***		
							Depth to Top of	Screen: //	Dt.		
							Depth to Screen	Midpoint: 11	514		
								1 day pun			
	10.						11000	871	Lat Dra		
		-					Slaw skyon		SWELL CITY		
							Purse and	name le			
MELL OF	A DII 17 A TIO						. The Orbest	Jan III			
WELLSTA	ABILIZATION	N									
	Water Level	Drawdown	Pumping Rate	Temp	Spec Conductance	Diss Oxy	pH	ORP	Turbidity		
Time	(feet)	(feet)	(ml/min)	_(°C)	(mS/cm)	(mg/l)	(S.U.)	(mV)	(NTU)		
1218	-	_	-	1,0	0.452	9.36	6.29	1105	1534		
									- 1		
1230	Camp	water to	CII con	DIRECT UN	fil dry Wai	+ 10 min	Lhousens	gaine			
123%		The state of the s		Dr.	1			Jan			
1249											
125-5							-	-			
1259											
							-				
		-									
		and the same of	No. Color		7 (22)	+/- 10%	NA CONTRACTOR	100000	+/- 10%		
			riteria:		+/- 3%	or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	or≤5		
Total Volume	Purged (L): 0	.3L			Purge Water Disposa	al:	MARK		N. 151-A.1		
AND RESIDENCE OF THE PERSON.	STATE OF THE PARTY	N	Sample Time	1224	THE RESERVE OF THE PARTY OF THE	with a second	Total Drawdown	-			
	C / 1		Daniple Time		1	100					
Appearance:	C16sely	Deven	_	Odor:	YORK	Duplicate Colle	cted?:/V	D			
NO POTTI ES	erae.	TVDE	EII TEDED		PRESERVA	ATIME:		PARAMETER:			
NO BOTTLES							PFCS	PARAMETER:			
-		. \	2		None, HCI, HNO3,						
2			yes no		100	NaOH, H2SO4	- Marin	nily			
6	250 ml	glass plastic	yes no		None HCI, (HNO3.)	NaOH, H2SO4	Mela	2			
5	_40 ml	glass plastic	yes no		None, HCD HNO3,	NaOH, H2SO4	VOC	5			
2	40 ml	glass) plastic	yes (no)		None, HCI, HNO3,	NaOH, H2SO4	4	504-			
	40 ml		yes ho		None, HCI, HNO3,	NaOH, H2SO4	N03	ac Al			
	40 ml	glass plastic	yes (no)		_	NaOH, H2SO4	Way	777			
FINAL INC	PECTION	glassic plastic	yas (110)		Trong Trigit Trivos,	110011	7-9-1				
Barr lock in pla		YES NO NA		Repairs needed?	YES NO A		Tubing added?	YES NO	0		
Well cap secur		YES NO NA)	Bolts needed?	YES NO NA		Lock replaced?	VES NO NA)		
Well cover bolt		YES NO NA	/				Well cap replaced?	YES NO			



Client:	SUPP		_			Well:					
	henrimade	Longe	01				1/23/2017				
Project N		32427001	0			Sample Tir	ne: <u>' 0947</u>				
	G PERSON	VEL			2/1			24 _			
Sample Co		27.7		Other Present:			Sampling Order				
INSPECT	ION		3		Standing water present?	02		YES NO MA	REMEDIED		
Barr lock?			EDIED		Is concrete pad in good re		Left.	YES NO NA	REMEDIED		
Label on well? Is reference m			EDIED W		Is protective casing locker Is inner cap in place and p			VES NO NA	REMEDIED		
Notes:	IOIN VIOLDIU E	TES NO REM	LUISIN		is inner cap in place one i	properly seaming we	en t	100 100	NONLUNCO		
1											
	VATER LEVE	L			Casing diameter: _	15		olume of water per foo	t:		
Depth to Wa					Water Depth:	14		1" well: 155 mL			
Total Depth:	190				Well Volume:	121		2" well: 617 mt.			
Total depth	verified? YES	s (NO)						4" well: 2.47 L			
HISTORIC	EVENTS	0	Total			Volume					
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?				
			_								
			_								
WELL PU	RGING				111		Pumping Start T	ime: DP.0	5		
VALLE PO								A 18 mm			
200	Water Level			e Appearance/O	dor		Pumping Stop T	1.0	/		
Time	(feet)	(feet)	(ml/min)	ol I	None		Total Depth:		_		
0811		-	115	Cloudy	More		Screen Length:	113			
	-	-					Depth to Top of	Screen:	_		
		-					Depth to Screen	Midpoint: 17.	5		
							Notes:		110		
WELL ST	ABILIZATION	N									
	Water Level	Drawdown	Pumping Rate	e Temp	Spec Conductance	Diss Oxy	pH	ORP	Turbidity		
Time_	(feet)	(feet)	(ml/min)	_(°C)	(mS/cm)	(mg/l)	(S.U.)	(mV)	(NTU)		
0823			115	8,0	0.626	2.19	6.49	-23.7	865		
0826		_	Pa.	a Stua, V	7 1						
0832		-	115	137	0627	2 4	1.04	-122	4/17		
0835	-		115	7.4	-	3/2	6.55	-166	115-11		
				0.5	0.627		NIC (-3.7	43,4		
0938			_1/5	8.6	0.626	3.04	760 33	70	43.2		
		_				-					
		-									
		4									
		Stabilization Cr	ritoria:		+/- 3%	+/- 10%	+/- 0.1 Units	+/- 10 mV	+/- 10%		
an organization of			itorio.			or ≤ 0.5	Office	- Id my	or ≤ 5		
Total Volume	THE RESIDENCE OF THE PARTY OF T	2.2 L			Purge Water Disposa		AUDA	-			
SAMPLE	COLLECTIO	N	Sample Time		Total Stabilization Tir	me: > 7min	_ Total Drawdown				
Appearance:	Slintelle	nd bellear		Odor:	None	Duplicate Colle	ected?:_ No				
	5	7									
NO./BOTTLES		TYPE:	FILTERED:		PRESERVA	ATIVE:	0-1	PARAMETER:			
2	150 ml	glass plastic	yes (no)		None, HCI, HNO3,	NaOH, H2SO4	PFCs				
	250 ml	glass plastic	yes (no)		None HCI, HNO3,	NaOH, H2SO4	Allalin	ih			
	250 ml	glass plastic	yes no		None, HCI, (HNO3)	NaOH, H2SO4	Mchals				
3	40 ml		yes (no)			NaOH, H2SO4	17065				
2	40 ml	249	yes (no)		None HCI, HNO3,	NaOH, H2SO4	CI- 5	104			
1	40 mi	Carry.	yes no		None, HCI, HNO3,	NaOH, H2SO4	103				
	40 ml	CON	yes no		None, HCI, HNO3,		Noz	27 10			
FINAL INC	PECTION	Igiassi plastic	yes (ng)		Hone, Hot, HNO3,	HBOH, 112504	1.02				
Barr lock in pla		YES NO NA		Repairs needed?	YES NO (M.		Tubing added?	YES NO	_		
Well cap secu		YES NO NA		Bolts needed?	YES NO NA		Lock replaced?	YES NO/NA)		
Well cover bolt	ed snugly?	YES NO NA					Well cap replaced?	VES NO			



Client: SAPP		Well: 199 35-36 Pt
Site: McNimask Long Project Number: 3242100101		Date: <u>\\ \23\/_2017</u> Sample Time: \(\(\(1057\)\)
SAMPLING PERSONNEL		Cample Time. 1037
Sample Collection By: N	Other Present: NA	Sampling Order: 25
INSPECTION	Standing water present?	YES NO /MA REMEDIED
Barr lock? YES NO REMEDIED	Is concrete pad in good re	
Label on well? YES NO REMEDIED	VA) Is protective casing locked	d and in good repair? YES NO NA REMEDIED
Is reference mark visible? YES NO REMEDIED	Is inner cap in place and p	properly sealing well? YES NO NA REMEDIED
Notes:		
STATIC WATER LEVEL	Casing diameter:	/, S Volume of water per foot:
Depth to Water: 10.3	Water Depth:	2.5, 7 1° well: 155 mL
Total Depth: 36	Well Volume:	4.3 L 2"well: 617 mL
Total depth verified? YES NO	vveii voidille.	4" well: 2.47 L
	otal	Volume
Date Total Depth Water Level Draw	down Pumping Rate Stabilization Time	Purged Purged Dry?
WELL PURGING	No. 1111	Pumping Start Time:
Water Level Drawdown Pumpi	ng Rate Appearance/Odor	Pumping Stop Time: 1/0 3
Time, (feet) (feet) (m)	min)	Total Depth: 36
10 30 - 4	to Cloudy Orange Brown /	Non Screen Length: 1C+
10 16 31	5 Sh. Clinada A	
10 4	S - 11 Clay they	
		Depth to Screen Midpoint: 35.5
		Notes:
WELL STABILIZATION		
Water Level Drawdown Pumpi	ng Rate Temp Spec Conductance	Diss Oxy pH ORP Turbidity
Time (feet) (feet) (ml/	min) (°C) (mS/cm)	(mg/l) (S.U.) (mV) (NTU)
1049 - 3-	15 10.6 0.532	1.75 500 1525 726
1052 3.	75 10.5 0.534	7.70 5.78 155.6 GG.5
1055 - 3	75 10.5 0.532	7.77 5.76 157.8 64.2
10	- 10.2	
0.170.000	1 000	+/- 10% +/- 10%
Stabilization Criteria:	+/- 3%	or ≤ 0.5 +/- 0.1 Units +/- 10 mV or ≤ 5
Total Volume Purged (L): 6 6 L	Purge Water Disposa	al: 0 M M
SAMPLE COLLECTION Sample	Time: 10 17 Total Stabilization Time	me: 25 m n Total Drawdown:
Appearance: St. Claudy	Odor: Nanc	Duplicate Collected?:
	RED: PRESERVA	
2 250 ml glass plastic yes	None HCI, HNO3,	NaOH, H2SO4 PFC3
250 ml glass plastic yes	None, HCI, HNO3,	NaOH, H2SO4 Allalinity
250 ml glass (plastic) yes	*** · · · · · · · · · · · · · · · · · ·	NaOH, H2SO4 Mulals
3 40 ml (glass) plastic yes		NaOH, H2SO4 VOCS
9 Un 3	× A	11= 1 =
1 1/0	in the second	4.2
110	None HCI, HNO3,	11-0 00
10 ml (glass) plastic yes	None, HCI, HNO3,	NaOH (H2SO4) NO 2
FINAL INSPECTION	Repairs needed? YES NO AA	Tubing added? YES NO.
Barr tock in place? YES NO NAI Well cap secured? YES NO NA	Repairs needed? YES NO (A) Bolts needed? YES NO (NA	Tubing added? YES NO. Lock replaced? YES NO.
Well cover bolted snugly? YES NO NA		Well cap replaced? YES NO



Site: Mer	PIP					Date:	423/2017		
Project Number	Carlot Service Control	242(00).0	01			Sample Tin	ne:	12	
SAMPLING PER Sample Collection		42		Other Present:	NA		Sampling Order	20	
INSPECTION	by.	1 22		Other Present:	Standing water present?		Sampling Order.	YES NO W	REMEDIED
Barr lock?		YES NO REM	EDIED A		Is concrete pad in good re	epair?		YES NO NA	REMEDIED
Label on well?		YES NO REM	EDIED (VA)		Is protective casing locke	and the second s		YES NO NA	REMEDIED
Is reference mark visible	e?	YES NO REM	EDIED		is inner cap in place and i	properly sealing we	117	YES NO NA	REMEDIED
Notes:									
STATIC WATER	LEVE	L			Casing diameter: _	1,5	v	olume of water per fo	ot:
Depth to Water:	15				Water Depth:	33		1" well: 155 mL	
Total Depth:4	18				Well Volume:	5.5L		2" west: 817 mL	
Total depth verified?	YES	NO						4" well: 2.47 L	
HISTORIC EVE	NTS		Total			Volume			
Date Total	Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?		
		-							
WELL PURGING	G				New York	_	Pumping Start T		20
Wate	er Level	Drawdown	Pumping Rate	Appearance/O	gor IMT MILL		Pumping Stop T	ime:	47
	leet)	(feet)	(ml/min)				Total Depth:	48	
1223	-		500	V. Clondy		12	Screen Length:	184	
1225	-	-	500	SliCloud	No	ovy	Depth to Top of	Screen:	17
							Depth to Screen		7.5
							Notes:		
WELL STABILIZ	ZATION	===							
	er Level		Pumping Rate	Temp	Spec Conductance	Diss Oxy	рН	ORP	Turbidity
	eet)	(feet)	(ml/min)	(°C)	(mS/cm)		3.000	(mV)	(NTU)
1253	eetj	(leet)	500	9.8	0.485	(mg/l)	(S.U.)	1730	13 4
1236			500	9.8	0.485	7.87	5.70	1775	110 011
1230	_		600	97	0.484	005	5.67	180.1	11 -10
1000	_	_	200		0.101	8-00		100.1	11.30
	_	-	-			_		_	
	_							-	
	_					-			
		1							
		2							
			_			_			
		Stabilization Cr	riteria:		+/- 3%	+/- 10%	+/- 0.1 Units	+/- 10 mV	+/- 10%
Total Volume Purge		3-5L			Purge Water Dispose	or ≤ 0.5	Jana	1 32311	or ≤ 5
SAMPLE COLL			Sample Time		Total Stabilization Ti		Total Drawdown	-	
Appearance:	Veer			Odor: 242	None	Duplicate Colle	ected?: N	0	
NO./BOTTLES: S	SIZE:	TYPE:	FILTERED:		PRESERV	ATIVE:		PARAMETER:	
	36 ml	1	27%		A		PECA	PARAMETER:	
1 7	3	glass plastic	yes no		796	NaOH, H2SO4	Al Kal	. V	
1 0	50 ml	glass plastin	yes no			NaOH, H2SO4	nd II.	7	
0	50 ml	glass plastic	yes no		None, HCI, (HNO3)		1006		
	40 ml	glass plastic	yes no		The same of the sa	NaOH, H2SO4	Vocs	504-	
-	40 ml	glass plastic	yes no		><	NaOH, H2SO4		204	
	40 ml	glass plastic	yes no			NaOH, H2SO4	No?	asW	
, , , , , , , , , , , ,	40 mt	glass) plastic	yes no		None, HCI, HNO3,	NaOH, H2SO4	Noz		
FINAL INSPECT	ION	2			07		w. 1.	and the same of	
Barr lock in place? Well cap secured?		YES NO NA		Repairs needed? Bolts needed?	YES NO NA		Tubing added? Lock replaced?	YES NO A	1
Well cover bolted snugly	0	YES NO NA		- ville (lausau)			Well cap replaced?	YES NO)



Client:	SUPP					Well:	APOG 3	6-578+			
	errimade	hansa				Date: \\23/2017					
Project N	umber:3	2421001	01			Sample Tim	e: 1419				
SAMPLIN	G PERSON	NEL						00			
Sample Co	llection By:	SPI		Other Present:	NA		Sampling Order	21 /	3		
INSPECT	ION		~		Standing water present	7		YES NO /NA	REMEDIED		
Barr lock?		YES NO REA	MEDIED M. IN		Is concrete pad in good			YES NO NA	REMEDIED		
Label on well?			HEDIED (////)		Is protective casing lock			YES NO NA	REMEDIED		
is reference m Notes:	nark visible?	YES NO HEN	IED/ED		Is inner cap in place and	d properly sealing well	e .	YES NO NA	REMEDIED		
140103.											
STATIC V	VATER LEVE				Casing diameter:	1,5	_	Volume of water per foo	di .		
Depth to Wa		>			Water Depth:	38.3	_	1" well: 155 mL			
Total Depth:	57				Well Volume:	6041		2" well: 617 mL			
Total depth v		s No						4" well: 2.47 L			
HISTORIC	EVENTS		Total			Volume					
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?				
						7.37.4					
WELL PU	RGING				an Min		Pumping Start T	ime: 13	53		
	Water Level	Drawdown	Pumping Rate	Appearance/Or	POL MIMILI	l .	Pumping Stop T	1/	125		
Time	(feet)	(feet)	(ml/min)				Total Depth:	10000			
1356	(1001)	-	460	V. Cloudy	toon	Hore	Screen Length:		_		
1359	~	_	450	S. audy		Non	Depth to Top of				
140%			450	Clear		Nort			-		
1100		-	400	Dun		Notes:					
			_	_			Notes:				
		-	-	_							
			_	_							
WELLST	ABILIZATION	N									
WELL ST				-							
12000	Water Level	Drawdown	Pumping Rate		Spec Conductance		pH	ORP	Turbidity		
Time	(feet)	(feet)	(ml/min)	(°C)	(mS/cm)	(mg/l)	(S.U.)	(mV)	(NTU)		
1411			450	-	0.497	1.63	5.69	17/,2	11,4		
1414		-	450	10.0	0.498	6.6769	3.68	1728	10.82		
1417	-		420	99	0.498	7.67	5.67	1737	12.7		
						_					
			/								
		Stabilization C	ritoria:		+/- 3%	+/- 10%	+/- 0.1 Units	+/- 10 mV	+/- 10%		
			mena.		17-376	or ≤ 0.5	1	+/- 10 mv	or ≤ 5		
Total Volume	The second second second second	9.12		1	Purge Water Dispos	Married Street, or other Persons and Perso	JOHN				
SAMPLE	COLLECTIO		Sample Time	: 1419	Total Stabilization T	ime: 16 min	_Total Drawdown	:			
Appearance:	Cle	45		Odor:N	one	Duplicate Collec	cted?: NO				
								Land Wall			
NO./BOTTLES		TYPE:	FILTERED:		PRESER		054	PARAMETER:			
- 5	250 ml		yes no		\sim	, NaOH, H2SO4	PECS	1			
	250 ml	glass plastic	yes (no)		None HCI, HNO3	, NaOH, H2SO4	Allaling	19			
	250 ml	glass plastic	yes (no)		None, HCI, HNO3	NaOH, H2SO4	Metal	5			
3	40 ml	glass plastic	yes no		None, HCD HN03	NaOH, H2SO4	VOCS				
- 2	40 ml	glass plastic	yes (no)		None, HCI, HNO3	, NaOH, H2SO4	CI- 51	24			
	40 ml	glass plastic	yes (no		None, HCI, HNO3	NaOH, H2SO4	No3	NW			
	40 ml	glass plastic	yes no	3	None, HCI, HNO3	NaOH, (H2SO4)	Nb2	NO IT			
FINAL INS	SPECTION				1			-	7		
Barr lock in pla		YES NO NA		Repairs needed?	YES NO (NA)		Tubing added?	YES NO ALA			
Well cap secur Well cover bolt		YES NO NA		Bolts needed?	YES NO NA		Lock replaced? Well cap replaced?	YES NO /V/	/		
TAGIL COAGL DOLL	an stindily t	YES NO NA					well cap replaced?	YES NO			



Client:	SGPP		_		Well: <u>APOG 65-66</u> Date: <u>V23/7ø17</u>						
Site: Project N	MINA MAC	1242100	I mi			Date: Sample Tir					
	G PERSONN					Sample III	ne				
Sample Co		VEL	1	Other Beacant:			Sampling Order	28			
INSPECT				Other Present:	Standing water present?		Sampling Order		PEMEDIED		
Barr lock?	014	YES NO REA	AEDIED		is concrete pad in good re	epair?		YES NO NA	REMEDIED		
Label on well?			MEDIED (A) (A)		Is protective casing locker		ir?	YES NO NA	REMEDIED		
Is reference m	ark visible?		MEDIED (Is inner cap in place and p			YES NO NA	REMEDIED		
Notes:											
STATIC W	ATER LEVE	1			Casing diameter;	15		Volume of water per fo			
	27-10-		1			442			00		
Depth to Wa	100	_			Water Depth:	9/	-	1" well: 155 mL			
Total Depth:	0.5	-0			Well Volume:	06		2" well: 617 mL			
Total depth v		S NO	1					4" well: 2.47 L			
HISTORIC	EVENIS		Total			Volume					
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?				
WELL PU	RGING				Authors		Pumping Start T	Time: / < 3	6		
	Water Level	Drawdown	Pumping Rate	Appearance/O	dor ITH N/N	(1)	Pumping Stop T	1 1			
Time	(feet)	(feet)	(ml/mig)	7,600.00.00.00	411	V	Total Depth:				
1540	(1661)	(ical)	450	V. 6/020	1 1/		Screen Length:	77.			
K43	-	-	400	11000	Pier				_		
277		_		- Wille	PIR		Depth to Top of		-		
			$\overline{}$				Depth to Screen	Midpoint: 65	.5		
							Notes:				
			_								
WELL ST	ABILIZATION	V			W-1-1-						
	Water Level	Drawdown	Pumping Rate	Temp	Spec Conductance	Diss Oxy	pH	ORP	Turbidity		
Time	(feet)	(feet)	(ml/min)	(°C)	(mS/cm)	(mg/l)	(S.U.)	(mV)	(NTU)		
1588	-	_	400	7.7	0.966	7.05	5.79	166.3	11.5		
1/00/		-	400	94	0.86	7.73	5.76	165.1	10.68		
TLAN		-	400	45	0.86	6.59	5,78	164.9	11.2		
1907			400	01.5	0.86	6.59	5:77	1 1	1-40		
1001		-	1/10/5	G M	-100	1000	877	310	4101		
1610		_	400	7.8	0.86	401	31/	165.4	1145		
		-	_								
						_					
						-					
-											
		01-1-11-11-1	4.2.		. 1 00/	+/- 10%			+/- 10%		
100		Stabilization C	ntena:		+/- 3%	or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	or≤5		
Total Volume	Purged (L):	12.BL			Purge Water Disposa	al:	Draw				
SAMPLE (COLLECTIO	N	Sample Time	1611	Total Stabilization Tir	me: 35 min	Total Drawdown	:			
Appearance:	01	25		1/	44	Duplicate Colle	la /	12			
rippearance:	CIE			Oddi. Tra	To face	Duplicate Coll	DOIGUT.				
NO./BOTTLES	: SIZE:	TYPE:	FILTERED:		PRESERVA	ATIVE:		PARAMETER:			
2	250 ml		yes no		None HCI, HNO3,		PECS				
1	250 ml	glass plastic	72			NaOH, H2SO4	Allelin	ih			
	250 ml	1	yes (no)		0			147			
2			yes (ho)			NaOH, H2SO4	Metals				
3	40 ml	glass plastic	yes (no)		20		Vocs	110			
6	40 ml	glass plastic	yes (no)			NaOH, H2SO4	CL 52	4"			
	40 ml	glass plastic	yes no		None HCI, HNO3,	NaOH, H2SO4	NO3	ASN-			
	40 mi	glass) plastic	yes no		None, HCI, HNO3.	NaOH, H2SO4	HOZ				
FINAL INS	PECTION	_	1			0		_			
Barr lock in pla		YES NO NA	1	Repairs needed?	YES NO (NA)		Tubing added?	YES NO A	11		
Well cap secur Well cover bolts		YES NO NA		Bolts needed?	YES NO NA		Lock replaced? Well cap replaced?	YES NO	/		
THE COVER DOLL	a dringly !	TO MAL MAY					Tren cap replaced?	TES NU			



	SGPP					Well: A	PO9 70-	71.6+			
	Merrimach	/	Date:								
Project Nu		2/2/00/	.0			Sample Tirr	ime:8				
SAMPLING	3 PERSON	NEL			183			20			
Sample Col		515		Other Present:	MA		Sampling Order	29	-		
INSPECTI	ON		0		Standing water present?			YES NO /NA	REMEDIED		
Barr lock? Label on well?			EDIED IV		Is concrete pad in good re is protective casing locker		a	YES NO NA	REMEDIED		
Is reference ma	irk visible?		EDIED		Is inner cap in place and p			YES NO NA	REMEDIED		
Notes:											
STATIC W	ATER LEVE	1			Cosina diameter	1.5					
	174.1	L			Casing diameter: _	57 M	-	Volume of water per fo	OC.		
Depth to Wa	1 1				Water Depth:	R. BL	_	1" weil: 155 ml.			
Total Depth:		- 0-			Well Volume:	0.00	-	2" well: 617 mL			
Total depth vi	The second secon	S (NO)	Total			Makima		4" well: 2.47 L			
	A CONTRACTOR OF STREET	111 1	Total	2000		Volume					
Date	Total Depth	Water Level	Drawdown	Pumping Rate	Stabilization Time	Purged	Purged Dry?				
		_									
	_										
	20012								223		
WELL PUP	RGING				THI THI	P41/ 11.	Pumping Start 1				
	Water Level	Drawdown	Pumping Rate	Appearance/O	gor LATITH	111711	Pumping Stop 7	ime: NF)		
Time	(feet)	(feet)	(ml/min)	101 1	Mrs. I		Total Depth:	71			
0946	_	-	350	V.Claudy		INI	Screen Length:	10+			
0956	_+	-	300	Cloude	Brown N	one	Depth to Top of	Screen: 170			
0903	_	-	250	Cloudy	Brunn N	nre	Depth to Screen	Midpoint:	2.5		
0912		-	400	SMA	Nex Batt. 5	AA	Notes:				
WELL STA	BILIZATION	N									
	Water Level	Drawdown	Pumping Rate	Temp	Spec Conductance	Diss Oxy	pH	ORP	Turbidity		
Time	(feet)	(feet)	(ml/min)	(°C)	(mS/cm)		(S.U.)	(mV)	(NTU)		
1918	(1,001)	(1001)	400	10.4	1,03	2.88	613	25.2	626		
1021		-	400	10.2	1.03	4.02	7.11	34.0	672		
1024	_	-	400	10.5	1.02	4/13	6.10	41.3	620		
1027	~		100	10.3	IDZ	4.40	6.08	48.6	637		
1036		-	400	10.2	1.62	4.43	6.07	483	725		
1035		-	400	102	1.02	445	1001	51.5	140		
10-1-			100	10.2	1.02	-1.70	0.06	2/.2	176		
		-				_		-	-		
		-					-				
						-	_				
_											
		-				-1.400/	-	7	+/- 10%		
		Stabilization C	riteria:		+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5		
Total Volume	Purged (L):	1484			Purge Water Disposa		nam.		0,20		
	OLLECTIO	AND RESIDENCE OF THE PERSON NAMED IN	Sample Time	: 1036	Total Stabilization Tir		and the later of t				
			Sample Time				4/				
Appearance:	Clondy			Odor:	Inc	Duplicate Colle	cted?: /V)	_		
NO /BOTTLES	SIZE:	TYPE:	FILTERED:		PRESERVA	ATIVE:		PARAMETER:			
23	750 mi		yes no		None HCI, HNO3,		VF-CG	· · · · · · · · · · · · · · · · · · ·			
1	250 mi		73		~	NaOH, H2SO4	Alkal	nila			
0		(42)	yes no		~ ~		Mela	3			
2	260 ml		yes (no)		the same of the same	NaOH, H2SO4	VOL:	1.5			
2	40 ml	1	yes no			NaOH, H2SO4					
4	1 to	glass plastic	yes no		240	NaOH, H2SO4	CI-	204			
-	HD mi	1	yes no			NaOH, H2SO4	Na.	asN			
	L(D mi	glass) plastic	yes (no)		None, HCI, HNO3,	NaOH, (H2SO4)	No2				
FINAL INS		-		\$ 2000	YES NO (H)		- 4.		7		
Barr lock in plan Well cap secure		YES NO NA		Repairs needed? Bolts needed?	YES NO NA		Tubing added? Lock replaced?	YES NO NE	()		
Well cover bolte		YES NO NA		Don't Heeded?	TES THE NAME OF THE PERSON OF		Well cap replaced?	to the second se	/		

WELL DEVEOPMENT LOG

	:		, , ,		_ ,	-	-141 -	.00				
Project Name: _<	GAP-1	Merrin	nack					Date St	arted:_ <u>\\</u>	11/16		
Project Number: _			,	٠.	-			Date Fir			_	
Field Parameters	J#	Well-Vc	lumes a	nd Carre	spondin	a Field F	aramete	rs Value				
	Intitial	1	2	3	4	5	6	7	8	9	10	
Water Level	45.43				<u> </u>				`			
рН		<u> </u>				<u>.</u>						
Conductivity (uS)	 			· .		<u> </u>						
ORP (mV)	ļ		69						×-35.			
DO (mg/L)	 							,				
Temperature (C)	Ü		7					<u> </u>				
Turbidity (NTU)			js.									
Monitoring Well: !	W.46 -	14	Notes:	Surve	CS.4	69:35	44-					
Total Depth: ५1.५	8			Blocka	au a	+ 27.	82 44	Cann	of Cit	baile	r any	deeper
Water Column: ℚ .				•	J		•	,				
One Well Volume:	0.350)		.e						٠		
Field Parameters			lumes a	nd Corre	spondin	g Field F	aramete	rs Value				
	Intitial	1	2	3	4	5	6	7	8	9	10	
Water Level		45,93	4595		45.93	45 <u>93</u>		45.91	45.93	45.93	45.93	
рН	8.19	18.0	6.44	6.77	6,12	10.09	5,98	6.01	5,96	5.89	5,86	
Conductivity (uS)	প্রীত	313	771	745	7,26	724	ጎኔጛ	コネフ	インで	724	726	
ORP (mV)	241.8	923	103.8		1238		139.1	1281	1350	143.4	143.6	
DO (mg/L)	6.46	6.31	8.36			10.55			9.43	10.04	3,26	
Temperature (C)	9.3	1.0	10.1	10.0	9.8	93	9.8	9.9	99	વુલ	લ્વ	
Turbidity (NTU)	1540 AU		OB	OR	DZ_	OR	118410	647AU	65400	-313k	(67,5	
Monitoring Well: M	W-45-	AΩ	Notes: 1	Surge	il to	.00 ીક	11:30		7.1	(kya)		
Total Depth: 51.7	8				أأ جميد ﴿	اما فالحنا	N LL L	2:45 R	l i	ju.		
Water Column: 5.				Purge	ું (12)	50 to	* 13:3	5				
One Well Volume:	E-MINISTER CONTRACTOR OF THE PARTY OF THE PA								·			•
Field Parameters		Well Vo		nd Corre	spondin	g Field F	aramete	rs Value		100	1 - 1	
	Intitial	1	2	3	4	5	6	7	8	. 9	10	
Water Level	30.50	42.19			<u></u>						<u> </u>	
pH .	<u>(e.11</u>	5.87 5.30								:		
Conductivity (uS)	358.7				<u> </u>							
ORP (mV)	30.0	42.5			 							
DO (mg/L)	1.2,3	4.83			ļ					·		
Temperature (C)	10.5	TOT			ļ							
Turbidity (NTU)	OR	pr.	<u> </u>	L	<u> </u>	<u> </u>		<u> </u>			\	1 77'
Monitoring Well: M	W-475-21	8	Notes:	Surge	at	14:4	5 40 15:1	5, WIXTE	(evel	quoppe	d belo	, 27°
Total Depth: 52.4				i 13		المن سأم	501	. 9 g	llons			
Water Column: 3/.				יין אַ ניי	haidea	CIAA CO	/ I-I	' ' ' '	(11411.7			
One Well Volume:		TA (S. IE-C.)			eren e di		1001000	es (7-1-				I
Field Parameters	1						-	rs Value			45	
18/-41	Intitial		2	3	4	5_	6	7	8	9	10	
Water Level	<u> </u>		 								 	
pH	<u> </u>		 		 -			 _	- -			
Conductivity (uS)	<u> </u>			<u> </u>		 -						
ORP (mV)	<u> </u>	<u> </u>		<u> </u>	<u> </u>			├ ──				

27' during Prige

DO (mg/L)
Temperature (C)
Turbidity (NTU)
Monitoring Well:

illoring vveii.

Notes:

Total Depth:

'Water Column:
One Well Volume:

WELL DEVEOPMENT LOG

Project Name: _S		Date Started: 11/2/16										
Project Number:	Date Finished:											
Field Parameters .		Mell Vr	lumes a	nd Corre	spondin	a Elein E	aremete	re Value				٠ ،
	Intitial	1	2	3	4	5	6	7	8	9	10	·
Mater Level		19.93				<u> </u>				3	- 10	
Water Level					 							}
pH	0.26	6,13		6.05	ļ		ļ -			 		
	247.9	3111		311.3	 		 			<u> </u>		
ORP (mV)	1899			2387	ļ		<u> </u>		ļ	ļ		
DO (mg/L)	6.14	3.66	888	17.8(· · · · ·	ļ	<u> </u>		!
Temperature (C)	11.5	11.1	11.1	11.2			<u> </u>	-				
Turbidity (NTU)		114 9 V	9-30110	(3) 5 de()	L	لـــــــــــــــــــــــــــــــــــــ	L	l. <u></u>	<u> </u>	<u> </u>		
Monitoring Well: M		7	Notes:	Surge Surge *	at 10.	90 ti	, (0):50	> _	_			
Total Depth: 76.3	15,			Suren i	Recar.		00 to	12:30				
Water Column: 56	. ללל.			201 JC 1	LUI	1/		17.50	مليونور			
One Well Volume:	9.0 gal	ons		Stup a								_
Field Parameters		Well Vo	lumes á	nd Corre	spondin	j Field P	aramete	rs Value				
	Intitial	1	2	3	4	5	6_	7	8	9	10	
Water Level	25.15	25.19	25.18	25.16	25.16			1		-		
рН	4.29	6.11	6.09	6.14			-					
Conductivity (uS)	3543	3483		345.6								
ORP (mV)	247.3	2512		2605								
DO (mg/L)	5.64	7.01		9.04		·						
Temperature (C)		11.2	11.1	11.1	11.1							
Turbidity (NTU)		308 AU	30	7	16							
Monitoring Well: ₩	1 7 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	1/200 100				C 3 - 1	6.00	1111	<u></u>			ŀ
	W (')"	L //2	Notes.	S.JCh.	ال الانت	ا خالاتانسان	n. ~i)	elen lin i	7 F7			
Total Depth: 71.93	1	Q	Notes.	Surge		Japon 1				h- 55		1, 6
Total Depth: フ៶.Ⴗჽ	١.	(a)	Notes.	Surge Purge						17:35	at	4 well
Total Depth: 79∂ Water Column: Գ(¢	ָרֵר, י,		Notes.	Surge Purge Volu						17:35	a+	4 well
Total Depth: 71,93 Water Column: 46 One Well Volume:	i 177' 7.5 gall	on <u>5</u>	1	Porge Volu	and mes, to	surge day	K 2;	lls: > Com	is for	17:35	a+	4 well
Total Depth: 79∂ Water Column: Գ(¢	1,77° 7.5 gall	ons Well Vo	lumes a	Purge Volu 1d Corre	and mes, to sponding	Surge Down Field P	k ∛. aramete	نال ۱۵۰۰ م Is Value	15 for		August 1	4 well
Total Depth: 71,99 Water Column: 4(& One Well Volume: Field Parameters	i 177' 7.5 gall	on <u>5</u>	1	Porge Volu	and mes, to	surge day	k %	lls: > Com	is for	11:35	0+ 10	4 well
Total Depth: 71,93 Water Column: 46 One Well Volume: Field Parameters Water Level	1,77° 7.5 gall	ons Well Vo	lumes a	Purge Volu 1d Corre	and mes, to sponding	Surge Down Field P	k ∛. aramete	نال ۱۵۰۰ م Is Value	15 for		August 1	4 well
Total Depth: 71,93 Water Column: 46 One Well Volume: Field Parameters Water Level pH	1,77° 7.5 gall	ons Well Vo	lumes a	Purge Volu 1d Corre	and mes, to sponding	Surge Down Field P	k ∛. aramete	نال ۱۵۰۰ م Is Value	15 for		August 1	4 well
Total Depth: 71,93 Water Column: 46 One Well Volume: Field Parameters Water Level pH Conductivity (uS)	1,77° 7.5 gall	ons Well Vo	lumes a	Purge Volu 1d Corre	and mes, to sponding	Surge Down Field P	k ∛. aramete	نال ۱۵۰۰ م Is Value	15 for		August 1	4 well
Total Depth: 71,43 Water Column: 46 One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV)	1,77° 7.5 gall	ons Well Vo	lumes a	Purge Volu 1d Corre	and mes, to sponding	Surge Down Field P	k ∛. aramete	نال ۱۵۰۰ م Is Value	15 for		August 1	4 well
Total Depth: 71,43 Water Column: 46 One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L)	1,77° 7.5 gall	ons Well Vo	lumes a	Purge Volu 1d Corre	and mes, to sponding	Surge Down Field P	k ∛. aramete	نال ۱۵۰۰ م Is Value	15 for		August 1	4 well
Total Depth: 71,43 Water Column: 46 One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C)	1,77° 7.5 gall	ons Well Vo	lumes a	Purge Volu 1d Corre	and mes, to sponding	Surge Down Field P	k ∛. aramete	نال ۱۵۰۰ م Is Value	15 for		August 1	4 well
Total Depth: 71,93 Water Column: 46 One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU)	1,77° 7.5 gall	ons Well Vo	lumeşia 2	Purge Volu 1d Corre	and mes, to sponding	Surge Down Field P	k ∛. aramete	نال ۱۵۰۰ م Is Value	15 for		August 1	4 well
Total Depth: 71,93 Water Column: 46 One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well:	1,77° 7.5 gall	ons Well Vo	lumes a	Purge Volu 1d Corre	and mes, to sponding	Surge Down Field P	k ∛. aramete	نال ۱۵۰۰ م Is Value	15 for		August 1	4 well
Total Depth: 71,93 Water Column: 46 One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth:	1,77° 7.5 gall	ons Well Vo	lumeşia 2	Purge Volu 1d Corre	and mes, to sponding	Surge Down Field P	k ∛. aramete	نال ۱۵۰۰ م Is Value	15 for		August 1	4 well
Total Depth: 71.93 Water Column: 46 One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column:	1,77° 7.5 gall	ons Well Vo	lumeşia 2	Purge Volu 1d Corre	and mes, to sponding	Surge Down Field P	k ∛. aramete	نال ۱۵۰۰ م Is Value	15 for		August 1	4 well
Total Depth: 71, 93 Water Column: 46 One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume:	77 gall	well vo	lumes a 2 Notes:	Porge Volov id Corre	and mes, to sponding 4	Surge David	aramete	tus rs Value 7	15 for 15		August 1	4 well
Total Depth: 71.93 Water Column: 46 One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column:	7.5 gall	well Vo	lumes a	Notice Notice Id Corre	sponding	Surge David Field P	aramete	rs Value	15 for 18 8	9	10	4 well
Total Depth: 71, 93 Water Column: 46 One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume: Field Parameters	77 gall	well vo	lumes a 2 Notes:	Porge Volov id Corre	and mes, to sponding 4	Surge David	aramete	tus rs Value 7	15 for 15		August 1	4 well
Total Depth: 71, 93 Water Column: 46 One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume: Field Parameters Water Level	7.5 gall	well Vo	lumes a	Notice Notice Id Corre	sponding	Surge David Field P	aramete	rs Value	15 for 18 8	9	10	4 well
Total Depth: 71, 93 Water Column: 46 One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume: Field Parameters: Water Level pH	7.5 gall	well Vo	lumes a	Notice Notice Id Corre	sponding	Surge David Field P	aramete	rs Value	15 for 18 8	9	10	4 well
Total Depth: 71, 93 Water Column: 4(e) One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume: Field Parameters Water Level pH Conductivity (uS)	7.5 gall	well Vo	lumes a	Notice Notice Id Corre	sponding	Surge David Field P	aramete	rs Value	15 for 18 8	9	10	4 well
Total Depth: 71, 93 Water Column: 4(w) One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV)	7.5 gall	well Vo	lumes a	Notice Notice Id Corre	sponding	Surge David Field P	aramete	rs Value	15 for 18 8	9	10	4 well
Total Depth: 71, 93 Water Column: 4(e) One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume: Field Parameters Water Level pH Conductivity (uS)	7.5 gall	well Vo	lumes a	Notice Notice Id Corre	sponding	Surge David Field P	aramete	rs Value	15 for 18 8	9	10	4 well
Total Depth: 71, 93 Water Column: 4(w) One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV)	7.5 gall	well Vo	lumes a	Notice Notice Id Corre	sponding	Surge David Field P	aramete	rs Value	15 for 18 8	9	10	4 well
Total Depth: 71, 93 Water Column: 4(e) One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L)	7.5 gall	well Vo	lumes a	Notice Notice Id Corre	sponding	Surge David Field P	aramete	rs Value	15 for 18 8	9	10	4 well
Total Depth: 71, 93 Water Column: 46 One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C)	7.5 gall	well Vo	lumes a	Notice Notice Id Corre	sponding	Surge David Field P	aramete	rs Value	15 for 18 8	9	10	4 well

Water Column: One Well Volume:

Project Name:	<u>1990</u>	-Meri	rimae	F				Date St	arted: <u>\</u>	13/16	
Project Number: _	16.6	126						Date Fir	nished:_		_
Field Parameters		Well Vo	lumes a	nd Corre	spondin	r Field F	aramete	ırs Value			
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level			2320			23.18	23,22	 '			- 10
pH	6.47	6.16		6.00		6.13	6.04			<u> </u>	
Conductivity (uS)			3004	2 49.	298.8		7 98 1		ļ	f	
ORP (mV)	55,4		1186		1270	1120	139.8	<u> </u>		_	
DO (mg/L)		541	713		7 38		8.78				
Temperature (C)	9.9	विभ		(0.1	10.1	101	10.1		<u> </u>		<u> </u>
Turbidity (NTU)	(D)	573	052		769		41.7			 	
Monitoring Well: №			Notes:					1) (')	<u> </u>	<u> </u>	<u> </u>
Total Depth: 35.0	(L) ,	114	NOICS.	Surge	ο ₄ (28.40	4009:	!D - ik+UĽ			
Motor Column: 10	ัวฉ่า			2010	+ Kura	eax or	4.25 At	. 10:45	1-1 . lea	1 . Gr	Livit
Water Column: 12	30 all	\ <		Purae	at 10	45 4	11.00	Turbi	atety De	სთ ეტ	MIO
One Well Volume:	0.0 9A1	I A JATE NA	hilaa aw a	J							
Field Parameters								rs Value			40
386-411	Intitial	22 00	2	3.	92.01	5	6	7	8	9	10
Water Level	23.43			23,95	3396	23.93	ļ				_
pH	5.97	5.97	5.95	5.94	6.00	(e.)]					_
Conductivity (uS)		3396	333.9		344.5						_
ORP (mV)	21.42.4		<u> </u>		251.2						
DO (mg/L)	7.68	7.60	.,		7.66						
Temperature (C)	113	11.0	10,9			10,7			<u> </u>		
Turbidity (NTU)					1115 AU			L		L	
Monitoring Well: N		8	Notes:	Surge	, ext	13:	30 H	15.5	ð		
Total Depth: (8.6)	7'.			ر ر			ur.				
	'→ <i>t</i> s'			SUYAa.	LDing.	~~ l	4 00.1	∿ IG`00	l		
Water Column: 4 서	74	11 a		Surge	+ Purge	at 1	4 00 H	v 16.00	ı		
Water Column:석서 One Well Volume:	7.3 %	Nons	4	Surge Purg	+Purage e 16:0	at 1	16:20	v 16.00			
Water Column: 4 서	7.2 cyc	Nors Well Vo		nd Corre	+Purye 16:0	j Field P	4.06 + 16:20 aramete	rs Value	a planta		
Water Column: 4 14 One Well Volume: Field Parameters	7.3 %	Nons Well Vo	lumes ar 2	Surge Purquid Corre 3	+Purage 2 16:0 sponding 4	at 1 10 to 1 Field P 5	7.00 + 16:20 aramete	v 6'.00 rs ∀alue 7	8 8	9	10
Water Column: 4 14 One Well Volume: Field Parameters Water Level	7.2 cgs	Well Vo		nd Corre	sponding	j Field P	aramete	rs Value	a planta	9	10
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH	7.2 cgs	Well Vo		nd Corre	sponding	j Field P	aramete	rs Value	a planta	9	10
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS)	7.2 cgs	Well Vo		nd Corre	sponding	j Field P	aramete	rs Value	a planta	9	10
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV)	7.2 cgs	Well Vo		nd Corre	sponding	j Field P	aramete	rs Value	a planta	9	10
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS)	7.2 cgs	Well Vo		nd Corre	sponding	j Field P	aramete	rs Value	a planta	9	10
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV)	7.2 cgs	Well Vo		nd Corre	sponding	j Field P	aramete	rs Value	a planta	9	10
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C)	7.2 cgs	Well Vo		nd Corre	sponding	j Field P	aramete	rs Value	a planta	9	10
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L)	7.2 cgs	Well Vo		nd Corre	sponding	j Field P	aramete	rs Value	a planta	9	10
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU)	7.2 cgs	Well Vo	2	nd Corre	sponding	j Field P	aramete	rs Value	a planta	9	10
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well:	7.2 cgs	Well Vo	2	nd Corre	sponding	j Field P	aramete	rs Value	a planta	9	10
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth:	7.2 cgs	Well Vo	2	nd Corre	sponding	j Field P	aramete	rs Value	a planta	9	10
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume:	7.2 cgs	Well Vo	2 Notes:	nd Gorre	sponding 4	Freid F	aramete 6	rs Value	8	9	10
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column:	7.2 cgs	Well Vo	2 Notes:	nd Gorre	sponding 4	Freid F	aramete 6	rs Value	8	9	10
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume:	Intitial	Well Vo	Notes:	id Gorre	sponding	Field P	aramete	rs Value	8		
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume: Field Parameters	Intitial	Well Vo	Notes:	id Gorre	sponding	Field P	aramete	rs Value	8		
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume: Field Parameters Water Level pH	Intitial	Well Vo	Notes:	id Gorre	sponding	Field P	aramete	rs Value	8		
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume: Field Parameters Water Level pH Conductivity (uS)	Intitial	Well Vo	Notes:	id Gorre	sponding	Field P	aramete	rs Value	8		
Water Column: 4 Hoone Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV)	Intitial	Well Vo	Notes:	id Gorre	sponding	Field P	aramete	rs Value	8		
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L)	Intitial	Well Vo	Notes:	id Gorre	sponding	Field P	aramete	rs Value	8		
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C)	Intitial	Well Vo	Notes:	id Gorre	sponding	Field P	aramete	rs Value	8		
Water Column: 4 Hone Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Total Depth: Water Column: One Well Volume: Field Parameters Water Level pH Conductivity (uS) ORP (mV) DO (mg/L)	Intitial	Well Vo	Notes:	id Gorre	sponding	Field P	aramete	rs Value	8		

Project Name: SGPP-Merrinack

Date Started: \\\U\/\L

Project Number: 16.6126

Date Finished: W41し

Field Parameters		Well Vo	umes a	nd Corre	spondin	Field P	aramete	rs Välue			
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level	૨ ૯.ગ્રેગ	26.39	2660	26.62	26.75	36.75				4	
рН	7.34	6.39	6.40	6.32	6.73	624					
Conductivity (uS)	241.6	375.9	2, 39.1	3501	354.3	351.5				Y 7	
ORP (mV)	59.4	155.8	119.4	96.7	104.2	729					
DO (mg/L)	2.05	9.21	9.95	1007	9.42	10-981					
Temperature (C)	9.3	9.9	9.6	9.3	9.3	93					
Turbidity (NTU)	636 AV	11 26N	02	08	6R	OR					

Monitoring Well: MW-45-54

Notes: Surge at 08:45 to 09:15
Purge + Surge at 09:20 to 11:50. Ran out of buckets to continue.

52.18 Total Depth: 34.72 26.76 Water Column: 13.5 9.3 One Well Volume: 2-2 4.3

Blockage at 35.7', able to send water level meter past it after ~ 15 min.

Fleid Parameters	100000000000000000000000000000000000000	Well Vo	lumes a	nd Corre	spondin	g Field P	aramete	rs Value			i i arei
	Intitial	1	2	3	4	5	6 ,	2.7	8	9	10
Water Level								12.00			
pН							176	4.			
Conductivity (uS)							William Co.		*	·	
ORP (mV)								3 - 200			
DO (mg/L)								3 - 5			
Temperature (C)					4				9		
Turbidity (NTU)									1		

Monitoring Well:

Notes:

Total Depth: Water Column:

One Well Volume:

Field Parameters		Well Vo	ilumes al	nd Corre	spondin	g Field P	aramete	rs Value			
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level											
рН											
Conductivity (uS)											
ORP (mV)											
DO (mg/L)		·									•
Temperature (C)								•			
Turbidity (NTU)											

Monitoring Well:

Notes:

Total Depth:

Water Column: One Well Volume:

Field Parameters		Well Vo	lumes ar	id Corre	spondin	a Field P	aramete	rs Value		*	
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level											
рН						:					
Conductivity (uS)					457						
ORP (mV)					17.						
DO (mg/L)											
Temperature (C)					,						,
Turbidity (NTU)									-	,	
5.8 14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			NI-1							•	

Monitoring Well:

Notes:

WELL DEVEODMENT LOC

			VVE	LL D	EVEC	JEIVIE	INI L	.OG			
Project Name:	GPP-	Werr	MOCK					Date St	arted:	11/08	116
Project Number: _	16.6	126		12/0	1.15			Date Fir	nished:_	11/08	116
Field Parameters	11:40	Well Vo	lumes a	nd Corre	spondin	g Field F	aramete	ers Value			
Time	Intitial	10	20	30	34	46	46	50	58	60	151
Water Level	22.91	23.06	23.07	23.06	33.06	23,05	2304	23.03	23.01	- 100	
pH	6.54	6.40	6.27	600	6-08	(-09	6.13	6.09	6.04		
Conductivity (uS)	620	682	527	560	546	562	571	564.3	568.2		
ORP (mV)	-107.5	-35.0	16.9	37.2	25.7	28.7	22.1	26.9	27.2		
DO (mg/L)	3.83	6-12	7.00	6.82	6.66	6.73	6-76	6:70	6-78		

Turbidity (NTU) 42.0

Monitoring Well: 45-4A
Total Depth: 448
Water Column: 2295

Temperature (C)

One Well Volume: 21.95C

tulang@ 42.1'

10.4

10.8

10.

10.6

Field Parameters		Well Vo	lumes a	nd Corre	spondin	g Field P	aramete	rs Valu	е		
15:00	Intitial	10	23	30	35	46	45	50	5.35	60	6510
Water Level	27,15	27,17	JF. 16	27.16	JA.16	27.16	27.16				
рН	5.92	5.70	5.56	5,45	5.41	5.43	5.39				
Conductivity (uS)	482.5	476.8	477.2	481.5	485.6	4893	496.5			7	
ORP (mV)	152.4	178.2	1983	210.5	218.0	2203	223,1				
DO (mg/L)	7,87	7.70	7.61	7.4/	7.24	7.30	7.36				
Temperature (C)	11.3	10.9	10.3	10.7	10.7	10.6	10.7				
Turbidity (NTU)	0.61	0.38	0.37	0.22	0.30	0.17	0.29				

Monitoring Well: 45

Total Depth:

Water Column: 17,15 JC One Well Volume:

Field Parameters		Well Vo	lumes a	nd Corre	sponding	g Field P	aramete	rs Value	11 - 11 - 11 - 11		
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level											
рН			77								
Conductivity (uS)											
ORP (mV)											
DO (mg/L)											
Temperature (C)					I						
Turbidity (NTU)											

Monitoring Well:

Notes:

Notes:

Total Depth: Water Column: One Well Volume:

Field Parameters		Well Vo	olumes a	nd Corre	spondin	g Field F	aramete	rs Value			
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level											
рН											
Conductivity (uS)											
ORP (mV)											
DO (mg/L)											
Temperature (C)		lu I									
Turbidity (NTU)											
Temperature (C)											

Monitoring Well:

Notes:

Project Name: SGPP- Merrimack

Project Number: 16.6126

Date Started: 1

Date Finished:

Field Parameters		Well Vo	lumes a	nd Corre	spondin	g Field P	arameter	rs Value			
	Intitial	1	2	3	4	8	100	7	8	9	10
Water Level	45.25	45.26	45.26	45.26	45.26	45.26	45.27				
pH	5.80	5.88	590	5.90	593	6.00	5.94				
Conductivity (uS)	1640	1531	1523	1537	1536	1534	1516				
ORP (mV)	139.5	145.5	148.7	150.4	151.1	1528	156.9				
DO (mg/L)	9.41	9.60	9.76	9.56	9,62	10,04	9.88				
Temperature (C)	145	12.1	11.5	13.3	12.0	12.0	11.6				
Turbidity (NTU)	02	OR	OK	DR	OR	OR	OR				
Monitoring Well: №		14	Notes:	Purge	at (2:20	to	3:00			7)1

Total Depth: 47.68 Water Column: 2.43

One Well Volume: 0.4

Field Parameters		Well Vo	lumes a	nd Corre	sponding	g Field P	aramete	rs Value			
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level											
pH											
Conductivity (uS)											
ORP (mV)											
DO (mg/L)											
Temperature (C)							-				
Turbidity (NTU)											

Monitoring Well:

Notes:

Total Depth: Water Column: One Well Volume:

-	2000
1	Field
10	
100	Make

Field Parameters	1000	Well Volumes and Corresponding Field Parameters Value											
	Intitial	10	20	30	34	40	456	50年	多金55	608	6530		
Water Level	19.70	19.69	19.69	19.69	19.69	19.69	19.69	19.69					
pH	6.09	6.01	5.99	5,99	5.99	5.99	5.98	5.98					
Conductivity (uS)	596	591	589	587	587	587	588	588					
ORP (mV)	1574	161.7	165.5	169,2	170.8	173.7	174.1	175.9					
DO (mg/L)	5.90	5.72	5.58	5.55	5.53	5.41	5,34	5.18					
Temperature (C)	11.8	11,5	11.3	11.2	11.2	11.2	11.2	11.3					
Turbidity (NTU)	1.51	2.20	4.02	6.84	4.78	7.15	7.52	7.13					
Monitoring Well: № Total Depth:	w-45.	- 7	Notes:		alte F						2 god		

Water Column:

Start at 15:20 to 16:10 Tubing at 65.5'

One Well Volume:

Field Parameters		Well Vo	lumes a	nd Corre	sponding	g Field P	aramete	rs Value			
	Intitial	-1	2	3	4	5	6	7	8	9	10
Water Level		7									
рН	91										
Conductivity (uS)											
ORP (mV)											
DO (mg/L)							7				
Temperature (C)				-	Yell						
Turbidity (NTU)											

Monitoring Well:

Notes:

Total Depth:

Water Column:

One Well Volume:

Project Name: JGPP- MER

Date Started: //- 09-2016

Project Number: 1606126

Date Finished: 11-69-2016

Field Parameters	Ino	Well Vo	iumes ai	na Corre	sponding	g riela r	aramete	rs value	10115		
	Intitial	10	20	30	354	408	458	507	558	608	10
Water Level	2296	23.6d	23,48	23,29	13.32	23.38	23.49	23.50	23,50		
pH	6.81	6.85	6.87	6.12	6.92	6.80	6.72	6.68	6.67		
Conductivity (uS)	566	547	548	550	549	547	546	546	547		1
ORP (mV)	-123,0	-1563	-192.6	185.5	-181.4	-125-8	-124.9	-125,1	-1254		
DO (mg/L)	0.16	0.77	0.92	0.34	037	0.38	0,87	0.89	0.84		
Temperature (C)	10.3	10.3	10.4	10.4	10.4	10.4	10.4	10,4	10.4		
Turbidity (NTU)	21.1	18-1	15.3	146	14.7	14.5	14.9	15.1	15.4		

Monitoring Well: 45-3.4 Notes: Two areas in well have some degree of blackage Total Depth: 48-48 perce and bottomy Winter level meter stopped at 48-48-47.

Water Column:

One Well Volume:

12.00

Field Parameters	1495	Well Vo	lumes a	nd Corre	spondin	g Field P	aramete	rs Value			
	Intitial	10	20	30	354	40,8	456	507	558	609	10
Water Level	19.58	23.01	27.15	30.52	32.21	33.86	35.09	36-50	-		
pH	[0007	6.40	6=67	6.74	6.80	6-83	6.84	6.89			
Conductivity (uS)	618	643	643	644	643	643	643	644			
ORP (mV)	-94.3	-21302	-247-1	-261.7	-260.9	-258.1	254.4	-251.3			
DO (mg/L)	5-38	0.73	0-21	1.03	0.29	0-28	0.32	0.30			
Temperature (C)	10.9	10.4	10-4	10.4	10.4	10.4	10-4	10-4			
Turbidity (NTU)	10.01	10.25	1011	11.1	10.59	160	10.59	11.14			

Monitoring Well: 45-28

Total Depth:

Notes:

Le sampled here samplede 1550

Water Column:

1505 1515 1520 1530 1540 One Well Volume:

ield Parameters 144		-		1.00	THE RESERVE OF THE PERSON NAMED IN	PART - NAME OF THE PARTY OF		and the second second			
Field Parameters	1445	Well Vo	lumes a	nd Corre	spondin	g Field F	'aramete	ers Value			
	Intitial	10	20	30	35 A	408	458	507	55.8	60.0	6520
Water Level	45.35	45.35	45,35	45,35	4536	45.35	45,35	45.35	45.35	45.35	45,35
рН	5.74	5.74.	526	5.75	5.72	5,71	5.72	5.70	569	5.68	5.68
Conductivity (uS)	1131	1158	1152	1139	1144	1157	1182	1180	1201	1211	1220
ORP (mV)	20.7	12.7	7.9	10.2	14.8	18.7	23.2	20.1	30.2	32.4	34.1
DO (mg/L)	4,04	0.5%	0.40	0.32	0.49	1.20	1.25	1.39	1.82	1.89	192
Temperature (C)	11,2	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	16.1
Turbidity (NTU)	125	6702	43.2	35.8	30.8	28.8	22.9	18.1	16.9	17.2	1607
	4 1 1								-		

Monitoring Well: 1 MW

Notes:

Total Depth: Water Column: One Well Volume:

Field Parameters		Well Vo	lumes a	nd Corre	sponding	g Field P	aramete	rs Value			
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level											
рН											
Conductivity (uS)											
ORP (mV)	1-0-1										
DO (mg/L)											
Temperature (C)											
Turbidity (NTU)											

Monitoring Well:

Notes:

Total Depth:

Water Column:

One Well Volume:

Date Started: 11/9/16 Project Name: SGPP-Merrimack 11/10/16 Project Number: 16,6126 Date Finished: Well Volumes and Corresponding Field Parameters Value Field Parameters Intitial 20 30 354 408 456 60 9 65 10 Water Level 25,27 25.39 25.40 25.40 25.41 25.41 6.45 6.49 6.48 6.48 6.48 6.47 6.47 6.46 449.5 450.8 455.7 459.2460.3 464.1 464.8 466.7 Conductivity (uS) -24.7-26.5-25.9-26.7-26.8 ORP (mV) -19.4 -20.3 -21.8 DO (mg/L) 0.66 0.81 0.72 0.57 0.49 047 0.41 0.47 11.4 11.3 11.4 Temperature (C) Turbidity (NTU) 21.8 10.06 10.96 9.86 113 171 Monitoring Well: LNG - MW-4 Notes: 16 20 After 1.75 gallens 15:30 Total Depth: 46,03 Parastaltic Pump Water Column: Tubing at One Well Volume: Field Parameters Well Volumes and Corresponding Field Parameters Value 10 9 45.40 45.40 45.40 45.40 45,40 Water Level 91 5.78 5.68 5.63 5.59 5.61 рН 5.61 Conductivity (uS) 4,74 3 95 151.2 1541 ORP (mV) 183.0 185.3 184.4 5 55 DO (mg/L) 11.4 Temperature (C) Turbidity (NTU) Monitoring Well: MER-MW-45-JANotes: Start Total Depth: 47.68 Triplicates, turbitity 97 NTU. After Sampling Containers Turkity reading 46 NTU Water Column: HI One Well Volume: Field Parameters Well Volumes and Corresponding Field Parameters Value 9 10 Intitial Water Level рН Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: Notes: Total Depth: Water Column:

Field Parameters		Well Vo	lumes a	nd Corre	sponding	Field P	aramete	rs Value			
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level											
рН											
Conductivity (uS)											
ORP (mV)											
DO (mg/L)											
Temperature (C)											
Turbidity (NTU)											

Monitoring Well:

Notes:

Project Name: SGPP - Merrimack Date Started: Project Number: 16.6126 Date Finished: Field Parameters Well Volumes and Corresponding Field Parameters Value MINS Intitial 20 46 58 09 00 23.83 23.83 23.83 5.57 5.55 5.56 853 9**5**4 852 Water Level 3353 23.83 Hq 5.54 5.54 355 856 853 Conductivity (uS) 989 1443 ORP (mV) 268.2 10.2 10.3 DO (mg/L) Temperature (C) 10.1 4.89 Turbidity (NTU) C 1030 Monitoring Well: ME2-45-8 Notes: Start Parastaltic Pump sampled Total Depth: Mid Screen departis 56 Water Column: Stoo @ 1045 One Well Volume: Well Volumes and Corresponding Field Parameters Value Field Parameters Mins Intitial 30 50 Lag Water Level 25.03 5.71 5.60 5.61 5.64 964 Conductivity (uS) 231.7 ORP (mV) DO (mg/L) 4.2 3,36 4,24 4,99 Temperature (C) Turbidity (NTU) STOP 1415 Monitoring Well: MER-45-(0 Start 1330 Total Depth: Tubing set @ 45' depth. Could not get tobing past this Water Column: depth. One Well Volume: Field Parameters Well Volumes and Corresponding Field Parameters Value 20 Intitial 10 30 36 10 MINS 26.24 26.27 26.27 26.25 26.26 26.27 Water Level 6.45 6.30 6.25 918 901 881 Conductivity (uSXd 943 859 -58.4 -21.4 ORP (mV) -80.5 -10.7 14.2 1.03 0.40 DO (mg/L) 4.48 4.29 4.46 .61 9.7 Temperature (C) 25.9 34.3 33.3 27 Turbidity (NTU) 23.2 18.2 Monitoring Well: Mer-45-50 Notes: Start - 1320 Total Depth: Dubing could all STOP - 1430 3 Water Column: o a di One Well Volume: Well Volumes and Corresponding Field Parameters Value Field Parameters Intitial 9 10 3 Water Level рН Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C)

Monitoring Well: Total Depth:

Notes:

Turbidity (NTU)

Water Column:

One Well Volume:

Project Name: SGPP-Mernmack Date Started: \\ | | | | Project Number: 16 6126 Date Finished: Field Parameters Well Volumes and Corresponding Field Parameters Value Intitial 10 20 30 35 46 50 109 10 DIME 22.35 72.35 Water Level 22.35 5.94 679 10.02 10.01 364.8 Conductivity (uS) ORP (mV) 180.8 180.6 DO (mg/L) Temperature (C) 12.3 12.3 Turbidity (NTU) 55 2.42 1.08 2.15 70 Monitoring Well: LNG-MW7-Notes: 2.5 gallors purged Total Depth: Water Column: Tubing set C One Well Volume: Well Volumes and Corresponding Field Parameters Value Field Parameters TIME Intitial 20 30 35 48 8 9 10 10 50 Water Level 18.71 18.69 18.69 18.69 рН 5.69 570 998 Conductivity (uS) 994 200-3 ORP (mV) 196.0 201.8 172-3 4.8 4.72 DO (mg/L) Temperature (C) 2.26 0.2 Turbidity (NTU) Monitoring Well: Notes: MERLIS-10 1230 Total Depth: Stop - 1310 Water Column: One Well Volume: Well Volumes and Corresponding Field Parameters Value Field Parameters Intitial 3 4 5 6 8 9 10 ×132.93 Water Level pH Conductivity (uS) ORP (mV) DO (mg/L) Temperature (C) Turbidity (NTU) Monitoring Well: MCQUS Notes: (Le Total Depth: Water Column: One Well Volume:

Field Parameters		Well Vo	lumes a	nd Corre	spondin	g Field P	'aramete	rs Value		31 31 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level											
pH											
Conductivity (uS)							100000000000000000000000000000000000000				
ORP (mV)											
DO (mg/L)											
Temperature (C)		U.									
Turbidity (NTU)											
Monitoring Moll:			Notes:								

Monitoring Well:

Notes:

Project Name: 5	So-Mes	ccimi	CK					Date S	Started:	11-10	16
Project Number:								Date F	inished	11-10-	16
r roject radiliber.	1012	4	6-11	Ay			13:15	Dute	misrica.	11 10	
Field Parameters	12:30			ind Corre						- 18 m	7 - 1
	Intitial	10	20	30	35A	40,5	456	507	55,8	60,9	6510
Water Level	27.46	27.47	2741	127.47	34.47	24.47					1
pH	6006	6.13	P +3	96.12	6.03	6.69	6.0				
Conductivity (uS)	623	608	604	610	624	627	627				
ORP (mV)	2013	2162	126,7	230.1	23+.7	339-6	241.9				
DO (mg/L)	10.62	474	4.84	5,04	5.4B	5.65	5.71				
Temperature (C)	10.7	10.0	9.9	16.0	00	9.9	9.8				
Turbidity (NTU)	29.0	19,7	11.4	6.68	3.23	4.54	12.91				
Monitoring Well	NW-3		Notes:	Bladd	er Ri	ub a	+ 39'				
Total Depth.				Start	at /	1 30					
Water Column:											
One Well Volume:				16 00		1610		1620			
Field Parameters	11630		lumes a	nd Corre	spondin	g Field F					
	Intitial	10	20	30	35A	408	45.8	502	558	609	6510
Water Level	45.65	45.90	45.87	45.87	45.88	45.88					
pH	6.78	7-1	5.15	5.85	5.84	5.82					
Conductivity (uS)	1406	1366	1276	1272	1271	1270					
ORP (mV)	-2.6	-84.3	103.1	116.6	118.5	120.8					
DO (mg/L)	1.58	1.14	6.65	7.07	7.13	7012					
Temperature (C)	10.8	10.4	10.4	10-3	10.32	10.3					
Turbidity (NTU)	17.9	37.5	15.1	7.56	6.96						
Total Depth: Water Column: One Well Volume: Field Parameters		Well Vo	lumes a	nd Corre	sponding	Field P	aramete	rs Value	e		
	Intitial	1	2	3	4	5	6	7	8	1 9	10
Water Level											
рН											
Conductivity (uS)											
ORP (mV)								il es			
DO (mg/L)								15.			11-
Temperature (C)								0 - 1			
Turbidity (NTU)											
Monitoring Well:			Notes:								
Total Depth:											
Water Column:											
One Well Volume:											
Field Parameters		Well Vol	umes ar	nd Corre	sponding	Field P	aramete	rs Value	2		1-11/11
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level	13.73(3144)	-								1	1
pH										1	
Conductivity (uS)											
ORP (mV)											
DO (mg/L)											
Temperature (C)											
Turbidity (NTU)											
Monitoring Well:			Notes:						1	_	

Project Name: 36+Merriage K

Date Started: 11-11-16

Project Number: 16,6126

Date Finished: 11-11-11

10

Field Parameters	10.10	I VVell Vo			sponding	g Field F	aramel	ters Valu	ie /	a distribution	THE W
	Intitial	10		303 P	354	405	456	507	55.8	609	6510
Water Level	25,21	24.21	23.21	28.21	28.21	18.21					
pH	6.36	5.64	5.82	5.82	5.82	5.84		1			
Conductivity (uS)	2767	265.0	241-5	237-2	242.3	236.5		1			
ORP (mV)	191.2	179-3	1869	197.1	200.1	202,0					
DO (mg/L)	8.65	8.50	8.78	3.87	8.72	8.78					
Temperature (C)	10 - 0	4.9	9.9	10,0	10.0	9.9					
Turbidity (NTU)	60.8	14.8	3.46	2.13	1.57	1.51					

Monitoring Well: LNG- L

Notes:

Total Depth; Water Column: One Well Volume:

Field Parameters		Well Vo	lumes a	nd Corre	spondin	g Field P	aramet	ers Valu	ie		
	Intitial	10	20	30	30,4	405	456	507	558	60,8	651,0
Water Level	32.93	32.46	32-96	32.96	32.90	32,96					1
pH	6.40	()	5.77	5.73	5.72	5.71					
Conductivity (uS)	353.3	690	1237	1353	1363	1367					
ORP (mV)	199.6	205.2	215.3	222.9	1258	2282					1
DO (mg/L)	10-61	9.13	8.60	9.71	9.75	9.76					
Temperature (C)	12.0	11.9	11.7	11.4.	11,4	11.4					
Turbidity (NTU)	2015	1,31	0.63	2.43	2.20	1.99					

Monitoring Well: MER45-11 Notes:

Total Depth: Water Column: One Well Volume:

Field Parameters		Well Vo	lumes a	nd Corre	spondin	g Field P	aramete	rs Value	ON THE PARTY	
	Intitial	1	2	3	4	5	6	7	8	9
Water Level								li i		
pH										
Conductivity (uS)										
ORP (mV)										

Turbidity (NTU) Monitoring Well:

DO (mg/L) Temperature (C)

Notes:

Total Depth: Water Column: One Well Volume:

Field Parameters	0.4	Well Vo	lumes a	nd Corre	sponding	g Field P	aramete	rs Value	k Slow	and his	
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level											
pH											
Conductivity (uS)											
ORP (mV)											
DO (mg/L)											
Temperature (C)											
Turbidity (NTU)											

Monitoring Well:

Notes:

ins

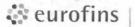
Lancaster Laboratories

Acct. #:	37191		Grou	up #:					Sam	ple #:										COC#:	15588	
Client: C.T. Male Associates						Matrix						Ar	alys	ses l	Requ	uest	ed			For Lab U	se Only	
Project Name/#: SGPP - Merrimack	Site ID:					M			1-1			Pi	rese	rvat	ion (Code	es			SF#: <u>285327</u>		
Project Manager: Kirk Moline	P.O. #: /	16.6/26	-		Ħ	ace			н	N		S								SCR#: 19606	32	
Sampler: Jonethan Depart Pat McHush					Sediment	Ground	3												1	Preserva	ation Codes	
Phone #: 518-786-7400	Quote #:	214135			Sed		124	ers		0				3)	()					H = HCI	T = Thiosulfate	
State where sample(s) were collected: NH						ble	4	Containers	() ()	(6010C)			6	320E	mod.)					N = HNO ₃	B = NaOH	
	Colle	ection		Composite		Potable NPDES	E Blan	# of	VOAs (8260C)	Mg, Na, K	(353.2)	(353.2)	(300.0)	nity (SM 2320B)	(EPA 537					$S = H_2SO_4$ O = Other	P = H ₃ PO ₄	
Sample Identification	Date	Time	Grab	Com	Soil	Water	Other:	Total	TCL	Ca, N	NO2	NO3	CI-, S	Alkalinity	PFCs					Rer	marks	-
SG 2 -APRB01 - 16/017 1630	10/17/16	1150	X				X	2							X							
SG 2 - APEBO 1 - 16/017 1600	10/11/16	1215	X		J. 9		X	11	X	X	X	X	X	X	X							
SG 2 -APOR - 18 - 16/017 18 00	10/17/16	1545	X			X		11	X	X	X	X	X	X	X				-112+	11		
SG2 -APOR - 28 - 16 10 18 16 (Sm)	allerlos	800	X			X		11	4	x	X	x	×	x	X							
SG 2 -APFTB - Kolose 16-PSON	olisho	855	X				X	1	7						X	119						
SG2 -APLTA - 161018 16 959)	10/18/10	-	X				X	3	X						X						*	
SG2 -APO8 -38-16/1018 46000	roli8/16	1120	X			X	*	11	X	K	x	x	K	X	×					Liber.		
SG2 -AP08 -48-161018 18 (50)	10/18/16	1625	*	7		X	15	11	×	x	*	*	×	X	×							
SG -AP - 16 500		1523	19								- 4	1		- 4								
SG -APF001-161018 16 173		-	X				X	11	1	+	7	+	4	*	*	1,1						
Turnaround Time Requested (TAT) (please of			RUS	H		nquished	by:				Date			Time		Rec	eive	d by:		Date	Time	
(RUSH TAT is subject to Eurofins Lancaster Laboratori Date results are needed:	es approval	and surchar	rges.)		Reli	nguished	hv.			_	Date		_	23 Time		Rec	eive	d by:	-	Date	Time	-
	Vine ecti	nabeom			1	nquioriou	Dy.				Duto			Citic		1,00	0140	a by.		Date	7 11110	
Data Package Options (please check if require		interest			Reli	nquished	by:				Date			Time	9	Rec	eive	d by:		Date	Time	
Type I (Validation/non-CLP)		TX TRRP	- 13		7 10												-					
Type III (Reduced non-CLP) CT RC	P 🗌				Reli	nquished	by:				Date			Time)	Rec	eive	d by:		Date	Time	
	ype A \square									1			1/2								14	
	ype B				Reli	inquished	by:				Date			Time	9	Rec	eive	d by:		Date	Time	
EDD Format: EQuIS					Airhi	ill No.:	_				_			_	_	_					- 21	
If site-specific QC (MS/MSD/Dup) required, submit triplicate volume.	indicate Q	C sample	es and	1		nquished b	y Con FedE		cial Ca	rrier: Othe	er					Tem	npera	ature u	oon rec	ceipt	°C	



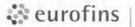


Acct	#: 37191		Grou	up #:					Sam	ple #:			AA							COC#:	15594
Client: C.T. Male Associates						Matrix						An	alys	es F	Requ	ıeste	d	7 -	4	For Lab Us	e Only
Project Name/#: SGPP - Merrimack	Site ID:											Pr	ese	rvati	on (Code	s		3	SF#: <u>285327</u>	
Project Manager: Kirk Moline	P.O. #: \(0.6120	0		1 =	ace ace	2		Н	N		S								SCR#: 196068	3
Sampler: PAT Mr Hus-H		- 1 -			Sediment	Ground	1					5							13	Preservati	ion Codes
Phone #: 907 - 378-8737	Quote #:	214135			Sed		3	ers		(C)		SS		<u>@</u>	()					H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						ble ES	4	Containers	()	(6010C)	图	TONH	()	320E	mod.)				-	N = HNO ₃	B = NaOH
	Coll	ection		Composite		Potable NPDES	F. BLAN	# of	VOAs (8260C)	Mg, Na, K ((353.2)-6	(353.2) 4	SO4- (300.0)	nity (SM 2320B)	(EPA 537					$S = H_2SO_4$ O = Other	P = H ₃ PO ₄
Sample Identification	Date	Time	Grab	Com	Soil	Water	Other:	Total	TCL	Ca, N	NO2	NO3	CI-, S	Alkalinity	PFCs					Rem	arks
SG 2 -APERO1-161020 18Pm	10/20/11-	850	X				X	2			-			-	X			No.			
SG 2 -APOT - 28-161020 16 Fin	0	1045	X			×		11	X	1		X	*	*	7					286 W6	rimain
SG 2 -APOT -38-161020 1605		1250	X			×		11	K	×		d	8	of	of			-		List	
SG 2 -APFTB - 161020 16(6)		1345	X				*	1							X		-				
SG 2 -AP LTB - 161020 16(6)	2						7	3	×						X						
SG 2 -AP 07 - 48-161020 18/35	2	1430	X			X		11	X	x		X	K	X	X						
SG 2 -AP 07 - 58-16/020 1681	DV	1625	×			X	4	9	X	x		×	*	x.			-		H's		The same
SG2 -APOT -58-16 10 21 1875	10/21/16	910	X			×		2	1					Se 344	×	1/	= /				
SG 2 -AP 1801- 161021 1670	Viliclus (G	1905	X	9 -			pK	2				1			X	1				V 5 1-	
SG 2 -APR802- 161021 16	D) robinic	1495	1				1	2	0			- 1			X						
Turnaround Time Requested (TAT) (plea (RUSH TAT is subject to Eurofins Lancaster Labora			RUS	Н		inquished		30%		145	Date		VA	Time	0	Rece	ived	by:		Date	Time
Date results are needed:			-		Reli	inquished	by:				Date			Time		Rece	ived	by:		Date	Time
E-mail address to send RUSH results: K • w	oline ed	male.	com					9.	,												4-1-1
Data Package Options (please check if red Type I (Validation/non-CLP)	uired)	TX TRRE	2 - 13		Reli	inquished	by:				Date		V	Time		Rece	eived	by:		Date	Time
Type III (Reduced non-CLP) CTI		9	-		Reli	inquished	by:		1		Date			Time		Rece	ived	by:		Date	Time
	Type A																				
Type VI (Raw Data Only)	Type B				Rel	inquished	by:				Date			Time		Rece	eived	by:		Date	Time
EDD Format: EQuIS																					
If site-specific QC (MS/MSD/Dup) require submit triplicate volume.	d, indicate C	C sample	es and	d		ill No.: nquished b S	y Cor Fedl		ial Ca	arrier: Othe	er					Tem	pera	ture up	on rec	eipt	°C



1	_	1
1	1	17)
1	D	(0)

Acct. #	37191		Gro	up #:		- 5	1		Sam	ple #:									(COC#:	155	94
Client: C.T. Male Associates					, I	Matrix	4					Ar	alys	ses F	Requ	ieste	d		F	or Lab l	Jse O	nly
Project Name/#: SGPP - Merrimack	Site ID:							1				Pi	ese	rvati	on (Code	s		S	F#: <u>28532</u>	7	
Project Manager: Kirk Moline	P.O. #: [6.612	6		ŧ	nnd			Н	N		S						-	S	CR#: 1960	68	
Sampler: PAT McHW6H					Sediment	Ground Surface						2								Preser	vation Co	des
Phone #: 907-378-8737	Quote #:	214135			Sed			ers		0		as							н	= HCI	T = Th	niosulfate
State where sample(s) were collected: NH					1	ple ES		Containers	() ()	(6010C)		100	6	320B	mod.)				N	= HNO ₃	B = Na	аОН
	Colle	ection		Composite		Potable NPDES	Ľ	# of	VOAs (8260C)	Mg, Na, K ((353.2)	(353.2)+W01	SO4- (300.0)	Alkalinity (SM 2320B)	(EPA 537					= H ₂ SO ₄ = Other	P = H ₃	₃ PO ₄
Sample Identification	Date	Time	Grab	Com	Soil	Water	Other:	Total	TCL	Ca, N	NO2	NO3	CI-, S	Alkali	PFCs					Re	marks	s
SG 2 -APO7 -68-161021 16670) Iolailio	11:00	×			70	157	11	×	×		×	×	×	×				1	- 1		1
SG 2 -APOT - 78-16021 16/25		1730	X	e =		X		11	X	X	- 1	X	4	X	Y.				1	>66 1A	JON A. Y.	work
SG -AP - 16																				List	V	
SG -AP - 16																				30 - C	1	
SG -AP - 16																				1-5	1	
SG -AP - 16																			1			
SG -AP - 16															41							
SG -AP - 16		E				1				1												
SG -AP - 16	195				14						7											
SG -AP - 16		1 S					-													10		
Turnaround Time Requested (TAT) (please (RUSH TAT is subject to Eurofins Lancaster Laborato			RUS	Н	Reli	nquished	bŷ:	-6)	10	Date	16		Time	11	Rece	1	by:		Date		Time
Date results are needed:					100	nquished	by:	/-			Date			Time		Rece	ived	by:		Date		Time
E-mail address to send RUSH results: K MO	lineac	tmale.	com		_	m2 1		_		_	121	_	_	330								
Data Package Options (please check if requ	iired)				Reli	nquished	by:				Date			Time		Rece	ived	by:	- 1	Date		Time
Type I (Validation/non-CLP) MA M		TX TRRE	- 13		Dali	nau iahad	hu				Data			Time		Dana	i a al	hou	_	Data	-	T:
Type III (Reduced non-CLP) CT R					Kell	nquished	by.				Date			Time		Rece	ivea	by:		Date		Time
The state of the s	Type A Type B				Reli	nquished	by:	6			Date			Time		Rece	ived	by:		Date	+	Time
EDD Format: EQuIS	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				1		9															
If site-specific QC (MS/MSD/Dup) required submit triplicate volume.	indicate Q	C sample	es and	d		ll No.: nquished b	y Cor Fedl		ial Ca	rrier: Othe	er					Temp	perat	ture upo	n receip	ot		_°C



Acct. #:	37191		Grou	up #:					Sam	ole #:										COC#:	15596
Client: C.T. Male Associates			-			Matrix						An	alys	es F	Requ	uest	ed			For Lab U	se Only
Project Name/#: SGPP - Merrimack	Site ID:					A D						Pr	ese	rvati	on (Code	es			SF#: <u>285327</u>	
Project Manager: Kirk Moline	P.O. #: 16	.6126			¥	nnd	2	14-1	Н	N		s		-		-				SCR#: 19607	0
Sampler: Jonathon Carter, Pat McHugh					Sediment	Ground Surface	1	147												Preserva	tion Codes
Phone #: 608-354 - 5253	Quote #:	214135			Sed		3	ers		0C)		2 30		<u>@</u>	<u></u>					H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						ble	K	Containers	()	(6010	1	1.0	. 6	320E	mod.)	-	-		-	N = HNO ₃	B = NaOH
	Colle	ction		Composite		Potable er NPDES	er: BLANK	# of	VOAs (8260C)	Jg, Na, K	(353.2)	(353.2)*NU ₃	SO4- (300.0)	Alkalinity (SM 2320B)	s (EPA 537					$S = H_2SO_4$ O = Other	$P = H_3PO_4$
Sample Identification	Date	Time	Grab	Con	Soil	Water	Other:	Total	TCL	Ca, I	NOS	NO3	5	Alkal	PFC		1			Ren	narks
SG2 -APO7 -85-161024 1683	10/24/16	1035	X			X		11	K	×		x	×	+	4		1			C	
SG 2 -APLTB - 161024 18 516	10/24/16	_	X				X	3	X					, V	X					No.	imach
GG 2 - APFT89-161024 16/590	10/24/16	1520	X				X	1							X						List
SG 2 - APERO1 - 1610 24 1600	10/24/16	1430	X				X	2		9					X						
SG2 -APOS - 21-16024 1651C	16/24/16	1630	X			X		11	X	X		X	×	X	X				95		
SG 2 -AP05 - 31-161024 16 000	10/24/16	1750	X			X	-	11.	X	X	1.7	×	X	×	X			-		With the	
SG 2 -AP 05 - 41 - 161025 16 050	10/25/16	0825	X			X		33	X	X		X	×	X	X	3				WZWZD	
SG 2 -AP 05 - 51 - 161025 16 500	10/25/10		X	-		X		11	X	X		X	X	X	X			16.		-	
SG 2 -AP 05 - 61 - 161025 16 516	10/25/14	1235	X			X		11	×	X		X	×	X	X					Tache.	100
SG 2 -AP 05 - 69 - 161025 16 TE		1430	X			X		H	X	χ		X	X	Χ	X		172		100	8,85	
Turnaround Time Requested (TAT) (please of			RUS	Н	Reli	nquished	by:	1	9	/	Date			Time	_	Rec	eived	d by:		Date	Time
RUSH TAT is subject to Eurofins Lancaster Laboratori	es approval	and surchar	ges.)		Poli	nquished	Alton hv:	190m	the	19	Date	16	10	Time	01	Pos	eived	d by:		Date	Time
Date results are needed: E-mail address to send RUSH results: k. mah		1 .			/	4-A	Ly.	1	0	1 3	25/	1		700		Nec	cived	i by.		Date	Time
Data Package Options (please check if requi		valo . Com			Reli	nquished	by:			_	Date	_		Time		Rec	eived	d by:		- Date	Time
Type I (Validation/non-CLP)	_	TX TRRP	- 13																		
Type III (Reduced non-CLP) CT RC			117		Reli	nquished	by:				Date			Time		Rec	eivec	d by:		Date	Time
Type IV (CLP SOW)	ype A 🔲				1		1											-			
	ype B				Reli	nquished	by:				Date			Time		Rec	eivec	d by:		Date	Time
EDD Format: EQuIS					Airt	ill No.:	_	1			<								1		
If site-specific QC (MS/MSD/Dup) required,	indicate Q	C sample	s and	d	Reli	nquished b	5		ial Ca							Tam				a la t	*0
submit triplicate volume.					UPS		Fed	_x		Othe	1			-		rem	ihera	iture	upon rec	eipt	°C

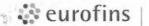
eurofins |

Lancaster Laboratories

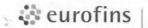
Acct. #	37191		Gro	up #:					Sam	ple #:										COC#:	15588
Client: C.T. Male Associates						Matrix						An	alys	ses l	Requ	uest	ed			For Lab U	ise Only
Project Name/#: SGPP - Merrimack	Site ID:					M [Pr	ese	rvat	on (Code	es			SF#: <u>285327</u>	
Project Manager: Kirk Moline	P.O. #: 1	6.6/26			ent	ace	N		Н	N		S								SCR#: 19606	32
Sampler: Jonathon Carter, Jonathan Digner	-				edime	Ground	LU					Z								Preserva	ation Codes
Phone #: 608-354-5253 , 578-786-7460	Quote #:	214135			Sed		WAT	ers		(c)		200		3)	Û.				1	H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						ble	2	ontainers	() ()	(6010C)		0Z+	(0.	320E	mod.					N = HNO ₃	B = NaOH
	Colle	ection		Composite		Potable NPDES	r. BLA	# of Cor	OAs (8260C)	Mg, Na, K	(353.2)	(353.2)	04- (300.	nity (SM 2320B)	(EPA 537					$S = H_2SO_4$ O = Other	P = H ₃ PO ₄
Sample Identification	Date	Time	Grab	Com	Soil	Water	Other:	Total	TCL	Ca, M	NO2	NO3	CI-, S	Alkalinity	PFCs					Rei	marks
SG 2 - APEBOI - 16/026 16 510	10/26/16	0815	X				X	2							X					Merrim	ack
SG 2 -APO6 - 19 - 161026 16 TO	10/26/16	1010	X			X		11	X	X		X	X	X	X					QAPP I	-ist
SG Z -APO6 - Z9 - 161026 16096	10/26/16	1145	X			X		11	X	X		X	X	K	X		-		- 7		
SG 2 -AP 06 - 39 - 161026 18 570	10/26/16	1325	X			X		11	X	X		X	X	X	X						
SGZ -APO6 - 49 - 161026 160	10/26/16	1505	X		2	X		12	X	X		X	X	X	X				1	Metals &	Batch QC
SG2 -AP06 -59-161027 1650	10/27/16	0905	X			X		11	X	X	7	X	X	X	X			1			
SG2 PITBU-16/027 166	phrha	-					×	3	X						X			wil.	31 114		
SG2 -APFT801 - 16/027 16(00)	10/27/16	1125	X	_			X	1	4					-	X						
SG2 -AP-301-AP06-68-161027 1600	10/27/16	1135	X			×		11	X	X		X	X	X	×						
SG2 -APoG -743-161027 1650	10/27/16	1355	X		1	X		11	X	X		X	×	×	×						
Turnaround Time Requested (TAT) (please	check): Stan	dard 🔀	RUS	Н	Reli	nquished	10	1		10.1	Date		11	Time	TELL	Rec	eivec	d by:		Date	Time
(RUSH TAT is subject to Eurofins Lancaster Laborato Date results are needed:	ries approval	and surchar	rges.)		Poli	nguished	1.0	Agon		10/1	Date		17	Time		Poc	eived	d by:		Date	Time
E-mail address to send RUSH results: k.mal	o O eta	de com		100	1	Hquistie	Dy.			Ih	12	1		200		Nec	CIVEC	I by.		Date	Time
Data Package Options (please check if requ		rate com			Reli	nquished	by:			101	Date	-	- 12	Time		Rec	eivec	d by:		Date	Time
Type I (Validation/non-CLP) MA M		TX TRRP	- 13										3								
Type III (Reduced non-CLP) CTR					Reli	inquished	d by:				Date			Time)	Rec	eive	by:		Date	Time
	Туре А 🗌												7.								3
	Type B				Reli	inquished	d by:				Date	9		Time	9	Rec	eive	d by:		Date	Time
EDD Format: EQuIS			_		Airh	ill No.:	-90	no pro					11	1							
If site-specific QC (MS/MSD/Dup) required submit triplicate volume.	indicate Q	C sample	s and	d	Reli	nquished		mmero			er			-		Tem	npera	ature u	ipon red	ceipt	°C



Acct. #:	37191		Grou	up #:					Sam	ple #:										COC#: 1	5591
Client: C.T. Male Associates						Matrix						An	alys	es R	equ	ieste	d			For Lab Us	e Only
Project Name/#: SGPP - Merrimack	Site ID:											Pr	ese	rvatio	on (Code	s			SF#: <u>285327</u>	
Project Manager: Kirk Moline	P.O. #:	6.612	6		ıt	ace			Н	N		S								SCR#: <u>196065</u>	
Sampler: Jonathon Carter, Jonathan Disput					Sediment	Ground	1					N						- 1		Preservation	on Codes
Phone #:608 - 354-5253 , 5/8-76-7400	Quote #:	214135			Sed		Jap	ers		0		45		<u>~</u>	<u>-</u>					H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						ple ES	7	Containers	()	(6010C)		Z0/V	6	320E	mod.)					N = HNO ₃	B = NaOH
	Colle	ection		Composite		Potable NPDES	r. Blant	# of	VOAs (8260C)	Mg, Na, K ((353.2)	(353.2) ↑	04- (300.0)	nity (SM 2320B)	(EPA 537	V				$S = H_2SO_4$ If $O = Other$	P = H ₃ PO ₄
Sample Identification	Date	Time	Grab	Com	Soil	Water	Other:	Total	TCL	Ca, N	NOZ	NO3	CI-, S	Alkalinity	PFCs					Rema	arks
SGZ -APEBU - /6/027 36	10/27/16	1620	X				X	11	X	X		X	X	X	X					Merrimac	K
SG -AP - 16							-										-			QAPP	List
SG -AP - 16																		4-1			
SG -AP - 16	F-13	A. T	-																		
SG -AP - 16		Transl 1																			
SG -AP - 16	RE I F		1														*				
SG -AP - 16															-						
SG -AP - 16					+																
SG -AP - 16	-								1									_			
SG -AP - 16	6																				
Turnaround Time Requested (TAT) (please of (RUSH TAT is subject to Eurofins Lancaster Laborator			RUSI	Н	Reli	nquished	by:	G	20	10	Date	110	1	Time	5	Rece	ived	by:		Date	Time
Date results are needed:	ics approvar	ana sarona	1903.7		Reli	nquished	by:				Date		-	Time	1	Rece	ived	by:		Date	Time
E-mail address to send RUSH results: K.m.	oline e	ctmale	e. Con	n	-	7/	2		_	19	127	116	1	800							
Data Package Options (please check if requi	red)				Reli	nquished	by:				Date			Time		Rece	ived	by:		Date	Time
Type I (Validation/non-CLP) 📈 MA MC		TX TRRE	- 13								-										
Type III (Reduced non-CLP) CT RC					Reli	nquished	by:			-8	Date			Time		Rece	ived	by:		Date	Time
	Type A Type B				Reli	nquished	l hv				Date			Time	-	Rece	ived	l hv:		Date	Time
EDD Format: EQuIS	ype D				1	quioricu	Jy.				Date			Time			., , , ,	Jy.		Date	1,1110
		0	1.7			ill No.:															
If site-specific QC (MS/MSD/Dup) required, submit triplicate volume.	indicate Q	C sample	es and	1	Relin	nquished b	y Cor Fed		ial Ca	rrier: Othe	er					Tem	pera	iture up	on rec	eipt	°C

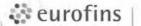


Acct.	#: 37191		Grou	up #:					Sam	ple #:										COC#:	15591
Client: C.T. Male Associates	-					Matrix		1	1			Ar	alys	ses F	Requ	ieste	d			For Lab U	se Only
Project Name/#: SGPP - Merrimack	Site ID:		1			X	V I		IV			Pi	rese	rvati	on (Codes	3			SF#: <u>285327</u>	
Project Manager: Kirk Moline	P.O. #:	16.612	6		1 =	ind			Н	N		S							4	SCR#: 19606	<u>i5</u>
Sampler: Jonathan Diggert					Sediment	Ground		-1				N								Preserva	ation Codes
Phone #: 5/1-786-7400	Quote #:	214135			Sed		1xte	ers		()		as A		3	J.)				1	H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						S ES	3	Containers	(C)	(6010C)		Noz	(0	320E	mod.)				- 1	N = HNO ₃	B = NaOH
	Colle	ection		ite		Potable NPDES	lank		VOAs (8260C)	×	-(2:	2)+	(300.0	(SM 2320B)	A 537					S = H ₂ SO ₄	P = H ₃ PO ₄
, -w	John	Cuon		sod		_	T.	l # of	/OAs	Ig, N	(353.2)	(353.	S04-		(EP					O = Other	
Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other:	Total	TCL	Ca, Mg, Na,	NO2	NO3	CI-, S	Alkalinity	PFCs) New		Rer	narks
SG2 -AP03 -25-161028 1609	10/28/16	0950	X		Mr.	X		11	X	×		×	×	×	X						111
SG 2 -ARL1801-161028 1689	10/28/16	-				- 1	×	3	X	17,	- 6				×						
SGZ PFTB01 - 161028 169	10/28/16	0945	×				X	1				The .			X						
SG 2 -AP 03 -35 - 16 1028 1630	10/28/16	1220	×			X		11	×	X		X	X	X	X						
SG2 -APFA01 - 16/028 16 10	10/28/16	_	X			×		11	X	×		×	×	×	X	1					
SG -AP - 16	×																				
SG -AP - 16																					
SG -AP - 16		Part In				19.									, -			7			
SG -AP - 16	72 41								17			1	100								T.
SG -AP - 16	9 4					4	1														
Turnaround Time Requested (TAT) (please				Н	Reli	nquished	by:	14	0	1	Date	1/11	11	Time	18	Recei	ved by:		9	Date	Time
(RUSH TAT is subject to Eurofins Lancaster Labora Date results are needed:	ories approval	and surcha	rges.)	-	Reli	nquished	bv.	-		101	Date	16	15	Time		Recei	ved by:			Date	Time
	moline e	1 tons	6 1	144	1												1				
Data Package Options (please check if rec		01701	10,00	0711	Reli	nquished	by:				Date)		Time		Recei	ved by:			Date	Time
Type I (Validation/non-CLP) MA	MCP	TX TRRE	P - 13																		
Type III (Reduced non-CLP)	RCP				Reli	nquished	by:				Date			Time	9	Recei	ived by:			Date	Time
	Type A						I L				D .			т:		D				Dete	T
	Type B		_	_	Reli	inquished	i by:				Date	9		Time		Rece	ived by:			Date	Time
EDD Format: EQuIS			-		Airb	ill No.:	-			1		-	1					-			1
If site-specific QC (MS/MSD/Dup) required submit triplicate volume.	I, indicate Q	C sample	es and	d		nquished b	y Cor Fedi		cial Ca	arrier: Othe	er					Temp	erature	upon	ı rece	eipt	°C



Acct. #	37191		Gro	up #:					Samp	ole #:		100									COC#: 1		
Client: C.T. Male Associates						Matrix			4.			An	alys	es l	Requ	uest	ed			-	For Lab Us	e Only	
Project Name/#: SGPP - Merrimack	Site ID:											Pr	ese	rvati	on (Code	es				SF#: <u>285327</u>		
Project Manager: Kirk Moline	P.O. #:	16. 61.	26		#	ind			Н	N		s									SCR#: <u>196063</u>		
Sampler: Jonahan Diggert	2				Sediment	Ground			FI .	1		×									Preservation	on Codes	
Phone #: 5/8-786-7440	Quote #:	214135			Sed		2	ers		0		4		9	<u></u>						H = HCI	T = Thiosulfate	ł
State where sample(s) were collected: NH						ble ES	3	Containers	0C)	(6010C)		NOZ	6	2320B)	7 mod.)						N = HNO ₃	B = NaOH	
	Colle	ection		Composite		Potable NPDES	F. Blank	# of	/OAs (8260C)	Mg, Na, K	(353.2)	(353.2) +	04- (300.	(SM	(EPA 537						$S = H_2SO_4$ FOR $O = Other$	P = H ₃ PO ₄	
Sample Identification	Date	Time	Grab	Com	Soil	Water	Other:	Total	TCL \	Ca, M	NO2	NO3	CI-, S	Alkalinity	PFCs						Rema	arks	
SGZ -AP03 -45 -161031 160	10/31/16	1010	X		14	X		11	X	X		X	X	X	X								
SG2 -APLTB01-161031 1600	1				(0)	1	X	3	X						X	1	17						
SG2 -APF781 - 161031 1600		1025	×				X	1		20					X		1			100	A 46.5		
SG2 -AP03 -55-161031 168	V	1255	×			×		11	X	×		X	X	X	X						3700		
SGZ -AP03 -65-161031 1650	10/31/16	1610	X		1	X		11	×	X		X	X	X	X							4	
SG 2 -APR801 - 161101 18(50)	11/1/16	1550	X		1		×	2							X								
SG2 -APIO - 20 - 16/102 18 18	11/2/16	0955	X			X		11	X	×		X	X	X	X			. ,				+	
SG2 -AP10 - 30 - 161102 1659	11/2/16	12/0	X			X		11	X	X		×	X	X	X				ly.				
SG2 -AP10 - 40-16/102 16	11/2/16	1435	X		1 1	X		12	X	X		X	X	X	X	7 -					Metals Bas	K QC	*
SG -AP - 16				1.7.0		-						-					4	1			1450		
Turnaround Time Requested (TAT) (please (RUSH TAT is subject to Eurofins Lancaster Laborato	The state of			H	Reli	nquished	by:			101	Date	16		Time		Rece	eive	d by:			Date	Time	
Date results are needed:					Reli	nquished	by:				Date	,		Time		Rec	eive	d by:			Date	Time	
E-mail address to send RUSH results:	molne e	ctmale.	ion		1	12	70	>		111	2/1	6		7/0								1	
Data Package Options (please check if requ	ired)				Reli	nquished	by:				Date			Time		Rec	eive	d by:			Date	Time	
Type I (Validation/non-CLP) MA M		TX TRRP	- 13		Dali	naujahad	by			4 -	Doto			Time		Doo	01110	يرط لم			Doto	Time	_
	CP _				Kell	nquished	by.				Date			Time	,	Rec	eive	u by.			Date	Time	
	Type A 🗌 Type B 🔲				Reli	nquished	bv:	-			Date			Time		Rec	eive	d by:		_	Date	Time	-
EDD Format: EQuIS	турсы				1		- j.														54.0		
If site-specific QC (MS/MSD/Dup) required,	indicate Q	C sample	s and	d	Reli	ill No.: nquished b			ial Ca												25.04		
submit triplicate volume.					UPS		Fedi	=X		Othe	Γ					lem	ipera	ature	upon	rec	eipt	°C	

eurofins :	Lancaster Laborato	ries A	cct. #			urofin		caster Labo		es En ample		nental u	se o	nly					C	OC #	51	2769
	Environmental	um atlan			-			Mateix	_				Α.	alvois	Day		a d		-	Faul ab IIa	o Only	
Client;	Client Info		cct. #:				_	Matrix			_	_		nalysis reserv	-	_			_	For Lab Us FSC:	e Only	
CT M.	1. A L.		ос. т.				Ш							reserv	ation	Code	5			SCR#:	4	3 -
Project Name/#:	12 173306,610	P	WSID #:				sue	p 9						\dashv	+	+	1				ervation	Codes
SGPP.	Merr mack						Tissue	Ground	4		00		California.		34					H=HCI		hiosulfate
Project Manager:	January Marie Control	P	.O. #:					Gr	10,16		1									N=HNO	3 B=1	NaOH
Kirk	Mer. mack		16	6/26			-		7	lers	8									S=H ₂ SC	-	Other
Sampler.		C	luote #:				Sediment	0 0	×	tain	N										Remark	
Jonethan State where samples were	collected: For Con	noliance:					dir	Potable NPDES	8180	on	1									Fa	ye 10	+/
NH			No 🗆			ite	Se	Pot	1	5	3											
		T				Composite	П			Total # of Containers	2											
Sampl	e Identification		7.22	ected	Grab	E E	Soil	Water	Other:	tal	4											
			Date	Time	Ü	ŭ	S	3	ō	ř												
SG2-RI	801-161102		1/2/16	1500	X				X	1	×											
562 - RB	02-161102			1502	X				X	3	X									145/	195D	
562-RB	03-16/102		1	1505	X				X)	X											
SG2 - RB	14-161102			1507	X				X	1	X											
SG2- RB	5-16/102			1570	X				25	1	X											
562-RB	06-161102		V	1512	X				X	1	X											
SG2-RBI	FD01-161102	-	1/1/16		X				X	/	×				_							- 6
				-					-						_	-	-					
															_		-					
												2			-						D .	Te
Turnarour Stan	nd Time (TAT) Req	uested (p Rus		:le)	Helino	uished	by	5	>			Date ///2	16	Time 18/6	He	ceived b	У				Date	Time
(Rush TAT is subje	ect to laboratory approval an	d surcharge.)			Relino	quished	by	//				Date		Time	Re	ceived b	У			W.S	Date	Time
Date results are nee	eded:				Relino	quished	by					Date		Time	Re	ceived b	у				Date	Time
E-mail address:	K. Maline	e ctma	6.00	59	Relino	quished	by		-	_		Date	_	Time	Re	ceived b	у				Date	Time
	Package Options				1																	
Type I/(EPA Le	avel 3	Type VI (R		Onka	Relino	quished	by					Date		Time	Re	ceived b	У				Date	Time
Equivalent/non	n-CLP)	Type VI (II	aw Dala	Office																		
Type III (Reduc	ced non-CLP)	NJ DKQP	TX	TRRP-13			If yes	EDD Re	quire	d?	Yes	No			Re	elinqui UPS_			mmer Ex	rcial Carrie Other		
NYSDEC Cate	egory A or B	MA MCP	CT	RCP				ecific QC cate QC samp								Т	empe	rature	upor	receipt _		_°C



Acct	#: 37191		Gro	up #:					Sam	ple #:											COC#: 1	5589
Client: C.T. Male Associates						Matrix			10			An	alys	ses l	Requ	uest	ed				For Lab Use	Only
Project Name/#: SGPP - Merrimack	Site ID:											Pr	ese	rvati	ion (Code	es				SF#: <u>285327</u>	
Project Manager: Kirk Moline	P.O. #:	16-612	6		Ħ	nud			Н	N		S									SCR#: <u>196063</u>	
Sampler: Jonathan Dippert					Sediment	Ground	5					>				3					Preservatio	n Codes
Phone #: 578-786-7400	Quote #:	214135			Sed		Jake	ers		ô	ы	150		(6	f.)						H = HCI T	= Thiosulfate
State where sample(s) were collected: NH				-		ble	N	Containers	() ()	(6010C)	9	+NO2	(0	320E	7 mod.)	1					N = HNO ₃	3 = NaOH
	Colle	ection		Composite		Potable NPDES	Blen	# of	VOAs (8260C)	Ca, Mg, Na, K	(353.2)-((353.2) +	SO4- (300.0)	nity (SM 2320B)	(EPA 537				1		$S = H_2SO_4$ F $O = Other$	° = H ₃ PO ₄
Sample Identification	Date	Time	Grab	Com	Soil	Water	Other:	Total	TCL	Ca, N	NO2	NO3	CI-, S	Alkalinity	PFCs						Rema	ırks
SG2 -AP/0 -50-16/103 1659	11/3/16	0755	×		1 2	X		11	X	X		X	X	X.	×	7	O'NO.				,	
SG 2 -AP/0 -60-16/103 186		0955	X		-	X		11	X	X		X	X	X	X	1						
SG 2 -APLT80- 16403 1650		-	X				X	3	X						X	1	-			-		
SG 2 -APFTB01 - 161103 1669		1015	×				X	1							X	6-						
SG2 -API0 -70 -16/103 16/5		1205	X			X		11	X	×		X	×	×	×							
SG2 -API0 -80 - 161103 1850	V	1420	X			X		11	X	X		X	×	×	X							
SG2 -APIO -84.5 - 16.1/03 1660	11/3/16	1635	X			X		11	X	X		X	×	×	X	1						
SG2 -AP09 -28 - 16/104 16(a)	11/4/16	0950	X			X		33	X	X		X	X	X	X			1	4		MSIMED	
SG2 -APRBOI - 16 1104 1660	11/4/16	0740	X				X	2							X						1	
SG -AP - 16				-					100													
Turnaround Time Requested (TAT) (plead (RUSH TAT is subject to Eurofins Lancaster Labora				н	Reli	nquished	l by:			11/	Date	-		Time)	Rec	eive	d by:			Date	Time
Date results are needed:			3		Reli	nquished	by:				Date			Time	9	Rec	eive	d by:			Date	Time
E-mail address to send RUSH results:	Moline	Q ctm	le. co	M					- /													
Data Package Options (please check if re-	uired)				Reli	nquished	by:				Date			Time	9	Rec	eive	d by:			Date	Time
Type I (Validation/non-CLP) MA		TX TRRE	- 13		-						D :			-						1.	-	
Type III (Reduced non-CLP) CT	The second				Reli	inquished	by:				Date			Time	9	Rec	eive	d by:			Date	Time
	Type A 🗌 Type B 🔄	31			Reli	inquished	d by:				Date			Time	9	Rec	eive	d by:			Date	Time
EDD Format: EQuIS																						
If site-specific QC (MS/MSD/Dup) require submit triplicate volume.	d, indicate C	C sample	es and	d		ill No.: nquished t S	oy Cor Fedi		ial Ca	arrier: Othe	er					Ten	npera	ature	upor	ı rec	eipt	°C

Acct. #	3/191		Gro	up #					Sam	ple #:											COC#. 1	0094
Client: C.T. Male Associates						Matrix						Ar	alys	es R	eque	este	d				For Lab Use	Only
Project Name/#: SGPP - Merrimack	Site ID:		1			MM						Pi	ese	rvatio	n C	ode	s				SF#. <u>286049</u>	
Project Manager: Kirk Moline	P.O. #:	16.612	6		t	ace ace			Н	N	S										SCR#: 196069	
Sampler: 30,30,10,84					Sediment	Ground	3		so.				0 B)								Preservation	n Codes
Phone #: 578-786-7400	Quote #:	214135			Sed		3	ers	+ TICs	()	(353.2)		N 232	- Fi							H = HCI T	= Thiosulfate
State where sample(s) were collected: NH						ble	1	Containers	OC) +	(6010C)		6	p (S)	mod.)		1					N = HNO ₃ B	= NaOH
	Colle	ection	0	Composite		Potable NPDES	er. Bla,	# of	VOAs (8260C)	Mg, Na, K (NO2 / NO3	300.	- Carb/Bicarb (SM 2320	s (EPA 537			-4				$S = H_2SO_4$ P $O = Other$	⁹ = H ₃ PO ₄
Sample Identification	Date	Time	Grab	Con	Soil	Water	Other:	Total	T0L	Ca, N	Total	Cl-, S	ALK +	PFCs							Rema	irks
562-SWD-Merr - 161107	11/2/16	155	X			SW		11	X	X	×	×	X	X								
SG2-SWDn Bab - 161107		1540	X	F		SW		11	X	X	X	X	X	X								1
5G2 - SUMIN BAB - 161107	1	1630	X			SW		11	×	X	X	X	X	X								
SGZ - SWFD4 - 16/107	11/7/16	-	×			SW		11	×	X	X	X	X	X								
SGZ - SHUp Bab - 16/108	11/8/16	0910	X			SW		33	X	X	X	X	×	X							MS/MSC	2
562 - SWUPMEN- 161108	11/8/11	1030	X			SW		11	X	X	X	X	X	X								
562-FT801-161108		0823					×	1						X								
SG2-LT801-161108		-					X	3	X					X								
SG2-MER45-8-161108	V	1030	X			GW		11	X	×	X	X	×	X								
SG2-SWEBO1-161108	11/8/16	1200	X				X	11	×	X	×	×	X	×								
Turnaround Time Requested (TAT) (please	check): Stan	dard 📉	RUS	H	Reli	nquished	2	-			Date			Time		Rece	ivec	by:			Date	Time
(RUSH TAT is subject to Eurofins Lancaster Laborato	ries approval	and surchar	rges.)	-	12/	men	-	an	4		181	10	-	7:45				V 100000				No.
Date results are needed:	. /	- 1	7		Reli	nquished	by:				Date			Time	1	Rece	iveo	d by:			Date	Time
	Mohae	e ctang	10.0	0,84.7	Reli	nquished	by	-			Date			Time	F	Rece	aiver	d by:			Date	Time
Data Package Options (please check if requirement Type I (Validation/non-CLP) MA MI		TX TRRP	40		1,011	riquiorica	Dy.				Duto			THE		1000	,,,,,	. by.			Date	14110
Type III (Reduced non-CLP) CT RC		IX IKKP	- 13		Reli	nguished	by:	-			Date			Time	F	Rece	eivec	d by:			Date	Time
	Type A 🗌																	111000				
	Type B				Reli	nquished	by:				Date			Time	F	Rece	eivec	d by:			Date	Time
EDD Format: EQuIS			IA.		1																	
If site-specific QC (MS/MSD/Dup) required, submit triplicate volume.	indicate Q	C sample	s and	1	100000000000000000000000000000000000000	ill No.: nquished b	y Cor Fedi		cial Ca	orrier:	er					Temi	pera	ature u	ı noqu	rece	eipt	°C

eurofins

Lancaster Laboratories

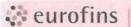
Environmental Services Analysis Request/Chain of Custody

Acet. #: 37191 🎾 COC#: 15594 Group #: Sample # **Analyses Requested** For Lab Use Only C.T. Male Associates Matrix Client: X Project Name/#: SGPP - Merrimack Site ID: **Preservation Codes** SF#: 286049 6.6126 Ground Surface S Project Manager: Kirk Moline P.O. #: H N SCR#: 196069 Sediment Carb/Bicarb (SM 2320 B) Sampler: JOJC, LC, RH Preservation Codes (353.2) of Containers Phone #: 518-786-7400 Quote #: 214135 (6010C) T = Thiosulfate FCL VOAs (8260C) State where sample(s) were collected: Potable N = HNO B = NaOH (300.0) NO2 / NO3 537 × S = H2SOa $P = H_3PO_4$ Composite (EPA Collection S04-Total # O = Other Grab PFCs Soil Sample Identification Date Remarks Time G2-RB01-16/108 R45-4A-161108 Bottles Walk Lir Sicken 415 MER45-6-161108 MER45-9-161108 1545 62-MER45-7-161108 1020 Relinquished by: Turnaround Time Requested (TAT) (please check): Standard RUSH Received by: Date Time Date Time Jordine / alu (RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.) Relinquished by: Date Time Received by: Date Time Date results are needed: E-mail address to send RUSH results: K moline C c+male. (U) Relinquished by: Date Time Time Received by: Date Data Package Options (please check if required) Type I (Validation/non-CLP) MA MCP TX TRRP - 13 Relinquished by: Date Time Received by: Date Time Type III (Reduced non-CLP) CT RCP ASP Type A Type IV (CLP SOW) ASP Type B Relinquished by: Date Time Type VI (Raw Data Only) Received by: Date Time EDD Format: **EQuIS** Airbill No.: If site-specific QC (MS/MSD/Dup) required, indicate QC samples and Relinquished by Commercial Carrier: submit triplicate volume. FedEx Temperature upon receipt

CHILDINIS

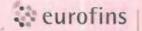
Lancaster Laboratories

Acct. #:	37191		Grou	p #t					Samp	ole#.									COC#:	15594	
Client: C.T. Male Associates						Matrix						Ar	alys	es Re	ques	ted			For Lab Us	e Only	
Project Name/#: SGPP - Merrimack	Site ID:					DI C						Pr	ese	rvatio	Co	des			SF#: 286049		
Project Manager: Kirk Moline	P.O.#:	16.6	124	2	t	nud	5		Н	N	S								SCR#: 196069	3	
Sampler: LC TC 2.4					Sediment	Ground	4		S				0 B)						Preservati	ion Codes	
Phone #: 518 - 786 - 7502	Quote #:	214135			Sed		3	ers	TICs	0	(3.5)		1 232	⊋		1			H ≈ HCI	T = Thiosulfate	
State where sample(s) were collected: NH						ele ES	X	Containers)C) +	(6010C)	353.	6	b (SA	(mod.)					N = HNO ₃	B = NaOH	
	Colle	ection		Composite		Potable NPDES	EB lar	# of	VOAs (8260C)	Mg, Na, K (NO2 / NO3	04- (300.0)	Carb/Bicarb (SM 2320 B)	(EPA 537					$S = H_2SO_4$ O = Other	P = H ₃ PO ₄	
Sample Identification	Date	Time	Grab	Com	Soil	Water	Other:	Total	TCL	Ca, N	Total	CI-, S	ALK +	PFCs					Rem	arks	
SG2-GWERN-161109	11/9/16	0815	X				X	11	X	X	X	X	X	X							
SG2-PTB01-161109	1 1 1 1	0830	X				X	1						X							
SGA-MER45-3A-161109		1015	X			Y		11	X	X	X	+	Y	X							
SG2-MERYS-5A-161109		1430	X			X		11	X	X	X	X	X	X							
SGQ-MER45-28-161109		1550	X			+		11	Y	x	+	Y	×	+							
SG2-MERIMW-161109		1550	X			X		10	X	X	Y	X	X	X							
SG2-LNGMW-4-161109		1630	X			X		11	X	X	X	X	X	K							
SG2-GWP001-161109			X			X		11	X	Y	X	+	+	X							
SG2-LTB01-161109		_					X	3	X					X							
Turnaround Time Requested (TAT) (please	check): Stan	dard 🔯	RUSH	4	Reli	nquished		1		11	Date	11	17	Time		ceive	d by:		Date	Time	
(RUSH TAT is subject to Eurofins Lancaster Laborator	ries approval	and surchar	rges.)		Poli	nguished	1	an	Ma	11	Date	10	15	Time		eceive	d hv:		Date	Time	
Date results are needed: E-mail address to send RUSH results:	oline	Gm	rile v	arva	T Can	riquisiriec	. Dy.				Date			Tittle	110	CCIVC	u by.		Date	Time	
Data Package Options (please check if requi			JA IC PI	043	Reli	nquished	by:				Date			Time	Re	eceive	d by:		Date	Time	-
Type I (Validation/non-CLP) MA MO	PA HARMAN	TX TRRP	- 13																		
Type III (Reduced non-CLP) CT RC				500	Reli	nquished	by:				Date			Time	Re	eceive	d by:		Date	Time	1
	Гуре А 🗌																				
	Гуре В 🗌				Reli	nquished	d by:				Date			Time	Re	eceive	d by:		Date	Time	
EDD Format: EQuIS	-				Airhi	II No.:	-								+						
If site-specific QC (MS/MSD/Dup) required,	indicate Q	C sample	es and		Relin	nquished I											20		3 T	22	
submit triplicate volume.					UPS		Fed	Ex		Othe	er				Te	emper	ature u	ipon red	ceipt	°C	

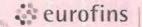


Acct. #	37191		Grou	ıp #:					Sam	ple#:	2					4					COC#:	15594
Client: C.T. Male Associates						Matrix						Ar	alys	ses Re	que	este	d				For Lab Us	se Only
Project Name/#: SGPP - Merrimack	Site ID:					内口						P	rese	rvatio	n C	ode	s				SF#: 286049	
Project Manager: Kirk Moline	P.O. #:	16.612	6		1 4	nd			Н	N	S										SCR#: 19606	9
Sampler: LC JC, RH					Sediment	Ground Surface	\$		cn.				0 8)								Preservat	ion Codes
Phone #: 518-786-7500	Quote #:	214135			Sed		Va	ers	+ TICs	0	(353.2)		A 2320	<u> </u>							H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						ble	X	Containers	0C) +	6010		(0	D (SM	7 mod.)		4					N = HNO ₃	B = NaOH
	Colle	ection		site		Potable	Blank	of Cor	VOAs (8260C)	Mg. Na. K (6010C)	2 / NO3	- (300.0)	Carb/Bicarb	EPA 537							S = H ₂ SO ₄	P = H ₃ PO ₄
			Grab	Composite	=	Water	Other:	Total #		Mg.	Total NO2	, SO4-	+	PFCs (E							O = Other	
Sample Identification	Date	Time	ō	ပိ	Soil	Š	ŏ	5	TCL	Ca,	To	, to	ALK	4	+	1	-				Rem	narks
SG2-17B01-161110	11/10/16	-	,				X	3	X					X	-				- 9			
SG2-RB01-161110		0800	X				X	1						X								
SG2-FTB01-161110		0805	X				X	1						X								
SG2-LNGMW-1-161110		1105	X			X		11	X	×	X	X	X	X								
SG2-MER45-10-161110		1310	X			X		34	X	X	X	X	X	×							Barrier Con	
962-LNGMW-3-161110		1315	X			X		11	X	X	×	X	X	X								
SG2-MER45-1A-161110		1420	X			X		15	X	X	X	X	×	×		31						
SG-2-RB02-161110		1440	X				X							X								
SG2-MER45-2A-161110	V	1615	X			X		11	X	X	X	X	X	×								
Turnaround Time Requested (TAT) (please	absolute Cton	dord [7/	RUSI		Reli	nguished	by:				Date			Time	F	Rece	ived	by:			Date	Time
(RUSH TAT is subject to Eurofins Lancaster Laborato					2	enand	-	am	IA	11	110/		1	730		1000	ived	Dy.			Date	Time
Date results are needed:	iles appierai	and surchar	903.7		Reli	nquished		DV IV			Date		-	Time	-	Rece	ived	by:			Date	Time
E-mail address to send RUSH results: 🗸 🤊 📉	Minella	2 am	vale.	-COX	1																	
Data Package Options (please check if requ					Reli	nquished	by:				Date			Time	F	Rece	ived	by:			Date	Time
Type I (Validation/non-CLP) MA M	CP 🗆	TX TRRP	- 13									4										
Type III (Reduced non-CLP) CT R	CP				Reli	nquished	by:				Date			Time	F	Rece	ived	by:			Date	Time
	e IV (CLP SOW) ASP Type A						at i				100											
	Type B 🗌				Reli	nquished	by:				Date			Time	f	Rece	ived	by:			Date	Time
EDD Format: EQuIS								-		_	-				+				-			
If site-specific QC (MS/MSD/Dup) required, submit triplicate volume.	e-specific QC (MS/MSD/Dup) required, indicate QC						y Con Fed!	nmerc Ex	ial Ca	rrier: Othe	er	14			-	Temp	perat	ture i	upon	rece	eipt	°C

Acct.#	3/191		Gro	up #:					Sam	ple#								_,		CUC#:	5594
Client: C.T. Male Associates						Matrix						Ar	nalys	es R	eque	sted				For Lab Us	e Only
Project Name/#: SGPP - Merrimack	Site ID:					D D						P	resei	vatio	n Co	des				SF#: <u>286049</u>	
Project Manager: Kirk Moline	P.O. #: /	6.61	26		#	nd	(Н	N	S						-			SCR#: 196069	
Sampler: JC					Sediment	Ground	ate		S				0 B)							Preservati	on Codes
Phone #: 518-786-7502	Quote #:	214135			Sed		3		+ TICs	0	(353.2)		A 2320	<u>=</u>						H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						ble	K	ntair	00°	6010		6	b (SM	mod.)					1	N = HNO ₃	B = NaOH
	Colle	ection		Composite		Potable NPDES	E Blank	I # of Containers	VOAs (8260C)	Ca, Mg, Na, K (6010C)	Total NO2 / NO3	\$04- (300.0)	Carb/Bicarb	(EPA 537						$S = H_2SO_4$ O = Other	P = H ₃ PO ₄
Sample Identification	Date	Time	Grab	Com	Soil	Water	Other:	Total #	TCL	Ca, N	Total	S -12	ALK +	PFCs						Rem	arks
SG2-LTBO1-161111	Monte						X	3	X					X	14						
SG2-FTB01-161111	MINH	0815	X				X	1						X							
SG2-LNGMW-2-161111	11/11/16	1050	X			X		11	X	×	X	×	X	X							
SG2-MER45-11-161111	11/11/16	THE RESERVE	X			X		11	X	X	X	X	x	+							
			Ī																		
											k ?										
		-										1-1									
		Part Hill															1				
Turnaround Time Requested (TAT) (please		-	RUS	Н	1	nquished	100	of ann		11	Date	111		Time	R	eceiv	ed by			Date	Time
(RUSH TAT is subject to Eurofins Lancaster Laborato Date results are needed:	ries approval	and surchar	ges.)		100	nguished		Co rui	w	11/	Date	10		Time	R	eceiv	ed by			Date	Time
	oline	a) Ctro	vale	am			-9:				2000			22/01/10/20			77.74			-5.75	21,001000
Data Package Options (please check if requ			-		Reli	nquished	by:	175		- 1	Date		1	Time	R	eceiv	ed by			Date	Time
Type I (Validation/non-CLP) MA M	CP 🗆	TX TRRP	- 13																		
Type III (Reduced non-CLP) CT RO	CP 🗌				Reli	nquished	by:				Date			Time	R	eceiv	ed by		30	Date	Time
	Type A 🗌																				
	Type B 🗌		70		Reli	nquished	by:				Date			Time	R	eceiv	ed by			Date	Time
EDD Format: EQuIS			-		Airbi	II No.:	-	-			-	=	_		+	-	-		-		
If site-specific QC (MS/MSD/Dup) required, submit triplicate volume.	indicate Q	C sample	s and	b	Relin	nquished b		nmerc		orrier:	er				T	empe	rature	upo	n rec	eipt	°C



Acct #:	37191		Group #:		-11			Samp	le #:										COC#:	15595
Client: C.T. Male Associates					Matrix			110			An	alys	es F	equ	este	ed			For Lab U	se Only
Project Name/#: SGPP - Merrimack	Site ID:										Pr	ese	rvati	on (Code	s			SF#: <u>285327</u>	
Project Manager: Kirk Moline	P.O.#:	16.6126		7 =	pu es			Н	N		s								SCR#: 19606	9
Sampler: Jan Dipport, Ryan Hobbid				Sediment	Ground	. 1					N								Preserva	tion Codes
Phone #: 578 - 786 - 7410	Quote #:	214135		Sed		Jak	ers		ô		12 45			()					H = HCI	T = Thiosulfate
State where sample(s) were collected: NH				1	els SE	4 1	Containers	() ()	(6010C)	(8)	X	(0	2320B)	mod.)					N = HNO ₃	B = NaOH
		war-n-	0		Potable	175		(8260C)	×	2)	2) +	300.0	(SM 2	537					S = H ₂ SO ₄	P = H ₁ PO ₄
	Colle	ction	osit		THE PARTY		# of	OAs	Na,	(353.5	(353.2	.40		(EP/					O = Other	
Sample Identification	Date	Time	Grab	Soil	Water	Other	Total	TCL V	Ca, Mg.	NO2 (NO3 (CI-, SC	Alkalinity	PFCs						narks
SG 2 -AP - 17801 - 16414	11/4/16	-				X	3	X						X		1				
SG 2 -AP - MVD4 - 06 - 16/1/4	11/14/10	1335	X		X		11	X	×		×	×	X	X						
SG 2 -AP MVD4 - 10 - 16 1114		1345	X		×		11	X	X		×	×	X	X					HEAT I	
SG 2 -AR - MVD4 - 20 - 16/114		1355	X		X		11	X	X		×	×	X	×					di consti	
SG 2 -AP - MVAY - 30 - 16 1114		1405	X		X		11	X	X		X	X	X	X						
SG 2 -AP - F1201 - 16 1114		1445	X			X		10						X						
SG 2 -APED - MVD5-00-16/114		1530	X		×		11	X	X		X	X	X	X					MARKET 1	
SG2 -APS - MVD5 - 10 - 16/114		1540	X		×		12	X	X		X	X	X	X					Motale	RARC
SG 2 -APG9 - MVD5-20 - 16 1114	1	1550	X		X		11	X	X		X	×	X	X						
SG2 -APD -MVD 5-30 - 161114	11/14/16	1600	X		X		罗	X	X		X	X	X	X					nsh	AZ
Turnaround Time Requested (TAT) (please	check): Stan	dard 🔯	RUSH] Rel	linquished	by:		60	2	Date	4		Time		Rece	eived	d by:		Date	Time
(RUSH TAT is subject to Eurofins Lancaster Laborator	es approval	and surchar	ges.)	Rel	linguished	hy	Japan	ult	10	Date	116	15	Time	5	Rece	aiver	d hvc		Date	Time
Date results are needed: E-mail address to send RUSH results:	Moline	e ctm	le com	_	inquisited	Dy.	0	0		hul		17	70		11000	CIVCO	ı oy.		Date	time
Data Package Options (please check if requi		00,	10-01-7	_	linquished	by:	-	>	11/	Date		F. F.	Time		Rece	eive	d by:		Date	Time
Type I (Validation/non-CLP) MA MC		TX TRRP	- 13																	
Type III (Reduced non-CLP) CTRC	P 🗌			Re	linquished	by:		TH		Date			Time		Rece	eive	d by:		Date	Time
	уре А 🗌						1							L						
	уре В			Re	linquished	by:				Date			Time		Rece	eive	d by:		Date	Time
EDD Format: EQuIS				Airt	bill No.:		-		k							4				
If site-specific QC (MS/MSD/Dup) required, submit triplicate volume	indicate Q	C sample	s and		linquished b	y Con			rrier.	er					Tem	pera	ature ur	oon rec	eipt	°C



Acct	# 37191		Group	» #.					Sam	ple #.										COC#:	15595
Client: C.T. Male Associates						Matri	x					Ar	alys	ses F	Requ	ieste	ed			For Lab U	se Only
Project Name/#: SGPP - Merrimack	Site ID:					M						Pi	ese	rvati	on (Code	s			SF#: 285327	
Project Manager: Kirk Moline	P.O. #:	16.612	6		#	pu es			Н	N		S					7			SCR#: 19606	59
Sampler: In Dippert, Ryen Hills					Sediment	Ground		131				1								Preserv	ation Codes
Phone #: 578-786-7460	Quote #:	214135		i	Sed	0		ers		0		3			(H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						e S		Containers	0	(6010C)		Nor	(320B	mod.)	1				N = HNO ₃	B = NaOH
		2		ø		Potable		Con	(8260C)	1990	4	+	(300.0)	M 2:	537					S = H ₂ SO ₄	P = H ₃ PO ₄
	Colle	ection		osit		1		# of	VOAs (Mg. Na, K	(359.2)	(353.2)	.40	ity (S	(EPA	100				Q = Other	300000000000000000000000000000000000000
Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other:	Total	TCL VC	Ca, Mg	NO2 (NO3 (;	Cl-, SO	Alkalinity (SM 2320B)	PFCs						marks
SG2 -APO - MVDFD01 - 16/11	1 7	-	X		0,	X		11	X	X		X	X	×	X		115				
SG -AP - 16	100			12						The second											
SG -AP - 16											1										
SG -AP - 16		HEE									111									Marine 1	
SG -AP - 16		THE STATE OF THE S		A																	
SG -AP - 16																					21
SG -AP - 16																					
SG -AP - 16																					
SG -AP - 16																					
SG -AP - 16																					
Turnaround Time Requested (TAT) (plea	se check): Stan	dard 🔯	RUSH	1	Reli	nquishe	ed by:				Date	1		Time		Rece	eivec	by:		Date	Time
(RUSH TAT is subject to Eurofins Lancaster Labora	ories approval	and surcha	rges.)		D !!	7/2	-	>		11	114/		1	20			.4				-
Date results are needed:	1 /	1 1			Rein	nquishe	ed by:				Date			Time		Rece	eivec	by:		Date	Time
E-mail address to send RUSH results: Data Package Options (please check if red	moline 6	O' prote	COM	-	Reli	nquishe	ed by:		-		Date			Time		Rece	eive	by:	-	Date	Time
	MCP	TX TRRP	0 13																		
Type III (Reduced non-CLP)	Comp.	TA TRACT	10		Reli	nquishe	ed by:		7		Date			Time		Rece	eive	by:		Date	Time
	Type A																				
	Type B				Reli	nquishe	ed by:	(1			Date			Time		Rece	eived	d by:		Date	Time
EDD Format: EQuIS						0.51		Ш													1
If site-specific QC (MS/MSD/Dup) require	d, indicate Q	C sample	es and			II No.: nquished	by Co	omme	cial Ca	arrier:									12		
submit triplicate volume.					UPS		_ Fe	dEx_		Othe	er					Tem	pera	iture u	pon red	ceipt	°C

eurofins	Lancaster Laboratories Environmental	Acct. #	7 191				caster Lab				mental	use o	nly						coc	# 51	2676
	Client Informatio	n		NWAYA	Silver -		Matrix				· .	A	naly	sis F	Requ	este	d		For Lab	Use Only	
Client:	1 La	Acct. #:				П	МП					yay.	Prese	ervati	on C	odes			FSC:		
	ssociates	- ALLOND II				e e					Marc.				lije,				SCR#:		
Project Name/#: らんピー M	errimack	PWSID #:				Tissue	Ground K	700		0	0	c			2	78			10 Proceeding	servation	
Project Manager:		P.O. #:		ARTA SS. MENERS S	3063 313	L	Gro	V.		09	70109	ζ		9	332065	37mod			H=HC N=HN		Thiosulfate NaOH
Kirk	Noline	16.	6126			Ш		N	ers	(2003)	3	7	7	300	Ž	N			S=H ₂ S	o ,	Other
Sampler: STS (S	Molinz taphan Sohnson)	Quote #: 2	14135			ment		4	Containers		singe.	19 10 19	88		S	10°			2 V 5 V 5 C 5 A 3 C 5	Remar	ks
State where samples were o	collected: For Compliance: Yes	No □			e e	Sediment	Potable NPDES	B	of Cor	200	Z,	Mass	NON	\$ 0 CT &	, £	4					
Sampl	e Identification	Colle	ected	ရွ	Composite		Water	Other:	Total # c	7	Š	X.	7 20 20 20	5	S Installa Sillia menna	$\tilde{\alpha}$					
		Date	Time	Grab	දි	Soil	Wa	ŧ	ē	}	S	Z,	Z)	and,						
SGZ-1901-	45-46-170110	1017	1103	X		W).	У		and district	X	×	X	X	Х	Х	X		18 B	F:N	r for W	whals
542-A101	-55-56-170110	1/10/17	147	10			X		deposits Catalogue	X	×	y	V	×	X	X			FW	ir form	elels
	1-65-66-170111	111117	0904	X		ilvi.	Х		1	M	×	M	Ж	×	X	\mathcal{X}		89	F:11	irmely	•
542-AP0	1-75-76-170111	1)11/17	1151	Ж			У		12	×	×	×	X	M	N	X			<i>₽:11</i>	in Medici	14
	1-79-80-170111	1/11/17	1522	N			79		12	X	×	×	X	M	N	X		May 1	F:14	e wit	12
	2-24-25- 1701	1112/17	1037	M			Ж		energy andlesson	×	X	1945 1937	X	X	X	X					
\$42-4P0Z	- 34-35-170112	1112/17	1212	K)0		estates destates	X	×		M	M	X	X					
547-AP02	-44-45-170112	1112117	1348	X			×		Office of	X	M		×	X	N	×	Y				
SLZ- F60Z		112/17	1548	×				×	2							X					
362- AP02-	54-55-170113	VI3/17	0115	У			K		peal (1) constitue	У	M		M	×	У	M					
	d Time (TAT) Requested	and the state of the National Control	le)	Reling	uished	by	1.1		NI VENE		Date	1.	Time	6 /%	Receiv	ed by				Date	Time
Stan		Rush		-	uished		<u> </u>	psons.		<u> </u>	M/ 13 Date	VI	17 Time	.75	Receiv	od by				Date	Time
(Rush TAT is subje	ct to laboratory approval and surcharg	10.)		i remiq	•	Uy	9				Date		Time		neceiv	eu by				Date	Time
Date results are nee	ded: ASAR			Relinq	uished	by					Date		Time		Receiv	ed by		<u>enekaran</u> Salaman		Date	Time
NAME OF THE PARTY	omoline @ ctmale	and the street of the street o		Relinq	uished	by					Date		Time		Receiv	ed by				Date	Time
	Package Options (circle if r	equired)		Relinq	uichod	hv	7.1				Date		Time		Receiv	od by				Date	Time
Type I (EPA Le Equivalent/non	A TOPA VI	(Raw Data	Only)	remiq	uloi IEÜ	Jy					Dale		111110		i iccelv	eu Dy				Date	Inne
Type III (Reduc	A CONTRACTOR OF THE PARTY OF TH	P TX1	TRRP-13			If yes	EDD Re	quire	d?	Yes	No					and the state	arreston. Di		nmercial Carı		
NYSDEC Cate	gory A or B MAMCF	Р СТІ	RCP			1.15	ecific QC	(MS/N	MSD/I	Dup)1	? Y	es	No			disamest)		ellusieses Sansieses	upon receipt		°C

(If yes, indicate QC sample and submit triplicate sample volume.)

CT RCP

MA MCP

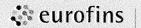
NYSDEC Category A or B

eurofins Lancaster Laboratories Environmental	Acct. #	37191				ncaster Lab												coc	#51	2677
Client Information	on					Matrix		T			A	naly	sis F	Requ	este	d		For Lab	Use Only	
Client:	Acct. #:	New State			Ш			1							odes			FSC:		
CT Male Associates	PWSID #:				9												ξ <u>.</u>	SCR#:_		
SLPP-Minimack	PWSID #:				Tissue	Ground Surface	6							50	P				servation	
Project Manager:	P.O. #:	67595275955275 5959547595758		949A 8888	匚	Gro	1		0	(3)	737		0	(90755M5	53.7mal)			H=HC N=HN		Thiosulfate NaOH
Kirk Moline	9	.6126			Ш		-1	ers	9378	0(09)	7	19	300.0)	Z	8.54.5			S=H ₂ S		Other
Sampler: STS Stephen Suhvison	Quote #:	14135			ment		740	ntain	-	-4	L	40	S	5				<u> </u>	Remar	ks
State where samples were collected: For Compliance:	No 🗆			site	Sediment	Potable NPDES	J.C	of Containers	V 0.4%	, Mar	13	+ 1102	504,	· .	Š					
Sample Identification	Colle	ected	g	Composite		Water	Other:	Total #	3	MS	2/1/	N03		411ks	57					
	Date	Time	Grab	ပ္ပ	Soil	Wa	<u></u>	P	r	9	桷			7						
Afsis							33)				SA)			N. N.				- T N		
Sh2-APOZ-64-65-170113	1/13/17	1244	X	90% 90%		N.		12	×	×	×	M	X	X	X			Fill	in his	-Alb.
TRIP Blank PFCs	date, and a	-					X	dinam					1, V/3, N 1, V/3, N		X			2.1	1745.	<u> </u>
SG2-EBWPO1-170113	13117	1424	×				×	2							X					14
342-EB PPOI - 170113	VIDIT	1,414	×				×	2							M			T N	<u> </u>	2 15
Tro Blank Voca	-			1878			M	27	X	(A)			V.)							
			(10)					24.2		1115				7.114 2.113	33.4					
	1 (2.18) (1.18) (1.18) (1.18)	100000000000000000000000000000000000000				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					101					Wij.				
					L.	i alama						9480 <u>1</u>				(48) -				
Turnaround Time (TAT) Requester Standard	N	le)		quished		// // // // // // // // // // // // //				Date	J17	Time		Recen	ed by				Date	Time
(Rush TAT is subject to laboratory approval and surchar	Rush			uished	- 3	7	rvedija. Jaganski	<u>Markara</u> Marakara	arteri	Date	4 · 4	Time		Receiv	ed by	<u> Maria</u>	in de la companie de La companie de la co		Date	Time
Date results are needed:			Relino	uished	by					Date		Time		Recei	ed by				Date	Time
E-mail address: Kimpline Oct	- 01 . 11) //	Dalla	uished	<u></u>	esse.				Date		T		5						
E-mail address: Finaline (C.C.) Data Package Options (circle if			Heinc	ausnea	ОУ					Date		Time		Hecen	ed by				Date	Time
Type I /EDA Level 2	Level 3 Type VI (Raw Data Only)							Name of the second		Date		Time		Receiv	ved by				Date	Time
Type-III (Reduced non-CLP) NJ DKC			If yes	EDD Re	quire	d?	Yes	No				or discourage.	nquist PS		. The extension of	nmercial Carr				
100000000000000000000000000000000000000			1			ecific QC	(MS/I	MSD/I	Dup)?	? Y	es	No	2002B		nasi Nadisi	Maria Maria		Y (100)	istances nesta	

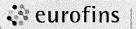
(If yes, indicate QC sample and submit triplicate sample volume.)

°C

Temperature upon receipt



Acct. #:	_ Grou	up #:					Sam	ple#:										COC#:	16303		
Client: C.T. Male Associates				1,50		Matrix						Aı	naly	ses l	Req	uest	ed			For Lab l	Jse Only
Project Name/#: SGPP - Merrimack	Site ID:											P	rese	rvat	ion	Cod	es			SF#: <u>28637</u>	<u>Z</u>
Project Manager: Kirk Moline	P.O. #:				Ħ	ace ace			Н	Ν	s									SCR#: <u>2002</u>	<u>80</u>
Sampler: Stephen Johnson STJ					Sediment	Ground			S				0 B)							Presen	vation Codes
Phone #: 7/5529 1670	Quote #:	214135			Sed			ers	E -	િ	(353.2)		1 232	mod.)						H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						pg SE			်ပွဲ	6010	3 (35	6	NS) q	537 r	570					N = HNO ₃	B = NaOH
	Colle	ection		Composite	M	Potable NPDES	ų.	Total # of Containers	TCL VOAs (8260C) + TICs	Ca, Mg, Na, K (6010C)	Total NO2 / NO3	CI-, SO4- (300.0)	Carb/Bicarb (SM 2320	(EPA	. 2,2 00	FCs	Moistone	0C		S = H ₂ SO ₄ O = Other	P = H ₃ PO ₄
Sample Identification	Date	Time	Grab	Com	Soil	Water	Other	Tota	Ā	Ca, N	Total	S '-iS	ALK +	16 PFCs	721	C	W			Re	marks
Shz-APOZ-3-5-170116	3-5-170116 /16/17 1145							5							X	Х	X	Х			
Shz- APOZ - 7-8-170116	416/17	0955	У		Х			5							Х	V	χ	X			
Sh2-4902-12-13-170116	416117	1033	Ŋ		X			5							Ж	Х	X	×			
Shz-4902-14-18-170116	1/16/17	1057	X		K			5							У	М	Х	Х			
562-4902-20-215-170116	416/17	16/17 1057 X X						5							У	M	X	Х			
Shz-AP03-68-69-170146	116/17	1422	X			Х		12	Ж	Х	y	×	Х	X						FILLIN	clus
Shz-AP04-27-28-170116	11417	1553	X			X		1)	Х	Ж	X	M	Х	Х							
Shz-APO4-34-35-170117	7/17/17	0417	Х			N		12	У	У	Х	×	Ж	Ж						Filter m	chals
Shz-APOY-44-48-170117	קוללול	1046	X			X	21	W.	X	У	X	×	X	X						M5/115B	j.
SGZ- FAOI-170117 APO4-34-35	17/17	eri establishi (Par	×	,		Х.		12	Х	W	M	×	y	Ж						Fills M	club
Turnaround Time Requested (TAT) (please	check): Stan	dard 🗌	RUS	нД	\$	nquished	by:				Date			Time		Rec	eive	d by:		Date	Time
(RUSH TAT is subject to Eurofins Lancaster Laborator	ies approval	and surcha	rges.)	,	and the second second	to /	<u> </u>			6612620510.441	9-17		8.239.000	16:4	8=820,791,853,791,95	D		J L		D-4-	T:
Date results are needed: E-mail address to send RUSH results:					1 Keiii	nquished	by.				Date			Time		Rec	eive	d by:		Date	Time
Data Package Options (please check if requi	red)				Reli	nguished	by:				Date	i i i i i i i i i i i i i i i i i i i		Time	;	Rec	eive	d by:		Date	Time
Type I (Validation/non-CLP) MA MC		TX TRRE	? - 13	П																	
					Reli	nquished	by:				Date	1		Time	•	Rec	eive	d by:		Date	Time
The state of the s	The second secon																				
	уре В 🗌				Relii	nquished	by:				Date			Time	•	Rec	eive	d by:		Date	Time
EDD Format: EQuIS			A :-1 "	ll No.:																	
If site-specific QC (MS/MSD/Dup) required, submit triplicate volume.	-specific QC (MS/MSD/Dup) required, indicate QC samples and								ial Ca	rrier: Othe	er			_		Ten	npera	ature	upon re	eceipt	°C



Acct. #:	_ Grou	.# qu					Sam	ple #:									_		COC#:	16303		
Client: C.T. Male Associates						Matrix						Aı	nalys	ses l	Req	uest	ed				For Lab U	se Only
Project Name/#: SGPP - Merrimack	Site ID:											P	rese	rvat	ion	Cod	es				SF#: <u>286377</u>	
Project Manager: Kirk Moline	P.O. #:				٦	l / pur	Natus		Н	Ν	S										SCR#: <u>20028</u>	<u>30</u>
Sampler: Stephen Johnson STJ		a service			Sediment	Ground Surface			Ø				0 B)								Preserva	ation Codes
Phone #: 7/5 529 1670	Quote #:	214135			Sed		#	ers	JE -	6	3.2)		1 232	mod.)							H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						es ES	72,	Itain	်	6010	35	ء ا	NS) q	537 r	5) @ <i>[</i>						N = HNO ₃	B = NaOH
	Colle	ection		Composite		Potable NPDES	r. P.Z.E.	I # of Containers	TCL VOAs (8260C) + TICs	Ca, Mg, Na, K (6010C)	Total NO2 / NO3 (353.2)	CI-, SO4- (300.0)	Carb/Bicarb (SM 2320	PFCs (EPA	1.2.2	シュー	Maishur	3			S = H ₂ SO ₄ O = Other	P = H ₃ PO ₄
Sample Identification	Date	Time	Grab	Com	Soil	Water	Other:	Total	고	Ca, №	Total	CF, S	ALK +	16 PF	701	4	//	1			Rer	narks
542-APOH 54-55-170117	2-APOH -54-55-170117 41717 1206					V		17	Х)d	Ж	Ж	X	М							Ella m	Lle
5hz-APO4-64-65-170117	MITHY	1429	1			X)			Х	Х	У	М	У	Ź							7 114	161(3)
Shz- APO4-74-75 -170118			Ý			1 V			У	M	Х	ý	X	У								
SGZ- APO4 - 83.5-84.5-170118	113/17 0843 Y 8 418/17 1057 X					W		12	Х	У	Х	χ	K	Х							FILM	chla
542- FB03- 170118	.,						2							X								
Shz- APO5-7-8-170118	1/18/17	1300	14		N		1000	5							Х	Х	Х	У			and the same of th	
Shz-A95-11.5-14.5-170118	418/17	1320	У		×			5							Х	X	Х	X				
S42-APU5-2-3-170118	418/7	1351	Х		У		1100	5							X	>o<	Х	X				
Shz 4A66-2,5-45-170118	118/17	1522	×		X			5							X	X	X	У				
SGZ - F202 -170118 APOS -11.5-14.5	VIBIT		K		X			5							Х	У	X	X				
Turnaround Time Requested (TAT) (please of				W		nquished	1				Date 4 ~ / l		100 No.	Time		Rec	eive	d by:	7		Date	Time
(RUSH TAT is subject to Eurofins Lancaster Laboratori Date results are needed:	es approval	and surcha	rges.)	•	 Discount (1) 	<u>∆</u> nquished					Date			Time		Rec	eive	d bv:			Date	Time
E-mail address to send RUSH results:							- , .															
Data Package Options (please check if requi	red)				Reli	nquished	by:		1000		Date	•		Time	•	Rec	eive	d by:			Date	Time
Type I (Validation/non-CLP)	:Р 🗌	TX TRRE	² - 13										*									
Type III (Reduced non-CLP) CT RC	Р 🗌				Reli	nquished	l by:				Date)		Time	3	Rec	eive	d by:	i.		Date	Time
Type IV (CLP SOW) ASP T			L.,																			
Type VI (Raw Data Only) ASP T			Keli	nquished	i by:				Date	•		Time)	Rec	eive	d by:			Date	Time		
EDD Format: EQuIS					Airbi	ll No.:		- 600														
If site-specific QC (MS/MSD/Dup) required, submit triplicate volume.	es and	le con		nquished b	y Cor Fed		ial Ca	rrier: Othe				_		Ten	npera	ature	upon	ı rece	eipt	°℃		

				-		
	P	Ш	ro	TI	n	C
-	•		, ,		3 8	_

For Eurofins Lancaster Laboratories Environmental use only

COC # 512678 **Lancaster Laboratories** Group # _____ Sample # ____ **Environmental Analysis Requested** Client Information Matrix For Lab Use Only Preservation Codes FSC: SCR#: Surface PWSID #: **Preservation Codes** H=HCI T=Thiosulfate P.O. #: N=HNO₃ B=NaOH Containers O=Other S=H2SO4 Sediment Quote #: Remarks Potable NPDES For Compliance: Composite Yes No 🗆 Soil Water Collected Grab Total Sample Identification Date Time SLZ-APO6-6-8-17011B MSMSM V18/17 VOCTOR Mark Received by Turnaround Time (TAT) Requested (please circle) 16:42 Standard Received by (Rush TAT is subject to laboratory approval and surcharge.) Relinguished by Date Time Received by Date results are needed: Relinguished by E-mail address: Received by Data Package Options (circle if required) Type I (EPA Level 3 Relinquished by Received by Type VI (Raw Data Only) Equivalent/non-CLP) EDD Required? (es) No Relinquished by Commercial Carrier: Type III (Reduced non-CLP) NJ DKQP TX TRRP-13 FedEx N If yes, format: ___ Site-Specific QC (MS/MSD/Dup)? NYSDEC Category A or B MA MCP CT RCP Temperature upon receipt (If yes, indicate QC sample and submit triplicate sample volume.)

eurofins |

Lancaster Laboratorie:

Acct. #	Gro	up #:		100			Sam	ple#:											COC#:	16303		
Client: C.T. Male Associates						Matrix						Ar	naly	ses l	₹eq	uest	ed				For Lab Us	se Only
Project Name/#: SGPP - Merrimack	Site ID:											Pi	rese	rvati	ion (Code	es				SF#: <u>286377</u>	
Project Manager: Kirk Moline	P.O.#:				۱ŧ	/ C 4	Ę		Н	N	s										SCR#: <u>20028</u>	<u>)</u>
Sampler: Stephen Johnson STJ					Sediment	Ground Surface	196		S				2320 B)								Preserva	ion Codes
Phone #: 7/5-529-16>0	Quote #:	214135			Sed		The water	ers) H	(၁	(353.2)		1 232	mod.)	3						H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						FIS E	22	Containers	ပွဲ	6010	3 (35	6	P (SM	537 r	Ŝ						N = HNO ₃	B = NaOH
	Colle	ection		Composite	团	Potable NPDES	F. PPCFAL	5	VOAs (8260C) + TICs	Mg, Na, K (6010C)	Total NO2 / NO3	SO4- (300.0)	Carb/Bicarb	PFCs (EPA	7.77	PFCs	Marchine	tor.			S = H ₂ SO ₄ O = Other	P = H ₃ PO ₄
Sample Identification	Date	Time	Grab	Com	Soil	Water	Other:	Total #	TCL \	Ca, M	Total	CI-, S	ALK +	16 PF	Ì						Rem	ıarks
Sh2-APO8-57-58-17019	U/9/17	1004	V			A		01	X	X	Ж	Ж	Ж	X		86		100.0				
Shz-AP08-67-68-170119	V19/17	1208	X			V		Γ_{ii}	X	X	X	W	М	М							MIMSY)	
Shz-AP08-77-78-170119	M19/17		V			V		1,1	X	×	У	W	W	X								
SAZ- FAO3-170119 APOB-67-68	V/19/17		Y			Źν			X	X	X	Ж	X	×								
Sh2-APOR-B1-B2-170120	1/20/17	V19/17 - X				X		12	Х	X	Х	Х	M	×						Sec. 3	F. HirMa	lak
-SUZ-AP09-25-3-170120	1/20/17	1118	Ж		X			5							X	X	X	X				
Sh2-AP09-6-8-170120	1/20/17	1129	×		N	Sept.		5							X	Х	×	Х				
Sh2-APO9-11-12-170120	1/20/17	1224	Х			Х		12	Ж	M	X	M	М	X							Filher Ma	lals
ShZ-FB03-170120	y 20/17	1420	X			,	X							X								
PFC Topblank	-		N				X							X		4						
Turnaround Time Requested (TAT) (please	check): Star	dard	RUS	нД		nquished		1			Date			Time		Rec	eive	d by:			Date	Time
(RUSH TAT is subject to Eurofins Lancaster Laborator	ries approval	and surcha	rges.)	<u>/.</u>	000000000000000000000000000000000000000	Steph	23/04/2017/05/19	Wy			20/1			72	Carlo Va	<u></u>		J L			Dete	Time
Date results are needed: E-mail address to send RUSH results:					Keili	nquished	by:				Date			Time		Rec	eive	d by:			Date	Time
Data Package Options (please check if requ	ired)			100	Relin	nquished	by:	*			Date			Time	•	Rec	eive	d by:			Date	Time
Type I (Validation/non-CLP) MA Mo		TX TRRP	- 13	П																	16	
Type III (Reduced non-CLP) CT RC		77 1144			Relin	nquished	by:		, in		Date			Time		Rec	eive	d by:			Date	Time
Type IV (CLP SOW) ASP																						
Type VI (Raw Data Only)			Reli	nquished	by:				Date			Time		Rec	eive	d by:			Date	Time		
EDD Format: EQuIS																						
If site-specific QC (MS/MSD/Dup) required, submit triplicate volume.	j		l No.: quished b	y Con Fedi		cial Ca	rrier: Othe	er			-		Tem	pera	ature	upon	ı reci	eipt	°C			

Lancaster Laboratories Environmental	Acct. #	57/9/				ncaster Labo												C	OC:	# 51	.883!	5	
Client Information			Matrix				Analysis Requested										Use Only						
Client: Acct. #:									Preserva					tion Codes					FSC: SCR#:				
Project Name/#: Sheff-Mennimack	PWSID #:				Tissue	Ground Surface													Construction of the Constr		n Codes =Thiosulfat	ie	
Project Manager: **Link* Malina**	P.O. #:					© 0	<	ST.	378										N=HN0 S=H ₂ S	-	B=NaOH D=Other		
Sampler: Quote #: 2)			2/4/35				70	Itain	THE COLUMN)									HANNESS IN	Rema	ırks		
State where samples were collected: For Compliance: Yes	No 🗆			site	Sediment	Potable NPDES	18 NA	Total # of Containers	SAOV														
Sample Identification	Collected		ه ا	Composite		Water	Other:	tal #	7														
	Date	Time	Grab	ပိ	Soil		ᅙ	P															
VOC Trip Blank	ganaraguer	*GROSSING .		is.		M	ĻX	12	X		8Y).			(())		\$\$)						Ů.	
			 										AND AND										
					MAA. Jack					ENEN			N. S.			NA NA				AND AND SA		di Ala	
<u>an dan dibengka balan dan dan dan dan dan dan dan dan dan d</u>		F883 (53.54)					1000 1000 1000 1000										3334 3339			<u>albanawas</u> Basanas V			
							1000. 1000.		DE T		(3.5) (3.1)		11 V VV/11				110						
							Harry Harris					NO.											
										NO.											and the same of th		
Turneround Time (TAT) Requested	<u> </u>	1-1	Relino	quished	by 1					Date		Time		Receiv	ed by					Date	Time		
Turnaround Time (TAT) Requested Standard	(piease circ	ie)				mal A					917	172	28	riccor	cu by					Date	Tane		
(Rush TAT is subject to laboratory approval and surcharg	je.)		Relind	quished	by \					Date		Time		Receiv	ed by					Date	Time		
Date results are needed:		_	Relina	quished	i by					Date	Date Time			Received by						Date	Time		
E-mail address:			Relina	quished	by	y				Date		Time	(1866 - 1870)	Receiv	red by					Date	Time	WV	
Data Package Options (circle if r	equired)																						
Type I (EPA Level 3 Equivalent/non-CLP) Type VI	(Raw Data	Only)	Reline	Relinquished by Date Time Receiv									Received by					Date	Time				
Type III (Reduced non-CLP) NJ DKQ	P TX	TRRP-13			If yes	EDD Red	quire	d?	Yes	No				110004000000			a. Nombre var		mercial Carrier: x Other				
NYSDEC Category A or B MA MCF	CT	RCP			Marine Carlo	ecific QC (developen.		A Charles of F			: 60 88 (B18)			Te	mpei	rature	upor	n receipt _		°C		

CT RCP

MA MCP

NYSDEC Category A or B

💸 eurofins	Lancaster Laboratories Environmental	Acct. #	37 [9]				caster Labo							<u>.</u>					C	OC :	# 51	8836			
				Matrix	3333			Analysis Requested						d			For Lab U	· Lab Use Only							
CT Male /	Associalis	Acct. #:			Tissue				(475) hi	Preserva				on C	odes	laven e			FSC: SCR#:						
Project Name/#: Shapp - Manni mack PWSID #:			PWSID #:				Ground Surface	è		1227	ري ا	2)	مدر.	Gallera	(jpa					CONTROL DE SERVICIO		n Codes Thiosulfate			
Project Manager:	P.O. #:	P.O. #:				<u>ଜ</u> ୁ ଅ	John	of Containers	1	(50 loc)	2	500.0		\$Timod,					N =HNC S =H ₂ S(=NaOH =Other					
Sampler:	Quote #: 214135						Free In		(2002)	Z) SØK	Š	My carb	3						Remar					
State where samples were	collected: For Compliance: Yes	No □			site	Sediment	Potable NPDES	X	of Co) * * C	My, Na,	10x	Soul		7										
Sampl	le Identification	(Allen en en en en	ected	Grab	Composite	Soil	Water	Other:	Total #	3	* 'Š	toki	C1 -:	4171	0.										
S42-A109-1	7-12-170123	Date	Time 0842	W		S	<u>></u>				NΛ	V		У	X										
562-1109-3		V23/17		X	Vi		Ŵ		93	У	Ś	×	X	X	X										
542-A109-4		V23/17	Same and the same	N	61A.	N.	ν)		9.3	W	X	Ж	×	У	X		No.				ń.Wardy	\$1700 Kilono			
342-1109-56		YZ3/17	1419	У	SEC.		V	18.55	1/1	×	Х	У	M	×	M			AN.							
Sh 2-AP09-65		Y23/17	1	V			ŞÕ		against a	70	20	-x0	M	X	K			33			TANKENIN.				
Sh2- FB05-		V/24/17	0822	W				M	2	N.A.			/(A)	0.0	X					MANAGANA.					
SAZ-EBDW	**************************************	V24/17	0825	M			STATE SA	M	2	MA				10 () () () () () () () () () (×				1888						
SUZ- EBSW	N 1 5 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7	V24/17	0827	X				y	2			Silv.			Х				\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\						
5LZ- EBWPC		V124/17	0842	У				X	2						X										
342-EBPPO		Y24/17	0653	X	1/1/2			M	2	MAN			NVV.		X			N/A	1000	VIOLENIA RIA					
Turnaround Time (TAT) Requested (please circle) Standard Rush					9	hed by					Date		Time 13	.25	Received by				D	Date	Time				
(Rush TAT is subje	ect to laboratory approval and surchar	ge.)		Relind	quished						Date		Time		Received by						Date	Time			
Date results are needed:					quished	i by					Date		Time		Received by					Date	Time				
E-mail address:					quished	l by	by				Date		Time		Received by				Date		Time				
Type I (EPA Level 3 Equivalent/non-CLP) Topata Package Options (circle if required) Type VI (Raw Data Only)					Relinquished by						Date Time			Received by					and the	Date	Time				
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13						EDD Required? Yes No If yes, format:											Relinquished by Commercial Carrier: UPS FedEx Other								
					Si	te-Sp	ecific QC	(MS/I	MSD/	Dup)'	? Y	es	No	100											

(If yes, indicate QC sample and submit triplicate sample volume.)

°C

Temperature upon receipt _

NYSDEC Category A or B

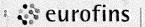
MA MCP

CT RCP

eurofins Lancaster Laboratories Environmental	Acct. #	37191				ncaster Lab						osale is					C	OC :	 #51	8925
Client Informat	ion	\$5505t005\$				Matrix			l T		A	naly	sis F	Requ	este	d	visiakyvisti s	For Lab U	se Only	
Client:	Acct. #:					風口						Pres	ervat	ion C	odes	1111111111		FSC:	\$16 15 (V)	
CT/luk Hosoerales Project Name/#:	DWOID #				Tissue	Control Street (St. 1997)							2	Sister.	-		19	SCR#:		
SCPP-Menrimack	PWSID#:	PWSID #: P.O. #:				Ground	1		TES	3	3	~	6m13700	37 mg)				Pres H=HCI	ervation T=	Codes Thiosulfate
Project Manager: Kink Malins	P.O. #:] Su	200	S	To	20105	(2532)	(500.0)	b Emi	3.0				N =HNO ₃ B =NaO S =H ₂ SO ₄ O =Othe		
Sampler: Stephen Ichuson ST	Quote #:	Quote #: 214135			ment	ြ မြ	San I	ntaine	3260		100%		16:00h	Maria (2006 1966 1968)						ks
State where samples were collected: For Compliance: Yes				site	Sediment	Potable NPDES	PFCFALL	of Containers	3) Ses	My, N.	Non	, 504	4 (216	27						
Sample Identification	Colle	ected	g g	Composite	Soil	Water	Other:	Total#	761	6	-6	15	111	_						
	Date	Time	Grab	ပိ	So	≥			-	U	ţ		li e							
ASLZ-APOG-70-71-170125	432/17	1038	X			V		12	X	X	X	X	X	V				FIN	Meda	1/5
Triablink PFCs	Sequence of the second		¥	1935 1937			M	genreprote						X						
Trib Blank VOCS	E		y	NA.		\$7.00 B.W.	X	2	V								e e			
				200		1144519			6											
			194			1000										88				
											3146						182 383			
								888				W.).		0.90 8486		SA I	849. Nije			
			6.75 Vo.			SECTION.											85.			1 D 2 D 2 D 3 D 3 D 3 D 3 D 3 D 3 D 3 D 3
															100 L					
						(48/48/48/4								1811A				AND NOTES	(Mariana)	
 Turnaround Time (TAT) Requeste 	d (please circ	le)		luished		١ ١				Date		Time		Receiv	ed by				Date	Time
	Rush)			top.		1/w_				9	5/17	13:	25							
(Rush TAT is subject to laboratory approval and surch	rge.)		Reling	luished	i by 🧏					Date		Time		Receiv	ed by				Date	Time
Data routh as pooded.					Relinquished by							Time	NEW Y	Receiv	ed by				Date	Time
Date results are needed:					. Compatible by							Time								
E-mail address: Relinquis					by	Minimum (Waysii ^s	Date		Time		Receiv	ed by				Date	Time
Data Package Options (circle i	required)																			
Type I (EPA Level 3 Equivalent/non-CLP) Type V	'I (Raw Data	Only)	Reling	Relinquished by Date Time Received by										Date						
Type III (Reduced non-CLP) NJ DK	QP TX	TRRP-13			If vee	EDD Re		d? <i>ባ ሴ</i> : «		No				edicariotic in				rcial Carrie		i di
NNOSEO O COMPANIONE DE LA LA LA			100000	11 13 14 15 15 15		ecific QC		8.62		Y	es	- No	6 (5) (6) (6)	J.	<u> </u>		- Gull	A Care		<u></u>

(If yes, indicate QC sample and submit triplicate sample volume.)

Temperature upon receipt



Laboratories

Lancaster Environmental Services Analysis Request/Chain of Custody

COC#: 16237 Acct. #: 37191 Sample #: Group #:

Client: C.T. Male Associates						Matrix	(Analyses Requested						For Lab Use Only					
Project Name/#: SGPP - Merrimack	Site ID:]					Pı	reservat	tion	Code	es			SF#: <u>266803</u>	
Project Manager: Kirk Moline	P.O.#:	16.6126			ŧ	ge ag													SCR#: <u>1999</u> 6	<u>86</u>
Sampler: Stephen Johnson STJ					Sediment	Ground													Preserva	ation Codes
Phone #: 7/5 529 1670	Quote #:	214135			Sec]	ers			d.)	D422)							H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						lble ES		Containers		<u></u>	7 mod.)	(ASTM E							N = HNO ₃	B = NaOH
	Colle	ction		Composite	\Box	Potable NPDES		ф #	(5310 B)	ıre (2540	(EPA 537	Size							$S = H_2SO_4$ O = Other	P = H ₃ PO ₄
Sample Identification	Date	Time	Grab	E	Soil	Water	Other:	Total	δ 5	Moisture	PFCs	Grain							Rer	marks
Sh2-APO2-25,7-26.5-170116	1/16/17	_	K		M							X								
SLZ-Afoz - 27-28.4-170116	VIU/17	-	У		X			1				X								
Shz-APOS-5NS-27.6-29.8-170118	V18/17	-	N/A	X	Х			1				У								
562-APO9-FS-14.1-17-170120	1/20/17	******		X				1				V.								
SGZ-APO9-34-35-170123	Y23/17)	V		V							X								
<u> </u>																				
																				T
Turnaround Time Requested (TAT) (please				HM	Reli	nquishe	d by:	,52		,/	Date /	17	Tim. 10.3		411	eive	1		Date	Time
(RUSH TAT is subject to Eurofins Lancaster Laborator Date results are needed:	ies approval a	and surcha	rges.)		Reli	nguishe	d by:				<i>⊘//</i> Date	/	Tim	3021/001802589	00 000000000000000000000000000000000000	₩// eiv e c			VIZ/I7 Date	15:05 Time
E-mail address to send RUSH results: Kamala	J a chu	ali irina				Jan Jan		No.		1/2	5/1	7	13.2							
Data Package Options (please check if requi		-1.C1C-01	•		Reli	nquishe	d by:	1 1 1 1 1 1			Date		Tim	е	Rec	eived	by:		Date	Time
Type I (Validation/non-CLP)	CP □	TX TRRE	² - 13															12814.0		
Type III (Reduced non-CLP)					Reli	nquishe	d by:				Date	•	Tim	е	Rec	eived	l by:	e de la companya de l	Date	Time
	Гуре А 🔲				Doli	nauiaha	d bu				Doto		Tim	_	Boo	eivec	bur		Date	Time
Type VI (Raw Data Only)	Гуре В 🗌				Treii	nquishe	u by.				Date		1 1/11	U	rec	eivec	ı by.		Date	Time
¥ /						ll No.:				<u> </u>										
site-specific QC (MS/MSD/Dup) required, indicate QC samples and ubmit triplicate volume.			ť	Relinquished by Commercial Carrier: UPS FedEx Other					Temperature upon receipt°C											
-			•										200000	econocionis Servicio					7.7	

se print or type. (Form de	signed for use on elite 1. Generator ID Nun	nber		2. Page 1 of	3. Emergency Respon	se Phone	4. Manifest	Tracking Nur	mber	Station The	STATE OF
WASTE MANIFEST	0	2746778	3	1	(800) 483		00	Tracking Nur 1990	311	.8 F	LE
Merrintack NI Generator's Phone: (60)	bster Highway I 03054 31420-9000	ATTN:Kim W	Vecks		Generator's Site Addre	ss (if different ti	han mailing addre	ss)			
6. Transporter 1 Company N		Service, Inc.				R	U.S. EPA ID I	Number	3222	250	
7, Transporter 2 Company N	lame						U.S. EPA ID I	Number		- 1	
8. Designated Facility Name Clean Harbors 37 Rumbery Ro South Portland Facility's Phone:	Environmental ad					V.	U.S. EPAID N	Number	6721	182	
9a. 9b. U.S. DOT Descr HM and Packing Group	iption (including Proper S (if any))	hipping Name, Hazard	Class, ID Number,		10. Cont No.	ainers Type	11. Total Quantity	12, Unit Wt./Vol.	13. V	Waste Code	s
1. NON HAZA	RDOUS, NON E	OT REGULA	TEO LIQUID), (WATER	n (G)	7-1-	748	16-	7 53		
2.								-			
3.		5			-						-
4. 14. Special Handling Instruct 1. CH1240206	p.		the contents of this	s consignment a	re fully and accurately o	lescribed above	a by the proper ship	inning name	and are class	sified nack	aned
14. Special Handling Instruct 1. CH1340306 15. GENERATOR'S/OFFE marked and labeled/pla Exporter, I certify that it	ROR'S CERTIFICATION carded, and are in all res the contents of this consigninimization statement id Typed Name	: I hereby declare that to pects in proper conditionment conform to the te entified in 40 CFR 262.2	on for transport according to the attached	ording to applicate the second of the second	able international and na edgment of Consent. erator) or (b) (if I am a sn eature	ational governm nall quantity ge	nental regulations.	If export ships	ment and I a	m the Prim	Yea
14. Special Handling Instruct 1. CH1 3 40 20 6 15. GENERATOR'S/OFFE marked and labeled/pla Exporter, I certify that the I certify that the waster	ROR'S CERTIFICATION carded, and are in all res the contents of this consigninimization statement Id	: I hereby declare that pects in proper conditionment conform to the teentified in 40 CFR 262.2	on for transport according to the attached	ording to applicate the second of the second	able international and nadgment of Consent. rator) or (b) (if I am a snature	nall quantity ge	nental regulations.	If export ships	ment and I a	m the Prim	Yea
14. Special Handling Instruct 1. CH 1.2 40 20 6 15. GENERATOR'S/OFFE marked and labeled/pla Exporter, I certify that the I certify that the waste of Generator's/Offeror's Printed	ROR'S CERTIFICATION carded, and are in all res le contents of this consigninimization statement id Typed Name Import to ports only):	: I hereby declare that pects in proper conditionment conform to the teentified in 40 CFR 262.2	on for transport according to the attached	ording to applicated EPA Acknowledge quantity gene	able international and nadgment of Consent. rator) or (b) (if I am a snature	nall quantity ge	nental regulations.	If export ships	ment and I a	m the Prim	Yea
14. Special Handling Instruct 1. CH1.24006 15. GENERATOR'S/OFFE marked and labeled/pla Exporter, I certify that th I certify that the waste of Generator's/Offeror's Printed 16. International Shipments Transporter signature (for ex	ROR'S CERTIFICATION carded, and are in all res to contents of this consigninimization statement id Typed Name Import to ports only): Lent of Receipt of Material Name A. Man	: I hereby declare that pects in proper conditionment conform to the teentified in 40 CFR 262.2	on for transport according to the attached	ording to applic d EPA Acknowle ge quantity gene Sign Export from U	able international and nadgment of Consent, rator) or (b) (if I am a snature	nall quantity ge	nental regulations.	If export shipr	ment and I a	th Day	Yea Yea 16
14. Special Handling Instruct 1. CH1.2 40 206 15. GENERATOR'S/OFFE marked and labeled/pla Exporter, I certify that th I certify that the waste of Generator's/Offeror's Printed 16. International Shipments Transporter signature (for ex 17. Transporter Acknowledgm Transporter 1 Printed/Typed I	ROR'S CERTIFICATION carded, and are in all res to contents of this consigninimization statement id Typed Name Import to ports only): Lent of Receipt of Material Name A. Man	: I hereby declare that i pects in proper conditio nment conform to the te entified in 40 CFR 262.2 U.S.	on for transport according to the attached	ording to applic d EPA Acknowle ge quantity gene Sign Export from U	able international and nadgment of Consent. rator) or (b) (if I am a snature S.S. Port of a Date lea	nall quantity ge	nental regulations, nerator) is true.	If export shipr	Mont	th Day	Yea Yea 16
14. Special Handling Instruct 1. CH 1. 2 4 0 2 0 6 15. GENERATOR'S/OFFE marked and labeled/pla Exporter, I certify that th I certify that the waste of Generator's/Offeror's Printed 16. International Shipments Transporter signature (for ex 17. Transporter Acknowledgm Transporter 1 Printed/Typed I	ROR'S CERTIFICATION carded, and are in all res the contents of this consigninimization statement id Typed Name Import to ports only): tent of Receipt of Material Name	: I hereby declare that the pects in proper conditionment conform to the teentified in 40 CFR 262.2 U.S.	on for transport according to the attached	ording to applic d EPA Acknowle ge quantity gene Sign Export from U	able international and nadgment of Consent. rator) or (b) (if I am a snature S.S. Port of a Date lea	nall quantity ge	nental regulations, nerator) is true.	If export ships	Mont	th Day	Yea Yea
14. Special Handling Instruct 1. CH1.3 40 30 6 15. GENERATOR'S/OFFE marked and labeled/pla Exporter, I certify that th I certify that the waste r Generator's/Offeror's Printed 16. International Shipments Transporter signature (for ex 17. Transporter Acknowledgm Transporter 1 Printed/Typed I Transporter 2 Printed/Typed I 18. Discrepancy	ROR'S CERTIFICATION carded, and are in all res the contents of this consigninimization statement id Typed Name Import to ports only): tent of Receipt of Material Name Quantity Quantity	: I hereby declare that the pects in proper conditionment conform to the teentified in 40 CFR 262.2 U.S.	on for transport accerms of the attache 27(a) (if I am a larg	ording to applic d EPA Acknowle ge quantity gene Sign Export from U	able international and nad generated from the consent. I arrator) or (b) (if I am a smalture) I.S. Port of a Date lead atture	nall quantity ge	mental regulations, nerator) is true.	If export ships	Mont	th Day	Yea Yea
14. Special Handling Instruct 1. CH 1. 2 4 0 2 0 6 15. GENERATOR'S/OFFE marked and labeled/pla Exporter, I certify that th I certify that the waste of Generator's/Offeror's Printed 16. International Shipments Transporter signature (for exporter 1 Printed/Typed International Pri	ROR'S CERTIFICATION carded, and are in all respective to this consignification statement id Typed Name Import to ports only): Lent of Receipt of Material Name A. Man Space Quantity Description:	: I hereby declare that the pects in proper conditionment conform to the teentified in 40 CFR 262.2 U.S.	on for transport accerms of the attache 27(a) (if I am a larg	ording to applic d EPA Acknowle ge quantity gene Sign Export from U	able international and nad generated from the consent. In the consent of Consent. In the consent of the conse	nall quantity ge	Partial Reje	If export ships	Mont	th Day th Day th Day Full Rej	Yeary Yeary Yeary Yeary Yeary
14. Special Handling Instruct 1. CH 1.2 40.006 15. GENERATOR'S/OFFE marked and labeled/pla Exporter, I certify that th I certify that the waste of Generator's/Offeror's Printed 16. International Shipments Transporter signature (for exporter 1 Printed/Typed International Shipments Transporter 2 Printed/Typed International Shipments 18. Discrepancy 18. Discrepancy 18. Discrepancy Indication Shipments 18. Discrepancy Indication Shipments 18. Discrepancy 18. Discrepancy Indication Shipments 18. Discrepancy Indication Shipments 18. Discrepancy Indication Shipments 18. Discrepancy Indication Shipments	ROR'S CERTIFICATION carded, and are in all residence of this consigninimization statement id Typed Name Import to ports only): eent of Receipt of Material Name A. Mary Name Cipace Quantity nerator) Management Method Co	: I hereby declare that pepers in proper conditionment conform to the telentified in 40 CFR 262.2 U.S. Is U.S. John March S John March S	on for transport accerms of the attache 27(a) (if I am a larg	ording to applic d EPA Acknowle ge quantity gene Sign Sign Sign Sign	able international and nadigment of Consent, rator) or (b) (if I am a snature S. Port of e Date lea ature Residue Manifest Reference	nall quantity ge	Partial Reje U.S. EPA ID N	If export ships	Mont Mont Mont	th Day th Day th Day Full Rej	Yeary Yeary Year Year
14. Special Handling Instruct 1 CH1 2 40 0 6 15. GENERATOR'S/OFFE marked and labeled/pla Exporter, I certify that th I certify that the waste of Generator's/Offeror's Printed 16. International Shipments Transporter signature (for ex 17. Transporter Acknowledger Transporter 1 Printed/Typed International Shipments Transporter 2 Printed/Typed International Shipments 18. Discrepancy	ROR'S CERTIFICATION carded, and are in all respective to this consigninimization statement id Typed Name Import to ports only): uent of Receipt of Material Name A. Mar Mare A. Mare	: I hereby declare that pepers in proper conditionment conform to the telentified in 40 CFR 262.2 U.S. Is U.S. John March S John March S	on for transport accerms of the attache 27(a) (if I am a larg	ording to applic d EPA Acknowle ge quantity gene Sign Export from U Sign	able international and nadigment of Consent, rator) or (b) (if I am a snature S. Port of e Date lea ature Residue Manifest Reference	nall quantity ge	Partial Reje	If export ships	Mont Mont Mont	th Day th Day th Day Full Rej	Yea Yea Yea

TR 2130

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 1 1 6035 3 609 001

SCPPW 11/29/2016

Form Approved. OMB No. 2050-0039

1		FORM HAZARDOUS	Generator ID Number	1	2. Page 1 of				4. Manifest	Tracking N	umber	0 5	-1 -
		ASTE MANIFEST enerator's Name and Mailin	NHD982746778		1 _)) 483-0		UU	336	1277	.y r	LE
	7 N Gene	laint Gobain '01 Daniel Web Aerrimack, NH C rato's Phone: (GO3)	ster Highway 33054 420-9000 ATTN-Kim Wee	ks		SAM		(if different t	han mailing addres				
ı		ansporter 1 Company Nam							U.S. EPA ID N		anner ber	uschdage des	
1	-	Insporter 2 Company Nam	nvironmental Service, Inc.	100					U.S. EPAID N		322	250	
	7. 110	maportor 2 company Nam							U.S. EFAID I	iumber			
	Ci	signated Facility Name an Lean Harbors Er 7 Russery Road outh Portland, I lys Phone:	rvironmental Service, Inc.						U.S. EPAID N		672:	182	
	9a. HM	9b. U.S. DOT Description and Packing Group (if a	on (including Proper Shipping Name, Hazard Class any))	s, ID Number			10. Contai	ners Type	11, Total Quantity	12. Unit Wt./Vol.	13.	Waste Code	s
GENERATOR -			DOUS, NON D.O.T. REGULATER) LIQUII	D, (WATER)		77	0754	G	V V		gv 2
- GEN		2.	Y —				r				10 20		
		3.											1 m
		4.									V III		
	15. C	marked and labeled/placar Exporter, I certify that the o	R'S CERTIFICATION: I hereby declare that the creded, and are in all respects in proper condition for contents of this consignment conform to the terms imization statement identified in 40 CFR 262.27(a)	transport ac	cording to applicated EPA Acknowle	able interna	tional and nati Consent.	onal governn	nental regulations.	pping name If export shi	, and are clas	sified, pack	aged, ary
1	Gener	ator's/Offeror's Prigted/Typ	MGAND (AS AGOTT	Fre	Sign	atyre /	V	*			Mon		Year
INT		ternational Shipments sporter signature (for expor	Import to U.S.	1	Export from U	.S.	Port of en		- 20	1011	विकास मान्य	4	Sept.
-		ansporter Acknowledgment			- 4		Date loavi	ing 0.0	100		4		
TR ANSPORTER	Transp	porter 1 Printed/Typed Nam porter 2 Printed/Typed Nam	TULLER		Sign Sign	ature	e R	d	ullew		Mon Mon	200	Year Year
R							200	-					
†	18. Dis	screpancy	1	7									Î
	18a. D	Discrepancy Indication Spa	ce Quantity	Туре			Residue est Reference	Number:	Partial Reje	ection		Full Reje	ection
DESIGNATED FACILITY		Itemate Facility (or Genera	ator)						U.S. EPA ID N	umber			#41 #
DF		y's Phone: Signature of Alternate Facili	ity (or Generator)	Here's			-		-		Мо	nth Day	Year
NATI							87.0037.2020-302		7-1		1	1	T
Sic			anagement Method Codes (i.e., codes for hazardo	us waste trea		and recycli	ng systems)		4.				
<u>-</u>	1. 1	H135	2.		3.								
			r Operator: Certification of receipt of hazardous ma	aterials cove			s noted in Item	n 18a				4 5	Vac
	Printed	d/Typed Name			Sign	ature					Mor	nth Day	Year

I N SI SI		*	NN 1602	NACORE	100	ce pp	W 11/2	o PATE	Ti	-L Z1	31
ase print or type.	(Form design	gned for use on elite (12-pitch) typewrite	r.)	2 Page 1 of	3 Em	ergency Respor	250 250 4100 1500		Form A	Approved. ON	IB No. 2050
UNIFORM HAZ		NHD982746778		2. rayo roi		00) 483		00	Tracking Num 990	3121	FL
5. Generator's Na	me and Maili	ng Address		- A-				than mailing addre		J + Li.	1 -
Saint Go		. 11.4									
Merrima		ster Highway			SA	N9E					
Generator's Phon	e: (603)	420-5000 ATTN:Kim W	eeks								
6. Transporter 1 C						7		U.S. EPA ID	Number		
7. Transporter 2 C		nvironmental Service, Inc.	-					MAI	00393	32225	0.
7. Hallsporter 2 C	ompany Nan	is .						U.S. EPA ID	Number		
8. Designated Fac	cility Name ar	nd Site Address			-			U.S. EPA ID	Number		
Clean Ha 37 Rume	rbors E	nvironmental Service, Inc.							39806	7218	2
9a. 9b. U.S. I	OT Descripti	on (including Proper Shipping Name, Hazard C	Class, ID Number	r,		10. Cont	ainers	11, Total	12. Unit		
	ing Group (if	any))				No.	Туре	Quantity	Wt./Vol.	13. Wast	e Codes
1. NON	HAZAR	DOUS, NON D.O.T. REGULAT	ED LIQUI	D, (WATER	1)	001	TT	B003	G		
2.			- 4			1	1	0003			
2.											
						1.1					
3.			-11-				1				_
							1		-		
4.											
						1				73	
14. Special Handli	ng Instruction	s and Additional Information			_		_				
1.CH134	02068										
a contract .	W. S. W. S. S.										
marked and I Exporter, I ce	abeled/placar rtify that the o	R'S CERTIFICATION: I hereby declare that the ded, and are in all respects in proper condition contents of this consignment conform to the terimization statement identified in 40 CFR 262.2	for transport ac ms of the attach	cording to applicated EPA Acknowle	able inte	mational and na of Consent.	ational govern	mental regulations			
Generator's/Offero	r's Printed/Ty	ped Name A LATIT FORCE	, (a) (ii i biii a iai	Sign	ature	Agua	FIT TO	5	_	Month	Day Ye
For	s u	JEST		1	-	Bas	14	Lut		1/21	06/1
16. International Sh		Import to U.S.	11/1	Export from U	1.0		entry/exit:				
Transporter signat	ure (for expo	The state of the s					ving U.S.:				
Contract to the second		t of Receipt of Materials	19 30								
Transporter 1 Print				Signa	ature	7	1. 1.	_		Month	Day Ye
Transporter 2 Print	63	WEST		Sign	ature	Sour	ulu			Month Month	06 11
Hansporter 2 Film	eu/Typed Nai	116	1.17	l J	ature		175			1 1	l l
18. Discrepancy					-	W-12E	-				_
18a. Discrepancy I	ndication Sna	re			-	7.					
roe. Disaropanoj il	nanounon opo	Quantity	Туре		_	Residue		Partial Rej	ection	LJF	ull Rejection
					Ma	anifest Reference	e Number:				
18b. Alternate Faci	lity (or Gener	ator)						U.S. EPA ID N	lumber		
Facility's Phone:											
18c. Signature of A	Itemate Facil	ity (or Generator)								Month	Day Y
46 (1)		ine in a second	and a contract of	almost discuss		ualian material					
	ste Report Ma	anagement Method Codes (i.e., codes for haza 2.	ardous waste trea	atment, disposal,	and rec	yoling systems)		4.			
1. H135		4		0.				,			

Printed/Typed Name

Signature

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Please	print or type. (Form desig	gned for use on elite (12-pitch) type	ewriter.)NH 1603	3534608	001 SCPP	W 11/25		Form A	pproved. OMB	No. 2050-0039
↑ U	NIFORM HAZARDOUS	Generator ID Number		2. Page 1 of	3. Emergency Respo		4. Manifest	Tracking Num	3123	
5.	WASTE MANIFEST Generator's Name and Maili	NHD9827467 ng Address	7.8	1.	Generator's Site Addre		han mailing addre	ss)	1160	FLE
	Saint Gobain					, amoroni	The tribing door			
Ш	701 Daniel Web Merrimack, MH (SAME					
Ge	enerator's Phone: (603)	420-9000 ATTN-Kir	m Weeks							
6.	Transporter 1 Company Nan						U.S. EPA ID I			W.
7.	Transporter 2 Company Nan	nvironmental Service, II	nc.				U.S. EPAID N		2225	0
							1			
8.	Designated Facility Name an	nd Site Address					U.S. EPA ID N	Number		
	Clean Harbors Er 37 Rumery Road South Portland, I cility's Phone:	nvironmental Service, la ME 04106	10.				MEE	9806	7218	2.
9a		ion (including Proper Shipping Name, H	azard Class ID Numbe	ar .	10, Con	tainers	44 7-141	40.11-3		
HN		any))	azaro olaso, is manico		No.	Туре	11. Total Quantity	12. Unit Wt./Vol.	13. Waste	Codes
GENERATOR	1. NON HAZAR	DOUS, NON D.O.T. REGI	ILATED LIQUI	D. (WATER	001	TT	4450	6 -		
SENC	2.						1			
ÌL										
	3.							3.0		
L	4.						-			
	7							-		
1	Secial Headler Leatership	ns and Additional Information			-33					
15.	marked and labeled/placar Exporter, I certify that the	R'S CERTIFICATION: I hereby declared, and are in all respects in proper contents of this consignment conform to imization statement identified in 40 CFF ped Name	ondition for transport ac the terms of the attach 2 262 27(a) (if I am a la	ccording to applic ned EPA Acknow arge quantity gen	able international and nedgment of Consent. erator) or (b) (if I am a sinature	ational governm	nental regulations.	ipping name, ar If export shipm	ent and I am the Month	Primary Day Year
	Hov	LEST.		- 1	60	xes di	les+		1/2/	07/16
=	International Shipments	Import to U.S.		Export from I	J.S. Port of	entry/exit:				
	ansporter signature (for exporter Acknowledgmen				Date lea	aving U.S.:				
	nsporter 1 Printed/Typed Nar	me		Sigi	pature Dan.	1. 1	1		Month	Day Year
	nsporter 2 Printed/Typed Nar	ob West		Sin	nature .	U Cu	-		Month (Day Year
Z III	risporter 2 Printed/Typed Nat	THE .		I	iaturo				1 1	l lear
_	Discrepancy									
18a	, Discrepancy Indication Spa	ace Quantity	Туре		Residue		Partial Reje	ection	Ful	Rejection
				2						
188	. Alternate Facility (or Gener	ator)		-	Manifest Referen	ce Number:	U.S. EPA ID N	lumber	_	_
3	10 mm - 10 mm	TO WORK					- Control of the Cont			
Fac	cility's Phone:									
180	Signature of Alternate Facil	ity (or Generator)			31116				Month I	Day Year
18t 18t 18t 19.	Hazardous Wasta Report Mi	anagement Method Codes (i.e., codes fi	or hazardous waste tre	eatment, disposal	and recycling systems					
1.	H135	2.	7000	3.	J. J. of all of the	15.	4.			
-	B	0	manda in a start of the Co		ant assauct for most of to the	am 10a				
1000	Designated Facility Owner on ted/Typed Name	r Operator: Certification of receipt of haz	zardous materials cove		est except as noted in It nature	em 168		-	Month	Day Year
	1467			1						
A For	m 8700-22 (Rey. 3-05) F	Previous editions are obsolete.	for and mill see	atra vacations			No.	GEN	ERATOR'S II	NITIAL COPY

Appendix E

Laboratory Analytical Reports



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: December 29, 2016

Project: SGPP - Merrimack

Submittal Date: 10/19/2016 Group Number: 1722616 SDG: MMK01 PO Number: 16.6126 State of Sample Origin: NH

	Lancaster Labs
Client Sample Description	<u>(LL) #</u>
SG2-APRB01-161017 Grab Blank Water	8650982
SG2-APEB01-161017 Grab Blank Water	8650983
SG2-AP08-18-161017 Grab Groundwater	8650984
SG2-AP08-28-161018 Grab Groundwater	8650985
SG2-APFTB-161018 Grab Blank Water	8650986
SG2-APLTB-161018 Grab Blank Water	8650987
SG2-AP08-38-161018 Grab Groundwater	8650988
SG2-AP08-48-161018 Grab Groundwater	8650989
SG2-APFD01-161018 Grab Groundwater	8650990

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	C. T. Male Associates	Attn: Jeff Marx
Electronic Copy To	C. T. Male Associates	Attn: Dan Reilly
Electronic Copy To	C. T. Male Associates	Attn: Kirk Moline



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250



Project Name: SGPP - Merrimack LL Group #: 1722616

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260C, GC/MS Volatiles

Sample #s: 8650983, 8650984, 8650985, 8650987, 8650988, 8650989, 8650990

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

EPA 537 Rev. 1.1 modified, Misc. Organics

<u>Sample #s: 8650982, 8650983, 8650985, 8650989, 8650990</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary.

The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed.

The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed.

The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Sample #s: 8650987

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits. The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package. Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and recoveries were within acceptable limits. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

In the initial extraction of this trip blank sample, several parameters were observed as reportable hits. In the re-extraction of this sample, no reportable hits were observed.

<u>Sample #s: 8650988</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits. The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and recoveries were within acceptable limits. The data is reported from the in-hold extraction. Both sets of data are included in the data package. Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Sample #s: 8650984

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits. The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and recoveries were within acceptable limits. The data is reported from the in-hold extraction. Both sets of data are included in the data package. Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Sample #s: 8650986

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits. The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and recoveries were within acceptable limits. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

In the initial extraction of this trip blank sample, several parameters were observed as reportable hits. In the re-extraction of this sample, only PFHXA was observed as a reportable hit.

Batch #: 16301011 (Sample number(s): 8650982-8650990 UNSPK: 8650988)

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8650982, 8650983, 8650984, 8650985, 8650986, 8650987, 8650988, 8650989, 8650990, Blank, LCS, LCSD, MS

SW-846 6010C, Metals

<u>Batch #: 163010635003 (Sample number(s): 8650983-8650985, 8650988-8650990 UNSPK: P643058 BKG: P643058)</u>

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Calcium, Sodium

SM 2320 B-1997, Wet Chemistry

Batch #: 16302005201A (Sample number(s): 8650983-8650985, 8650988-8650990 UNSPK: P650711 BKG: P650703, P650711)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Total Alkalinity to pH 4.5



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax; 717-656-2681 • www,LancasterLabs.com

Sample Description: SG2-APRB01-161017 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8650982 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/17/2016 11:50 by JD C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 10/19/2016 10:00 Reported: 12/29/2016 10:11

SDG#: MMK01-01RB

S3901

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 F	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	3	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	3		0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.7	J	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	4	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	1	JB	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroo	ctanesu	lfonamidoa	acetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-m	ethyl perfluoro	octanes	ulfonamid	pacetic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
------------	--------	----------	--------

Method Dilution CAT Analysis Name Trial# Batch# Analysis Analyst Date and Time Factor No. EPA 537 Rev. 1.1 10954 16 PFCs 16301011 11/18/2016 16:15 Jason W Knight 1 modified



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APRB01-161017 Grab Blank Water

SGPP - Merrimack

modified

LL Sample # WW 8650982 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/17/2016 11:50 by JD C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 10/19/2016 10:00 Reported: 12/29/2016 10:11

S3901 SDG#: MMK01-01RB

Laboratory Sample Analysis Record

 CAT
 Analysis
 Name
 Method
 Trial#
 Batch#
 Analysis
 Analysis
 Analyst
 Dilution

 No.
 14091
 PFAA Water Prep
 EPA 537 Rev. 1.1
 1
 16301011
 10/31/2016
 08:30
 Robert Brown
 1

*=This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APEB01-161017 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8650983 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/17/2016 12:15 by JD

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/19/2016 10:00 Latham NY 12110

Reported: 12/29/2016 10:11

S3902 SDG#: MMK01-02EB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	Ū	0.5	1	1
11997	Bromochloromethane	74-97-5	1	Ū	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	12		1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	Ŭ	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ŭ	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ŭ	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	Ŭ 	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U 	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ŭ	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APEB01-161017 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8650983 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/17/2016 12:15 by JD C. T. Male Associates

50 Century Hill Drive

Submitted: 10/19/2016 10:00 Latham NY 12110

Reported: 12/29/2016 10:11

S3902 SDG#: MMK01-02EB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260C	ug/l	ug/l	ug/l	
11997	o-Xylene	95-47-6	0.5 υ	0.5	1	1
A Me	thod Detection Limit	(MDL) standard is analyzed	to confirm sensitivit	y of		
the	instrument for sampl	les with non-detect analytes	associated with a			

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified	l					
10954	Perfluorooctanoic acid	335-67-1	3	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	1	J	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.9	J	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.6	J	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	6	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	1	JB	0.5	2	1
10954	NEtFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesu	ılfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APEB01-161017 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8650983 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/17/2016 12:15 by JD

C. T. Male Associates

50 Century Hill Drive

Submitted: 10/19/2016 10:00

Latham NY 12110

Reported: 12/29/2016 10:11

S3902 SDG#: MMK01-02EB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals	SW-846 601	LOC	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	4.59	0.0382	0.400	1
01757	Magnesium	7439-95-4	1.05	0.0190	0.200	1
01762	Potassium	7440-09-7	0.572 J	0.160	1.00	1
01767	Sodium	7440-23-5	2.36	0.173	2.00	1
Wet Ch	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	2.0	0.20	0.40	1
00228	Sulfate	14808-79-8	3.3	0.30	1.0	1
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	0.56	0.040	0.10	1
	SM 2320 B-	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	15.9	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	15.9	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163011AA	10/27/2016	12:38	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163011AA	10/27/2016	12:38	Brett W Kenyon	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16301011	11/18/2016	16:35	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16301011	10/31/2016	08:30	Robert Brown	1
01750	Calcium	SW-846 6010C	1	163010635003	10/30/2016	19:29	Elaine F Stoltzfus	: 1
01757	Magnesium	SW-846 6010C	1	163010635003	10/30/2016	19:29	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163010635003	10/30/2016	19:29	Elaine F Stoltzfus	: 1
01767	Sodium	SW-846 6010C	1	163010635003	10/30/2016	19:29	Elaine F Stoltzfus	: 1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	163010635003	10/27/2016	23:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	2	16294972171B	10/20/2016	23:28	Alexandria M Lanager	1
00228	Sulfate	EPA 300.0	2	16294972171B	10/20/2016	23:28	Alexandria M Lanager	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APEB01-161017 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8650983 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/17/2016 12:15 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 10/19/2016 10:00 Latham NY 12110

Reported: 12/29/2016 10:11

S3902 SDG#: MMK01-02EB

Laboratory Sample Analysis Record									
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	1	Analyst	Dilution Factor	
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16301118102A	10/27/2016 0	4:11	Joseph E McKenzie	1	
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16302005201A	10/28/2016 1	6:56	Brandon P Costik	1	
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016 1	6:56	Brandon P Costik	1	
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016 1	6:56	Brandon P Costik	1	

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE	NO.
VOLATILE ORGANICS ANA				
TENTATIVELY IDENTIF	IED COMPOUNDS	!		!
		!	S3902	!
Lab Name: Lancaster Laboratories	Contract:	!		!
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8650	983		
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0935	55.i/16od	ct27a.b/	yc27s07.d
Level: (low/med) LOW	Date Received: 10/1	L9/16		
Moisture: not dec.	Date Analyzed: 10/2	27/16		
Column: (pack/cap) CAP	Dilution Factor: 1.	. 0		
	CONCENTRATION UNI	TS:		
Number TICs found: 0	(ua/L or ua/Ka) ı	ıa/L		

CAS NUMBER	! COMPOUND NAME ==!===========		EST. CONC.	~
	!Total VOC TICs	===:=====: !		!===== ! U
2.		!!!	!	!
3.	!			!
	<u> </u>	<u> </u>		1
	!	!		!
6.	!	!		!
	!	i		i
		i		i
		i		1
0.		i		i
1.		i		!
	<u> </u>	i		i
	<u>;</u>	ii		i
	<u> </u>	i		i
	<u> </u>	i		i
		ii		i — —
	<u>;</u>	ii		i — —
	<u> </u>	i		
	i	ii		i
	<u>;</u>	ii		i
	!	i		·
	!	i		i
	!	i		i
	:			·
	!	i		i
		i		i
			I	·
8	<u></u>	ii	·	i
	<u></u>	ii	·	i
		:i	·	·
•		:	·	i
ge 1 of 1	·	··		•

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-18-161017 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650984 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/17/2016 15:45 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 10/19/2016 10:00 Latham NY 12110

Reported: 12/29/2016 10:11

S3903 SDG#: MMK01-03

GC/MS Volatiles SW-846 8260C Vol. Vol.	
11997 Benzene	
11997 Bromochloromethane	
11997 Bromodichloromethane	
11997 Bromoform 75-25-2 0.5 U 0.5 1 1 1 1 1 1 1 1 1	
11997 Bromomethane	
11997 2-Butanone	
11997 Carbon Disulfide	
11997 Carbon Tetrachloride	
11997 Chlorobenzen	
11997 Chloroethane	
11997 Chloroftame	
11997 Chloroform	
11997 Cyclohexane	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	
11997 1,2-Dibromoethane	
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 1 1 1 1	
11997 1,2-Dichlorobenzene	
11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5 1 1 1 1 1 1 1 1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 <t< td=""><td></td></t<>	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 0.5 1 1 11997 Methylcoclohexane 108-87-2 1 U 1 5 1 <t< td=""><td></td></t<>	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Hethyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcoclohexane 108-87-2 1 U 1 5 1 <	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylchene Chloride 75-09-2 2 U 2 4 1 <td></td>	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1	
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1	
11997 Styrene 100-42-5 1 U 1 5 1	
11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	
11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1	
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1	
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1	
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1	
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1	
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-18-161017 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650984 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/17/2016 15:45 by JD

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 10/19/2016 10:00

Reported: 12/29/2016 10:11

S3903 SDG#: MMK01-03

CAT No. Anal	ysis Name		CAS Number	As Rec Resul	ceived t	As Received Method Detection Lim	As Received Limit of it* Quantitation	Dilution
GC/MS Vol	atiles :	SW-846	8260C	ug/l		ug/l	ug/l	
11997 o-Xy	rlene		95-47-6	0.5	U	0.5	1	1
A Method	Detection Limit (MDI.) star	ndard is analyzed	to conf	irm sensi	tivity of		

the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	210	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	9		0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	J	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	21		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	28		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	7		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	5		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	75		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	12	В	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	14	В	0.5	2	1
10954	NEtFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluorod	octanesul	fonamidoad	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	IJ	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid. The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and recoveries were within acceptable limits. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-18-161017 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650984 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/17/2016 15:45 by JD

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 10/19/2016 10:00

Reported: 12/29/2016 10:11

S3903 SDG#: MMK01-03

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	SW-846 601	L0C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	15.7	0.0382	0.400	1
01757	Magnesium	7439-95-4	3.03	0.0190	0.200	1
01762	Potassium	7440-09-7	2.60	0.160	1.00	1
01767	Sodium	7440-23-5	49.2	0.173	2.00	1
Wet Ch	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	84.5	4.0	8.0	20
00228	Sulfate	14808-79-8	14.1	1.5	5.0	5
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	4.2	0.20	0.50	5
	SM 2320 B-	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	22.1	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	22.1	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163011AA	10/27/2016	16:41	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163011AA	10/27/2016	16:41	Brett W Kenyon	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16301011	11/18/2016	16:56	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16301011	10/31/2016	08:30	Robert Brown	1
01750	Calcium	SW-846 6010C	1	163010635003	10/30/2016	19:32	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	163010635003	10/30/2016	19:32	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163010635003	10/30/2016	19:32	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163010635003	10/30/2016	19:32	Elaine F Stoltzfus	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635003	10/27/2016	23:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	16294972171B	10/20/2016	18:22	Alexandria M Lanager	20
00228	Sulfate	EPA 300.0	1	16294972171B	10/20/2016	18:07	Alexandria M Lanager	5

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-18-161017 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650984 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/17/2016 15:45 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 10/19/2016 10:00 Latham NY 12110

Reported: 12/29/2016 10:11

S3903 SDG#: MMK01-03

Laboratory Sample Analysis Record									
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ie	Analyst	Dilution Factor	
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16301118102A	10/27/2016	04:32	Joseph E McKenzie	5	
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16302005201A	10/28/2016	16:50	Brandon P Costik	1	
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016	16:50	Brandon P Costik	1	
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016	16:50	Brandon P Costik	1	

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E VOLATILE ORGANICS A	EPA SAMPLE NO.						
	TENTATIVELY IDENTIFIED COMPOUNDS						
	_	! S3903	!				
Lab Name: Lancaster Laboratories	Contract:	_ !	!				
Lab Code: LANCAS Case No.:	SAS No.:	SDG No.:	_				
Matrix: (soil/water) WATER	Lab Sample ID: 865098	34					
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355	.i/16oct27a.b/yc27	s18.d				
Level: (low/med) LOW	Date Received: 10/19	/16					
Moisture: not dec.	Date Analyzed: 10/27,	/16					
Column: (pack/cap) CAP	Dilution Factor: 1.0						
	CONCENTRATION UNITS	S:					
Number TICs found: 0	(ug/L or ug/Kg) ug/	/L					

	! COMPOUND NAME		EST. CONC.	
	==!===================================	!		•
2.		i		!
	!			!
	!	i		! !
5		!!		!
6.	!	!		!
		!!		!
8	!	!		!
9	!	!!		!
.0	!	!!	l	!
1		!!		!
.2	!	!!	l	!
	!	!!		!
.4	!	!!	l	!
	!	!!	l	!
	!	!!	l	!
	!	!!		!
	!	!!	l	!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
			·	
	!			
		!!		!
27	_!	!!		!
	_!	!		!
	!	!!		!
30	_!	!!		!
	!	!!!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-28-161018 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650985 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 08:00 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/19/2016 10:00 Reported: 12/29/2016 10:11

S3904 SDG#: MMK01-04

GC/MS Volatiles SW-846 8260C Ug/1 Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-28-161018 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650985 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 08:00 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/19/2016 10:00

Reported: 12/29/2016 10:11

S3904 SDG#: MMK01-04

CAT No.	Analysis Name		CAS Number		eceived Lt	As Received Method Detection Limit	As Received Limit of * Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846	8260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
	thod Detection Limit							

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified	l					
10954	Perfluorooctanoic acid	335-67-1	71	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.8	J	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.6	J	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.9	J	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	1	J	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	17		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	14		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	5		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	3		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	11	В	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	10	В	0.5	2	1
10954	NEtFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesu	lfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-28-161018 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650985 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 08:00 by JD

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 10/19/2016 10:00

Reported: 12/29/2016 10:11

S3904 SDG#: MMK01-04

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	SW-846 60	10C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	16.0	0.0382	0.400	1
01757	Magnesium	7439-95-4	5.31	0.0190	0.200	1
01762	Potassium	7440-09-7	5.19	0.160	1.00	1
01767	Sodium	7440-23-5	44.2	0.173	2.00	1
Wet Ch	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	78.6	4.0	8.0	20
00228	Sulfate	14808-79-8	11.9	1.5	5.0	5
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	4.1	0.20	0.50	5
	SM 2320 B	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	17.8	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	17.8	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163011AA	10/27/2016	17:03	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163011AA	10/27/2016	17:03	Brett W Kenyon	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16301011	12/06/2016	10:59	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16301011	10/31/2016	08:30	Robert Brown	1
01750	Calcium	SW-846 6010C	1	163010635003	10/30/2016	19:35	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	163010635003	10/30/2016	19:35	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163010635003	10/30/2016	19:35	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163010635003	10/30/2016	19:35	Elaine F Stoltzfus	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635003	10/27/2016	23:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	16294972171B	10/20/2016	19:49	Alexandria M Lanager	20
00228	Sulfate	EPA 300.0	1	16294972171B	10/20/2016	19:35	Alexandria M Lanager	5

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-28-161018 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650985 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 08:00 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 10/19/2016 10:00 Latham NY 12110

Reported: 12/29/2016 10:11

S3904 SDG#: MMK01-04

Laboratory Sample Analysis Record									
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor	
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16301118102A	10/27/2016	04:34	Joseph E McKenzie	5	
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16302005201A	10/28/2016	17:57	Brandon P Costik	1	
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016	17:57	Brandon P Costik	1	
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016	17:57	Brandon P Costik	1	

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS ! S3904 Lab Name: Lancaster Laboratories Contract: ! !	
! S3904 Lab Name: Lancaster Laboratories Contract: !	
Lab Name: Lancaster Laboratories Contract: !	!
	!
Lab Code: LANCAS Case No.: SAS No.: SDG No.:	.!
Matrix: (soil/water) WATER Lab Sample ID: 8650985	
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16oct27a.b/yc27	s19.d
Level: (low/med) LOW Date Received: 10/19/16	
Moisture: not dec. Date Analyzed: 10/27/16	
Column: (pack/cap) CAP Dilution Factor: 1.0	
CONCENTRATION UNITS:	
Number TICs found: 0 (ug/L or ug/Kg) ug/L	

! ! CAS NUMBER	! ! COMPOUND NAME ==!==================================	! ! RT	! ! EST. CONC.	~
!=======! ! 1. VOCTIC	==:===================================	: !	•	!====== ! U
. 2	!	!	!	!
! 3	!!	!	!	!
		!	!	!
	!	!	!	!
	_!	!	!	!
	_!	!	!	!
	!	!	!	!
	<u></u> !	!	!	!
			!	!
		:	!	!
			!	<u>;</u>
14.		<u>-</u> i	!	:
	i	;	·	<u>;</u>
		:	·	i
		;	!	i
			 !	!
	<u> </u>	i	 !	i ———
20			!	!
21		!	!	!
22.	!		!	!
23	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!		!	!
	!	!	!	!
30	_!	!	!	!
page 1 of 1	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

Sample Description: SG2-APFTB-161018 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8650986 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 08:55

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/19/2016 10:00 Reported: 12/29/2016 10:11

S3905 SDG#: MMK01-05TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	2	JB	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	J	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	2	J	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.6	J	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	6	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.7	JB	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	hyl perfluoroo	ctanesu	lfonamidoaceti	ic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanes	ulfonamidoacet	cic Acid.		

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and recoveries were within acceptable limits. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

In the initial extraction of this trip blank sample, several parameters were observed as reportable hits. In the re-extraction of this sample, only PFHxA was observed as a reportable hit.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APFTB-161018 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8650986 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 08:55

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/19/2016 10:00

Reported: 12/29/2016 10:11

S3905 SDG#: MMK01-05TB

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16301011	11/18/2016	17:37	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16301011	10/31/2016	08:30	Robert Brown	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APLTB-161018 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8650987 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

Submitted: 10/19/2016 10:00

Reported: 12/29/2016 10:11

S3906 SDG#: MMK01-06TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APLTB-161018 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8650987 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016

C. T. Male Associates 50 Century Hill Drive

Submitted: 10/19/2016 10:00 Latham NY 12110

Reported: 12/29/2016 10:11

S3906 SDG#: MMK01-06TB

CAT No.	Analysis Name	C	AS Number	Result	:	Method Detection Li	Limit of mit* Quantita	Dilution
GC/MS	Volatiles	SW-846 8260	С	ug/l		ug/l	ug/l	
11997	o-Xylene	9	5-47-6	0.5	U	0.5	1	1
A Me	thod Detection Limit	(MDL) standard	is analyzed	to conf	irm sensit	ivity of		
	instrument for sample		-					

continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	2	JB	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	4		0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.9	J	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	2	J	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	2	J	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	3		0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.7	J	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.7	J	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	5	J	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	7	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.8	JB	0.5	2	1
10954	NEtFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesu	ılfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	ŢŢ	1	3	1

 ${\tt NMeFOSAA} \ \, {\tt is} \ \, {\tt the} \ \, {\tt acronym} \ \, {\tt for} \ \, {\tt N-methyl} \ \, {\tt perfluorooctane sulfonamidoacetic} \ \, {\tt Acid}.$

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and recoveries were within acceptable limits. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APLTB-161018 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8650987 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 C. T. Male Associates

50 Century Hill Drive

Submitted: 10/19/2016 10:00 Latham NY 12110

Reported: 12/29/2016 10:11

S3906 SDG#: MMK01-06TB

CAT
No. Analysis Name
CAS Number Result

Method Limit of Dilution
Detection Limit* Quantitation Factor

In the initial extraction of this trip blank sample, several parameters were observed as reportable hits. In the re-extraction of this sample, no reportable

hits were observed.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163011AA	10/27/2016	13:00	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163011AA	10/27/2016	13:00	Brett W Kenyon	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16301011	11/18/2016	17:58	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16301011	10/31/2016	08:30	Robert Brown	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE NO.	•
VOLATILE ORGANICS ANAL	YSIS DATA SHEET			_
TENTATIVELY IDENTIFI	ED COMPOUNDS	!		!
		!	S3906	!
Lab Name: Lancaster Laboratories	Contract:	!		!
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8650987			
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355.i	/1600	ct27a.b/yc2	27s08.d
Level: (low/med) LOW	Date Received: 10/19/1	б		
Moisture: not dec.	Date Analyzed: 10/27/1	5		
Column: (pack/cap) CAP	Dilution Factor: 1.0			
	CONCENTRATION UNITS:			
Number TICs found: 0	(ug/L or ug/Kg) ug/L			

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
	!Total VOC TICs	:: !		: ! U
	_!	i i	•	!
	<u> </u>			1
	· ·			!
	<u> </u>	! !		!
6	!	!		!
7.	!	!!		!
	!	!!		!
9	!	!!		!
.0.	!	!!		!
1	!	!!		!
2	!	!!		!
.3	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
.7	!	!!		!
	!	!!		!
		!!		!
		!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
0	!	!!		!
	!	!!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-38-161018 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650988 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 11:20 by JD C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 10/19/2016 10:00 Reported: 12/29/2016 10:11

S3907 SDG#: MMK01-07

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	IJ	0.5	1	1
11997	Bromochloromethane	74-97-5	1	IJ	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	IJ	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	II	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	IJ	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	II	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	IJ	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1	1
	,	75-35-4	0.5	Ū	0.5	1	1
11997			0.5	IJ	0.5	1	1
11997 11997	cis-1,2-Dichloroethene	156-59-2	0.5	IJ		1	1
	trans-1,2-Dichloroethene	156-60-5		-	0.5		
11997		78-87-5	0.5	U 	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	-	100-41-4	0.5	U 	0.5	1	1
11997	Freon 113	76-13-1	2	U 	2	10	1
11997	2-Hexanone	591-78-6	3	U 	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	-	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997		71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-38-161018 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650988 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 11:20 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/19/2016 10:00

Reported: 12/29/2016 10:11

S3907 SDG#: MMK01-07

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846	8260C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5 U	0.5	1	1
A Met	hod Detection Limit	(MDL) sta	ndard is analyzed	to confirm sensitivit	y of		

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified	L					
10954	Perfluorooctanoic acid	335-67-1	47	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.6	J	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	12		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	9		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	4		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	3		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	9	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	8	В	0.5	2	1
10954	NEtFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluorod	octanesu	ılfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted

outside the holding time and recoveries were within acceptable limits. The data is reported from the in-hold extraction. Both sets of data are $\frac{1}{2}$

included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-38-161018 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650988 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 11:20 by JD

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 10/19/2016 10:00

Reported: 12/29/2016 10:11

S3907 SDG#: MMK01-07

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	SW-846 60	10C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	15.3	0.0382	0.400	1
01757	Magnesium	7439-95-4	3.61	0.0190	0.200	1
01762	Potassium	7440-09-7	4.11	0.160	1.00	1
01767	Sodium	7440-23-5	44.9	0.173	2.00	1
Wet Ch	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	81.3	4.0	8.0	20
00228	Sulfate	14808-79-8	11.5	1.5	5.0	5
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	4.2	0.20	0.50	5
	SM 2320 B	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	13.3	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	13.3	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163011AA	10/27/2016	17:25	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163011AA	10/27/2016	17:25	Brett W Kenyon	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16301011	11/18/2016	14:32	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16301011	10/31/2016	08:30	Robert Brown	1
01750	Calcium	SW-846 6010C	1	163010635003	10/30/2016	19:39	Elaine F Stoltzfus	: 1
01757	Magnesium	SW-846 6010C	1	163010635003	10/30/2016	19:39	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163010635003	10/30/2016	19:39	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163010635003	10/30/2016	19:39	Elaine F Stoltzfus	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635003	10/27/2016	23:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	16294972171B	10/20/2016	20:18	Alexandria M Lanager	20
00228	Sulfate	EPA 300.0	1	16294972171B	10/20/2016	20:04	Alexandria M Lanager	5

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-38-161018 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650988 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 11:20 by JD

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 10/19/2016 10:00

Reported: 12/29/2016 10:11

S3907 SDG#: MMK01-07

	Laboratory Sample Analysis Record							
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	a a	Analyst	Dilution Factor
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16301118102A	10/27/2016 0	4:36	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16302005201A	10/28/2016 1	7:29	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016 1	7:29	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016 1	7:29	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

.d

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA SAMPLE NO.	
VOLATILE ORGANICS AND		
TENTATIVELY IDENTI	!!!	
		! S3907 !
Lab Name: Lancaster Laboratories	Contract:	!
Lab Code: LANCAS Case No.:	SAS No.:	_ SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID: 8650	988
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0935	5.i/16oct27a.b/yc27s20
Level: (low/med) LOW	Date Received: 10/1	9/16

% Moisture: not dec.

Column: (pack/cap) CAP

Date Analyzed: 10/27/16

Concentration Units:

Number TICs found: 0

Concentration Units:

(ug/L or ug/Kg) ug/L

CAS NUMBER	. COMPOUND NAME		! EST. CONC.	~
	==!===================================	:===!====== !	•	!===== ! U
2		i	!	
	!	i	1	<u> </u>
	!	i	!	<u>i</u>
			!	
		i	1	<u> </u>
	<u> </u>	i	!	<u>i</u>
	<u> </u>	i	· !	i — —
		i	1	<u> </u>
	<u> </u>	i	!	<u>i</u>
1		i	!	<u>i</u>
2.		i	·	;——
3.		i	i	;——
		i	i	;——
	<u>.</u>	i	·	;——
6		i	i	;——
		i	i	i
		i	i	;——
		i	i	;——
		i	i	i
1.		i	i	;——
2		i	i	;——
3.		i	!	<u>i</u>
	<u>.</u>	i	!	<u>;</u>
	<u> </u>		!	<u>i</u>
6.		i	·	i ——
		i	!	i —
		i	·	i
		i	·	i
0.	·	i	i	;——
·		:	·	;

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-48-161018 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650989 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 15:25 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 10/19/2016 10:00 Latham NY 12110

Reported: 12/29/2016 10:11

S3908 SDG#: MMK01-08

GC/MS Volatiles SW-846 8260C Ug/1 Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-48-161018 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650989 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 15:25 by JD C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 10/19/2016 10:00 Reported: 12/29/2016 10:11

S3908 SDG#: MMK01-08

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260C	ug/l	ug/l	ug/l	
11997	o-Xylene	95-47-6	0.5 υ	0.5	1	1
		(MDL) standard is analyzed		y of		

the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	46	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	1	J	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.6	J	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.7	J	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	2	J	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	9		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	8		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	3		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	3		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	3	J	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	7	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	7	В	0.5	2	1
10954	NEtFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesu	ılfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	IJ	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-48-161018 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650989 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 15:25 by JD

C. T. Male Associates
50 Century Hill Drive

50 Century Hill Drive Latham NY 12110

Submitted: 10/19/2016 10:00

Reported: 12/29/2016 10:11

S3908 SDG#: MMK01-08

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	SW-846 603	L0C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	13.9	0.0382	0.400	1
01757	Magnesium	7439-95-4	2.31	0.0190	0.200	1
01762	Potassium	7440-09-7	2.46	0.160	1.00	1
01767	Sodium	7440-23-5	44.0	0.173	2.00	1
Wet Ch	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	73.9	4.0	8.0	20
00228	Sulfate	14808-79-8	11.2	1.5	5.0	5
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	0.83	0.040	0.10	1
	SM 2320 B	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	13.7	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	13.7	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163011AA	10/27/2016	17:47	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163011AA	10/27/2016	17:47	Brett W Kenyon	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16301011	11/18/2016	18:18	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16301011	10/31/2016	08:30	Robert Brown	1
01750	Calcium	SW-846 6010C	1	163010635003	10/30/2016	19:42	Elaine F Stoltzfus	: 1
01757	Magnesium	SW-846 6010C	1	163010635003	10/30/2016	19:42	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163010635003	10/30/2016	19:42	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163010635003	10/30/2016	19:42	Elaine F Stoltzfus	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635003	10/27/2016	23:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	16294972171B	10/20/2016	21:17	Alexandria M Lanager	20
00228	Sulfate	EPA 300.0	1	16294972171B	10/20/2016	21:02	Alexandria M Lanager	5

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-48-161018 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650989 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 15:25 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 10/19/2016 10:00 Latham NY 12110

Reported: 12/29/2016 10:11

S3908 SDG#: MMK01-08

	Laboratory Sample Analysis Record							
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor	
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16301118102A	10/27/2016 04:3	8 Joseph E McKenzie	1	
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16302005201A	10/28/2016 18:0	4 Brandon P Costik	1	
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016 18:0	4 Brandon P Costik	1	
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016 18:0	4 Brandon P Costik	1	

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA SAMPLE NO.		
VOLATILE ORGANICS A			
TENTATIVELY IDENT	!!!		
		! S3908 !	
Lab Name: Lancaster Laboratories	Contract:	!	
Lab Code: LANCAS Case No.:_	SAS No.:	SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8650)989	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0935	55.i/16oct27a.b/yc27s21.d	
Level: (low/med) LOW	Date Received: 10/1	L9/16	
Moisture: not dec.	Date Analyzed: 10/2	27/16	
Column: (pack/cap) CAP	Dilution Factor: 1.	. 0	
	CONCENTRATION UNI	ITS:	
Number TICs found: 0	(ug/L or ug/Kg) ı	ıg/L	

CAS NUMBER	! COMPOUND NAME		EST. CONC.	~
	!Total VOC TICs	===:=====: !		!===== ! U
2	!	1		1
		<u> </u>		!
4.	i .	i		!
	· ·	Ī		1
6.	!	<u> </u>		
	!	i		!
	· ·	Ī		1
9.	!	i i		1
1.	<u> </u>	Ī		
	!	i i		!
	1	i		!
	!	Ī		
	!	<u> </u>		!
	1	i		!
	!	Ī		
	!	<u> </u>		
	!	Ī		
	!	Ī		
	!	<u> </u>		!
2		Ī		
3		Ī		
4.	!			
	<u> </u>	Ī		
	!	!		!
	!	!		!
	!	!		!
	!	!		!
0.		· ·		!
	<u> </u>	i		1

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APFD01-161018 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650990 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 by JD

50 Century Hill Drive

C. T. Male Associates

Latham NY 12110

Submitted: 10/19/2016 10:00 Reported: 12/29/2016 10:11

S3909 SDG#: MMK01-09FD

GC/MS Volatiles SW-846 8260C ug/l ug/l ug/l 11997 Acetone 67-64-1 6 U 6 20	1
11007 Agetons	1
11997 Acetone 67-64-1 6 U 6 20	1
11997 Benzene 71-43-2 0.5 U 0.5 1	1
11997 Bromochloromethane 74-97-5 1 U 1 5	1
11997 Bromodichloromethane 75-27-4 0.5 U 0.5 1	1
11997 Bromoform 75-25-2 0.5 U 0.5 4	_ 1
11997 Bromomethane 74-83-9 0.5 U 0.5 1	1
11997 2-Butanone 78-93-3 3 U 3 10	1
11997 Carbon Disulfide 75-15-0 1 U 1 5	1
11997 Carbon Tetrachloride 56-23-5 0.5 U 0.5 1	1
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1	1
11997 Chloroethane 75-00-3 0.5 U 0.5 1	1
11997 Chloroform 67-66-3 0.5 U 0.5 1	1
11997 Chloromethane 74-87-3 0.5 U 0.5 1	1
11997 Cyclohexane 110-82-7 2 U 2 5	1
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5	1
11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1	1
11997 1,2-Dibromoethane 106-93-4 0.5 U 0.5 1	1
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5	1
11997 1,3-Dichlorobenzene 541-73-1 1 U 1 5	1
11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5	1
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1	1
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1	1
11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1	1
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1	1
11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1	1
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1	1
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1	1
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1	1
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1	1
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1	1
11997 Freon 113 76-13-1 2 U 2 10	1
11997 2-Hexanone 591-78-6 3 U 3 10	1
11997 Isopropylbenzene 98-82-8 1 U 1 5	1
11997 Methyl Acetate 79-20-9 1 U 1 5	1
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	1
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10	1
11997 Methylcyclohexane 108-87-2 1 U 1 5	1
11997 Methylene Chloride 75-09-2 2 U 2 4	1
11997 Styrene 100-42-5 1 U 1 5	1
11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1	1
11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1	1
11997 Toluene 108-88-3 0.5 U 0.5 1	1
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5	1
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5	1
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1	1
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1	1
11997 Trichloroethene 79-01-6 0.5 U 0.5 1	1
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1	1
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1	1
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APFD01-161018 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650990 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/19/2016 10:00 Reported: 12/29/2016 10:11

S3909 SDG#: MMK01-09FD

CAT No.	and a very contract of the con		As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor	
GC/MS	Volatiles	SW-846	8260C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5 υ	0.5	1	1
3 37		(25DT)					

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified	<u>[</u>					
10954	Perfluorooctanoic acid	335-67-1	71	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	2		0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	16		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	14		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	5		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	3	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	9	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	10	В	0.5	2	1
10954	NEtFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluorod	octanesu	ılfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APFD01-161018 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650990 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 by JD

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/19/2016 10:00

Latham NY 12110

Reported: 12/29/2016 10:11

S3909 SDG#: MMK01-09FD

CAT No.	Analysis Name		CAS Number	As Rece Result	eived	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	SW-84	601	0C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	15.7		0.0382	0.400	1
01757	Magnesium		7439-95-4	4.29		0.0190	0.200	1
01762	Potassium		7440-09-7	4.33		0.160	1.00	1
01767	Sodium		7440-23-5	43.9		0.173	2.00	1
Wet Ch	nemistry EPA 3	0.00		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	81.1		4.0	8.0	20
00228	Sulfate		14808-79-8	11.3		1.5	5.0	5
	EPA 3	53.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitro	gen	n.a.	4.4		0.20	0.50	5
	SM 23	20 B-	1997	mg/l as	CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5		n.a.	15.0		1.7	5.0	1
12149	Bicarbonate Alkalinity		n.a.	15.0		1.7	5.0	1
12148	Carbonate Alkalinity		n.a.	1.7	U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163011AA	10/27/2016	18:09	Brett W Kenyon	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163011AA	10/27/2016	18:09	Brett W Kenyon	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16301011	11/18/2016	18:39	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16301011	10/31/2016	08:30	Robert Brown	1
01750	Calcium	SW-846 6010C	1	163010635003	10/30/2016	19:50	Elaine F Stoltzfus	: 1
01757	Magnesium	SW-846 6010C	1	163010635003	10/30/2016	19:50	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163010635003	10/30/2016	19:50	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163010635003	10/30/2016	19:50	Elaine F Stoltzfus	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635003	10/27/2016	23:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	16294972171B	10/20/2016	21:46	Alexandria M Lanager	20
00228	Sulfate	EPA 300.0	1	16294972171B	10/20/2016	21:31	Alexandria M Lanager	5

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APFD01-161018 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8650990 LL Group # 1722616 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/18/2016 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 10/19/2016 10:00 Latham NY 12110

Reported: 12/29/2016 10:11

S3909 SDG#: MMK01-09FD

Laboratory Sample Analysis Record								
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	9	Analyst	Dilution Factor
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16301118102A	10/27/2016 0)4:39	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16302005201A	10/28/2016 1	7:22	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016 1	7:22	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016 1	7:22	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



page 1 of 1

Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA	SAMPLE NO.	
VOLATILE ORGANICS ANALYSIS DATA SHEET	_		_
TENTATIVELY IDENTIFIED COMPOUNDS	!		!
	!	S3909	!
Lab Name: Lancaster Laboratories Contract:	!		_!
Lab Code: LANCAS Case No.: SAS No.:	SDG	No.:	
Matrix: (soil/water) WATER Lab Sample ID: 8650990			

Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16oct27a.b/yc27s22.d Level: (low/med) LOW Date Received: 10/19/16 % Moisture: not dec. Date Analyzed: 10/27/16

Column: (pack/cap) CAP Dilution Factor: 1.0

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) ug/L

!	!	!	1	· · ·
! CAS NUMBER	! COMPOUND NAME	! RT	! EST. CONC.	! O !
!=========	!===========	!=======	!========	!======!
! 1. VOCTIC	!Total VOC TICs	İ	. 0	! U !
! 2		İ		
		!	!	! !
! 4.		!		!!
! 5.		!		!!
! 6	!	!		
! 7		i		i ——— i
! 8		i		i ——— i
! 9		i	i	; —— ;
!10.		<u>i</u>		i — — i
!11.		i		i ——— i
!12		i	i	; —— ;
!13	!	i		;
!14		i		;
!15		i		;;
!16	!	i		;
	!	i		;
!18		i		;;
	!	i	i————	;;
120	!	i	i————	;;
!21.		i		;;
! 22.		i	i————	;;
! 23		i		;;
! 24		i		;;
! 25		i		;;
! 26		i		;;
! 27		i	·	;;
! 28 .		i	·	ii
! 29		i	·	;;
130.		i	·	;i
	·	i	·	;
·	i	•		·:

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1722616

Reported: 12/29/2016 10:11

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Batch number: Y163011AA	Sample	number	(s): 86509	83-8650985,8650987-8650990
Acetone	6	U	6	20
Benzene	0.5	U	0.5	1
Bromochloromethane	1	U	1	5
Bromodichloromethane	0.5	U	0.5	1
Bromoform	0.5	U	0.5	4
Bromomethane	0.5	Ū	0.5	1
2-Butanone	3	U	3	10
Carbon Disulfide	1	U	1	5
Carbon Tetrachloride	0.5	U	0.5	1
Chlorobenzene	0.5	Ū	0.5	1
Chloroethane	0.5	U	0.5	1
Chloroform	0.5	U	0.5	1
Chloromethane	0.5	U	0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	U	2	5
Dibromochloromethane	0.5	U	0.5	1
1,2-Dibromoethane	0.5	U	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5
Dichlorodifluoromethane	0.5	Ū	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	U	0.5	1
trans-1,2-Dichloroethene	0.5	U	0.5	1
1,2-Dichloropropane	0.5	U	0.5	1
cis-1,3-Dichloropropene	0.5	U	0.5	1
trans-1,3-Dichloropropene	0.5	U	0.5	1
Ethylbenzene	0.5	U	0.5	1
Freon 113	2	U	2	10
2-Hexanone	3	U	3	10
Isopropylbenzene	1	U	1	5
Methyl Acetate	1	U	1	5
Methyl Tertiary Butyl Ether	0.5	U	0.5	1
4-Methyl-2-pentanone	3	U	3	10
Methylcyclohexane	1	U	1	5
Methylene Chloride	2	U	2	4
Styrene	1	U	1	5
1,1,2,2-Tetrachloroethane	0.5	U	0.5	1

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1722616

Reported: 12/29/2016 10:11

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Tetrachloroethene	0.5	U	0.5	1
Toluene	0.5	U	0.5	1
1,2,3-Trichlorobenzene	1	U	1	5
1,2,4-Trichlorobenzene	1	U	1	5
1,1,1-Trichloroethane	0.5	U	0.5	1
1,1,2-Trichloroethane	0.5	U	0.5	1
Trichloroethene	0.5	U	0.5	1
Trichlorofluoromethane	0.5	U	0.5	1
Vinyl Chloride	0.5	U	0.5	1
m+p-Xylene	0.5	U	0.5	1
o-Xylene	0.5	U	0.5	1
	ng/l		ng/l	ng/l
Batch number: 16301011	_			0982-8650990
Perfluorooctanoic acid	1	J	0.5	2
Perfluorononanoic acid	0.6	U	0.6	2
Perfluorodecanoic acid	0.5	U	0.5	2
Perfluoroundecanoic acid	1	U	1	3
Perfluorododecanoic acid	0.5	U	0.5	2
Perfluorotridecanoic acid	0.5	U	0.5	2
Perfluorotetradecanoic acid	0.5	U	0.5	2
Perfluorohexanoic acid	0.5	U	0.5	2
Perfluoroheptanoic acid	0.5	U	0.5	2
Perfluorobutanesulfonate	0.7	U	0.7	2
Perfluorohexanesulfonate	1	U	1	3
Perfluoro-octanesulfonate	2	U	2	6
Perfluorobutanoic Acid	5	J -	3	10
Perfluoropentanoic Acid	0.5	J	0.5	2
NETFOSAA	1	U	1	3
NMeFOSAA	1	U	1	3
	mg/l		mg/l	mg/l
Batch number: 163010635003				983-8650985,8650988-8650990
Calcium	0.0382		0.0382	0.400
Magnesium	0.0190		0.0190	0.200
Potassium	0.160		0.160	1.00
Sodium	0.173	Ū	0.173	2.00
Batch number: 16294972171B	Sample	number	(s): 8650	983-8650985,8650988-8650990
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
Batch number: 16301118102A	Sample	number	(s): 8650	983-8650985,8650988-8650990
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
	mg/1 3	a G2G03	mg/l as	mg/l as
	шу/та	s cacos	CaCO3	CaCO3
Batch number: 16302005201A	Sample	number		0983-8650985,8650988-8650990
Total Alkalinity to pH 4.5	1.7	U	1.7	5.0
• • •				

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1722616

Reported: 12/29/2016 10:11

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: Y163011AA	Sample numbe	_	983-8650985,86	50987-8650	990				
Acetone	150	172.64	150	167.83	115	112	50-168	3	30
Benzene	20	20.06	20	20.7	100	103	78-120	3	30
Bromochloromethane	20	21.13	20	20.88	106	104	80-125	1	30
Bromodichloromethane	20	20.76	20	21.08	104	105	80-120	2	30
Bromoform	20	17.47	20	17.67	87	88	59-120	1	30
Bromomethane	20	16.05	20	16.58	80	83	55-123	3	30
2-Butanone	150	136.57	150	139.24	91	93	57-145	2	30
Carbon Disulfide	20	18.05	20	18.61	90	93	58-120	3	30
Carbon Tetrachloride	20	20.24	20	21.03	101	105	74-130	4	30
Chlorobenzene	20	19.74	20	20.21	99	101	80-120	2	30
Chloroethane	20	16.26	20	17.08	81	85	56-120	5	30
Chloroform	20	20.73	20	21.13	104	106	80-120	2	30
Chloromethane	20	16.51	20	17.62	83	88	59-127	7	30
Cyclohexane	20	17.97	20	18.78	90	94	65-131	4	30
1,2-Dibromo-3-chloropropane	20	16.05	20	16.19	80	81	59-120	1	30
Dibromochloromethane	20	19.11	20	19.42	96	97	78-120	2	30
1,2-Dibromoethane	20	20.1	20	20.42	100	102	80-120	2	30
1,2-Dichlorobenzene	20	19.54	20	19.8	98	99	80-120	1	30
1,3-Dichlorobenzene	20	19.31	20	19.83	97	99	80-120	3	30
1,4-Dichlorobenzene	20	19.49	20	20.08	97	100	80-120	3	30
Dichlorodifluoromethane	20	17	20	17.48	85	87	49-134	3	30
1,1-Dichloroethane	20	21.37	20	22.09	107	110	80-120	3	30
1,2-Dichloroethane	20	22.46	20	22.82	112	114	66-128	2	30
1,1-Dichloroethene	20	19	20	19.74	95	99	76-124	4	30
cis-1,2-Dichloroethene	20	19.46	20	19.99	97	100	80-120	3	30
trans-1,2-Dichloroethene	20	20.14	20	20.75	101	104	80-120	3	30
1,2-Dichloropropane	20	21.24	20	21.92	106	110	80-120	3	30
cis-1,3-Dichloropropene	20	19.6	20	20.15	98	101	80-120	3	30
trans-1,3-Dichloropropene	20	20.05	20	20.71	100	104	76-120	3	30
Ethylbenzene	20	19.69	20	20.36	98	102	78-120	3	30
Freon 113	20	18.11	20	18.89	91	94	64-136	4	30
2-Hexanone	100	95.7	100	97.01	96	97	49-146	1	30
Isopropylbenzene	20	18.85	20	19.53	94	98	80-120	4	30
Methyl Acetate	20	21.41	20	21.71	107	109	61-137	1	30
Methyl Tertiary Butyl Ether	20	19.07	20	19.49	95	97	75-120	2	30
4-Methyl-2-pentanone	100	96.64	100	97.95	97	98	55-141	1	30
Methylcyclohexane	20	18.52	20	19.42	93	97	66-126	5	30
Methylene Chloride	20	19.49	20	19.87	97	99	80-120	2	30
Styrene	20	18.69	20	19.11	93	96	80-120	2	30
1,1,2,2-Tetrachloroethane	20	19.04	20	19.69	95	98	72-120	3	30
Tetrachloroethene	20	20.43	20	20.61	102	103	80-129	1	30
Toluene	20	19.83	20	20.29	99	101	80-120	2	30
1,2,3-Trichlorobenzene	20	17.79	20	18.37	89	92	69-120	3	30
1,2,4-Trichlorobenzene	20	17.75	20	18.23	89	91	72-120	3	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1722616

Reported: 12/29/2016 10:11

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
1,1,1-Trichloroethane	20	17.32	20	17.78	87	89	66-126	3	30
1,1,2-Trichloroethane	20	19.78	20	20.21	99	101	80-120	2	30
Trichloroethene	20	20.39	20	20.96	102	105	80-120	3	30
Trichlorofluoromethane	20	18.54	20	18.74	93	94	67-129	1	30
Vinyl Chloride	20	15.99	20	16.91	80	85	63-121	6	30
m+p-Xylene	40	38.66	40	39.94	97	100	80-120	3	30
o-Xylene	20	18.31	20	18.93	92	95	80-120	3	30
-	ng/l	ng/l	ng/l	ng/l					
D + 1 16201011			_	119/1					
Batch number: 16301011	Sample numb			004 05	0.0	100	E0 120	1.0	2.0
Perfluorooctanoic acid	200	184.04	200	204.27	92	102	70-130	10	30
Perfluorononanoic acid	200	184.52	200	187.02	92	94	70-130	1	30
Perfluorodecanoic acid	200	165.65	200	182.4	83	91	70-130	10	30
Perfluoroundecanoic acid	200	185.02	200	180.74	93	90	70-130	2	30
Perfluorododecanoic acid	200	174.61	200	196.19	87	98	70-130	12	30
Perfluorotridecanoic acid	200	188.59	200	206.75	94	103	70-130	9	30
Perfluorotetradecanoic acid	200	167.76	200	194.3	84	97	70-130	15	30
Perfluorohexanoic acid	200	167.05	200	186.71	84	93	70-130	11	30
Perfluoroheptanoic acid	200	184.35	200	193.26	92	97	70-130	5	30
Perfluorobutanesulfonate	178.6	144.11	176.8	169.21	81	96	70-130	16	30
Perfluorohexanesulfonate	189.2	164.95	189.2	185.66	87	98	70-130	12	30
Perfluoro-octanesulfonate	191.2	150.3	191.2	185.62	79	97	70-130	21	30
Perfluorobutanoic Acid	200	154.99	200	177.55	77	89	70-130	14	30
Perfluoropentanoic Acid	200	159.53	200	188.64	80	94	70-130	17	30
NETFOSAA	200	179.01	200	207.99	90	104	70-130	15	30
NMeFOSAA	200	192.78	200	216.82	96	108	70-130	12	30
	mg/l	mg/l	mg/l	mg/l					
Batch number: 163010635003	Sample numb	er(s): 86509	983-8650985,86	550988-8650	990				
Calcium	4.00	4.05			101		80-120		
Magnesium	2.00	2.05			102		80-120		
Potassium	10	10.07			101		80-120		
Sodium	10	9.61			96		80-120		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 16294972171B	Sample numb	er(s): 86509	83-8650985,86	550988-8650	990				
Chloride	3.00	2.94			98		90-110		
Sulfate	7.50	7.30			97		90-110		
Batch number: 16301118102A	Sample numb	er(s): 86509	983-8650985,86	550988-8650	990				
Total Nitrite/Nitrate Nitrogen	2.50	2.51			100		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16302005201A	-		983-8650985,86	550988-8650					
Total Alkalinity to pH 4.5	188	179.55			96		84-110		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1722616

Reported: 12/29/2016 10:11

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ng/l	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/1	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 16301011	Sample numb	er(s): 8650	982-8650	990 UNSPK: 8	3650988					
Perfluorooctanoic acid	47.05	200.84	238.83			95		70-130		
Perfluorononanoic acid	0.6 U	200.84	184.41			92		70-130		
Perfluorodecanoic acid	0.5 U	200.84	179.97			90		70-130		
Perfluoroundecanoic acid	1 U	200.84	180.17			90		70-130		
Perfluorododecanoic acid	0.5 U	200.84	190.79			95		70-130		
Perfluorotridecanoic acid	0.5 U	200.84	200.52			100		70-130		
Perfluorotetradecanoic acid	0.567	200.84	188.79			94		70-130		
Perfluorohexanoic acid	11.63	200.84	191.02			89		70-130		
Perfluoroheptanoic acid	8.76	200.84	181.39			86		70-130		
Perfluorobutanesulfonate	3.81	170.72	164.17			94		70-130		
Perfluorohexanesulfonate	3.12	190	180.11			93		70-130		
Perfluoro-octanesulfonate	2 U	192.01	164.6			86		70-130		
Perfluorobutanoic Acid	9.26	200.84	167.86			79		70-130		
Perfluoropentanoic Acid	7.68	200.84	183.6			88		70-130		
NETFOSAA	1 U	200.84	190.27			95		70-130		
NMeFOSAA	1 U	200.84	221.61			110		70-130		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 163010635003	Cample numb	or/a). 06E(002 0650	985,8650988-	0650000	IINCDV: D6	12050			
Calcium	50.25	4.00	55.34	4.00	56.07	127 (2)		75-125	1	20
Magnesium	10.92	2.00	12.88	2.00	13.29	98 (2)		75-125	3	20
Potassium	11.53	10	23.67	10	22.58	121	111	75-125	5	20
Sodium	216.88	10	277.94	10	240.28	611 (2)		75-125	15	20
Sociali	210.00	10	211.91	10	240.20	011 (2)	234 (2)	73-123	13	20
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 16294972171B	Sample numb	er(s): 8650	983-8650	985,8650988-	-8650990	UNSPK: 865	50984			
Chloride	84.47	80	169.53			106		90-110		
Sulfate	14.07	50	63.15			98		90-110		
Batch number: 16301118102A	Sample numb	er(s): 8650	1983-8650	985,8650988-	-8650990	IINSPK: P6	53675			
Total Nitrite/Nitrate Nitrogen	2.45	1.00	3.39	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0030330	94	33073	90-110		
	mg/l as	mg/l as	mg/l as	mg/l as	mg/l as					
	CaCO3	CaCO3	CaCO3	CaCO3	CaCO3					
Batch number: 16302005201A	Sample numb	er(s): 8650	983-8650	985,8650988-	-8650990	UNSPK: P65	50711			
Total Alkalinity to pH 4.5	1.7 U	188	84.05	188	86.31	45*	46*	84-110	3	5

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Group Number: 1722616 Client Name: C. T. Male Associates

Reported: 12/29/2016 10:11

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Batch number: 163010635003 Calcium Magnesium Potassium Sodium	Sample number(s): 50.25 10.92 11.53 216.88	8650983-8650985,8 50.65 10.99 11.67 216.58	650988-8650990 1 1 1 0	BKG: P643058 20 20 20 20 20
	mg/l	mg/l		
Batch number: 16294972171B Chloride Sulfate	Sample number(s): 84.47 14.07	8650983-8650985,8 84.96 14.01	650988-8650990 1 0 (1)	BKG: 8650984 15 15
Batch number: 16301118102A Total Nitrite/Nitrate Nitrogen	Sample number(s): 2.45	8650983-8650985,8 2.47	650988-8650990 1	BKG: P653675 2
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 16302005201A Total Alkalinity to pH 4.5	Sample number(s): 1.7 U	8650983-8650985,8 1.7 U	650988-8650990 0 (1)	BKG: P650711

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles Batch number: Y163011AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8650983	105	103	97	96
8650984	105	101	96	95
8650985	105	104	96	95
8650987	104	103	96	95
8650988	106	103	96	95
8650989	105	103	96	95
8650990	106	103	96	96
Blank	102	100	97	96
LCS	101	100	97	101
LCSD	100	99	98	101
Limits:	80-116	77-113	80-113	78-113

Analysis Name: 16 PFCs Batch number: 16301011

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1722616

Reported: 12/29/2016 10:11

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 16301011

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8650982	4*	15*	23*	14*	13*	12*
8650983	9*	43*	71	60*	62*	57*
8650984	7*	36*	87	53*	71	59*
8650985	6*	30*	72	39*	48*	45*
8650986	11*	54*	62*	46*	37*	39*
8650987	9*	41*	42*	31*	17*	18*
8650988	33*	43*	98	53*	74	55*
8650989	8*	60*	135*	51*	60*	48*
8650990	9*	44*	83	51*	48*	44*
Blank	12*	64*	85	96	92	100
LCS	12*	59*	80	80	90	84
LCSD	12*	63*	88	93	105	105
MS	7*	42*	92	58*	76	61*
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8650982	10*	9*	9*	6*	16*	4*
8650983	53*	60*	46*	48*	72	39*
8650984	56*	67*	70	49*	55*	38*
8650985	45*	41*	48*	34*	49*	25*
8650986	31*	30*	26*	20*	71	15*
8650987	12*	9*	8*	5*	39*	3*
8650988	55*	69*	59*	61*	53*	43*
8650989	41*	44*	37*	24*	62*	16*
8650990	39*	34*	38*	25*	64*	15*
Blank	90	89	93	91	72	85
LCS	82	84	79	89	89	79
LCSD	100	93	99	96	94	92
MS	61*	78	68*	63*	57*	46*

	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
8650982	16*	3*	2*	
8650983	83	27*	20*	
8650984	54*	32*	32*	
8650985	51*	21*	6*	
8650986	71	12*	11*	
8650987	49*	3*	5*	
8650988	60*	31*	33*	
8650989	69*	12*	10*	
8650990	71	11*	9*	
Blank	80	87	88	
LCS	85	81	88	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1722616

Reported: 12/29/2016 10:11

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 16301011

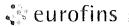
	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
LCSD	91	86	93	
MS	68*	37*	41*	
Limits:	70-130	70-130	70-130	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



Laboratories

Environmental Services Analysis Request/Chain of Custody

Acct. #:	37191		Grou	ıp #:	17	226	16	,	Sam	ple #:	80	05	00	87) -(90)				COC#:	15588
Client: C.T. Male Associates					Matrix							принения	an and the state of the state o	Buryad Mediya	iuuuntooggiiiiii		sted For Lab Use Only					
Project Name/#: SGPP - Merrimack	Site ID:											Pı	ese	rvati	ion	Code	es				SF#: <u>285327</u>	
Project Manager: Kirk Moline	P.O. #: /	6.6126	· >] _E	ace			Н	N		s									SCR#: <u>19606</u> 2	? .
Sampler: Jonethan Dippert Pat Mallyle					Sediment	Ground	5														Preservat	ion Codes
Phone #: 378-786-7400	Quote #:	214135			Sec		Nak	ners		်				3	d.)						H = HCl	T = Thiosulfate
State where sample(s) were collected: NH	• 233		5 Fare market m	202200 \$20000		a'ble DES		457	()	(6010C)			(0)	23201	7 mod.)						N = HNO ₃	B = NaOH
	Colle	ction		ite		Potable NPDES	Blook	of Co	VOAs (8260C)		(5)	.2)	(300.0)	Alkalinity (SM 2320B)	A 537						S = H ₂ SO ₄	P = H ₃ PO ₄
				sod		L .		#	VOAs	Mg, Na, K	(353.2)	(353.2)	.04-	nity	(EP.						O = Other	
Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other:	Total	TCL	Ca. №	NO2	NO3	CI-, S	Alkali	PFCs						Rem	arks
SG 2 -APREO - 16/017 1850	10/17/16	1150	X				Х	2							X							
SG 2 -APEBOI - 16/017 (50)	10/17/16	1215	X				X	11	LX.	Х	Х	X	X	X	X							
SC 7 ADAG 19 - 1/4/7 18/6	14/17/16	1545	X		<u> </u>	X		11	X	X	X	X	X	K	X					•		
SG 2 -APOR - 18 - 16 10 18 15 - 15	21/81/01	800	X			X		1/	1	7	X	X	*	7	X							
SG2 -APFIB - KOLONE 18 PS-	orlshoi	855	X				X	1							X							
SG2 -APLTB - 161018 1500	11/81/01	.aucit//date//	X	*************			X	3	X						X							
SG & -APO8 -38-161018 16000	toliRJ(P	1120	X			X		- interested	X	X.	X	7	x	X	X							
	ग्वाह्या	1525	X		<u> </u>	X		11	X	×	*	×	Y.	X	K							
S General and the Francisco Control of the Control																	<u> </u>					
	ाजीखीक		X		 	<u> </u>	*	11	X	1	1	1	¥	À	X				ļ			T
Turnaround Time Kaquesten (TAT) (please of				4	ŧ	311	by:				Date			Time		Rec	eived	ı by:			Date	Time
(RUSH LAT is subject to Eurofins Lancaster Laboratorional Date results are needed:	es approval a	and surchar	ges)	***************************************	₽ ፲\ Relir	v <u>//</u> nquished	by:				<u>ે l(</u> Date	-	_	<u> </u>	-	Rec	eived	d by:			Date	Time
E-mail address to send RUSH results. K. Mü	line Ceta	rale ivm					•											,		i		
Data Package Options (please check if requir					Reli	nquished	by:				Date			Time		Rec	eive	d by:		ĺ	Date	Time
Type I (Validation/non-CLP)	Р 🗌	TX TRRP	- 13																			Name of the Owner, which we see the owner, which we se
Type III (Reduced non-CLP) CT RCI	· []				Reli	nquished	by:				Date			Time		Rec	eived	d by:		أسنب	Date	Time
	ype A 🗌				Dali	nquished	b.u.				Date			Time		Res	م م	J by	and the second second		Data	Tiran
Type VI (Raw Data Only) EDD Format: EQuIS	уре В 🗍			-	I Coll	iquisileu					Daile			111116			W.	; by 1/4) lee,	A,	Date 10/19/16	18:00
If site-specific QC (MS/MSD/Dup) required, i	ndicate Ot	C sample	s and			l No.: quished by	, Com	mero	ial Ca	rrior		n!				<u> </u>	Ú	<u>- •y</u>	/-	/i	<u> </u>	4
submit triplicate volume.	Talouto Q	c sumple	c and				FedE			Othe	r			•		ī em	pera	iture ι	ipon	rece	ipt <u>/ 13 ~ .</u>	23c



Sample Administration Receipt Documentation Log

Doc Log ID:

165705

Group Number(s): 1722616

Client: C.T. Male Associates

Environmental

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

10/19/2016 10:00

Number of Packages:

2

Number of Projects:

1

State/Province of Origin:

NH

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

Yes

Custody Seal Present:

Yes

Sample Date/Times match COC:

Yes

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

Air Quality Samples Present:

N/A

No

Samples Chilled:

Yes

Total Trip Blank Qty:

3

Paperwork Enclosed:

Yes

Trip Blank Type:

HCI

Samples Intact: Missing Samples:

Yes

No

Extra Samples:

No

Discrepancy in Container Qty on COC:

No

Unpacked by Cathy Murphy (10960) at 15:16 on 10/19/2016

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	<u>Ice Type</u>	Ice Present?	Ice Container	Elevated Temp?
1	DT146	2.3	DT	Pack/Wet	Υ	Bagged	N
2	DT146	1.3	DT	Pack/Wet	Υ	Bagged	N



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RL Reporting Limit kg **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight Besults printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: December 21, 2016

Project: SGPP - Merrimack

Submittal Date: 10/22/2016 Group Number: 1723907 SDG: MMK02 PO Number: 16.6126 State of Sample Origin: NH

	Lancaster Labs
Client Sample Description	<u>(LL) #</u>
SG2-APEB01-161020 Grab Blank Water	8656715
SG2-AP07-28-161020 Grab Groundwater	8656716
SG2-AP07-38-161020 Grab Groundwater	8656717
SG2-APFTB-161020 Grab Blank Water	8656718
SG2-APLTB-161020 Blank Water	8656719
SG2-AP07-48-161020 Grab Groundwater	8656720
SG2-AP07-58-161020 Grab Groundwater	8656721
SG2-AP07-58-161021 Grab Groundwater	8656722
SG2-APRB01-161021 Grab Blank Water	8656723
SG2-APRB02-161021 Grab Blank Water	8656724
SG2-AP07-68-161021 Grab Groundwater	8656725
SG2-AP07-78-161021 Grab Groundwater	8656726

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	C. T. Male Associates	Attn: Jeff Marx
Electronic Copy To	C. T. Male Associates	Attn: Dan Reilly
Electronic Copy To	C. T. Male Associates	Attn: Kirk Moline



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250

Project Name: SGPP - Merrimack LL Group #: 1723907

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260C, GC/MS Volatiles

Sample #s: 8656716, 8656717, 8656719

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

EPA 537 Rev. 1.1 modified, Misc. Organics

<u>Sample #s: 8656715, 8656720, 8656726</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Sample #s: 8656716, 8656717, 8656722, 8656724

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits. The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package. Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

<u>Sample #s: 8656718</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits. The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

In the initial extraction of this trip blank sample, PFBA, PFTEDA, and PFOA were observed as reportable hits. In the re-extraction of this sample, only PFBA was observed as a reportable hit.

Sample #s: 8656723, 8656725

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits. The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and recoveries were within acceptable limits. The data is reported from the in-hold extraction. Both sets of data are included in the data package. Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

<u>Sample #s: 8656719</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits. The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and the recoveries were within acceptable limits. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

In the initial extraction of this trip blank sample, several parameters were observed as reportable hits. In the re-extraction of this sample, there were no reportable hits.

<u>Batch #: 16306001 (Sample number(s): 8656715-8656720, 8656722-8656726 UNSPK: 8656726)</u>

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8656715, 8656716, 8656717, 8656718, 8656719, 8656720, 8656722, 8656723, 8656724, 8656725, 8656726, Blank, LCS, LCSD, MS

<u>SW-846 6010C, Metals</u>

<u>Batch #: 163010635003 (sample number(s): 8656716-8656717, 8656720-8656721, 8656725-8656726 UNSPK: P643058 BKG: P643058)</u>

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Calcium, Sodium

EPA 300.0, Wet Chemistry

<u>Batch #: 16309972602A (Sample number(s): 8656716-8656717 UNSPK: P660373 BKG: P660373)</u>

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Sulfate



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

Sample Description: SG2-APEB01-161020 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8656715 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 08:50 by PM

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00

Reported: 12/21/2016 11:51

M0201 SDG#: MMK02-01EB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 H	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	3	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.8	J	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	1	JB	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	1	J	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	4	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.7	J	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroc	ctanesu	lfonamid	pacetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid. The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) us

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

Method Trial# Batch# Dilution CAT Analysis Name Analysis Analyst Date and Time Factor No. EPA 537 Rev. 1.1 Jason W Knight 10954 16 PFCs 16306001 11/18/2016 23:47 1 modified



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APEB01-161020 Grab Blank Water

SGPP - Merrimack

modified

LL Sample # WW 8656715 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 08:50 by PM

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00 Reported: 12/21/2016 11:51

M0201 SDG#: MMK02-01EB

Laboratory Sample Analysis Record

CAT Analysis Name Method Trial# Batch# Analysis Analyst Dilution
No.
14091 PFAA Water Prep EPA 537 Rev. 1.1 1 16306001 11/01/2016 19:00 Devon M Whooley 1

*=This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-28-161020 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656716 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 10:45 by PM C. T. Male Associates 50 Century Hill Drive

Submitted: 10/22/2016 10:00 Latham NY 12110

Reported: 12/21/2016 11:51

M0202 SDG#: MMK02-02

GC/MS Volatiles SW-846 8260C Ug/1 CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor		
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-28-161020 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656716 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 10:45 by PM C. T. Male Associates 50 Century Hill Drive

Submitted: 10/22/2016 10:00 Latham NY 12110

Reported: 12/21/2016 11:51

M0202 SDG#: MMK02-02

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846	8260C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5 υ	0.5	1	1
	thod Detection Limit				rity of		

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified	i					
10954	Perfluorooctanoic acid	335-67-1	7	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	2	JB	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	1	J	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	5	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	2	J	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesu	ılfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-28-161020 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656716 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 10:45 by PM

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 10/22/2016 10:00

Reported: 12/21/2016 11:51

M0202 SDG#: MMK02-02

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	SW-846 60	10C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	15.7	0.0382	0.400	1
01757	Magnesium	7439-95-4	3.78	0.0190	0.200	1
01762	Potassium	7440-09-7	3.12	0.160	1.00	1
01767	Sodium	7440-23-5	104	0.173	2.00	1
Wet Ch	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	185	10.0	20.0	50
00228	Sulfate	14808-79-8	4.7 J	1.5	5.0	5
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	1.8	0.040	0.10	1
	SM 2320 B	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	27.1	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	27.1	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163041AA	10/30/2016	19:39	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163041AA	10/30/2016	19:39	Angela D Sneeringer	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306001	11/19/2016	00:07	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306001	11/01/2016	19:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163010635003	10/30/2016	19:53	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	163010635003	10/30/2016	19:53	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163010635003	10/30/2016	19:53	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163010635003	10/30/2016	19:53	Elaine F Stoltzfus	1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	163010635003	10/27/2016	23:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	16309972602A	11/05/2016	07:33	Alexandria M Lanager	50

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-28-161020 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656716 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 10:45 by PM C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00 Reported: 12/21/2016 11:51

M0202 SDG#: MMK02-02

Laboratory Sample Analysis Record							
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	16309972602A	11/05/2016 07:18	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16304118101B	10/30/2016 17:03	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16306005102A	11/02/2016 02:14	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16306005102A	11/02/2016 02:14	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16306005102A	11/02/2016 02:14	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE	NO.	
VOLATILE ORGANICS ANAL TENTATIVELY IDENTIFI				—— _!	
		!	M0202	!	
Lab Name: Lancaster Laboratories	Contract:	!		!	
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:		
Matrix: (soil/water) WATER	Lab Sample ID: 8656716	5			
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID: HP09355.	/1600	ct30a.b/	yc30s	20.d
Level: (low/med) LOW	Date Received: 10/22/2	.6		_	
Moisture: not dec.	Date Analyzed: 10/30/2	.6			
Column: (pack/cap) CAP	Dilution Factor: 1.0				
	CONCENTRATION UNITS				
Number TICs found: 0	(ug/L or ug/Kg) ug/I	_			

! COMPOUND NAME	! RT !	EST. CONC.	~
!Total VOC TICs	::: !		: ! U
!	!!		!
!	!		!
!	!		!
!	!		!
!	!		!
	!		!
	!		!
	!		!
	!		!
<u> </u>	!		!
!			!
<u> </u>	· ·		!
	1		!
			·
			·
			!
			·
<u> </u>	i		
i	i		·
	i		·
_ <u> </u>	ii		i
			i
	i		•
			;
<u>_</u>	:i	·	;
	:i	·	;———
<u>-</u>	<u>-</u>		:
	Total VOC TICS	Total VOC TICS	Total VOC TICS 0

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-38-161020 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656717 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 12:50 by PM C. T. Male Associates 50 Century Hill Drive

Submitted: 10/22/2016 10:00 Latham NY 12110

Reported: 12/21/2016 11:51

M0203 SDG#: MMK02-03

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	Ŭ	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U 	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U 	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U 	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3 1	U U	3 1	10 5	1 1
11997	Isopropylbenzene	98-82-8		IJ			
11997	Methyl Acetate	79-20-9	1 0.5	U	1 0.5	5 1	1 1
11997 11997	Methyl Tertiary Butyl Ether	1634-04-4 108-10-1	3	U	3	10	1
	4-Methyl-2-pentanone		3 1	IJ	3 1		1
11997 11997	Methylcyclohexane Methylene Chloride	108-87-2 75-09-2	2	U	2	5 4	1
11997	Styrene Chioride	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	IJ	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	IJ	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1
	11				* * *		

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-38-161020 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656717 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 12:50 by PM C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00 Reported: 12/21/2016 11:51

M0203 SDG#: MMK02-03

CAT No.	Analysis Name	CAS Numbe	As Received r Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260C	ug/l	ug/l	ug/l	
11997	o-Xylene	95-47-6	0.5 ΰ	0.5	1	1
A Me	thod Detection Limit	(MDL) standard is analy	zed to confirm sensi	tivity of		
the	instrument for sample	es with non-detect analy	tes associated with	a		

continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	c. Organics EPA 537 Rev. 1.1		ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	5	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	J	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.9	JB	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.6	J	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	1	J	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	3	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	9	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.7	J	0.5	2	1
10954	NEtFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluorod	octanesu	ılfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	IJ	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-38-161020 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656717 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 12:50 by PM

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00 Reported: 12/21/2016 11:51

M0203 SDG#: MMK02-03

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	SW-846 601	LOC	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	35.5	0.0382	0.400	1
01757	Magnesium	7439-95-4	9.16	0.0190	0.200	1
01762	Potassium	7440-09-7	4.98	0.160	1.00	1
01767	Sodium	7440-23-5	72.3	0.173	2.00	1
Wet Ch	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	194	10.0	20.0	50
00228	Sulfate	14808-79-8	13.2	1.5	5.0	5
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	0.063 J	0.040	0.10	1
	SM 2320 B-	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	29.1	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	29.1	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163041AA	10/30/2016	20:01	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163041AA	10/30/2016	20:01	Angela D Sneeringer	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306001	11/19/2016	00:28	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306001	11/01/2016	19:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163010635003	10/30/2016	19:57	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	163010635003	10/30/2016	19:57	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163010635003	10/30/2016	19:57	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163010635003	10/30/2016	19:57	Elaine F Stoltzfus	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635003	10/27/2016	23:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	16309972602A	11/05/2016	08:05	Alexandria M Lanager	50

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-38-161020 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656717 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 12:50 by PM C. T. Male Associates 50 Century Hill Drive

Submitted: 10/22/2016 10:00 Latham NY 12110

Reported: 12/21/2016 11:51

M0203 SDG#: MMK02-03

Laboratory Sample Analysis Record											
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor			
00228	Sulfate	EPA 300.0	1	16309972602A	11/05/2016	07:49	Alexandria M Lanager	5			
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16304118101B	10/30/2016	17:05	Joseph E McKenzie	1			
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16306005102A	11/02/2016	02:21	Brandon P Costik	1			
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16306005102A	11/02/2016	02:21	Brandon P Costik	1			
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16306005102A	11/02/2016	02:21	Brandon P Costik	1			

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	1E VOLATILE ORGANICS ANALYSIS DATA SHEET							
VOLATILE ORGANICS A TENTATIVELY IDENT	,							
IENIAIIVELI IDENI	IFIED COMPOUNDS	: ! M0203	!					
ab Name: Lancaster Laboratories	Contract:	!	!					
ab Code: LANCAS Case No.:	SAS No.:	SDG No.:	_					
Matrix: (soil/water) WATER	Lab Sample ID: 865	6717						
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP093	55.i/16oct30a.b/yc30	s21.d					
evel: (low/med) LOW	Date Received: 10/	22/16						
Moisture: not dec.	Date Analyzed: 10/	30/16						
column: (pack/cap) CAP	Dilution Factor: 1	. 0						
	CONCENTRATION UN	ITS:						
Number TICs found: 0	(lia/L or lia/Ka)	ıa/T						

CAS NUMBER	! COMPOUND NAME	! RT	EST. CONC.	
	==!===================================	!		!===== ! []
	_!	i		!
]			i
	<u> </u>	i		i
	<u> </u>	ii		!
6.	!			1
8.	!			!
9.				!
0.				!
	_!			!
	_!			!
	_!			!
	_!	!		!
5	_!	!		!
6	!	!		!
7	!	!		!
8	_!	!!	!	!
9.	!!	!		!
0	!!	!!		!
1	!	!!		!
2	!!	!!		!
3	!	!!		!
4	!!	!!		!
5	!	!!		!
	!	!!		!
7	!	!!		!
8	!	!!		!
9	!	!!		!
0	!	!!		!
	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

Sample Description: SG2-APFTB-161020 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8656718 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 13:45

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00 Reported: 12/21/2016 11:51

12/21/2010 11:5

M0204 SDG#: MMK02-04TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	3	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid 72629-		0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	11		0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	JB	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.7	J	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	4	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroc	ctanesu	lfonamido	pacetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me	ethyl perfluoro	octanes	ulfonamid	doacetic Acid.		

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

In the initial extraction of this trip blank sample, PFBA, PFTeDA, and PFOA were observed as reportable hits. In the re-extraction of this sample, only PFBA was observed as a reportable hit.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APFTB-161020 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8656718 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 13:45

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00

Reported: 12/21/2016 11:51

M0204 SDG#: MMK02-04TB

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306001	11/19/2016	00:48	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306001	11/01/2016	19:00	Devon M Whooley	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APLTB-161020 Blank Water

SGPP - Merrimack

LL Sample # WW 8656719 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00 Reported: 12/21/2016 11:51

M0205 SDG#: MMK02-05TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APLTB-161020 Blank Water

SGPP - Merrimack

LL Sample # WW 8656719 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00 Reported: 12/21/2016 11:51

M0205 SDG#: MMK02-05TB

CAT No.	Analysis Name		CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	260C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5 U	0.5	1	1
	thod Detection Limit instrument for sample				vity of		

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc	c. Organics	EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
		modified	1					
1095	4 Perfluorooctanoi	c acid	335-67-1	150	В	0.5	2	1
1095	54 Perfluorononanoio	c acid	375-95-1	0.6	U	0.6	2	1
1095	4 Perfluorodecanoio	c acid	335-76-2	3		0.5	2	1
1095	4 Perfluoroundecand	oic acid	2058-94-8	6		1	3	1
1095	4 Perfluorododecano	oic acid	307-55-1	0.5	U	0.5	2	1
1095	4 Perfluorotridecan	noic acid	72629-94-8	0.5	U	0.5	2	1
1095	54 Perfluorotetrade	canoic acid	376-06-7	25		0.5	2	1
1095	4 Perfluorohexanoio	c acid	307-24-4	6	В	0.5	2	1
1095	4 Perfluoroheptano:	ic acid	375-85-9	7		0.5	2	1
1095	4 Perfluorobutanesu	ılfonate	375-73-5	1	J	0.7	2	1
1095	4 Perfluorohexanesu	ılfonate	355-46-4	19		1	3	1
1095	4 Perfluoro-octanes	sulfonate	1763-23-1	89		2	6	1
1095	54 Perfluorobutanoio	c Acid	375-22-4	8	JB	3	10	1
1095	4 Perfluoropentano:	ic Acid	2706-90-3	0.8	J	0.5	2	1
1095	54 NETFOSAA		2991-50-6	1	U	1	3	1
	NEtFOSAA is the a	acronym for N-	ethyl perfluoro	octanesu	lfonamidoa	cetic Acid.		
1095	54 NMeFOSAA		2355-31-9	1	U	1	3	1
		_						

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid. The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and the recoveries were within acceptable limits. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APLTB-161020 Blank Water

SGPP - Merrimack

LL Sample # WW 8656719 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00

Reported: 12/21/2016 11:51

M0205 SDG#: MMK02-05TB

CAT
No. Analysis Name
CAS Number Result

Method Limit of Dilution
Detection Limit* Quantitation Factor

In the initial extraction of this trip blank sample, several parameters were observed as reportable hits. In the re-extraction of this sample, there were

no reportable hits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163041AA	10/30/2016	19:17	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163041AA	10/30/2016	19:17	Angela D Sneeringer	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306001	11/19/2016	01:09	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306001	11/01/2016	19:00	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.
VOLATILE ORGANICS	ANALYSIS DATA SHEET	
TENTATIVELY IDEN	TIFIED COMPOUNDS	!!!
		! M0205 !
Lab Name: Lancaster Laboratories	Contract:	!!
Lab Code: LANCAS Case No.:_	SAS No.:	_ SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID: 8656	719
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0935	5.i/16oct30a.b/yc30s19.d
Level: (low/med) LOW	Date Received: 10/2	2/16
Moisture: not dec.	Date Analyzed: 10/3	0/16
Column: (pack/cap) CAP	Dilution Factor: 1.	0
	CONCENTRATION UNI	TS:
Number TICs found: 0	(ug/L or ug/Kg) u	g/L

CAS NUMBER	! COMPOUND NAME		EST. CONC.	~
	!Total VOC TICs	!: !		!===== ! U
2	_!	!!	!	!
	_!	!		!
	!	!	!	!
	!		!	!
6	!	!	!	!
7	!		!	!
8	!!	!!	<u> </u>	!
9	!	!!	!	!
.0	!	!!		!
1	!!	!!		!
2	!	!!	!	!
.3	!!	!!		!
4	!	!!	!	!
.5	!	!!		!
	!	!!	!	!
7	!	!!	!	!
.8	!	!!	!	!
9	!	!!	!	!
0	!	!!	!	!
1	!	!!		!
2	!!	!!		!
3	!	!!	!	!
4	!!	!!		!
	!	!!	!	!
6	!!	!!	!	!
.7	!	!!		!
	!	!!		!
9	!	!!		!
0	!	!!		!
	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-48-161020 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656720 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 14:30 by PM

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/22/2016 10:00 Latham NY 12110

Reported: 12/21/2016 11:51

M0206 SDG#: MMK02-06

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	IJ	0.5	1	1
11997	Bromochloromethane	74-97-5	1	IJ	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	IJ	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	II	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	IJ	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	II	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	IJ	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1	1
11997	,	75-35-4	0.5	Ū	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1	1
11997	trans-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1	1
11997	•	78-87-5	0.5	IJ	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5	1	1
11997		10061-01-5	0.5	IJ	0.5	1	1
11997	trans-1,3-Dichloropropene Ethylbenzene	10061-02-6	0.5	IJ	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
				IJ		10	
11997	2-Hexanone	591-78-6	3 1	Ū	3 1	5	1
11997	Isopropylbenzene	98-82-8	1	IJ	1	5 5	1 1
11997	-	79-20-9	0.5	IJ	0.5		
11997	Methyl Tertiary Butyl Ether	1634-04-4		U	0.5 3	1	1
11997	4-Methyl-2-pentanone	108-10-1	3 1	IJ	1	10 5	1
11997	Methylcyclohexane	108-87-2		IJ	2		1
11997	Methylene Chloride	75-09-2	2	-		4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U 	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U 	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U 	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U 	1	5	1
11997		71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-48-161020 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656720 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 14:30 by PM

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00

Reported: 12/21/2016 11:51

M0206 SDG#: MMK02-06

CAT No. Analysis Na	ne CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/1 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.		Rev. 1.1	ng/l		ng/l	ng/l	
	modified	1					
10954	Perfluorooctanoic acid	335-67-1	11	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	4	В	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	2	J	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	1	J	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	2	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	8	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	2		0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluorod	octanesu	lfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	IJ	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	3	SW-846 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	11.5	0.0382	0.400	1
01757	Magnesium	7439-95-4	2.74	0.0190	0.200	1
01762	Potassium	7440-09-7	2.53	0.160	1.00	1
01767	Sodium	7440-23-5	28.1	0.173	2.00	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-48-161020 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656720 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 14:30 by PM

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00 Reported: 12/21/2016 11:51

M0206 SDG#: MMK02-06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Ch	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	47.8	4.0	8.0	20
00228	Sulfate	14808-79-8	10.1	1.5	5.0	5
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	0.097 J	0.040	0.10	1
	SM 2320 B	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	23.3	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	23.3	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

		Laborat	ory Sa	ample Analysi	s Record			
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163071AA	11/02/2016	13:35	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163071AA	11/02/2016	13:35	Angela D Sneeringer	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306001	11/19/2016	01:29	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306001	11/01/2016	19:00	Devon M Whooley	1
01750		SW-846 6010C	1	163010635003	10/30/2016	20:00	Elaine F Stoltzfus	
01757	Magnesium	SW-846 6010C	1	163010635003	10/30/2016	20:00	Elaine F Stoltzfus	_
01762	Potassium	SW-846 6010C	1	163010635003	10/30/2016	20:00	Elaine F Stoltzfus	_
01767	Sodium	SW-846 6010C	1	163010635003	10/30/2016	20:00	Elaine F Stoltzfus	
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635003	10/27/2016	23:00	Annamaria Kuhns	1
00224 00228	Chloride Sulfate	EPA 300.0 EPA 300.0	1	16309972602B 16309972602B	11/07/2016 11/05/2016	22:54 10:27	Clinton M Wilson Alexandria M Lanager	20 5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16304118101B	10/30/2016	17:10	Joseph E McKenzie	1
12150	Total Alkalinity to pH	SM 2320 B-1997	1	16306005103A	11/02/2016	05:12	Brandon P Costik	1
12149 12148	Bicarbonate Alkalinity Carbonate Alkalinity	SM 2320 B-1997 SM 2320 B-1997	1 1	16306005103A 16306005103A	11/02/2016 11/02/2016	05:12 05:12	Brandon P Costik Brandon P Costik	1 1

*=This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

	EPA SAMPLE NO.	
ANALYSIS DATA SHEET		
TIFIED COMPOUNDS	!!!	
	! M0206 !	
Contract:	_ !!	
SAS No.:	SDG No.:	
Lab Sample ID: 86567	20	
Lab File ID:HP09915	.i/16nov02a.b/ln02s0	8.0
Date Received: 10/22	/16	
Date Analyzed: 11/02	/16	
Dilution Factor: 1.0		
CONCENTRATION UNIT	S:	
(ug/L or ug/Kg) ug	/L	
	CONTRACT: SAS No.: Lab Sample ID: 86567 Lab File ID:HP09915 Date Received: 10/22 Date Analyzed: 11/02 Dilution Factor: 1.0 CONCENTRATION UNIT	ANALYSIS DATA SHEET TIFIED COMPOUNDS

CAS NUMBER	: !		! EST. CONC.	~
1. VOCTIC	==!===================================	!	•	!====== ! U
2	!!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
8	!	!	!	!
	!	!	!	!
	!	!	!	!
11	!	!	!	!
12	!	!	!	!
13	!	!	!	!
14	!	!	!	!
	!	!	!	!
	!	!	!	!
17	!	!	!	!
	!	!	!	!
19	!	!	!	!
20		!	!	!
21	!!	!	!	!
22	!!	!	!	!
23	!	!	!	!
24	!	!	!	!
25	!	!	!	!
26	!	!	!	!
27	!	!	!	!
	!	!	!	!
	_ !	!	!	!
30.			!	!
	1	i	1	

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-58-161020 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656721 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 16:25 by PM C. T. Male Associates 50 Century Hill Drive

Submitted: 10/22/2016 10:00 Latham NY 12110

Reported: 12/21/2016 11:51

M0207 SDG#: MMK02-07

GC/MS Volatiles SW-846 8260C Ug/1 CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor		
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax; 717-656-2681 • www,LancasterLabs.com

Sample Description: SG2-AP07-58-161020 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656721 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 16:25 by PM

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 10/22/2016 10:00

Reported: 12/21/2016 11:51

M0207 SDG#: MMK02-07

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW	1-846 826	0C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5 U	0.5	1	1
00882	VOA Library Search The results from the vo FORM 1 - VOA-TIC. The on the back of this for	olatile lib qualifiers					
Metals	s SW	7-846 601	0C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	10.5	0.0382	0.400	1
01757	Magnesium		7439-95-4	2.65	0.0190	0.200	1
01762	Potassium		7440-09-7	3.19	0.160	1.00	1
01767	Sodium		7440-23-5	31.8	0.173	2.00	1
Wet Ch	nemistry EP	A 300.0		mg/l	mg/l	mg/l	
00224	Chloride		16887-00-6	18.3	1.0	2.0	5
00228	Sulfate		14808-79-8	9.0	1.5	5.0	5
	EP	A 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate	Nitrogen	n.a.	0.20	0.040	0.10	1
	SM	1 2320 B-	1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH	4.5	n.a.	23.8	1.7	5.0	1
12149	Bicarbonate Alkalinity		n.a.	23.8	1.7	5.0	1
12148	Carbonate Alkalinity		n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles SW-846 8260C L163071AA 11/02/2016 13:57 Angela D 1 Sneeringer 01163 GC/MS VOA Water Prep SW-846 5030C L163071AA 11/02/2016 13:57 1 Angela D Sneeringer SW-846 6010C 163010635003 01750 Calcium 10/30/2016 20:03 Elaine F Stoltzfus 1 01757 Magnesium SW-846 6010C 163010635003 10/30/2016 20:03 Elaine F Stoltzfus 1 163010635003 Elaine F Stoltzfus 1 01762 Potassium SW-846 6010C 10/30/2016 20:03 01767 Sodium SW-846 6010C 163010635003 10/30/2016 20:03 Elaine F Stoltzfus 1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-58-161020 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656721 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/20/2016 16:25 by PM

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/22/2016 10:00 Latham NY 12110

Reported: 12/21/2016 11:51

M0207 SDG#: MMK02-07

Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor		
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635003	10/27/2016	23:00	Annamaria Kuhns	1		
00224	Chloride	EPA 300.0	1	16309972602B	11/05/2016	10:42	Alexandria M Lanager	5		
00228	Sulfate	EPA 300.0	1	16309972602B	11/05/2016	10:42	Alexandria M Lanager	5		
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16304118101B	10/30/2016	17:12	Joseph E McKenzie	1		
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16306005103A	11/02/2016	03:37	Brandon P Costik	1		
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16306005103A	11/02/2016	03:37	Brandon P Costik	1		
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16306005103A	11/02/2016	03:37	Brandon P Costik	1		

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE	NO.
VOLATILE ORGANICS ANAL	YSIS DATA SHEET			
TENTATIVELY IDENTIFI	ED COMPOUNDS	!		!
		!	M0207	!
Lab Name: Lancaster Laboratories	Contract:	!		!
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8656721			
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID: HP09915.i	/16nd	ov02a.b/	ln02s09.d
Level: (low/med) LOW	Date Received: 10/22/10	5		
Moisture: not dec.	Date Analyzed: 11/02/10	5		
Column: (pack/cap) CAP	Dilution Factor: 1.0			
	CONCENTRATION UNITS:			
Number TICs found: 0	(ug/L or ug/Kg) ug/L			

CAS NUMBER	! COMPOUND NAME		! EST. CONC.	
	==!===================================	!	•	!====: ! U
	_!	į	!	
	!	1	!	!
	!		· !	!
	<u> </u>	!	!	!
		!	!	!
	!	!	!	!
			!	!
	!	!	!	!
)	!	!	!	!
	!	!	!	!
2	!	!	!	!
3	!	!	!	!
l	!	!	!	!
5	!	!	!	!
5	!	!	!	!
7		!	!	!
3		!	!	!
	!	!	!	!
٠		!	!	!
	!	!	!	!
	!	!	!	!
3	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
·	!	!	!	!
	!	!	!	!
	!	!	!	!
١	!	!	!	!
	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

Sample Description: SG2-AP07-58-161021 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656722 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/21/2016 09:10 by PM

C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00 Reported: 12/21/2016 11:51

M0208 SDG#: MMK02-08

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	5	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.7	J	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.7	J	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.9	J	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	2	J	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	2	JB	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	2	J	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	2	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	5	J	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	6	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	2	J	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluorod	octanesu	lfonamidoac	etic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-	methyl perfluoro	octanes	ulfonamidoa	cetic Acid.		

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
	16 PFCs	EPA 537 Rev. 1.1	1	16306001	11/19/2016 0	Jason W Knight	1
		modified					



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-58-161021 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656722 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/21/2016 09:10 by PM C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00 Reported: 12/21/2016 11:51

M0208 SDG#: MMK02-08

Laboratory Sample Analysis Record

CAT Analysis Name Method Trial# Batch# Analysis Analyst Dilution No.

14091 PFAA Water Prep EPA 537 Rev. 1.1 1 16306001 11/01/2016 19:00 Devon M Whooley 1 modified



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

Sample Description: SG2-APRB01-161021 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8656723 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/21/2016 14:05 by PM

C. T. Male Associates

50 Century Hill Drive

Submitted: 10/22/2016 10:00

Latham NY 12110

Reported: 12/21/2016 11:51

M0209 SDG#: MMK02-09RB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit	Limit of * Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	12	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.8	J	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	1	JB	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	1	J	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	1	J	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	2	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	J	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	5	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.8	J	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluorod	ctanesu	lfonamido	acetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-	methyl perfluoro	octanes	ulfonamid	loacetic Acid.		

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

can be obtained to carculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and recoveries were within acceptable limits. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

Method Trial# Batch# Dilution CAT Analysis Name Analysis Analyst Date and Time Factor No. EPA 537 Rev. 1.1 10954 16 PFCs 16306001 11/19/2016 02:11 Jason W Knight 1 modified



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APRB01-161021 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8656723 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/21/2016 14:05 by PM C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00 Reported: 12/21/2016 11:51

M0209 SDG#: MMK02-09RB

Laboratory Sample Analysis Record

CAT Analysis Name Method Trial# Batch# Analysis Analyst Dilution No.

14091 PFAA Water Prep EPA 537 Rev. 1.1 1 16306001 11/01/2016 19:00 Devon M Whooley 1 modified



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax; 717-656-2681 • www,LancasterLabs.com

Sample Description: SG2-APRB02-161021 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8656724 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/21/2016 14:22 by PM C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00 Reported: 12/21/2016 11:51

M0210 SDG#: MMK02-10RB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit [*]	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	2	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.9	J	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	2	JB	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.9	J	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	1	J	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	4	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.7	J	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	thyl perfluoroc	ctanesu	lfonamido	acetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me	ethyl perfluoro	octanes	ulfonamid	oacetic Acid.		

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are

included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

Method Trial# Batch# Dilution CAT Analysis Name Analysis Analyst Date and Time Factor No. EPA 537 Rev. 1.1 Jason W Knight 10954 16 PFCs 16306001 11/19/2016 03:33 1 modified



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APRB02-161021 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8656724 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/21/2016 14:22 by PM C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00 Reported: 12/21/2016 11:51

M0210 SDG#: MMK02-10RB

Laboratory Sample Analysis Record

Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution No. Date and Time Factor EPA 537 Rev. 1.1 1 16306001 11/01/2016 19:00 Devon M Whooley 14091 PFAA Water Prep modified

*=This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-68-161021 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656725 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/21/2016 11:00 by PM C. T. Male Associates 50 Century Hill Drive

Submitted: 10/22/2016 10:00 Latham NY 12110

Reported: 12/21/2016 11:51

M0211 SDG#: MMK02-10

GC/MS Volatiles SW-846 8260C Ug/1 CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor		
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-68-161021 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656725 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/21/2016 11:00 by PM C. T. Male Associates

50 Century Hill Drive

Submitted: 10/22/2016 10:00

Latham NY 12110

Reported: 12/21/2016 11:51

M0211 SDG#: MMK02-10

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles	SW-846 8260C	ug/l 0.5 U	ug/1 0.5	ug/l	1
11997	0-xyrene	95-47-0	0.5 0	0.5	1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined

Misc.	Organics EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	3	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	6	В	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	2		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	1	J	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	9	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	3		0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	hyl perfluoroo	ctanesu	lfonamidoa	acetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and recoveries were within acceptable limits. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	3	SW-846 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	15.7	0.0382	0.400	1
01757	Magnesium	7439-95-4	3.22	0.0190	0.200	1
01762	Potassium	7440-09-7	2.32	0.160	1.00	1
01767	Sodium	7440-23-5	20.3	0.173	2.00	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-68-161021 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656725 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/21/2016 11:00 by PM

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/22/2016 10:00 Latham NY 12110

Reported: 12/21/2016 11:51

M0211 SDG#: MMK02-10

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Ch	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	43.8	10.0	20.0	50
00228	Sulfate	14808-79-8	17.4	1.5	5.0	5
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	0.049 J	0.040	0.10	1
	SM 2320 B-	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	26.9	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	26.9	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

	Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor			
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163071AA	11/02/2016	14:19	Angela D Sneeringer	1			
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163071AA	11/02/2016	14:19	Angela D Sneeringer	1			
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306001	11/19/2016	03:53	Jason W Knight	1			
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306001	11/01/2016	19:00	Devon M Whooley	1			
01750	Calcium	SW-846 6010C	1	163010635003	10/30/2016	20:06	Elaine F Stoltzfus	1			
01757	Magnesium	SW-846 6010C	1	163010635003	10/30/2016	20:06	Elaine F Stoltzfus	1			
01762	Potassium	SW-846 6010C	1	163010635003	10/30/2016	20:06	Elaine F Stoltzfus	1			
01767	Sodium	SW-846 6010C	1	163010635003	10/30/2016	20:06	Elaine F Stoltzfus	1			
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635003	10/27/2016	23:00	Annamaria Kuhns	1			
00224	Chloride	EPA 300.0	1	16309972602B	11/05/2016	11:14	Alexandria M Lanager	50			
00228	Sulfate	EPA 300.0	1	16309972602B	11/05/2016	10:58	Alexandria M Lanager	5			
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16304118101B	10/30/2016	17:14	Joseph E McKenzie	1			
12150	Total Alkalinity to pH	SM 2320 B-1997	1	16306005103A	11/02/2016	04:39	Brandon P Costik	1			
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16306005103A	11/02/2016	04:39	Brandon P Costik	1			

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-68-161021 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656725 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/21/2016 11:00 by PM C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00 Reported: 12/21/2016 11:51

M0211 SDG#: MMK02-10

Laboratory Sample Analysis Record



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.
VOLATILE ORGANICS	ANALYSIS DATA SHEET	
TENTATIVELY IDEN	!!!	
		! M0211 !
Lab Name: Lancaster Laboratories	Contract:	!!
Lab Code: LANCAS Case No.:_	SAS No.:	_ SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID: 8656'	725
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0991!	5.i/16nov02a.b/ln02s10.d
Level: (low/med) LOW	Date Received: 10/2	2/16
Moisture: not dec.	Date Analyzed: 11/0	2/16
Column: (pack/cap) CAP	Dilution Factor: 1.0	0
	CONCENTRATION UNIT	rs:
Number TICs found: 0	(ug/L or ug/Kg) ug	g/L

CAS NUMBER	! COMPOUND NAME		! EST. CONC.	
	==!===================================	!	•	!====: ! U
	_!	i	!	
	!	1	!	!
	!		· !	!
	<u> </u>	!	!	!
		!	!	!
	!	!	!	!
			!	!
	!	!	!	!
)	!	!	!	!
	!	!	!	!
2	!	!	!	!
3	!	!	!	!
l	!	!	!	!
5	!	!	!	!
5	!	!	!	!
7		!	!	!
3		!	!	!
	!	!	!	!
٠		!	!	!
	!	!	!	!
	!	!	!	!
3	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
·	!	!	!	!
	!	!	!	!
	!	!	!	!
١	!	!	!	!
	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-78-161021 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656726 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/21/2016 17:30 by PM C. T. Male Associates 50 Century Hill Drive

Submitted: 10/22/2016 10:00 Latham NY 12110

Reported: 12/21/2016 11:51

M0212 SDG#: MMK02-11

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	3260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	IJ	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	tī	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	τι	0.5	1	1
			0.5	Ū	0.5	1	1
11997 11997	1,2-Dibromoethane	106-93-4 95-50-1	0.5 1	ττ	0.5	5	1
	1,2-Dichlorobenzene			-			
11997	1,3-Dichlorobenzene	541-73-1	1	U 	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U 	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	Ū	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	Ū	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	Ū	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	IJ	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	tī	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	Ū	0.5	1	1
1122/	m+b-virene	1/9001-23-1	0.5	U	0.5	±	±

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-78-161021 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656726 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/21/2016 17:30 by PM

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00 Reported: 12/21/2016 11:51

(CPOICEQ 12/21/2010 11)

M0212 SDG#: MMK02-11

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles	SW-846 8260C	ug/l 0.5 U	ug/1 0.5	ug/l	1
11997	0-xyrene	95-47-0	0.5 0	0.5	1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537 modified	Rev. 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	Δ	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	IJ	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	IJ	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	IJ	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	Ū	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	Ū	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	4	В	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	1	J	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	1	J	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	9	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	2		0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesu	lfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	3	SW-846 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	10.8	0.0382	0.400	1
01757	Magnesium	7439-95-4	2.92	0.0190	0.200	1
01762	Potassium	7440-09-7	4.07	0.160	1.00	1
01767	Sodium	7440-23-5	17.4	0.173	2.00	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-78-161021 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656726 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/21/2016 17:30 by PM

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/22/2016 10:00 Latham NY 12110

Reported: 12/21/2016 11:51

M0212 SDG#: MMK02-11

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Cl	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	21.0	1.0	2.0	5
00228	Sulfate	14808-79-8	17.9	1.5	5.0	5
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	0.10	0.040	0.10	1
	SM 2320 B	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	30.8	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	30.8	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

	Laboratory Sample Analysis Record										
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor			
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163071AA	11/02/2016		Angela D Sneeringer	1			
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163071AA	11/02/2016	14:41	Angela D Sneeringer	1			
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306001	11/18/2016	21:44	Jason W Knight	1			
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306001	11/01/2016	19:00	Devon M Whooley	1			
01750	Calcium	SW-846 6010C	1	163010635003	10/30/2016	20:09	Elaine F Stoltzfus	1			
01757	Magnesium	SW-846 6010C	1	163010635003	10/30/2016	20:09	Elaine F Stoltzfus	1			
01762	Potassium	SW-846 6010C	1	163010635003	10/30/2016	20:09	Elaine F Stoltzfus	1			
01767	Sodium	SW-846 6010C	1	163010635003	10/30/2016	20:09	Elaine F Stoltzfus	1			
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635003	10/27/2016	23:00	Annamaria Kuhns	1			
00224	Chloride	EPA 300.0	1	16309972602В	11/05/2016	11:30	Alexandria M Lanager	5			
00228	Sulfate	EPA 300.0	1	16309972602B	11/05/2016	11:30	Alexandria M Lanager	5			
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16304118101B	10/30/2016	17:15	Joseph E McKenzie	1			
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16306005103A	11/02/2016	04:46	Brandon P Costik	1			
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16306005103A	11/02/2016	04:46	Brandon P Costik	1			

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-78-161021 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8656726 LL Group # 1723907 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/21/2016 17:30 by PM

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/22/2016 10:00 Reported: 12/21/2016 11:51

M0212 SDG#: MMK02-11

Laboratory Sample Analysis Record

CAT	Analysis Name	Method	Trial#	Batch#	Analysis	Analyst	Dilution
No.					Date and Time		Factor
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16306005103A	11/02/2016 04:46	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA SAMPLE NO.			
VOLATILE ORGANICS	ANALYSIS DATA SHEET			
TENTATIVELY IDENTIFIED COMPOUNDS		!!!		
		! M0212 !		
Lab Name: Lancaster Laboratories	Contract:	!		
Lab Code: LANCAS Case No.:_	SAS No.:	_ SDG No.:		
Matrix: (soil/water) WATER	Lab Sample ID: 8656	726		
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0991	5.i/16nov02a.b/ln02s11.d		
Level: (low/med) LOW	Date Received: 10/2	2/16		
Moisture: not dec.	Date Analyzed: 11/0	2/16		
Column: (pack/cap) CAP	Dilution Factor: 1.0			
	CONCENTRATION UNI	TS:		
Number TICs found: 0	(ug/L or ug/Kg) u	g/L		

CAS NUMBER	! COMPOUND NAME		EST. CONC.	~
	!Total VOC TICs	:: !		!===== ! U
2	_!	!!	!	!
	_!	!		!
	!	!		!
	!			!
6	!	!		!
7	!			!
8	!	!!		!
9	!	!!		!
.0	!	!!		!
1	!	!!		!
2	!	!!		!
.3	!	!!		!
4	!	!!		!
	!	!!		!
	!	!!		!
7	!	!!		!
.8	!	!!		!
9	!	!!		!
0	!	!!		!
1	!	!!		!
2	!	!!		!
	!	!!		!
4	!	!!		!
	!	!!		!
	!	!!	l	!
	!	!!	l	!
	!	!!	l	!
9	!	!!	l	!
0	!	!!		!
	1	!!!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1723907

Reported: 12/21/2016 11:51

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Batch number: L163071AA	Sample	number	(s): 86567	20-8656721,8656725-8656726
Acetone	6	U	6	20
Benzene	0.5	U	0.5	1
Bromochloromethane	1	U	1	5
Bromodichloromethane	0.5	U	0.5	1
Bromoform	0.5	U	0.5	4
Bromomethane	0.5	U	0.5	1
2-Butanone	3	U	3	10
Carbon Disulfide	1	U	1	5
Carbon Tetrachloride	0.5	Ū	0.5	1
Chlorobenzene	0.5	U	0.5	1
Chloroethane	0.5	U	0.5	1
Chloroform	0.5	Ū	0.5	1
Chloromethane	0.8	J	0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	U	2	5
Dibromochloromethane	0.5	U	0.5	1
1,2-Dibromoethane	0.5	U	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5
Dichlorodifluoromethane	0.5	U	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	U	0.5	1
trans-1,2-Dichloroethene	0.5	U	0.5	1
1,2-Dichloropropane	0.5	U	0.5	1
cis-1,3-Dichloropropene	0.5	U	0.5	1
trans-1,3-Dichloropropene	0.5	U	0.5	1
Ethylbenzene	0.5	U	0.5	1
Freon 113	2	U	2	10
2-Hexanone	3	U	3	10
Isopropylbenzene	1	U	1	5
Methyl Acetate	1	U	1	5
Methyl Tertiary Butyl Ether	0.5	U	0.5	1
4-Methyl-2-pentanone	3	U	3	10
Methylcyclohexane	1	U	1	5
Methylene Chloride	2	U	2	4
Styrene	1	U	1	5
1,1,2,2-Tetrachloroethane	0.5	U	0.5	1

^{*-} Outside of specification

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1723907

Reported: 12/21/2016 11:51

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ
• • • • • • • • • • • • • • • • • • • •	ug/l		ug/l	ug/l
Mat	_		_	_
Tetrachloroethene Toluene	0.5	U	0.5 0.5	1 1
1,2,3-Trichlorobenzene	1	U	1	5
1,2,4-Trichlorobenzene	1	U	1	5
1,1,1-Trichloroethane	0.5	IJ	0.5	1
1,1,2-Trichloroethane	0.5	U	0.5	1
Trichloroethene	0.5	Ū	0.5	1
Trichlorofluoromethane	0.5	Ū	0.5	1
Vinyl Chloride	0.5	U	0.5	1
m+p-Xylene	0.5	U	0.5	1
o-Xylene	0.5	U	0.5	1
Batch number: Y163041AA	Sample	number	(s): 86567	716-8656717,8656719
Acetone	6	U	6	20
Benzene	0.5	U	0.5	1
Bromochloromethane	1	U	1	5
Bromodichloromethane	0.5	U	0.5	1
Bromoform	0.5	U	0.5	4
Bromomethane	0.5	U	0.5	1
2-Butanone	3	U	3	10
Carbon Disulfide	1	U	1	5
Carbon Tetrachloride	0.5	U	0.5	1
Chlorobenzene	0.5	U	0.5	1
Chloroethane	0.5	U	0.5	1 1
Chloroform Chloromethane	0.5 0.5	U U	0.5 0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	Ū	2	5
Dibromochloromethane	0.5	Ū	0.5	1
1,2-Dibromoethane	0.5	Ū	0.5	1
1,2-Dichlorobenzene	1	Ū	1	5
1,3-Dichlorobenzene	1	Ū	1	5
1,4-Dichlorobenzene	1	Ū	1	5
Dichlorodifluoromethane	0.5	Ū	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	U	0.5	1
trans-1,2-Dichloroethene	0.5	U	0.5	1
1,2-Dichloropropane	0.5	U	0.5	1
cis-1,3-Dichloropropene	0.5	U	0.5	1
trans-1,3-Dichloropropene	0.5	U	0.5	1
Ethylbenzene	0.5	U	0.5	1
Freon 113	2	U	2	10
2-Hexanone	3	U	3	10
Isopropylbenzene	1	U	1	5
Methyl Acetate	1	U	1	5
Methyl Tertiary Butyl Ether	0.5	U	0.5	1
4-Methyl-2-pentanone	3	U	3	10

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1723907

Reported: 12/21/2016 11:51

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Methylcyclohexane	1	U	1	5
Methylene Chloride	2	IJ	2	4
Styrene	1	IJ	1	5
1,1,2,2-Tetrachloroethane	0.5	IJ	0.5	1
Tetrachloroethene	0.5	U	0.5	1
Toluene	0.5	IJ	0.5	1
1,2,3-Trichlorobenzene	1	U	1	5
1,2,4-Trichlorobenzene	1	IJ	1	5
1,1,1-Trichloroethane	0.5	U	0.5	1
1,1,2-Trichloroethane	0.5	U	0.5	1
Trichloroethene	0.5	IJ	0.5	1
Trichlorofluoromethane	0.5	U	0.5	1
Vinyl Chloride	0.5	IJ	0.5	1
m+p-Xylene	0.5	U	0.5	1
o-Xylene	0.5	U	0.5	1
0-xylene	0.5	U	0.5	1
	ng/l		ng/l	ng/l
Batch number: 16306001	Sample	number	(s): 86567	715-8656720,8656722-8656726
Perfluorooctanoic acid	1	J	0.5	2
Perfluorononanoic acid	0.6	U	0.6	2
Perfluorodecanoic acid	0.5	U	0.5	2
Perfluoroundecanoic acid	1	U	1	3
Perfluorododecanoic acid	0.5	U	0.5	2
Perfluorotridecanoic acid	0.5	U	0.5	2
Perfluorotetradecanoic acid	0.5	U	0.5	2
Perfluorohexanoic acid	0.5	J	0.5	2
Perfluoroheptanoic acid	0.5	U	0.5	2
Perfluorobutanesulfonate	0.7	U	0.7	2
Perfluorohexanesulfonate	1	U	1	3
Perfluoro-octanesulfonate	2	U	2	6
Perfluorobutanoic Acid	6	J	3	10
Perfluoropentanoic Acid	0.5	U	0.5	2
NETFOSAA	1	U	1	3
NMeFOSAA	1	U	1	3
	/7		/7	/1
	mg/l		mg/l	mg/l
Batch number: 163010635003				716-8656717,8656720-8656721,8656725-8656726
Calcium	0.0382		0.0382	0.400
Magnesium	0.0190		0.0190	0.200
Potassium		U	0.160	1.00
Sodium	0.173	U	0.173	2.00
Batch number: 16304118101B	Sample	number	(s): 86567	716-8656717,8656720-8656721,8656725-8656726
Total Nitrite/Nitrate Nitrogen	0.040		0.040	0.10
Batch number: 16309972602A	Sample	number	(s): 86567	716-8656717
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1723907

Reported: 12/21/2016 11:51

Method Blank (continued)

Analysis Name	Result MDL** LOQ mg/l mg/l mg/l
Batch number: 16309972602B	Sample number(s): 8656720-8656721,8656725-8656726
Chloride	0.20 U 0.20 0.40
Sulfate	0.30 U 0.30 1.0
	mg/l as CaCO3 mg/l as mg/l as CaCO3 CaCO3
Batch number: 16306005102A	Sample number(s): 8656716-8656717
Total Alkalinity to pH 4.5	1.7 U 1.7 5.0
Batch number: 16306005103A	Sample number(s): 8656720-8656721,8656725-8656726
Total Alkalinity to pH 4.5	2.8 J 1.7 5.0

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l	one	ORLEC	DIMI CD		11021
Batch number: L163071AA	Sample numbe	r(s): 86567	720-8656721,86	56725-8656	726				
Acetone	150	159.37	150	181.58	106	121	50-168	13	30
Benzene	20	18.37	20	18.41	92	92	78-120	0	30
Bromochloromethane	20	20.3	20	19.76	101	99	80-125	3	30
Bromodichloromethane	20	17.84	20	17.84	89	89	80-120	0	30
Bromoform	20	16.29	20	15.66	81	78	59-120	4	30
Bromomethane	20	16.43	20	17.4	82	87	55-123	6	30
2-Butanone	150	145.69	150	150.45	97	100	57-145	3	30
Carbon Disulfide	20	17.43	20	17.29	87	86	58-120	1	30
Carbon Tetrachloride	20	18.37	20	18.34	92	92	74-130	0	30
Chlorobenzene	20	18.51	20	18.36	93	92	80-120	1	30
Chloroethane	20	16.13	20	16.09	81	80	56-120	0	30
Chloroform	20	18.94	20	18.86	95	94	80-120	0	30
Chloromethane	20	15.65	20	16.17	78	81	59-127	3	30
Cyclohexane	20	19.21	20	19.47	96	97	65-131	1	30
1,2-Dibromo-3-chloropropane	20	17.12	20	16.51	86	83	59-120	4	30
Dibromochloromethane	20	17.49	20	17.14	87	86	78-120	2	30
1,2-Dibromoethane	20	19.59	20	18.9	98	95	80-120	4	30
1,2-Dichlorobenzene	20	18.97	20	18.55	95	93	80-120	2	30
1,3-Dichlorobenzene	20	18.39	20	18.32	92	92	80-120	0	30
1,4-Dichlorobenzene	20	18.54	20	18.59	93	93	80-120	0	30
Dichlorodifluoromethane	20	16.15	20	16.55	81	83	49-134	2	30
1,1-Dichloroethane	20	18.39	20	18.47	92	92	80-120	0	30
1,2-Dichloroethane	20	20.02	20	19.78	100	99	66-128	1	30
1,1-Dichloroethene	20	18.89	20	18.9	94	94	76-124	0	30
cis-1,2-Dichloroethene	20	19	20	19.1	95	95	80-120	0	30
trans-1,2-Dichloroethene	20	19.14	20	18.9	96	95	80-120	1	30
1,2-Dichloropropane	20	18.48	20	18.25	92	91	80-120	1	30
cis-1,3-Dichloropropene	20	17.8	20	17.75	89	89	80-120	0	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1723907

Reported: 12/21/2016 11:51

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
trans-1,3-Dichloropropene	20	17.92	20	17.65	90	88	76-120	2	30
Ethylbenzene	20	18.38	20	18.22	92	91	78-120	1	30
Freon 113	20	20.13	20	19.96	101	100	64-136	1	30
2-Hexanone	100	86.06	100	85.18	86	85	49-146	1	30
Isopropylbenzene	20	18.97	20	18.75	95	94	80-120	1	30
Methyl Acetate	20	19.24	20	19.39	96	97	61-137	1	30
Methyl Tertiary Butyl Ether	20	19.16	20	19.04	96	95	75-120	1	30
4-Methyl-2-pentanone	100	88.14	100	86.9	88	87	55-141	1	30
Methylcyclohexane	20	20.74	20	20.53	104	103	66-126	1	30
Methylene Chloride	20	19.06	20	18.79	95	94	80-120	1	30
Styrene	20	18.96	20	18.73	95	94	80-120	1	30
1,1,2,2-Tetrachloroethane	20	17.99	20	18.01	90	90	72-120	0	30
Tetrachloroethene	20	18.87	20	18.57	94	93	80-129	2	30
Toluene	20	18.54	20	18.43	93	92	80-120	1	30
1,2,3-Trichlorobenzene	20	18.07	20	18.19	90	91	69-120	1	30
1,2,4-Trichlorobenzene	20	18.36	20	18.35	92	92	72-120	0	30
1,1,1-Trichloroethane	20	16.16	20	16.17	81	81	66-126	0	30
1,1,2-Trichloroethane	20	19.02	20	18.58	95	93	80-120	2	30
Trichloroethene	20	18.39	20	18.32	92	92	80-120	0	30
Trichlorofluoromethane	20	20.25	20	20.12	101	101	67-129	1	30
Vinyl Chloride	20	16.65	20 40	16.59	83 94	83	63-121	0	30
m+p-Xylene	40 20	37.46	40 20	36.7		92	80-120	2	30
o-Xylene	20	18.69	20	18.56	93	93	80-120	1	30
Batch number: Y163041AA	Sample numbe	r(s): 86567	16-8656717,86	56719					
Acetone	150	208.75	150	248.06	139	165	50-168	17	30
Benzene	20	20.34	20	20.18	102	101	78-120	1	30
Bromochloromethane	20	21.28	20	21.29	106	106	80-125	0	30
Bromodichloromethane	20	21.69	20	21.48	108	107	80-120	1	30
Bromoform	20	18.62	20	18.45	93	92	59-120	1	30
Bromomethane	20	16.84	20	16.84	84	84	55-123	0	30
2-Butanone	150	118.28	150	128	79	85	57-145	8	30
Carbon Disulfide	20	19.72	20	19.43	99	97	58-120	1	30
Carbon Tetrachloride	20	21.9	20	21.46	109	107	74-130	2	30
Chlorobenzene	20	19.96	20	19.79	100	99	80-120	1	30
Chloroethane	20	17.42	20	17.19	87	86	56-120	1	30
Chloroform	20	21.47	20	21.16	107	106	80-120	1	30
Chloromethane	20	17.13	20	17.24	86	86	59-127	1	30
Cyclohexane	20	18.59	20	18.83	93	94	65-131	1	30
1,2-Dibromo-3-chloropropane	20	14.33	20	13.78	72	69	59-120	4	30
Dibromochloromethane	20	20.4	20	20.13	102	101	78-120	1	30
1,2-Dibromoethane	20	19.22	20	19.26	96	96	80-120	0	30
1,2-Dichlorobenzene	20 20	19.88	20 20	19.72	99 100	99 98	80-120 80-120	1 2	30 30
1,3-Dichlorobenzene	20	19.98	20 20	19.53	100	98 99		2 1	30 30
1,4-Dichlorobenzene Dichlorodifluoromethane	20 20	20.01 17.46	20 20	19.76 17.29	100 87	99 86	80-120 49-134	1	30 30
1,1-Dichloroethane	20	21.58	20	21.66	108	108	80-120	0	30
1,1-Dichloroethane	20	23.14	20	23.04	116	115	66-128	0	30
T, Z-DICHIOLOGCHAHE	∠∪	43.14	∠∪	43.04	TT0	TIO	00-120	U	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1723907

Reported: 12/21/2016 11:51

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/1	ug/1	ug/1	ug/l					
1,1-Dichloroethene	20	20	20	19.89	100	99	76-124	1	30
cis-1,2-Dichloroethene	20	20.21	20	20.09	101	100	80-120	1	30
trans-1,2-Dichloroethene	20	20.8	20	20.56	104	103	80-120	1	30
1,2-Dichloropropane	20	21.35	20	21.52	107	108	80-120	1	30
cis-1,3-Dichloropropene	20	20.07	20	20.05	100	100	80-120	0	30
trans-1,3-Dichloropropene	20	21.02	20	20.7	105	104	76-120	2	30
Ethylbenzene	20	20.25	20	20.04	101	100	78-120	1	30
Freon 113	20	19.69	20	19.32	98	97	64-136	2	30
2-Hexanone	100	81.17	100	84.37	81	84	49-146	4	30
Isopropylbenzene	20	19.42	20	19.31	97	97	80-120	1	30
Methyl Acetate	20	17.76	20	17.87	89	89	61-137	1	30
Methyl Tertiary Butyl Ether	20	19.3	20	19.41	97	97	75-120	1	30
4-Methyl-2-pentanone	100	82.77	100	83.66	83	84	55-141	1	30
Methylcyclohexane	20	19.1	20	18.97	95	95	66-126	1	30
Methylene Chloride	20	19.98	20	20	100	100	80-120	0	30
Styrene	20	18.98	20	18.84	95	94	80-120	1	30
1,1,2,2-Tetrachloroethane	20	17.81	20	17.93	89	90	72-120	1	30
Tetrachloroethene	20	21.05	20	20.86	105	104	80-129	1	30
Toluene	20	20.09	20	19.92	100	100	80-120	1	30
1,2,3-Trichlorobenzene	20	18.75	20	18.21	94	91	69-120	3	30
1,2,4-Trichlorobenzene	20	18.76	20	18.14	94	91	72-120	3	30
1,1,1-Trichloroethane	20	20.39	20	19.92	102	100	66-126	2	30
1,1,2-Trichloroethane	20	19.54	20	19.56	98	98	80-120	0	30
Trichloroethene	20	20.61	20	20.65	103	103	80-120	0	30
Trichlorofluoromethane	20	20.18	20	19.67	101	98	67-129	3	30
Vinyl Chloride	20	16.8	20	16.76	84	84	63-121	0	30
m+p-Xylene	40	39.27	40	38.94	98	97	80-120	1	30
o-Xylene	20	18.78	20	18.56	94	93	80-120	1	30
	ng/l	ng/l	ng/l	ng/l					
Batch number: 16306001	Sample numbe	er(s): 86567	15-8656720,86	556722-8656	726				
Perfluorooctanoic acid	200	206.27	200	220.11	103	110	70-130	6	30
Perfluorononanoic acid	200	200.8	200	202.66	100	101	70-130	1	30
Perfluorodecanoic acid	200	193.47	200	206.4	97	103	70-130	6	30
Perfluoroundecanoic acid	200	202.78	200	216.17	101	108	70-130	6	30
Perfluorododecanoic acid	200	197.45	200	212.18	99	106	70-130	7	30
Perfluorotridecanoic acid	200	207.14	200	225.77	104	113	70-130	9	30
Perfluorotetradecanoic acid	200	208.48	200	207.64	104	104	70-130	0	30
Perfluorohexanoic acid	200	193.85	200	214.17	97	107	70-130	10	30
Perfluoroheptanoic acid	200	211.03	200	228.53	106	114	70-130	8	30
Perfluorobutanesulfonate	176.8	178.56	176.8	189.01	101	107	70-130	6	30
Perfluorohexanesulfonate	189.2	183.99	189.2	204.41	97	108	70-130	11	30
Perfluoro-octanesulfonate	191.2	221.56	191.2	201.48	116	105	70-130	9	30
Perfluorobutanoic Acid	200	184.63	200	192.81	92	96	70-130	4	30
Perfluoropentanoic Acid	200	189.03	200	212.44	95	106	70-130	12	30
NETFOSAA	200	195.22	200	221.15	98	111	70-130	12	30
NMeFOSAA	200	236.73	200	240.53	118	120	70-130	2	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1723907

Reported: 12/21/2016 11:51

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/l	LCS Conc mg/l	LCSD Spike Added mg/l	LCSD Conc mg/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 163010635003	Sample numbe	er(s): 86567	716-8656717,86	56720-8656	721,8656	725-8656	726		
Calcium	4.00	4.05			101		80-120		
Magnesium	2.00	2.05			102		80-120		
Potassium	10	10.07			101		80-120		
Sodium	10	9.61			96		80-120		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 16304118101B	Sample numbe	er(s): 86567	716-8656717,86	56720-8656	721,8656	725-8656	726		
Total Nitrite/Nitrate Nitrogen	2.50	2.51			100		90-110		
Batch number: 16309972602A	Sample numbe	er(s): 86565	716-8656717						
Chloride	3.00	2.96			99		90-110		
Sulfate	7.50	7.44			99		90-110		
Batch number: 16309972602B	Sample numbe	er(s): 86565	720-8656721,86	56725-8656	726				
Chloride	3.00	2.96			99		90-110		
Sulfate	7.50	7.44			99		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16306005102A	Sample number	er(s): 86567	716-8656717						
Total Alkalinity to pH 4.5	188	173.59			92		84-110		
Batch number: 16306005103A Total Alkalinity to pH 4.5	Sample number 188	er(s): 86567 173.02	720-8656721,86	56725-8656	5726 92		84-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspik Conc ng/l	!	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 16306001	Sample 1	numb	er(s): 865	6715-8656	720,8656722-	-8656726	UNSPK: 86	556726			
Perfluorooctanoic acid	3.56		199.16	228.65			113		70-130		
Perfluorononanoic acid	0.6	U	199.16	207.8			104		70-130		
Perfluorodecanoic acid	0.5	U	199.16	213.64			107		70-130		
Perfluoroundecanoic acid	1	U	199.16	222.36			112		70-130		
Perfluorododecanoic acid	0.5	U	199.16	225.54			113		70-130		
Perfluorotridecanoic acid	0.5	U	199.16	235.08			118		70-130		
Perfluorotetradecanoic acid	0.5	U	199.16	220.33			111		70-130		
Perfluorohexanoic acid	3.79		199.16	219.78			108		70-130		
Perfluoroheptanoic acid	1.44		199.16	237.55			119		70-130		
Perfluorobutanesulfonate	1.21		176.26	196.84			111		70-130		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1723907

Reported: 12/21/2016 11:51

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ng/l	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Perfluorohexanesulfonate	1 п	188.21	206.68			110		70-130		
Perfluoro-octanesulfonate	2 U	190.2	199.26			105		70-130		
Perfluorobutanoic Acid	8.75	199.16	202.74			97		70-130		
Perfluoropentanoic Acid	2.47	199.16	214.27			106		70-130		
NETFOSAA	1 U	199.16	215.78			108		70-130		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 163010635003	Sample numb	er(s): 8656	5716-8656	717,8656720	-8656721,	8656725-	8656726 U	NSPK: P64	3058	
Calcium	50.25	4.00	55.34	4.00	56.07		145 (2)	75-125	1	20
Magnesium	10.92	2.00	12.88	2.00	13.29		118 (2)	75-125	3	20
Potassium	11.53	10	23.67	10	22.58	121	111	75-125	5	20
Sodium	216.88	10	277.94	10	240.28	611 (2)	234 (2)	75-125	15	20
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 16304118101B	Sample numb	er(s): 8656	5716-8656	717.8656720	-8656721.	8656725-	8656726 U	NSPK: P65	7025	
Total Nitrite/Nitrate Nitrogen	0.893	1.00	1.92	,	,	102		90-110		
Batch number: 16309972602A	Sample numb	er(s): 8656	5716-8656	717 UNSPK:	P660373					
Chloride	26.35	20	45.02			93		90-110		
Sulfate	53.71	50	130.94			154*		90-110		
Batch number: 16309972602B	Sample numb	er(s): 8656	5720-8656	721,8656725	-8656726	UNSPK: P	658434			
Chloride	230.85	200	410.35			90		90-110		
Sulfate	30.61	50	78.86			97		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16306005102A	Sample numb	er(s): 8656	5716-8656	717 UNSPK:	P655813					
Total Alkalinity to pH 4.5	1.7 U	188	166.91	188	173.07	89	92	84-110	4	5
Batch number: 16306005103A	Sample numb	er(s): 8656	5720-8656	721,8656725	-8656726	UNSPK: 8	656721			
Total Alkalinity to pH 4.5	23.75	188	195.15			91		84-110		

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD	DUP RPD Max			
	mg/l	mg/l					
Batch number: 163010635003	Sample number(s):	8656716-8656717,86	56720-8656721	1,8656725-865672	26 BKG:	P643058	
Calcium	50.25	50.65	1	20			
Magnesium	10.92	10.99	1	20			

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1723907

Reported: 12/21/2016 11:51

Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD	DUP RPD Max
	mg/l	mg/l		
Potassium	11.53	11.67	1	20
Sodium	216.88	216.58	0	20
	mg/l	mg/l		
Batch number: 16304118101B	Sample number(s):	8656716-8656717,8656	720-8656721	,8656725-8656726 BKG: P657025
Total Nitrite/Nitrate Nitrogen	0.893	0.896	0	2
Batch number: 16309972602A Chloride Sulfate	Sample number(s): 26.35 53.71	8656716-8656717 BKG: 26.21 53.39	P660373 1 1	15 15
Batch number: 16309972602B	Sample number(s):	8656720-8656721,8656	725-8656726	5 BKG: P658434
Chloride	230.85	216.85	6	15
Sulfate	30.61	30.65	0	15
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 16306005102A	Sample number(s):	8656716-8656717 BKG:	P655813	
Total Alkalinity to pH 4.5	1.7 U	1.7 U	0 (1)	5
Batch number: 16306005103A Total Alkalinity to pH 4.5	Sample number(s): 23.75	8656720-8656721,8656 23.77	5725-8656726 0 (1)	5 BKG: 8656721 5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: L163071AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8656720	101	100	99	98
8656721	100	101	99	98
8656725	101	101	100	98
8656726	101	100	99	98
Blank	102	101	99	98
LCS	101	100	101	99
LCSD	102	101	100	99
Limits:	80-116	77-113	80-113	78-113

Analysis Name: SOM02.2 Volatiles

Batch number: Y163041AA

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1723907

Reported: 12/21/2016 11:51

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: Y163041AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8656716	107	104	95	94
8656717	108	101	95	94
8656719	106	101	96	95
Blank	103	102	96	95
LCS	102	101	97	102
LCSD	101	99	97	101
Limits:	80-116	77-113	80-113	78-113

Analysis Name: 16 PFCs Batch number: 16306001

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8656715	11*	59*	89	74	71	75
8656716	8*	45*	85	65*	78	72
8656717	7*	35*	79	60*	76	63*
8656718	8*	37*	34*	19*	11*	11*
8656719	8*	38*	33*	13*	6*	5*
8656720	8*	43*	77	66*	70	65*
8656722	10*	52*	80	71	75	67*
8656723	7*	35*	50*	46*	51*	44*
8656724	8*	42*	65*	61*	66*	62*
8656725	8*	41*	73	63*	73	66*
8656726	57*	51*	79	83	78	81
Blank	12*	61*	81	92	84	90
LCS	12*	58*	74	84	81	81
LCSD	10*	51*	70	72	78	77
MS	9*	48*	72	76	80	75
Limits:	70-130	70-130	70-130	70-130	70-130	70-130

	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8656715	68*	80	61*	58*	58*	31*
8656716	70	86	70	67*	67*	67*
8656717	60*	86	67*	67*	59*	66*
8656718	8*	6*	5*	4*	45*	2*
8656719	3*	0*	2*	2*	63*	1*
8656720	60*	73	61*	64*	61*	57*
8656722	60*	71	58*	50*	62*	42*
8656723	39*	53*	37*	36*	47*	28*
8656724	56*	75	58*	53*	85	56*
8656725	62*	66*	50*	58*	62*	59*
8656726	78	95	89	66*	67*	65*
Blank	89	89	94	83	71	76
LCS	81	76	80	83	73	80
LCSD	74	83	77	74	66*	73

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1723907

Reported: 12/21/2016 11:51

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 16306001

	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
MS	73	95	97	65*	65*	59*
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA			
8656715	42*	20*	11*			
8656716	71	66*	64*			
8656717	60*	63*	61*			
8656718	53*	2*	1*			
8656719	69*	1*	1*			
8656720	66*	58*	54*			
8656722	63*	36*	31*			
8656723	45*	20*	22*			
8656724	75	38*	29*			
8656725	64*	52*	50*			
8656726	66*	58*	57*			
Blank	68*	74	71			
LCS	88	82	81			
LCSD	72	75	73			
MS	77	57*	59*			
Limits:	70-130	70-130	70-130			

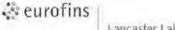
^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

EUC Picksheet: P6467861 Eurolins QC, Inc Cust: U00064 Schd: 43093 JOE RENNER ZYDUS PHARMACEUTICALS, INC. 73 ROUTE 31 NORTH	Start D	Name: ZYI ate: 04/24/0	ed: MONDAY 10/03/16 - 12/3 DUS PHARMACEUTICALS, ING 8 Stop Date: /Schedule Details:		#############	B USE ONLY Ascorbic/Hi NA2S2O3 Na0H/Zn ai HNO3 p H2SO4 p	cetate pH	HCL Vials	1723	901	
PENNINGTON, NJ 08534 (609)730-1900 (609)730-8935 OTHER (609)970-6367 JOE RENNER-CELL (609)730-8784 LILLY DIXON Route: 11 ANDE			PWSID: 1106337	P s e C o u H o c o d o C l	#	NaOH p Unpreserve HCL NH4CL MEOH Na2SO3/HC DI Water Collection Date	d	Free Cl2	I Tests By: pH/TempC BR2 mg/	/Time: Total CL2	
6467861-1 VOCS) TP001001 NJDEPE 60 VOC	POE					10/20/16					
6467861-2 RAW WATER NJDEPE 60 VOC						1	1000				
			D-11-31								
		1								1	
		-									
									Cooler ID:		
Sample Collected By Circle On Client	EQC	Initials		Required	TAT: Standard	_/Rush# Days_	_				
Relinquistred By Carling Time/	JUD 10/2	Date 20/11-0	MANA Selen	Time 1400	10/2010	3,6 × 7	Iced Y/N Site	Initials	Comments (reporting.	methods, etc)	
L 07.00 47.00 F 07.00 47.00 W 07.00 47.00 T 07.00			Kan 12	-1820	1929/4	05	4 Elle	40			_
M: 07:00-17:00 T: 07:00-17:00 W: 07:00-17:00 Th: 07: M: - T: - W: - Th: - F: - PM: MJADICO	St: - Sn:		- Sn: - Printed: 09	714/10 G	PS X: -74.78741	1, 40,30899			Hazardous Y/N		



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

Group Number(s):

Client: EQCL

Delivery and Receipt Information

Delivery Method:

EQCL Drop Off

Arrival Timestamp:

10/20/2016 18:20

Number of Packages:

1

Number of Projects:

8

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

Yes

Custody Seal Present:

Yes

Sample Date/Times match COC:

Yes

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

Air Quality Samples Present:

N/A

Samples Chilled:

Yes

Total Trip Blank Qty:

Paperwork Enclosed:

Yes

No

Samples Intact:

Yes

Missing Samples:

No

Extra Samples:

No No

Unpacked by Karen Diem (3060) at 19:44 on 10/20/2016

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler# Thermometer ID DT131

Discrepancy in Container Qty on COC:

Corrected Temp 0.8

Therm. Type DT

Ice Type Wet

Ice Present?

Ice Container Bagged

Elevated Temp?

Page 3 of 8

2425 New Holland Pike Lancaster, PA 17605-2425

Page 60 of 61



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RLReporting Limit kg **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Environmental Services Analysis Request/Chain of Custody C.T. Male Associates COC#: 15594 Project Name/# SGPP - Merrimack Matrix Site ID. **Analyses Requested** For Lab Use Only Project Manager Kirk Moline 16,6126 **Preservation Codes** SF# 285327 Sampler MARKEN HN SCR# 196068 Phone # 303 - 378 - 8737 2 Quote #: 214135 Preservation Codes State where sample(s) were collected. T = Trees alate (SM 2320B) B = NaOH Collection 5 = H,50, P=HPO. SO4 Grab Sample identification O = Other Date Time SG 3 -APEROT 161939 Remarks tolactin 850 SG 7 -APC7 - 28-161020 18 6-2 1045 × × see Merrimule 19 2 -APOT - 38-161020 VIPE 1250 of 962 -APFTE - 161020 List 18(100) 1345 SG 2 -APLTS - 161020 18(Pm2) * 13 G 2 -APOT - 48-161020 10000 1430 X × * -AP 57 - 58 - 16/020 1625 XX * -APOT - 58 -16 10 21 18 13 mg 10 21 11 910 2 × -APRECL 161021 1405 2 X SG 2 APRIDA 161021 2 Turnaround Time Requested (TAT) (mease check): Standard RUSH Relinquished by: Date Time Received by: Date Time

183014 RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges) 10/21/16 1830 roma Data results are needed Relinquished by Date Time Received by: Date Time E-mail address to send RUSH results: R. moline Oct mala.com Relinquished by: Data Package Options (please check if required) Date Time Received by: Date Time

Type / (Validation/non-CLP) TX TRRP - 13 MA MCP Date Relinquished by: Time Type III (Reduced non-CLP) Received by: Date Time CTRCP Type IV (CLP SOW) ASP Type A Relinquished by: Date Time Received by: Date Type VI (Raw Data Only) ASP Type B Time

EDD Format EQUIS Airpill No. if site-specific QC (MS/MSD/Dup) required, indicate QC samples and

submit triplicate volume.

of the Initial Site

Relinquished by Commercial Carrier FedEx

°C Temperature upon receipt Issued by Dept. 40 Management

OF IT MADE ASSOCIATES								-	- Sattif							-	-	and the		COC#: 1	5594
Project Name/#: SGPP - Merrimack	Site ID.			100		Matrix	-					An	alys	es F	Requ	estec	d			For Lab Use	Only
Project Manager Kirk Moline	P.O. # [- (17)		-		M			MILE.			Pr	eser	vati	on C	odes				SF# 285327	
Sampler PAT MCHWAH		ASSECTION !	2	1000	ent	Ground Surface			Н	N		S								SCR# 196068	
Phone #: 907-378-8737	Quote#	214135	-	-	Sediment] Gr		ça				asN								Preservation	on Codes
State where sample(s) were collected: NH		211100			S	4 (0		iner	-	(6010C)		100		(8)	170				1	H = HC1	f a Thiosulfate
		The Paris				Potable NPDES		Containers	260C	_		(353.2)+WO2	(300.0)	(SM 2320B)	537 mod.)					N = HNO;	H = NaOH
	Colle	ction		osite	1	a z		of C	45 (8;	Mg. Na. K	(353.2)	3.27	- (30		(EPA 5				13	S = H2SO.	P = H,PO,
Sample Identification			Grab	Composite	7	Water	Other:	Total #	TCL VOAs (8260C)	Mg.	_	The same	504	alinity	_			3		() = Other	
	Date	Time		ŭ	Soil		100	P	10	S	NO2	NO3	ည်	AK	PFCs					Rem	arks
SG 2 - APO7 - 68 - 161021 160	THE RESERVE AND ADDRESS OF THE PARTY NAMED IN		×			The second second	E.	11	×	×		X	*	×	*					See Mo	www.k
SG 2 -APOT - TB-1610 21 186	11	1730	*			X		11	X	K		*	*	*	*				2	List	
SG -AP - 16																			-	-131	
SG -AP - 16			-						-										+		
SG -AP - 16				+	-				-				100								
		-700																	7 10		
00			1					100													
10																D	in a	-		Date	Time
SG -AP - 16 Turnaround Time Requested (TAT) (p	lease check): Star	ndard 🔲	RUS	ян□		inquished	159	4	7	L	Pat	100	1	Tim	00	Rece	Sol	by:		Date	Tillio
(RUSH TAT is subject to Eurofins Lancaster Laboration	oratories approva	and surcha	rges.)			linquished	dist	7		TIC	Dat		1	Tim		Rece	200	by:		Date	Time
The state of the s					-	Sm2		-	_	1	ola1	116	1	83	0				_	Date	Time
E-mail address to send RUSH results: K.	molineed	et male.	CON	_	Re	linquishe	d by:				Dat	е		Tim	10	Rece	eived	by:		Date	Title
Data Package Options (please check if	required)	TX TRRE		1777							Dat	0	+	Tim	ne	Rece	eived	by:		Date	Time
Type I (Validation/hor-cur)	TRCP	12 11			Re	linquishe	d by:				Da										-
Type III (Reduced noir-CLF)	SP Type A					linquishe	d hv	-	_	+	Da	te		Tin	ne	Rece	eived	by:		Date	Time
Type IV (CLP SOW) Type VI (Raw Data Only)	SP Type B		-	-	Re	iinquisiie	u by.									-	-	-	-		
EDD Format EQuIS			-		Air	bill No.:		10000		Carrio	ri.								non re	ceipt	°C
If site-specific QC (MS/MSD/Dup) requi	red indicate (C sample	es ar	nd	Do	linguished	by Co	omme dEx	rciai	_ Ot	her_				717 66	Tem	npera	ture u	pon re	Issued by Dept.	40 Managem
If site-specific QC (MS/MSD/Dup) requi	red, indicate (Lavina	Envir	opme	ntal • 2425	New	Holla	nd Pil	ke, La	ncast	er, P	A 176	J1 • /	111-00	0-2.000					
submit triplicate volume.	Eurofins Lanca	aster Labora	folies	Citani																-	The Part of the last

Group #



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: January 04, 2017

Project: SGPP - Merrimack

Submittal Date: 10/26/2016 Group Number: 1725147 SDG: MMK03 PO Number: 16.6126 State of Sample Origin: NH

	Lancaster Labs
Client Sample Description	<u>(LL) #</u>
SG2-AP07-85-161024 Grab Groundwater	8662643
SG2-APLTB-161024 Blank Water	8662644
SG2-APFTB01-161024 Blank Water	8662645
SG2-APEB01-161024 Grab Blank Water	8662646
SG2-AP05-21-161024 Grab Groundwater	8662647
SG2-AP05-31-161024 Grab Groundwater	8662648
SG2-AP05-41-161025 Grab Groundwater	8662649
SG2-AP05-41-161025 MS Grab Groundwater	8662650
SG2-AP05-41-161025 MSD Grab Groundwater	8662651
SG2-AP05-41-161025 Dupl Grab Groundwater	8662652
SG2-AP05-51-161025 Grab Groundwater	8662653
SG2-AP05-61-161025 Grab Groundwater	8662654
SG2-AP05-69-161025 Grab Groundwater	8662655

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	C. T. Male Associates	Attn: Jeff Marx
Electronic Copy To	C. T. Male Associates	Attn: Dan Reilly
Electronic Copy To	C. T. Male Associates	Attn: Kirk Moline



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250

Project Name: SGPP - Merrimack LL Group #: 1725147

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

EPA 537 Rev. 1.1 modified, Misc. Organics

<u>Sample #s: 8662643, 8662646, 8662647, 8662648, 8662649, 8662650, 8662653, 8662654, 8662655</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits. The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package. Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no target analytes were observed in the blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

<u>Sample #s: 8662644</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits. The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no target analytes were observed in the blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

In the initial extraction of this trip blank sample, several parameters were observed as reportable hits. In the re-extraction of this sample, only PFBA was observed as a reportable hit.

Sample #s: 8662651

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and recoveries were within acceptable limits. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no target analytes were observed in the blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Sample #s: 8662645

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits. The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and recoveries were within acceptable limits. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no target analytes were observed in the blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

In the initial extraction of this trip blank sample, several parameters were observed as reportable hits. In the re-extraction of this sample, only PFDOA was observed as a reportable hit.

<u>Batch #: 16306002 (Sample number(s): 8662643-8662651, 8662653-8662655 UNSPK: 8662649)</u>

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: NMeFOSAA

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8662643, 8662644, 8662645, 8662646, 8662647, 8662648, 8662649, 8662650, 8662651, 8662653, 8662654, 8662655, Blank, LCS, MS, MSD

SM 2320 B-1997, Wet Chemistry

<u>Batch #: 16309004201A (Sample number(s): 8662649-8662652 UNSPK: 8662649 BKG: P8662649-P664206)</u>

The relative percent difference(s) for the following analyte(s) in the MS/MSD were outside acceptance windows: Total Alkalinity to pH 4.5

<u>Batch #: 16309004203A (Sample number(s): 8662653 UNSPK: P664194 BKG: P664194.</u>

<u>P664204)</u>

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Alkalinity to pH 4.5



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-85-161024 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662643 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/24/2016 10:35 by JC

C. T. Male Associates
50 Century Hill Drive

50 Century Hill Drive Latham NY 12110

Submitted: 10/26/2016 09:30 Reported: 01/04/2017 12:19

07-85 SDG#: MMK03-01

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	Metho	ceived d tion Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l		ug/l	
11997	Acetone	67-64-1	6	U	6		20	1
11997	Benzene	71-43-2	0.5	U	0.5		1	1
11997	Bromochloromethane	74-97-5	1	IJ	1		5	1
11997	Bromodichloromethane	75-27-4	0.5	IJ	0.5		1	1
11997	Bromoform	75-25-2	0.5	U	0.5		4	1
11997	Bromomethane	74-83-9	0.5	U	0.5		1	1
11997	2-Butanone	78-93-3	3	IJ	3		10	1
11997	Carbon Disulfide	75-15-0	1	U	1		5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5		1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5		1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5		1	1
11997	Chloroform	67-66-3	0.5	U	0.5		1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5		1	1
11997	Cyclohexane	110-82-7	2	IJ	2		5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2		5	1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5		1	1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5		1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1		5	1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1		5	1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1		5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5		1	1
11997	1,1-Dichloroethane	75-71-6	0.5	Ū	0.5		1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5		1	1
11997	,	75-35-4	0.5	Ū	0.5		1	1
11997	1,1-Dichloroethene cis-1,2-Dichloroethene		0.5	Ū	0.5		1	1
	•	156-59-2	0.5	IJ	0.5		1	
11997	trans-1,2-Dichloroethene	156-60-5	0.5	IJ			1	1 1
11997	1,2-Dichloropropane	78-87-5		-	0.5			
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5		1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5 0.5	U U	0.5 0.5		1 1	1 1
11997	Ethylbenzene	100-41-4		-	2			
11997	Freon 113	76-13-1	2	U			10	1
11997	2-Hexanone	591-78-6	3	U	3		10	1
11997	Isopropylbenzene	98-82-8	1	U 	1		5	1
11997	Methyl Acetate	79-20-9	1	U 	1		5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U 	0.5		1	1
11997	4-Methyl-2-pentanone	108-10-1	3	Ū	3		10	1
11997	Methylcyclohexane	108-87-2	1	U	1		5	1
11997	Methylene Chloride	75-09-2	2	U	2		4	1
11997	Styrene	100-42-5	1	U	1		5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5		1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5		1	1
11997	Toluene	108-88-3	0.5	U	0.5		1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1		5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1		5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5		1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5		1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5		1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5		1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5		1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5		1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-85-161024 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662643 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/24/2016 10:35 by JC

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 10/26/2016 09:30

Reported: 01/04/2017 12:19

07-85 SDG#: MMK03-01

CAT No.	Analysis Name	CAS Num	As Received aber Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles o-Xylene	SW-846 8260C 95-47-6	ug/l 5 0.5 ℧	ug/1 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	3	Rev. 1.1	ng/l		ng/l	ng/l	
	modified	l					
10954	Perfluorooctanoic acid	335-67-1	41	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.7	J	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.6	J	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	8	В	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	6		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	3		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	2	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	3	J	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	9	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	4	В	0.5	2	1
10954	NEtFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesu	ılfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	ŢŢ	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no target analytes were observed in the blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	3	SW-846 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	14.3	0.0382	0.400	1
01757	Magnesium	7439-95-4	2.99	0.0190	0.200	1
01762	Potassium	7440-09-7	4.45	0.160	1.00	1
01767	Sodium	7440-23-5	35.3	0.173	2.00	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP07-85-161024 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662643 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/24/2016 10:35 by JC

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/26/2016 09:30 Latham NY 12110

Reported: 01/04/2017 12:19

07-85 SDG#: MMK03-01

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Cl	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	57.2	10.0	20.0	50
00228	Sulfate	14808-79-8	15.8	1.5	5.0	5
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	2.2	0.040	0.10	1
	SM 2320 B	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	28.1	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	28.1	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163063AA	11/02/2016	00:35	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163063AA	11/02/2016	00:35	Matthew S Krause	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306002	11/24/2016	10:26	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306002	11/01/2016	19:15	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163050635001	11/01/2016	06:11	Joanne M Gates	1
01757	Magnesium	SW-846 6010C	1	163050635001	11/01/2016	06:11	Joanne M Gates	1
01762	Potassium	SW-846 6010C	1	163050635001	11/01/2016	06:11	Joanne M Gates	1
01767	Sodium	SW-846 6010C	1	163050635001	11/01/2016	06:11	Joanne M Gates	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635011	10/28/2016	05:51	James L Mertz	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	2	163050635001	10/31/2016	17:40	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16312120601A	11/07/2016	19:12	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16312120601A	11/07/2016	18:57	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16308118101B	11/03/2016	12:21	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16309004202A	11/05/2016	02:09	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16309004202A	11/05/2016	02:09	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16309004202A	11/05/2016	02:09	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA SAMPLE N	io.	
VOLATILE ORGANICS AND			
TENTATIVELY IDENTI	!	!	
		! 07-85	!
Lab Name: Lancaster Laboratories	Contract:	!	!
Lab Code: LANCAS Case No.:	SAS No.:	SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 866	2643	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP099	L5.i/16nov01b.b/l	n01s69.
Level: (low/med) LOW	Date Received: 10/2	26/16	
% Mojeture: not dec	Date Analyzed: 11/	12/16	

% Moisture: not dec.

Column: (pack/cap) CAP

Number TICs found: 0

Date Analyzed: 11/02/16

Dilution Factor: 1.0

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/L

1	1	1 1		
			EST. CONC.	
•	=!====================================	==!=====!	.========	!===== ! U
! 2				: U
	!	:i		i ———
		:i		i
	!	;i		!
! 6				·
	!	;i		!
	i i			!
! 9.		· ·		!
!10				!
!11.	i i			!
!12				!
!13.	i i			!
!14		!		!
!15				!
!16	!	!		!
!17	!	!!		!
	!	!		!
!19.		!		!
	!	!!		!
!21.	!			!
! 22	!			!
!23		!!		!
!24	!	!!		!
! 25	.!	!!		!
! 26	_!	!!		!
! 27	.!	!!		!
! 28	.!	!!		!
! 29	.!	!!		!
!30		!!		!
!	!	!!		!

page 1 of 1 FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APLTB-161024 Blank Water

SGPP - Merrimack

LL Sample # WW 8662644 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/24/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30

Reported: 01/04/2017 12:19

07B5T SDG#: MMK03-02TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U U	2 1	4 5	1 1
11997	Styrene	100-42-5	1 0.5	U	0.5	1	1
11997	1,1,2,2-Tetrachloroethane Tetrachloroethene	79-34-5	0.5	U		1	
11997 11997	Toluene	127-18-4 108-88-3	0.5	U	0.5 0.5	1	1 1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-00-5 79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-09-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1
11221	W. P WATCHE	1,7001-23-1	0.5	U	0.5	-	±

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APLTB-161024 Blank Water

SGPP - Merrimack

LL Sample # WW 8662644 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/24/2016

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/26/2016 09:30 Latham NY 12110

Reported: 01/04/2017 12:19

07B5T SDG#: MMK03-02TB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles o-Xylene	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/l 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	1	JB	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	2	J	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	5	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.6	JB	0.5	2	1
10954	NEtFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-e	ethyl perfluorod	octanesu	lfonamido	acetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no target analytes were observed in the blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

In the initial extraction of this trip blank sample, several parameters were observed as reportable hits. In the re-extraction of this sample, only PFBA was observed as a reportable hit.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APLTB-161024 Blank Water

SGPP - Merrimack

LL Sample # WW 8662644 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/24/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30 Reported: 01/04/2017 12:19

07B5T SDG#: MMK03-02TB

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163063AA	11/02/2016 00:	13 Matthew S Kraus	se 1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163063AA	11/02/2016 00:	13 Matthew S Kraus	se 1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306002	11/24/2016 10:	47 Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306002	11/01/2016 19:	15 Devon M Whooley	1



page 1 of 1

Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA SAMPLE NO.	
VOLATILE ORGANICS AN		
TENTATIVELY IDENTI	!!!	
		! 07B5T !
ab Name: Lancaster Laboratories	Contract:	!
ab Code: LANCAS Case No.:	SAS No.:	_ SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID: 8662	644
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0991	5.i/16nov01b.b/ln01s68.d
evel: (low/med) LOW	Date Received: 10/2	6/16
Moisture: not dec.	Date Analyzed: 11/0	2/16
clumn: (pack/cap) CAP	Dilution Factor: 1.	0
	CONCENTEDATION UNIT	TC •

Number TICs found: 0

Diluction Factor: 1.0

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/L

	! ! COMPOUND NAME		! ! EST. CONC.	
! 1. VOCTIC	!============ !Total VOC TICs	!=======	!======================================	
! 2		·!	!	
	!	·!	!	
	!		!	
		:	!	
! 6		:		
! 7	!	:		
	: !	:		
!10.		:		
!11		i	i	
!12		;	i	·
!13.		;	i	
!14		;	i	
!15		;	·	
!16		;	i	·
	!	;	!	i ———
!18		·	·	·
!19.		·	·	
	!	!	!	
! 21.		!	!	
! 22.	!	!		
! 23.		!		
! 24.	!	!	!	!
! 25		!	!	!
! 26		!	!	
! 27	!	!	!	!
! 28	!	!	!	
! 29		!	! <u></u>	!
!30	!	!	!	!
!	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APFTB01-161024 Blank Water

SGPP - Merrimack

LL Sample # WW 8662645 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/24/2016 15:20

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30 Reported: 01/04/2017 12:19

075FT SDG#: MMK03-03TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	3	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	J	1	3	1
10954	Perfluorododecanoic acid	307-55-1	3		0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	8		0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	12		0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	JB	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	1	J	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	1	JB	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroc	ctanesu	lfonamido	acetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-m	ethyl perfluoro	octanes	ulfonamid	oacetic Acid.		

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and recoveries were within acceptable limits. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no target analytes were observed in the blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

In the initial extraction of this trip blank sample, several parameters were observed as reportable hits. In the re-extraction of this sample, only PFDoA was observed as a reportable hit.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APFTB01-161024 Blank Water

SGPP - Merrimack

LL Sample # WW 8662645 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/24/2016 15:20

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30 Reported: 01/04/2017 12:19

075FT SDG#: MMK03-03TB

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306002	11/24/2016	11:08	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306002	11/01/2016	19:15	Devon M Whooley	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax; 717-656-2681 • www,LancasterLabs.com

Sample Description: SG2-APEB01-161024 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8662646 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/24/2016 14:30 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30

Reported: 01/04/2017 12:19

07B5E SDG#: MMK03-04EB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	2	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.8	JB	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.7	JB	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluoroc	octanesu	lfonamido	acetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	THE TOOLS ! !!	. 1. 7					

 $\tt NMeFOSAA$ is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid. The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no target analytes were observed in the blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

Method Trial# Batch# Dilution CAT Analysis Name Analysis Analyst Date and Time Factor No. EPA 537 Rev. 1.1 10954 16 PFCs 16306002 11/24/2016 11:28 Jason W Knight 1 modified



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-APEB01-161024 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8662646 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/24/2016 14:30 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30

Reported: 01/04/2017 12:19

07B5E SDG#: MMK03-04EB

Laboratory Sample Analysis Record

 CAT
 Analysis Name
 Method
 Trial#
 Batch#
 Analysis
 Analysis
 Analyst
 Dilution

 No.
 14091
 PFAA Water Prep
 EPA 537 Rev. 1.1
 1
 16306002
 11/01/2016
 19:15
 Devon M Whooley
 1

modified



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-21-161024 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662647 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/24/2016 16:30 by JC

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/26/2016 09:30 Latham NY 12110

Reported: 01/04/2017 12:19

05-21 SDG#: MMK03-05

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	ŢŢ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	Ū	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	Ū	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	Ū	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	IJ	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	II O	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	tī	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	tī	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	τι	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	tī	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5	1	1
11997	Ethylbenzene	10001-02-0	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	τι	2	10	1
11997	2-Hexanone	591-78-6	3	τι	3	10	1
11997	Isopropylbenzene	98-82-8	1	IJ	1	5	1
11997	Methyl Acetate	79-20-9	1	τι	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	τι	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	IJ	3	10	1
11997	Methylcyclohexane	108-87-2	1	tī	1	5	1
11997	Methylene Chloride	75-09-2	2	τι	2	4	1
11997	Styrene Chioride	100-42-5	1	IJ	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	tī	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	τι	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	τι	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	Ū	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	Trichloroethene	79-00-5 79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5	1	1
11997	Vinyl Chloride	75-69-4	0.5	ττ	0.5	1	1
11997	-	179601-23-1	0.5	U	0.5	1	1
1199/	m+p-Xylene	1/9001-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-21-161024 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662647 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/24/2016 16:30 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30

Reported: 01/04/2017 12:19

05-21 SDG#: MMK03-05

CAT No. Analysis Na	e CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles 11997 o-Xylene	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/1 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	3	Rev. 1.1	ng/l		ng/l	ng/l	
	modified	l					
10954	Perfluorooctanoic acid	335-67-1	39	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	12	В	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	8		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	3		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	2	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	J	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	8	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	9	В	0.5	2	1
10954	NEtFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesu	ılfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	IJ	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no target analytes were observed in the blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	3	SW-846	6010C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	16.7	0.0382	0.400	1
01757	Magnesium		7439-95-4	2.98	0.0190	0.200	1
01762	Potassium		7440-09-7	2.13	0.160	1.00	1
01767	Sodium		7440-23-5	64.9	0.173	2.00	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-21-161024 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662647 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/24/2016 16:30 by JC

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/26/2016 09:30 Latham NY 12110

Reported: 01/04/2017 12:19

05-21 SDG#: MMK03-05

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Cl	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	108	10.0	20.0	50
00228	Sulfate	14808-79-8	10.8	1.5	5.0	5
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	2.4	0.040	0.10	1
	SM 2320 B-	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	22.0	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	22.0	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163063AA	11/02/2016	00:57	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163063AA	11/02/2016	00:57	Matthew S Krause	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306002	11/24/2016	11:49	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306002	11/01/2016	19:15	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163050635001	11/01/2016	06:14	Joanne M Gates	1
01757	Magnesium	SW-846 6010C	1	163050635001	11/01/2016	06:14	Joanne M Gates	1
01762	Potassium	SW-846 6010C	1	163050635001	11/01/2016	06:14	Joanne M Gates	1
01767	Sodium	SW-846 6010C	1	163050635001	11/01/2016	06:14	Joanne M Gates	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635011	10/28/2016	05:51	James L Mertz	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	2	163050635001	10/31/2016	17:40	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16312120601A	11/07/2016	19:44	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16312120601A	11/07/2016	19:28	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16308118101B	11/03/2016	12:23	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16309004202A	11/05/2016	01:37	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16309004202A	11/05/2016	01:37	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16309004202A	11/05/2016	01:37	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.
VOLATILE ORGANICS A	ANALYSIS DATA SHEET	
TENTATIVELY IDENT	!!!	
		! 05-21 !
Lab Name: Lancaster Laboratories	Contract:	!
Lab Code: LANCAS Case No.:_	SAS No.:	SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID: 8662	2647
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0991	L5.i/16nov01b.b/ln01s70.d
Level: (low/med) LOW	Date Received: 10/2	26/16
Moisture: not dec.	Date Analyzed: 11/0	02/16
Column: (pack/cap) CAP	Dilution Factor: 1.	. 0
	CONCENTRATION UNI	ITS:
Number TICs found: 0	(ug/L or ug/Kg) ı	ıg/L

CAS NUMBER	! COMPOUND NAME		EST. CONC.	~
	!Total VOC TICs	:: !		!===== ! U
2	_!	!!	!	!
	_!	!		!
	!	!		!
	!			!
6	!	!		!
7	!			!
8	!	!!		!
9	!	!!		!
.0	!	!!		!
1	!	!!		!
2	!	!!		!
.3	!	!!		!
4	!	!!		!
.5	!	!!		!
	!	!!		!
7	!	!!		!
.8	!	!!		!
9	!	!!		!
0	!	!!		!
1	!	!!		!
2	!	!!		!
	!	!!		!
4	!	!!		!
	!	!!		!
	!	!!	l	!
	!	!!		!
	!	!!	l	!
9	!	!!	l	!
0	!	!!		!
	1	!!!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-31-161024 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662648 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/24/2016 17:50 by JC

C. T. Male Associates
50 Century Hill Drive

50 Century Hill Drive Latham NY 12110

Submitted: 10/26/2016 09:30 Reported: 01/04/2017 12:19

05-31 SDG#: MMK03-06

CAT No.	Analysis Name	CAS Number	As Rec Result	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 82	260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	Ū	0.5	1	1
11997	Bromochloromethane	74-97-5	1	IJ	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	Ū	0.5	1	1
11997	Bromoform	75-25-2	0.5	IJ	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	Ū	0.5	1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1	1
11997	Chloroform	67-66-3	0.5	Ū	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	IJ	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	IJ	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	Ū	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	IJ	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-01-5	0.5	IJ	0.5	1	1
11997	Ethylbenzene	10061-02-6	0.5	IJ	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
11997	2-Hexanone	591-78-6	3	IJ	3	10	1
11997			3 1	U	1	5	1
11997	Isopropylbenzene	98-82-8 79-20-9	1	IJ	1	5	1
	Methyl Acetate		0.5	IJ			
11997	Methyl Tertiary Butyl Ether	1634-04-4	3	U	0.5 3	1 10	1 1
11997 11997	4-Methyl-2-pentanone	108-10-1 108-87-2	3 1	IJ	1	5	1
	Methylcyclohexane		_	•			=
11997	Methylene Chloride	75-09-2	2 1	U U	2 1	4 5	1
11997	Styrene	100-42-5		U II			1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	0	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1 1	1
11997	Toluene	108-88-3	0.5	U	0.5	_	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U 	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ŭ	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-31-161024 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662648 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/24/2016 17:50 by JC

C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30

Reported: 01/04/2017 12:19

05-31 SDG#: MMK03-06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles o-Xylene	SW-846 8260C 95-47-6	ug/1 0.5 U	ug/1 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined

Misc.	2 2	Rev. 1.1	ng/l		ng/l	ng/l	
	modified	L					
10954	Perfluorooctanoic acid	335-67-1	100	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.9	J	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	15	В	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	15		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	6		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	4		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	5	J	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	7	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	11	В	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesu:	lfonamidoad	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid. The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no target analytes were observed in the blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals		SW-846 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	15.7	0.0382	0.400	1
01757	Magnesium	7439-95-4	2.88	0.0190	0.200	1
01762	Potassium	7440-09-7	2.71	0.160	1.00	1
01767	Sodium	7440-23-5	49.4	0.173	2.00	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-31-161024 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662648 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/24/2016 17:50 by JC

C. T. Male Associates

50 Century Hill Drive Submitted: 10/26/2016 09:30 Latham NY 12110

Reported: 01/04/2017 12:19

/04/2017 12:19

05-31 SDG#: MMK03-06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Cl	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	80.8	10.0	20.0	50
00228	Sulfate	14808-79-8	11.2	1.5	5.0	5
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	4.6	0.20	0.50	5
	SM 2320 B	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	21.4	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	21.4	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163063AA	11/02/2016	01:19	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163063AA	11/02/2016	01:19	Matthew S Krause	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306002	11/24/2016	12:09	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306002	11/01/2016	19:15	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163050635001	11/01/2016	06:17	Joanne M Gates	1
01757	Magnesium	SW-846 6010C	1	163050635001	11/01/2016	06:17	Joanne M Gates	1
01762	Potassium	SW-846 6010C	1	163050635001	11/01/2016	06:17	Joanne M Gates	1
01767	Sodium	SW-846 6010C	1	163050635001	11/01/2016	06:17	Joanne M Gates	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635011	10/28/2016	05:51	James L Mertz	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	2	163050635001	10/31/2016	17:40	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16312120601A	11/07/2016	20:47	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16312120601A	11/07/2016	20:31	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16308118101B	11/03/2016	13:40	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16309004202A	11/05/2016	01:43	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16309004202A	11/05/2016	01:43	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16309004202A	11/05/2016	01:43	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E VOLATILE ORGANICS ANAL	VCIC DATA CHEFT	EPA	SAMPLE N	. 01
TENTATIVELY IDENTIFIE		!	05-31	!
Lab Name: Lancaster Laboratories Lab Code: LANCAS Case No.:	Contract: SAS No.:	!_ SDG	No.:	i
Matrix: (soil/water) WATER Sample wt/vol: 5.0 (g/mL)mL	Lab Sample ID: 8662648 Lab File ID: HP09915.i	/16n	ov01b.b/l	n01s71.d
Level: (low/med) LOW % Moisture: not dec.	Date Received: 10/26/10 Date Analyzed: 11/02/10			
Column: (pack/cap) CAP	Dilution Factor: 1.0 CONCENTRATION UNITS:			
Number TICs found: 0	(ug/L or ug/Kg) ug/L			

CAS NUMBER	! COMPOUND NAME	! RT	EST. CONC.	~
	==!===================================	!		!===== ! U
	_!	ii	!	
	<u> </u>	i		!
	<u> </u>	i		!
	1			!
6.				!
7.	!			!
8.	<u> </u>			!
9.	_!			!
	_!	!	!	!
	_!	!	!	!
.2.	!	!	!	!
.3	!	!	!	!
.4	!	!		!
.5	!	!!	!	!
.6		!		!
.7	!	!!		!
.8	!!	!!	!	!
	!	!		!
20	!	!!		!
21	!	!!	!	!
22	!	!		!
23	!	!!		!
24	!!	!!	!	!
		!!		!
26	!!	!!		!
	!	!!	!	!
8	!	!!		!
9	!!	!!		!
0	!	!!	!	!
	!		1	

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-41-161025 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662649 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 08:25 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30 Reported: 01/04/2017 12:19

05-41 SDG#: MMK03-07BKG

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-41-161025 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662649 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 08:25 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30

Reported: 01/04/2017 12:19

05-41 SDG#: MMK03-07BKG

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
	Volatiles	SW-846 8260C	ug/l	ug/l	ug/l	
11997	o-Xylene	95-47-6	0.5 U	0.5	1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	. •	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	140	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	1	J	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	19	В	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	19		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	7		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	4		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	10		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	9	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	12	В	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesu:	lfonamidoad	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	IJ	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no target analytes were observed in the blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals		SW-846	SW-846 6010C		mg/l	mg/l	
01750	Calcium		7440-70-2	17.9	0.0382	0.400	1
01757	Magnesium		7439-95-4	3.02	0.0190	0.200	1
01762	Potassium		7440-09-7	3.00	0.160	1.00	1
01767	Sodium		7440-23-5	59.3	0.173	2.00	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-41-161025 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662649 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 08:25 by JC

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/26/2016 09:30 Latham NY 12110

Reported: 01/04/2017 12:19

05-41 SDG#: MMK03-07BKG

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Ch	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	96.4	10.0	20.0	50
00228	Sulfate	14808-79-8	11.5	1.5	5.0	5
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	4.8	0.20	0.50	5
	SM 2320 B-	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	21.7	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	21.7	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163063AA	11/01/2016	23:07	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163063AA	11/01/2016	23:07	Matthew S Krause	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306002	11/24/2016	08:03	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306002	11/01/2016	19:15	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163050635001	11/01/2016	05:16	Joanne M Gates	1
01757	Magnesium	SW-846 6010C	1	163050635001	11/01/2016	05:16	Joanne M Gates	1
01762	Potassium	SW-846 6010C	1	163050635001	11/01/2016	05:16	Joanne M Gates	1
01767	Sodium	SW-846 6010C	1	163050635001	11/01/2016	05:16	Joanne M Gates	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635011	10/28/2016	05:51	James L Mertz	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	2	163050635001	10/31/2016	17:40	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16312120601A	11/07/2016	17:38	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16312120601A	11/07/2016	17:22	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16308118101B	11/03/2016	13:35	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16309004201A	11/04/2016	20:53	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16309004201A	11/04/2016	20:53	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16309004201A	11/04/2016	20:53	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	NALVOIC DATA CHEET	EPA SAMPLE NO).		
	VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS				
		! 05-41	!		
ab Name: Lancaster Laboratories	Contract:	!	!		
ab Code: LANCAS Case No.:	SAS No.:	SDG No.:			
Matrix: (soil/water) WATER	Lab Sample ID: 866	2649			
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP099	15.i/16nov01b.b/lr	n01s65.d		
evel: (low/med) LOW	Date Received: 10/	26/16			
Moisture: not dec.	Date Analyzed: 11/	01/16			
column: (pack/cap) CAP	Dilution Factor: 1	. 0			
	CONCENTRATION UN	ITS:			
Number TICs found: 0	(ua/L or ua/Ka)	110 / T.			

! ! CAS NUMBER	! ! COMPOUND NAME ==!===========	! ! RT	! ! EST. CONC.	
! 1. VOCTIC	==!===================================	!	•	! ===== : ! U
! 2	!!	!	!	!!
! 3	!	!	!	!!
	!	!	!	!!
! 5	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!			!
!10	!	!	!	!
!11			!	!
	!	<u>-</u>	!	<u>:</u> ———
	<u>-</u>	:	·	:
		<u>i</u>	·	i
		i	:	i
		i	·	i
		i	·	i
!19.	!	i	 !	
! 20.		i	 !	!
	!		!	!
	1		!	!
!23	!	!	!	!
!24	!	!	!	!
	<u></u>	!	!	!
	!	!	!	!!
!27	!	!	!	!!
!28	!	!	!	!!
!29		!	!	!!
!30	!	!	!	!!
!	!	!	!	!

page 1 of 1

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-41-161025 MS Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662650 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 08:25 by JC

C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30 Reported: 01/04/2017 12:19

05-41 SDG#: MMK03-07MS

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l	ug/l	ug/l	
11997	Acetone	67-64-1	150	6	20	1
11997	Benzene	71-43-2	20	0.5	1	1
11997	Bromochloromethane	74-97-5	21	1	5	1
11997	Bromodichloromethane	75-27-4	19	0.5	1	1
11997	Bromoform	75-25-2	16	0.5	4	1
11997	Bromomethane	74-83-9	19	0.5	1	1
11997	2-Butanone	78-93-3	140	3	10	1
11997	Carbon Disulfide	75-15-0	21	1	5	1
11997	Carbon Tetrachloride	56-23-5	21	0.5	1	1
11997	Chlorobenzene	108-90-7	20	0.5	1	1
11997	Chloroethane	75-00-3	19	0.5	1	1
11997	Chloroform	67-66-3	20	0.5	1	1
11997	Chloromethane	74-87-3	18	0.5	1	1
11997	Cyclohexane	110-82-7	23	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	17	2	5	1
11997	Dibromochloromethane	124-48-1	18	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	19	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	20	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	20	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	19	1	5	1
11997	Dichlorodifluoromethane	75-71-8	19	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	21	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	2.0	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	22	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	21	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	21	0.5	1	1
11997	•	78-87-5	20	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	19	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	18	0.5	1	1
11997	Ethylbenzene	100-41-4	20	0.5	1	1
11997	Freon 113	76-13-1	24	2	10	1
11997	2-Hexanone	591-78-6	82	3	10	1
11997	Isopropylbenzene	98-82-8	21	1	5	1
11997	Methyl Acetate	79-20-9	19	1	5	1
11997		1634-04-4	20	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	85	3	10	1
11997	Methylcyclohexane	108-87-2	23	1	5	1
11997	Methylene Chloride	75-09-2	21	2	4	1
11997	Styrene	100-42-5	20	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	18	0.5	1	1
11997	Tetrachloroethene	127-18-4	21	0.5	1	1
11997	Toluene	108-88-3	20	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	18	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	19	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	18	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	19	0.5	1	1
11997	Trichloroethene	79-01-6	20	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	23	0.5	1	1
11997	Vinyl Chloride	75-01-4	20	0.5	1	1
11997	m+p-Xylene	179601-23-1	40	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-41-161025 MS Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662650 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 08:25 by JC

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/26/2016 09:30 Latham NY 12110

Reported: 01/04/2017 12:19

05-41 SDG#: MMK03-07MS

CAT No.	Analysis Name		CAS Number	As Rec Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	:60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	20		0.5	1	1
Misc.	Organics	EPA 537 F	ev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic a	acid	335-67-1	340	В	0.5	2	1
10954	Perfluorononanoic a	acid	375-95-1	200		0.6	2	1
10954	Perfluorodecanoic a	acid	335-76-2	200		0.5	2	1
10954	Perfluoroundecanoi	c acid	2058-94-8	220		1	3	1
10954	Perfluorododecanoio	c acid	307-55-1	220		0.5	2	1
10954	Perfluorotridecano:	ic acid	72629-94-8	240		0.5	2	1
10954	Perfluorotetradeca	noic acid	376-06-7	210		0.5	2	1
10954	Perfluorohexanoic	acid	307-24-4	230	В	0.5	2	1
10954	Perfluoroheptanoic	acid	375-85-9	250		0.5	2	1
10954	Perfluorobutanesul:	fonate	375-73-5	200		0.7	2	1
10954	Perfluorohexanesul	fonate	355-46-4	190		1	3	1
10954	Perfluoro-octanesu	lfonate	1763-23-1	200		2	6	1
10954	Perfluorobutanoic	Acid	375-22-4	190	В	3	10	1
10954	Perfluoropentanoic Acid 270		2706-90-3	220	В	0.5	2	1
10954	NETFOSAA		2991-50-6	220		1	3	1
	NEtFOSAA is the act	ronym for N-e			fonamidoac	etic Acid.		
10954	NMeFOSAA		2355-31-9	270	E	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no target analytes were observed in the blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	SW-846 6010C	mg/l	mg/l	mg/l	
01750 Calcium	7440-70-2	21.9	0.0382	0.400 1	
01757 Magnesium	7439-95-4	4.97	0.0190	0.200 1	
01762 Potassium	7440-09-7	13.0	0.160	1.00 1	
01767 Sodium	7440-23-5	69.0	0.173	2.00 1	
Wet Chemistry	EPA 300.0	mg/l	mg/l	mg/l	
00224 Chloride	16887-00-6	286	20.0	40.0 10	0 (
00228 Sulfate	14808-79-8	60.6	3.0	10.0 10)

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-41-161025 MS Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662650 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 08:25 by JC C. T. Male Associates 50 Century Hill Drive

Submitted: 10/26/2016 09:30 Latham NY 12110

Reported: 01/04/2017 12:19

05-41 SDG#: MMK03-07MS

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Cl 07882	nemistry Total Nitrite/Nitrat	EPA 353.2 te Nitrogen	n.a.	mg/l 10.1	mg/l 0.20	mg/l 0.50	5
12150	Total Alkalinity to	SM 2320 B- pH 4.5	1997 n.a.	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163063AA	11/01/2016	23:29	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163063AA	11/01/2016	23:29	Matthew S Krause	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306002	11/24/2016	08:23	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306002	11/01/2016	19:15	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163050635001	11/01/2016	05:26	Joanne M Gates	1
01757	Magnesium	SW-846 6010C	1	163050635001	11/01/2016	05:26	Joanne M Gates	1
01762	Potassium	SW-846 6010C	1	163050635001	11/01/2016	05:26	Joanne M Gates	1
01767	Sodium	SW-846 6010C	1	163050635001	11/01/2016	05:26	Joanne M Gates	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635011	10/28/2016	05:51	James L Mertz	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	2	163050635001	10/31/2016	17:40	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16312120601A	11/07/2016	18:41	Hallie Burnett	100
00228	Sulfate	EPA 300.0	1	16312120601A	11/07/2016	18:25	Hallie Burnett	10
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16308118101B	11/03/2016	13:36	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16309004201A	11/04/2016	21:06	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-41-161025 MSD Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662651 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 08:25 by JC

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/26/2016 09:30 Latham NY 12110

Reported: 01/04/2017 12:19

05-41 SDG#: MMK03-07MSD

SCAR Solatiles SW-846 8260C CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor	
11997 Renzene	GC/MS	Volatiles SW-846	8260C	ug/l	ug/l	ug/l	
11997 Rromodichloromethane	11997	Acetone	67-64-1	150	6	20	1
11997 Bromoform 75-27-4 18	11997	Benzene	71-43-2	20	0.5	1	1
11997 Bromonethane	11997	Bromochloromethane	74-97-5	21	1	5	1
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	18	0.5	1	1
11997 2-Butanone 78-93-3 140 3 10 1 19197 1-2-Dichlorochane 108-90-7 19 0.5 1 1 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	16	0.5	4	1
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	19	0.5	1	1
11997 Carbon Disulfide	11997	2-Butanone	78-93-3	140	3	10	1
11997 Carbon Tetrachloride							
11997 Chloroebrane							
11997 Chlorosthane							
11997 Chloroform							
11997 Chloromethane							
11997 Cyclohexane							
11997 1,2-Dibromo-3-chloropropane 96-12-8 16 2 5 1 1 1997 1,2-Dibromochloromethane 124-48-1 18 0.5 1 1 1 1997 1,2-Dibromochloromethane 106-93-4 19 0.5 1 1 1 1 1 1 1 1 1							
11997 Dibromochloromethane 124-48-1 18 0.5 1 1 1 1 1 1 1 1 1							
11997 1,2-Dichlorobenzen							
11997 1,2-Dichlorobenzene							
11997 1,3-Dichlorobenzene		·					
11997 1,4-Dichlorobenzene 106-46-7 19 1 5 1 1 1 1 1 1 1 1		•					
11997 Dichlorodifluoromethane 75-71-8 19 0.5 1 1 1 1 1 1 1 1 1							
11997		,					
11997							
11997							
11997 cis-1,2-Dichloroethene 156-59-2 20 0.5 1 1 1 1 1 1 1 1 1		·					
11997 trans-1,2-Dichloroethene		•					
11997 1,2-Dichloropropane 78-87-5 19 0.5 1 1 1 1 1 1 1 1 1							
11997 cis-1,3-Dichloropropene 10061-01-5 18 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 18 0.5 1 1 11997 Ethylbenzene 100-41-4 20 0.5 1 1 11997 Freon 113 76-13-1 23 2 10 1 11997 Lexanone 591-78-6 81 3 10 1 11997 Methyl Dectate 98-82-8 20 1 5 1 11997 Methyl Acetate 79-20-9 19 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 20 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 84 3 10 1 11997 Methyl-2-pentanone 108-87-2 23 1 5 1 11997 Methyl-cyclohexane 108-87-2 23 1 5 1 11997 Methyl-c		•					
11997 trans=1,3-Dichloropropene 10061-02-6 18 0.5 1 1 1 1 1 1 1 1 1							
11997 Ethylbenzene 100-41-4 20 0.5 1 1 11997 Freon 113 76-13-1 23 2 10 1 11997 2-Hexanone 591-78-6 81 3 10 1 11997 Isopropylbenzene 98-82-8 20 1 5 1 11997 Methyl Acetate 79-20-9 19 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 20 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 84 3 10 1 11997 Methylcyclohexane 108-10-1 84 3 10 1 11997 Methylchec Chloride 75-09-2 20 2 4 1 11997 Styrene 100-42-5 20 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 18 0.5 1 1 11997 Toluene 108-08-3 20 0.5 1 1 11997 1,2,3-Trichloro							
11997 Freon 113 76-13-1 23 2 10 1 11997 2-Hexanone 591-78-6 81 3 10 1 11997 Isopropylbenzene 98-82-8 20 1 5 5 1 11997 Methyl Acetate 79-20-9 19 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 20 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 84 3 10 1 11997 Methylcyclohexane 108-87-2 23 1 5 1 11997 Methylene Chloride 75-09-2 20 2 4 1 11997 Styrene 100-42-5 20 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 18 0.5 1 11997 Toluene 108-88-3 20 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 18 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 19 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 18 0.5 1 1 11997 1,1,1-Trichloroethane 71-55-6 18 0.5 1 1 11997 1,1,1-Trichloroethane 77-55-6 18 0.5 1 1 11997 1,1,2-Trichloroethane 77-55-6 18 0.5 1 1 11997 1,1,1-Trichloroethane 77-55-6 18 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 19 0.5 1							
11997 2-Hexanone 591-78-6 81 3 10 1 11997 Isopropylbenzene 98-82-8 20 1 5 1 11997 Methyl Acetate 79-20-9 19 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 20 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 84 3 10 1 11997 Methylcyclohexane 108-87-2 23 1 5 1 11997 Methylene Chloride 75-09-2 20 2 4 1 11997 Styrene 100-42-5 20 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 18 0.5 1 1 11997 Toluene 108-88-3 20 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 18 1 5 1 11997 1,2,4-Trichloroethane 71-55-6 18 0.5 1 1 11997 <		-					
11997 Isopropylbenzene 98-82-8 20 1 5 1 11997 Methyl Acetate 79-20-9 19 1 5 1 1 1 1 1 1 1 1							
11997 Methyl Acetate 79-20-9 19 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 20 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 84 3 10 1 11997 Methylcyclohexane 108-87-2 23 1 5 1 11997 Methylene Chloride 75-09-2 20 2 4 1 11997 Styrene 100-42-5 20 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 18 0.5 1 1 11997 Tetrachloroethene 127-18-4 21 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 18 1 5 1 11997 1,2,4-Trichloroethane 120-82-1 19 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 18 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 19 0.5 1 1		2-Hexanone					
11997 Methyl Tertiary Butyl Ether 1634-04-4 20 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 84 3 10 1 11997 Methylcyclohexane 108-87-2 23 1 5 1 11997 Methylene Chloride 75-09-2 20 2 4 1 11997 Styrene 100-42-5 20 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 18 0.5 1 1 11997 Tetrachloroethane 127-18-4 21 0.5 1 1 11997 Toluene 108-88-3 20 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 18 1 5 1 11997 1,2,4-Trichloroethane 71-55-6 18 0.5 1 1 11997 1,1,1-Trichloroethane 71-55-6 18 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 19 0.5 1 1 </td <td>11997</td> <td>Isopropylbenzene</td> <td>98-82-8</td> <td></td> <td></td> <td></td> <td></td>	11997	Isopropylbenzene	98-82-8				
11997 4-Methyl-2-pentanone 108-10-1 84 3 10 1 11997 Methylcyclohexane 108-87-2 23 1 5 1 11997 Methylene Chloride 75-09-2 20 2 4 1 11997 Styrene 100-42-5 20 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 18 0.5 1 11997 Tetrachloroethene 127-18-4 21 0.5 1 11997 Toluene 108-88-3 20 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 18 1 5 1 11997 1,2,4-Trichloroethane 71-55-6 18 0.5 1 11997 1,1,1-Trichloroethane 71-55-6 18 0.5 1 11997 1,1,2-Trichloroethane 79-00-5 19 0.5 1			79-20-9				
11997 Methylcyclohexane 108-87-2 23 1 5 1 11997 Methylene Chloride 75-09-2 20 2 4 1 11997 Styrene 100-42-5 20 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 18 0.5 1 1 11997 Tetrachloroethane 127-18-4 21 0.5 1 1 11997 Toluene 108-88-3 20 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 18 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 19 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 18 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 19 0.5 1 1	11997	Methyl Tertiary Butyl Ether	1634-04-4	20		1	1
11997 Methylene Chloride 75-09-2 20 2 4 1 11997 Styrene 100-42-5 20 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 18 0.5 1 1 11997 Tetrachloroethane 127-18-4 21 0.5 1 1 11997 Toluene 108-88-3 20 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 18 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 19 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 18 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 19 0.5 1 1			108-10-1				
11997 Styrene 100-42-5 20 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 18 0.5 1 1 11997 Tetrachloroethane 127-18-4 21 0.5 1 1 11997 Toluene 108-88-3 20 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 18 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 19 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 18 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 19 0.5 1 1	11997	Methylcyclohexane	108-87-2	23		5	1
11997 1,1,2,2-Tetrachloroethane 79-34-5 18 0.5 1 1 11997 Tetrachloroethene 127-18-4 21 0.5 1 1 11997 Toluene 108-88-3 20 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 18 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 19 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 18 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 19 0.5 1 1	11997	Methylene Chloride	75-09-2	20	2		1
11997 Tetrachloroethene 127-18-4 21 0.5 1 1 11997 Toluene 108-88-3 20 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 18 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 19 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 18 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 19 0.5 1 1	11997	Styrene	100-42-5	20	1	5	1
11997 Toluene 108-88-3 20 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 18 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 19 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 18 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 19 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	18	0.5	1	1
11997 1,2,3-Trichlorobenzene 87-61-6 18 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 19 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 18 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 19 0.5 1 1	11997	Tetrachloroethene	127-18-4	21	0.5	1	1
11997 1,2,4-Trichlorobenzene 120-82-1 19 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 18 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 19 0.5 1 1	11997	Toluene	108-88-3	20	0.5	1	1
11997 1,1,1-Trichloroethane 71-55-6 18 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 19 0.5 1 1	11997	1,2,3-Trichlorobenzene	87-61-6	18	1	5	1
11997 1,1,2-Trichloroethane 79-00-5 19 0.5 1 1	11997	1,2,4-Trichlorobenzene	120-82-1	19	1	5	1
	11997	1,1,1-Trichloroethane	71-55-6	18	0.5	1	1
, ,	11997	1,1,2-Trichloroethane	79-00-5	19	0.5	1	1
11997 Trichioroethene /9-01-6 20 0.5 1 1	11997	Trichloroethene	79-01-6	20	0.5	1	1
11997 Trichlorofluoromethane 75-69-4 23 0.5 1 1							
11997 Vinyl Chloride 75-01-4 19 0.5 1 1							
11997 m+p-Xylene 179601-23-1 40 0.5 1 1	11997	-	179601-23-1	40		1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-41-161025 MSD Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662651 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 08:25 by JC C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30 Reported: 01/04/2017 12:19

05-41 SDG#: MMK03-07MSD

CAT No.	Analysis Name		CAS Number	As Recei Result	ived	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	50C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	20		0.5	1	1
Misc.	Organics	EPA 537 Re	ev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic ad	cid	335-67-1	350	В	0.5	2	1
10954	Perfluorononanoic ad	cid	375-95-1	190		0.6	2	1
10954	Perfluorodecanoic ad	cid	335-76-2	210		0.5	2	1
10954	Perfluoroundecanoic	acid	2058-94-8	210		1	3	1
10954	Perfluorododecanoic	acid	307-55-1	210		0.5	2	1
10954	Perfluorotridecanoio	c acid	72629-94-8	230		0.5	2	1
10954	Perfluorotetradecand	oic acid	376-06-7	230		0.5	2	1
10954	Perfluorohexanoic ad	cid	307-24-4	210	В	0.5	2	1
10954	Perfluoroheptanoic a	acid	375-85-9	250		0.5	2	1
10954	Perfluorobutanesulfo	onate	375-73-5	200		0.7	2	1
10954	Perfluorohexanesulfo	onate	355-46-4	190		1	3	1
10954	Perfluoro-octanesul:	fonate	1763-23-1	250		2	6	1
10954	Perfluorobutanoic A	cid	375-22-4	180	В	3	10	1
10954	Perfluoropentanoic A	Acid	2706-90-3	230	В	0.5	2	1
10954	NETFOSAA		2991-50-6	250	E	1	3	1
	NEtFOSAA is the acro	onym for N-et	hyl perfluoroo	ctanesulfo	onamidoacetic	Acid.		
10954	NMeFOSAA		2355-31-9	250		1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid. The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and recoveries were within acceptable limits. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no target analytes were observed in the blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals		SW-846 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	21.6	0.0382	0.400	1
01757	Magnesium	7439-95-4	4.93	0.0190	0.200	1
01762	Potassium	7440-09-7	12.9	0.160	1.00	1
01767	Sodium	7440-23-5	68.4	0.173	2.00	1
Wet Ch	emistry	SM 2320 B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity	to pH 4.5 n.a.	191	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-41-161025 MSD Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662651 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 08:25 by JC C. T. Male Associates 50 Century Hill Drive

Submitted: 10/26/2016 09:30 Latham NY 12110

Reported: 01/04/2017 12:19

05-41 SDG#: MMK03-07MSD

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163063AA	11/01/2016	23:51	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163063AA	11/01/2016	23:51	Matthew S Krause	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306002	11/24/2016	08:44	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306002	11/01/2016	19:15	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163050635001	11/01/2016	05:29	Joanne M Gates	1
01757	Magnesium	SW-846 6010C	1	163050635001	11/01/2016	05:29	Joanne M Gates	1
01762	Potassium	SW-846 6010C	1	163050635001	11/01/2016	05:29	Joanne M Gates	1
01767	Sodium	SW-846 6010C	1	163050635001	11/01/2016	05:29	Joanne M Gates	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635011	10/28/2016	05:51	James L Mertz	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	2	163050635001	10/31/2016	17:40	JoElla L Rice	1
12150	Total Alkalinity to pH	SM 2320 B-1997	1	16309004201A	11/04/2016	21:12	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-41-161025 Dupl Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662652 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 08:25 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30 Reported: 01/04/2017 12:19

_

05-41 SDG#: MMK03-07DUP

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metal	s S	SW-846	6010C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	17.8	0.0382	0.400	1
01757	Magnesium		7439-95-4	3.01	0.0190	0.200	1
01762	Potassium		7440-09-7	2.98	0.160	1.00	1
01767	Sodium		7440-23-5	59.0	0.173	2.00	1
Wet Cl	nemistry I	EPA 300	.0	mg/l	mg/l	mg/l	
00224	Chloride		16887-00-6	103	10.0	20.0	50
00228	Sulfate		14808-79-8	12.6	1.5	5.0	5
	I	EPA 353	.2	mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate	Nitroge	n n.a.	4.8	0.20	0.50	5
	2	SM 2320	B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to p	он 4.5	n.a.	20.9	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Tim	e		Factor
01750	Calcium	SW-846 6010C	1	163050635001	11/01/2016	05:23	Joanne M Gates	1
01757	Magnesium	SW-846 6010C	1	163050635001	11/01/2016	05:23	Joanne M Gates	1
01762	Potassium	SW-846 6010C	1	163050635001	11/01/2016	05:23	Joanne M Gates	1
01767	Sodium	SW-846 6010C	1	163050635001	11/01/2016	05:23	Joanne M Gates	1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	163010635011	10/28/2016	05:51	James L Mertz	1
	U4							
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	2	163050635001	10/31/2016	17:40	JoElla L Rice	1
	U4							
00224	Chloride	EPA 300.0	1	16312120601A	11/07/2016	18:09	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16312120601A	11/07/2016	17:54	Hallie Burnett	5
07882	Total Nitrite/Nitrate	EPA 353.2	1	16308118101B	11/03/2016	13:38	Joseph E McKenzie	5
	Nitrogen							
12150	Total Alkalinity to pH	SM 2320 B-1997	1	16309004201A	11/04/2016	20:59	Brandon P Costik	1
	4.5							



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-51-161025 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662653 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 11:00 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30 Reported: 01/04/2017 12:19

05-51 SDG#: MMK03-08

GC/MS Volatiles SW-846 8260C Ug/1 CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor		
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-51-161025 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662653 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 11:00 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30

Reported: 01/04/2017 12:19

05-51 SDG#: MMK03-08

CAT No. Analysis Na	ne CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/1 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	. •	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	120	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	1	J	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.8	J	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	19	В	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	18		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	7		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	4		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	10		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	8	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	12	В	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesu:	lfonamidoad	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	IJ	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no target analytes were observed in the blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals		SW-846 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	12.8	0.0382	0.400	1
01757	Magnesium	7439-95-4	2.15	0.0190	0.200	1
01762	Potassium	7440-09-7	2.94	0.160	1.00	1
01767	Sodium	7440-23-5	60.0	0.173	2.00	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-51-161025 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662653 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 11:00 by JC

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/26/2016 09:30 Latham NY 12110

Reported: 01/04/2017 12:19

05-51 SDG#: MMK03-08

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Ch	nemistry EPA	300.0		mg/l	mg/l	mg/l	
00224	Chloride		16887-00-6	94.2	10.0	20.0	50
00228	Sulfate		14808-79-8	11.0	1.5	5.0	5
	EPA	353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nit	rogen	n.a.	4.4	0.20	0.50	5
	SM 2	320 B-	1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.	5	n.a.	22.3	1.7	5.0	1
12149	Bicarbonate Alkalinity		n.a.	22.3	1.7	5.0	1
12148	Carbonate Alkalinity		n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163063AA	11/02/2016	01:41	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163063AA	11/02/2016	01:41	Matthew S Krause	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306002	11/24/2016	12:30	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306002	11/01/2016	19:15	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163050635001	11/01/2016	06:27	Joanne M Gates	1
01757	Magnesium	SW-846 6010C	1	163050635001	11/01/2016	06:27	Joanne M Gates	1
01762	Potassium	SW-846 6010C	1	163050635001	11/01/2016	06:27	Joanne M Gates	1
01767	Sodium	SW-846 6010C	1	163050635001	11/01/2016	06:27	Joanne M Gates	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635011	10/28/2016	05:51	James L Mertz	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	2	163050635001	10/31/2016	17:40	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16312120601A	11/07/2016	21:18	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16312120601A	11/07/2016	21:03	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16308118101B	11/03/2016	13:42	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16309004203A	11/05/2016	03:55	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16309004203A	11/05/2016	03:55	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16309004203A	11/05/2016	03:55	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	MALUO COM DIDUI	EPA SAMPLE NO.	
VOLATILE ORGANICS A TENTATIVELY IDENT		!	
		! 05-51 !	
Lab Name: Lancaster Laboratories	Contract:	!	
Lab Code: LANCAS Case No.:	SAS No.:	_ SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8662	653	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0991	5.i/16nov01b.b/ln01s72.	ċ
Level: (low/med) LOW	Date Received: 10/2	6/16	
Moisture: not dec.	Date Analyzed: 11/0	2/16	
Column: (pack/cap) CAP	Dilution Factor: 1.	0	
	CONCENTRATION UNI	TS:	
Number TICs found: 0	(ua/L or ua/Ka) u	α/I.	

CAS NUMBER	: ! COMPOUND NAME ==!=============		: ! EST. CONC.	~
1. VOCTIC	!Total VOC TICs	! !	•	: ! U
	!	_!	!	!
	_!	_!	!	!
	!		!	!
5	!	_!	!	!
6	!	_!	!	!
7	_!	_!	!	!
	!	_!	!	!
	!	_!	!	!
	!	_!	!	!
	_!	_!	!	!
	_!	_!	!	!
		_!	!	!
14	_!	_!	!	!
15	!	_!	!	!
	_!	_!	!	!
	!	_!	!	!
	!	_!	!	!
19	!	_!	!	!
		_!	!	!
21	!	_!	!	!
	!	_!	!	!
23	!	_!	!	!
24	_!	_!	!	!
25	!	_!	!	!
26	_!	_!	!	!
27	_!	_!	!	!
28	_!		!	!
29.	_!			!
	_!	-!	!	!
		1	1	1

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-61-161025 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662654 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 12:35 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30 Reported: 01/04/2017 12:19

05-61 SDG#: MMK03-09

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	Metho	ceived d tion Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l		ug/l	
11997	Acetone	67-64-1	6	U	6		20	1
11997	Benzene	71-43-2	0.5	U	0.5		1	1
11997	Bromochloromethane	74-97-5	1	IJ	1		5	1
11997	Bromodichloromethane	75-27-4	0.5	IJ	0.5		1	1
11997	Bromoform	75-25-2	0.5	U	0.5		4	1
11997	Bromomethane	74-83-9	0.5	U	0.5		1	1
11997	2-Butanone	78-93-3	3	IJ	3		10	1
11997	Carbon Disulfide	75-15-0	1	U	1		5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5		1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5		1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5		1	1
11997	Chloroform	67-66-3	0.5	U	0.5		1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5		1	1
11997	Cyclohexane	110-82-7	2	IJ	2		5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2		5	1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5		1	1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5		1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1		5	1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1		5	1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1		5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5		1	1
11997	1,1-Dichloroethane	75-71-6	0.5	Ū	0.5		1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5		1	1
11997	,	75-35-4	0.5	Ū	0.5		1	1
11997	1,1-Dichloroethene cis-1,2-Dichloroethene		0.5	Ū	0.5		1	1
	•	156-59-2	0.5	IJ	0.5		1	
11997	trans-1,2-Dichloroethene	156-60-5	0.5	IJ			1	1 1
11997	1,2-Dichloropropane	78-87-5		-	0.5			
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5		1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5 0.5	U U	0.5 0.5		1 1	1 1
11997	Ethylbenzene	100-41-4		-	0.5			
11997	Freon 113	76-13-1	2	U			10	1
11997	2-Hexanone	591-78-6	3	U	3		10	1
11997	Isopropylbenzene	98-82-8	1	U 	1		5	1
11997	Methyl Acetate	79-20-9	1	U 	1		5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U 	0.5		1	1
11997	4-Methyl-2-pentanone	108-10-1	3	Ū	3		10	1
11997	Methylcyclohexane	108-87-2	1	U	1		5	1
11997	Methylene Chloride	75-09-2	2	U	2		4	1
11997	Styrene	100-42-5	1	U	1		5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5		1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5		1	1
11997	Toluene	108-88-3	0.5	U	0.5		1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1		5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1		5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5		1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5		1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5		1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5		1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5		1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5		1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-61-161025 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662654 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 12:35 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30

Reported: 01/04/2017 12:19

05-61 SDG#: MMK03-09

CAT No. Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles 11997 o-Xylene	SW-846 8260C	ug/l 0.5 Մ	ug/1 0.5	ug/l	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	2 2	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	120	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.8	J	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	22	В	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	18		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	6		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	4		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	9		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	6	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	13	В	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesu	lfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no target analytes were observed in the blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	3	SW-846 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	14.4	0.0382	0.400	1
01757	Magnesium	7439-95-4	2.66	0.0190	0.200	1
01762	Potassium	7440-09-7	2.84	0.160	1.00	1
01767	Sodium	7440-23-5	62.9	0.173	2.00	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-61-161025 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662654 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 12:35 by JC

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 10/26/2016 09:30 Reported: 01/04/2017 12:19

05-61 SDG#: MMK03-09

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Cl	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	95.1	10.0	20.0	50
00228	Sulfate	14808-79-8	12.4	1.5	5.0	5
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	4.6	0.20	0.50	5
	SM 2320 B	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	32.0	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	32.0	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163063AA	11/02/2016	02:03	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163063AA	11/02/2016	02:03	Matthew S Krause	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306002	11/24/2016	12:50	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306002	11/01/2016	19:15	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163050635001	11/01/2016	06:30	Joanne M Gates	1
01757	Magnesium	SW-846 6010C	1	163050635001	11/01/2016	06:30	Joanne M Gates	1
01762	Potassium	SW-846 6010C	1	163050635001	11/01/2016	06:30	Joanne M Gates	1
01767	Sodium	SW-846 6010C	1	163050635001	11/01/2016	06:30	Joanne M Gates	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635011	10/28/2016	05:51	James L Mertz	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	2	163050635001	10/31/2016	17:40	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16312120601A	11/07/2016	21:50	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16312120601A	11/07/2016	21:34	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16308118101B	11/03/2016	13:43	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16309004202A	11/05/2016	02:03	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16309004202A	11/05/2016	02:03	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16309004202A	11/05/2016	02:03	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.
VOLATILE ORGANICS AN	NALYSIS DATA SHEET	
TENTATIVELY IDENTI	!!!	
		! 05-61 !
Lab Name: Lancaster Laboratories	Contract:	!
Lab Code: LANCAS Case No.:	SAS No.:	SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID: 866	52654
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP099	15.i/16nov01b.b/ln01s73.d
Level: (low/med) LOW	Date Received: 10/	26/16
Moisture: not dec.	Date Analyzed: 11/	02/16
Column: (pack/cap) CAP	Dilution Factor: 1	0
	CONCENTRATION UN	IITS:
Number TICs found: 0	(ug/L or ug/Kg)	ug/L

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
	==!===================================	!		!===== ! U
2.	!	!	!	!
	!			!
		!		!
i	!	!	!	!
5	!	!	!	!
·	!	!	!	!
3	!	!	!	!
		!!	!	!
)	!	!	!	!
· ·	!	!	<u> </u>	!
2	!	!		!
8	!	!	<u> </u>	!
! .	<u>!</u>	!	!	!
·	<u>!</u>	!	!	!
5	!	!		!
·	!	!!	!	!
	!	!!	!	!
	!	!:	!	!
)		!	! <u></u>	!
	!	!:	!	!
	!	!	! <u></u>	!
	!	!		!
	!	!	! <u></u>	!
	!	!		!
	!	!		!
	!	!	!	!
3	!	!	!	!
•	_!	!	!	!
٠	!	!		!
	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-69-161025 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662655 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 14:30 by JC

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/26/2016 09:30 Latham NY 12110

Reported: 01/04/2017 12:19

05-69 SDG#: MMK03-10

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	3260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	IJ	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	tī	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	τι	0.5	1	1
			0.5	Ū	0.5	1	1
11997 11997	1,2-Dibromoethane	106-93-4 95-50-1	0.5 1	ττ	0.5	5	1
	1,2-Dichlorobenzene			-			
11997	1,3-Dichlorobenzene	541-73-1	1	U 	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U 	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	Ū	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	Ū	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	Ū	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	IJ	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	tī	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	Ū	0.5	1	1
1122/	m+b-virene	1/9001-23-1	0.5	U	0.5	1	±

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-69-161025 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662655 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 14:30 by JC

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 10/26/2016 09:30

Reported: 01/04/2017 12:19

05-69 SDG#: MMK03-10

CAT No.	Analysis Name		CAS Number	As Rec Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846	8260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537		ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	130	В	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	1	J	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	16	В	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	16		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	6		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	5		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	6		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	7	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	11	В	0.5	2	1
10954	NEtFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesu.	lfonamidoad	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no target analytes were observed in the blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	3	SW-846 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	18.7	0.0382	0.400	1
01757	Magnesium	7439-95-4	6.51	0.0190	0.200	1
01762	Potassium	7440-09-7	4.13	0.160	1.00	1
01767	Sodium	7440-23-5	49.5	0.173	2.00	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-69-161025 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8662655 LL Group # 1725147 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/25/2016 14:30 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/26/2016 09:30 Reported: 01/04/2017 12:19

-

05-69 SDG#: MMK03-10

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Ch	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	87.1	20.0	40.0	100
00228	Sulfate	14808-79-8	18.7	1.5	5.0	5
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	3.2	0.040	0.10	1
	SM 2320 B-	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	35.6	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	35.6	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163063AA	11/02/2016	02:25	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163063AA	11/02/2016	02:25	Matthew S Krause	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16306002	11/24/2016	14:12	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306002	11/01/2016	19:15	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163050635001	11/01/2016	06:33	Joanne M Gates	1
01757	Magnesium	SW-846 6010C	1	163050635001	11/01/2016	06:33	Joanne M Gates	1
01762	Potassium	SW-846 6010C	1	163050635001	11/01/2016	06:33	Joanne M Gates	1
01767	Sodium	SW-846 6010C	1	163050635001	11/01/2016	06:33	Joanne M Gates	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163010635011	10/28/2016	05:51	James L Mertz	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	2	163050635001	10/31/2016	17:40	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16312120601A	11/07/2016	22:21	Hallie Burnett	100
00228	Sulfate	EPA 300.0	1	16312120601A	11/07/2016	22:06	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16308118101B	11/03/2016	12:33	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16309004202A	11/05/2016	01:18	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16309004202A	11/05/2016	01:18	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16309004202A	11/05/2016	01:18	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE N	Ю.
VOLATILE ORGANICS ANA TENTATIVELY IDENTIF		! !	05-69	! !
Lab Name: Lancaster Laboratories Lab Code: LANCAS Case No.:	Contract: SAS No.:	!_ SDG	No.:	! !
Matrix: (soil/water) WATER Sample wt/vol: 5.0 (g/mL)mL	Lab Sample ID: 8662655 Lab File ID: HP09915.i		ov01b.b/l	n01s74.d

Level: (low/med) LOW

Bate Received: 10/26/16
% Moisture: not dec.

Column: (pack/cap) CAP

Date Analyzed: 11/02/16

Dilution Factor: 1.0

CONCENTRATION UNITS:

Number TICs found: 0

CONCENTRATION UNITS:

	! COMPOUND NAME		! EST. CONC.	~
	==!===================================	!	!======================================	!===== ! []
2		į		
	·	1	1	
	<u> </u>	i		<u>i</u>
	<u> </u>	i	!	<u>.</u>
	·	i		
	<u> </u>			
	<u> </u>		!	
	!			!
	<u> </u>	i	!	<u>.</u>
				!
	· ·			!
		i	!	!
	!	!	!	!
.5.		!	!	!
.6.		!	!	!
		!	!	!
.8.	!	!	!	!
.9.		!	!	!
20		!	!	!
21	!	!	!	!
		!	!	!
23	<u> </u>	!	!	!
24		!	!	!
25		!	!	!
26	!	!	!	!
27	!	!	!	!
	!	!	!	!
	!	!	!	!!
80	!	!	!	!
	1	1	1	

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1725147

Reported: 01/04/2017 12:19

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL*	**	LOQ
	ug/l		ug/l	L	ug/l
Batch number: L163063AA	Sample	number	(s):	866264	13-8662644,8662647-8662651,8662653-8662655
Acetone	6	U	6		20
Benzene	0.5	U	0.5		1
Bromochloromethane	1	U	1		5
Bromodichloromethane	0.5	U	0.5		1
Bromoform	0.5	U	0.5		4
Bromomethane	0.5	Ū	0.5		1
2-Butanone	3	U	3		10
Carbon Disulfide	1	U	1		5
Carbon Tetrachloride	0.5	Ū	0.5		1
Chlorobenzene	0.5	U	0.5		1
Chloroethane	0.5	U	0.5		1
Chloroform	0.5	Ū	0.5		1
Chloromethane	0.5	U	0.5		1
Cyclohexane	2	U	2		5
1,2-Dibromo-3-chloropropane	2	U	2		5
Dibromochloromethane	0.5	U	0.5		1
1,2-Dibromoethane	0.5	U	0.5		1
1,2-Dichlorobenzene	1	U	1		5
1,3-Dichlorobenzene	1	U	1		5
1,4-Dichlorobenzene	1	U	1		5
Dichlorodifluoromethane	0.5	U	0.5		1
1,1-Dichloroethane	0.5	U	0.5		1
1,2-Dichloroethane	0.5	U	0.5		1
1,1-Dichloroethene	0.5	U	0.5		1
cis-1,2-Dichloroethene	0.5	U	0.5		1
trans-1,2-Dichloroethene	0.5	U	0.5		1
1,2-Dichloropropane	0.5	U	0.5		1
cis-1,3-Dichloropropene	0.5	U	0.5		1
trans-1,3-Dichloropropene	0.5	U	0.5		1
Ethylbenzene	0.5	U	0.5		1
Freon 113	2	U	2		10
2-Hexanone	3	U	3		10
Isopropylbenzene	1	U	1		5
Methyl Acetate	1	U	1		5
Methyl Tertiary Butyl Ether	0.5	U	0.5		1
4-Methyl-2-pentanone	3	U	3		10
Methylcyclohexane	1	U	1		5
Methylene Chloride	2	U	2		4
Styrene	1	U	1		5
1,1,2,2-Tetrachloroethane	0.5	U	0.5		1

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1725147

Reported: 01/04/2017 12:19

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Tetrachloroethene	0.5	U	0.5	1
Toluene	0.5	U	0.5	1
1,2,3-Trichlorobenzene	1	U	1	5
1,2,4-Trichlorobenzene	1	U	1	5
1,1,1-Trichloroethane	0.5	U	0.5	1
1,1,2-Trichloroethane	0.5	U	0.5	1
Trichloroethene	0.5	U	0.5	1
Trichlorofluoromethane	0.5	U	0.5	1
Vinyl Chloride	0.5	U	0.5	1
m+p-Xylene	0.5	U	0.5	1
o-Xylene	0.5	U	0.5	1
	ng/l		ng/l	ng/l
Batch number: 16306002	Sample	number	(s): 86626	543-8662651,8662653-8662655
Perfluorooctanoic acid	1	J	0.5	2
Perfluorononanoic acid	0.6	U	0.6	2
Perfluorodecanoic acid	0.5	U	0.5	2
Perfluoroundecanoic acid	1	U	1	3
Perfluorododecanoic acid	0.5	U	0.5	2
Perfluorotridecanoic acid	0.5	U	0.5	2
Perfluorotetradecanoic acid	0.5	U	0.5	2
Perfluorohexanoic acid	0.6	J	0.5	2
Perfluoroheptanoic acid	0.5	U	0.5	2
Perfluorobutanesulfonate	0.7	U	0.7	2
Perfluorohexanesulfonate	1	U	1	3
Perfluoro-octanesulfonate	2	U	2	6
Perfluorobutanoic Acid	4	J	3	10
Perfluoropentanoic Acid	0.5	J	0.5	2
NETFOSAA	1	U	1	3
NMeFOSAA	1	U	1	3
	mg/l		mg/l	mg/l
Batch number: 163050635001	Sample	number	(s): 86626	543,8662647-8662655
Calcium	0.0382	. U	0.0382	0.400
Magnesium	0.0190	U	0.0190	0.200
Potassium	0.160	U	0.160	1.00
Sodium	0.173	U	0.173	2.00
Batch number: 16308118101B	Sample	number	(s): 86626	543,8662647-8662650,8662652-8662655
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 16312120601A				543,8662647-8662650,8662652-8662655
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
	mg/l a	s CaCO3	mg/l as CaCO3	mg/l as CaCO3
Batch number: 16309004201A	Sample	number		549-8662652
Total Alkalinity to pH 4.5	1.7	U	1.7	5.0
	- • •	_	- · ·	= · ·

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1725147

Reported: 01/04/2017 12:19

Method Blank (continued)

Analysis Name	Result	MDL**	LOQ
	mg/l as CaCO3	3 mg/l as CaCO3	mg/l as CaCO3
Batch number: 16309004202A Total Alkalinity to pH 4.5		1.7	543,8662647-8662648,8662654-8662655 5.0
Batch number: 16309004203A Total Alkalinity to pH 4.5	Sample number	(s): 86626 1.7	553 5.0

LCS/LCSD

Analysis Name	LCS Spike	LCS	LCSD Spike	LCSD	LCS	LCSD	LCS/LCSD	RPD	RPD
	Added ug/l	Conc	Added ug/l	Conc ug/l	%REC	%REC	Limits		Max
		ug/l		-					
Batch number: L163063AA	-		543-8662644,866	52647-8662		653-8662			
Acetone	150	168.32			112		50-168		
Benzene	20	18.97			95		78-120		
Bromochloromethane	20	19.99			100		80-125		
Bromodichloromethane	20	18.17			91		80-120		
Bromoform	20	15.95			80		59-120		
Bromomethane	20	18.27			91		55-123		
2-Butanone	150	141.06			94		57-145		
Carbon Disulfide	20	19.24			96		58-120		
Carbon Tetrachloride	20	19.1			95		74-130		
Chlorobenzene	20	18.63			93		80-120		
Chloroethane	20	17.4			87		56-120		
Chloroform	20	19.11			96		80-120		
Chloromethane	20	17.55			88		59-127		
Cyclohexane	20	20.38			102		65-131		
1,2-Dibromo-3-chloropropane	20	16.95			85		59-120		
Dibromochloromethane	20	17.56			88		78-120		
1,2-Dibromoethane	20	19.12			96		80-120		
1,2-Dichlorobenzene	20	18.89			94		80-120		
1,3-Dichlorobenzene	20	18.39			92		80-120		
1,4-Dichlorobenzene	20	18.6			93		80-120		
Dichlorodifluoromethane	20	18.14			91		49-134		
1,1-Dichloroethane	20	19.12			96		80-120		
1,2-Dichloroethane	20	19.1			95		66-128		
1,1-Dichloroethene	20	19.89			99		76-124		
cis-1,2-Dichloroethene	20	19.53			98		80-120		
trans-1,2-Dichloroethene	20	19.65			98		80-120		
1,2-Dichloropropane	20	18.78			94		80-120		
cis-1,3-Dichloropropene	20	18.14			91		80-120		
trans-1,3-Dichloropropene	20	18.34			92		76-120		
Ethylbenzene	20	18.54			93		78-120		
Freon 113	20	21.21			106		64-136		
2-Hexanone	100	82.78			83		49-146		
Isopropylbenzene	20	19.09			95		80-120		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1725147

Reported: 01/04/2017 12:19

LCS/LCSD (continued)

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Methyl Acetate	20	19.55			98		61-137		
Methyl Tertiary Butyl Ether	20	19.74			99		75-120		
4-Methyl-2-pentanone	100	85.98			86		55-141		
Methylcyclohexane	20	20.65			103		66-126		
Methylene Chloride	20	19.35			97		80-120		
Styrene	20	19.15			96		80-120		
1,1,2,2-Tetrachloroethane	20	18.54			93		72-120		
Tetrachloroethene	20	19.18			96		80-129		
Toluene	20	18.99			95		80-120		
1,2,3-Trichlorobenzene	20	18.23			91		69-120		
1,2,4-Trichlorobenzene	20	18.38			92		72-120		
1,1,1-Trichloroethane	20	16.55			83		66-126		
1,1,2-Trichloroethane	20	18.76			94		80-120		
Trichloroethene	20	18.83			94		80-120		
Trichlorofluoromethane	20	20.3			101		67-129		
Vinyl Chloride	20	17.98			90		63-121		
m+p-Xylene	40	37.57			94		80-120		
o-Xylene	20	18.88			94		80-120		
	ng/l	ng/l	ng/l	ng/l					
Batch number: 16306002	Sample numbe	er(s): 86626	643-8662651,86	62653-866	2655				
Perfluorooctanoic acid	200	200.13			100		70-130		
Perfluorononanoic acid	200	210.1			105		70-130		
Perfluorodecanoic acid	200	193.16			97		70-130		
Perfluoroundecanoic acid	200	211.76			106		70-130		
Perfluorododecanoic acid	200	211.94			106		70-130		
Perfluorotridecanoic acid	200	215.31			108		70-130		
Perfluorotetradecanoic acid	200	209.59			105		70-130		
Perfluorohexanoic acid	200	211.95			106		70-130		
Perfluoroheptanoic acid	200	215.26			108		70-130		
Perfluorobutanesulfonate	176.8	188.63			107		70-130		
Perfluorohexanesulfonate	189.2	204.64			108		70-130		
Perfluoro-octanesulfonate	191.2	209.57			110		70-130		
Perfluorobutanoic Acid	200	197.4			99		70-130		
Perfluoropentanoic Acid	200	204.3			102		70-130		
NETFOSAA	200	234.88			117		70-130		
NMeFOSAA	200	217.81			109		70-130		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 163050635001	Sample numbe	er(s): 86626	543,8662647-86	62655					
Calcium	4.00	3.97			99		80-120		
Magnesium	2.00	1.99			99		80-120		
Potassium	10	9.89			99		80-120		
Sodium	10	9.91			99		80-120		
	mg/l	mg/l	mg/l	mg/l					
D-+-b 16200110101D	~ 1	()	(4) 0(()(47 0(

Batch number: 16308118101B Sample number(s): 8662643,8662647-8662650,8662652-8662655

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1725147

Reported: 01/04/2017 12:19

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/l	LCS Conc mg/l	LCSD Spike Added mg/l	LCSD Conc mg/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Total Nitrite/Nitrate Nitrogen	2.50	2.56			102		90-110		
Batch number: 16312120601A	Sample numbe	er(s): 86626	43,8662647-86	662650,8662	652-8662	655			
Chloride	3.00	2.79	•	·	93		90-110		
Sulfate	7.50	7.07			94		90-110		
	mg/l as	mg/l as	mg/l as	mg/l as					
	CaCO3	CaCO3	CaCO3	CaCO3					
Batch number: 16309004201A	Sample number	er(s): 86626	49-8662652						
Total Alkalinity to pH 4.5	188	182.05			97		84-110		
Batch number: 16309004202A	Sample number	er(s): 86626	43,8662647-86	662648,8662	654-8662	655			
Total Alkalinity to pH 4.5	188	182.62			97		84-110		
Batch number: 16309004203A	Sample number	er(s): 86626	53						
Total Alkalinity to pH 4.5	188	181.41			96		84-110		

MS/MSD

 ${\tt Unspiked} \ ({\tt UNSPK}) \ = \ {\tt the} \ {\tt sample} \ {\tt used} \ {\tt in} \ {\tt conjunction} \ {\tt with} \ {\tt the} \ {\tt matrix} \ {\tt spike}$

Analysis Name	Unspi Cor ug/	ıc	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: L163063AA	Sample	numb	er(s): 8662	2643-8662	644,8662647-	-8662651,	3662653-	8662655	UNSPK: 866	2649	
Acetone	6	U	150	154.51	150	150.74	103	100	50-168	2	30
Benzene	0.5	U	20	20.36	20	19.83	102	99	78-120	3	30
Bromochloromethane	1	U	20	20.99	20	20.86	105	104	80-125	1	30
Bromodichloromethane	0.5	U	20	19.11	20	18.39	96	92	80-120	4	30
Bromoform	0.5	U	20	15.87	20	15.51	79	78	59-120	2	30
Bromomethane	0.5	U	20	19.3	20	19.25	97	96	55-123	0	30
2-Butanone	3	U	150	136.39	150	135.1	91	90	57-145	1	30
Carbon Disulfide	1	U	20	21.11	20	20.3	106	101	58-120	4	30
Carbon Tetrachloride	0.5	U	20	21.22	20	20.67	106	103	74-130	3	30
Chlorobenzene	0.5	U	20	19.63	20	19.4	98	97	80-120	1	30
Chloroethane	0.5	U	20	18.84	20	18.41	94	92	56-120	2	30
Chloroform	0.5	U	20	20.49	20	20.08	102	100	80-120	2	30
Chloromethane	0.5	U	20	17.77	20	17.42	89	87	59-127	2	30
Cyclohexane	2	U	20	22.79	20	22.23	114	111	65-131	2	30
1,2-Dibromo-3-chloropropane	2	U	20	16.93	20	16.12	85	81	59-120	5	30
Dibromochloromethane	0.5	U	20	17.68	20	17.55	88	88	78-120	1	30
1,2-Dibromoethane	0.5	U	20	19.45	20	18.96	97	95	80-120	3	30
1,2-Dichlorobenzene	1	U	20	19.83	20	19.41	99	97	80-120	2	30
1,3-Dichlorobenzene	1	U	20	19.64	20	19.35	98	97	80-120	1	30
1,4-Dichlorobenzene	1	U	20	19.5	20	19.27	97	96	80-120	1	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1725147

Reported: 01/04/2017 12:19

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Dichlorodifluoromethane	0.5 U	20	19.22	20	19.09	96	95	49-134	1	30
1,1-Dichloroethane	0.5 U	20	20.62	20	20.24	103	101	80-120	2	30
1,2-Dichloroethane	0.5 U	20	19.53	20	19.49	98	97	66-128	0	30
1,1-Dichloroethene	0.5 U	20	22.49	20	21.7	112	109	76-124	4	30
cis-1,2-Dichloroethene	0.5 U	20	20.89	20	20.44	104	102	80-120	2	30
trans-1,2-Dichloroethene	0.5 U	20	21.49	20	20.94	107	105	80-120	3	30
1,2-Dichloropropane	0.5 U	20	19.9	20	19.32	99	97	80-120	3	30
cis-1,3-Dichloropropene	0.5 U	20	18.5	20	18.42	93	92	80-120	0	30
trans-1,3-Dichloropropene	0.5 U	20	18.24	20	18.36	91	92	76-120	1	30
Ethylbenzene	0.5 U	20	20.03	20	19.57	100	98	78-120	2	30
Freon 113	2 U	20	24.32	20	23.07	122	115	64-136	5	30
2-Hexanone	3 U	100	81.82	100	81.22	82	81	49-146	1	30
Isopropylbenzene	1 U	20	20.71	20	20.16	104	101	80-120	3	30
Methyl Acetate	1 U	20	19.22	20	19.18	96	96	61-137	0	30
Methyl Tertiary Butyl Ether	0.5 U	20	19.75	20	19.51	99	98	75-120	1	30
4-Methyl-2-pentanone	3 U	100	85.38	100	84.17	85	84	55-141	1	30
Methylcyclohexane	1 U	20	23.25	20	22.89	116	114	66-126	2	30
Methylene Chloride	2 U	20	20.56	20	19.99	103	100	80-120	3	30
Styrene	1 U	20	20.04	20	19.83	100	99	80-120	1	30
1,1,2,2-Tetrachloroethane	0.5 U	20	18.05	20	17.79	90	89	72-120	1	30
Tetrachloroethene	0.5 U	20	20.71	20	20.64	104	103	80-129	0	30
Toluene	0.5 U	20	20.32	20	20.06	102	100	80-120	1	30
1,2,3-Trichlorobenzene	1 U	20	18.44	20	18.37	92	92	69-120	•	30
1,2,4-Trichlorobenzene	1 U 0.5 U	20 20	18.83 18.04	20 20	18.68 17.71	94 90	93 89	72-120 66-126	1 2	30 30
1,1,1-Trichloroethane 1,1,2-Trichloroethane	0.5 U	20	18.04	20	18.51	90	89 93	80-120	1	30
Trichloroethene	0.5 U	20	20.47	20	20.15	102	101	80-120	2	30
Trichlorofluoromethane	0.5 U	20	23.09	20	22.68	115	113	67-129	2	30
Vinyl Chloride	0.5 U	20	19.52	20	19.42	98	97	63-121	0	30
m+p-Xylene	0.5 U	40	40.38	40	39.53	101	99	80-120	2	30
o-Xylene	0.5 U	20	19.9	20	19.65	99	98	80-120	1	30
0 11/10110							,,,	00 120	-	50
	ng/l	ng/l	ng/l	ng/l	ng/l					
Batch number: 16306002	Sample num	ber(s): 866	2643-8662	651,8662653	-8662655	UNSPK:	8662649			
Perfluorooctanoic acid	144.4	200.38	341.05	200.08	350.85	98	103	70-130	3	30
Perfluorononanoic acid	1.29	200.38	204.58	200.08	185	101	92	70-130	10	30
Perfluorodecanoic acid	0.5 U	200.38	196.89	200.08	214.09	98	107	70-130	8	30
Perfluoroundecanoic acid	1 U	200.38	222.87	200.08	213.89	111	107	70-130	4	30
Perfluorododecanoic acid	0.5 U	200.38	223.24	200.08	214.93	111	107	70-130	4	30
Perfluorotridecanoic acid	0.5 U	200.38	239.36	200.08	234.57	119	117	70-130	2	30
Perfluorotetradecanoic acid	0.5 U	200.38	213.46	200.08	230.32	107	115	70-130	8	30
Perfluorohexanoic acid	19.19	200.38	230.43	200.08	214.61	105	98	70-130	7	30
Perfluoroheptanoic acid	18.94	200.38	248.92	200.08	254.11	115	118	70-130	2	30
Perfluorobutanesulfonate	6.75	177.34	198.14	177.07	198.23	108	108	70-130	0	30
Perfluorohexanesulfonate	4.29	189.36	192.37	189.08	190.31	99	98	70-130	1	30
Perfluoro-octanesulfonate	10.5	191.36	199.85	191.08	254.86	99	128	70-130	24	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1725147

Reported: 01/04/2017 12:19

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ng/l	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Perfluorobutanoic Acid	9.08	200.38	191.65	200.08	183.85	91	87	70-130	4	30
Perfluoropentanoic Acid	12.13	200.38	219.5	200.08	230.27	103	109	70-130	5	30
NETFOSAA	1 U	200.38	218.13	200.08	252.77	109	126	70-130	15	30
NMeFOSAA	1 U	200.38	267.8	200.08	248.86	134*	124	70-130	7	30
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 163050635001	Sample numb	er(s): 8662	2643,8662	647-8662655	UNSPK: 8	662649				
Calcium	17.93	4.00	21.92	4.00	21.65	100 (2)	93 (2)	75-125	1	20
Magnesium	3.02	2.00	4.97	2.00	4.93	97	95	75-125	1	20
Potassium	3.00	10	12.95	10	12.9	100	99	75-125	0	20
Sodium	59.34	10	69.01	10	68.41	97 (2)	91 (2)	75-125	1	20
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 16308118101B	Sample numb	er(s): 8662	2643,8662	647-8662650	,8662652-	8662655 t	JNSPK: 86	62649		
Total Nitrite/Nitrate Nitrogen	4.79	5.00	10.11			106		90-110		
Batch number: 16312120601A	Sample numb	er(s): 8662	2643,8662	647-8662650	,8662652-	8662655 t	JNSPK: 86	562649		
Chloride	96.41	200	285.55			95		90-110		
Sulfate	11.46	50	60.59			98		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16309004201A	Sample numb	er(s): 8662	2649-8662	652 UNSPK: 8	8662649					
Total Alkalinity to pH 4.5	21.67	188	202.34	188	190.57	96	90	84-110	6*	5
Batch number: 16309004202A	Sample numb	er(s): 8662	2643,8662	647-8662648	,8662654-	8662655 t	JNSPK: P6	62780		
Total Alkalinity to pH 4.5	284.58	188	445.63			86		84-110		
Batch number: 16309004203A Total Alkalinity to pH 4.5	Sample numb	er(s): 8662 188	2653 UNSP 416.65	K: P664194		64*		84-110		

Laboratory Duplicate

 ${\tt Background}$ (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD	DUP RPD Max
	mg/l	mg/l		
Batch number: 163050635001	Sample number(s):	8662643,8662647-	-8662655 BKG:	8662649
Calcium	17.93	17.84	1	20
Magnesium	3.02	3.01	0	20
Potassium	3.00	2.98	1 (1)	20
Sodium	59.34	59.02	1	20

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1725147

Reported: 01/04/2017 12:19

Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD	DUP RPD Max	
	mg/l	mg/l			
	mg/l	mg/l			
Batch number: 16308118101B Total Nitrite/Nitrate Nitrogen	Sample number(s): 4.79	8662643,8662647- 4.83	8662650,8662652 1	-8662655 BKG: 2	8662649
Batch number: 16312120601A Chloride Sulfate	Sample number(s): 96.41 11.46	8662643,8662647- 102.99 12.57	8662650,8662652 7 (1) 9 (1)	15	8662649
	mg/l as CaCO3	mg/l as CaCO3			
Batch number: 16309004201A Total Alkalinity to pH 4.5	Sample number(s): 21.67	8662649-8662652 20.89	BKG: 8662649 4 (1)	5	
Batch number: 16309004202A Total Alkalinity to pH 4.5	Sample number(s): 284.58	8662643,8662647- 281.27	8662648,8662654 1	-8662655 BKG: 5	P662780
Batch number: 16309004203A Total Alkalinity to pH 4.5	Sample number(s): 297.08	8662653 BKG: P66 295.8	4194	5	

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: L163063AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	l oluene-d8	4-Bromofluorobenzene
8662643	100	100	99	98
8662644	100	102	99	98
8662647	100	100	99	98
8662648	100	99	100	98
8662649	100	101	99	99
8662650	102	102	100	98
8662651	101	100	100	99
8662653	100	102	100	98
8662654	99	101	99	98
8662655	99	99	99	98
Blank	101	100	100	99
LCS	102	101	101	99
MS	102	102	100	98
MSD	101	100	100	99
Limits:	80-116	77-113	80-113	78-113

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1725147

Reported: 01/04/2017 12:19

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 16306002

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8662643	9*	49*	72	72	78	77
8662644	8*	33*	35*	21*	16*	12*
3662645	10*	45*	46*	30*	18*	15*
3662646	9*	56*	80	71	80	70
3662647	8*	51*	91	68*	90	67*
3662648	8*	53*	100	57*	71	58*
8662649	51*	57*	107	69*	70	63*
3662650	8*	53*	111	63*	90	63*
3662651	6*	40*	87	51*	72	49*
3662653	7*	53*	91	61*	65*	53*
3662654	8*	55*	109	48*	66*	51*
3662655	7*	50*	97	64*	65*	65*
Blank	11*	60*	73	75	79	75
LCS	11*	58*	72	79	79	77
MS	8*	53*	111	63*	90	63*
MSD	6*	40*	87	51*	72	49*
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
1	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8662643	66*	83	84	54*	71	56*
3662644	9*	13*	8*	6*	61*	4*
3662645	10*	11*	9*	6*	61*	4*
3662646	66*	57*	53*	51*	48*	22*
3662647	69*	74	55*	49*	56*	46*
3662648	56*	68*	49*	49*	52*	43*
3662649	61*	76	63*	59*	62*	50*
3662650	61*	86	63*	67*	73	62*
3662651	46*	57*	57*	49*	60*	48*
3662653	55*	59*	51*	50*	53*	52*
3662654	53*	70	55*	48*	60*	38*
3662655	54*	86	67*	57*	62*	50*
3lank	74	72	68*	72	79	73
CS	76	82	72	75	85	73
MS	61*	86	63*	67*	73	62*
MSD	46*	57*	57*	49*	60*	48*
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA			
8662643	70	50*	49*			
3662644	68*	3*	2*			
8662645	64*	2*	1*			
8662646	41*	16*	23*			

^{*-} Outside of specification

8662647

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1725147

Reported: 01/04/2017 12:19

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 16306002

	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
8662648	56*	39*	39*	
8662649	68*	49*	51*	
8662650	84	60*	65*	
8662651	62*	49*	47*	
8662653	52*	45*	48*	
8662654	64*	35*	37*	
8662655	66*	54*	51*	
Blank	86	73	68*	
LCS	87	73	73	
MS	84	60*	65*	
MSD	62*	49*	47*	
Limits:	70-130	70-130	70-130	

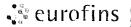
P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

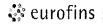
⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



Lancaster Environmenta! Services Analysis Request/Chain of Custody

Acct. #:	37191		Group	#:	17	251	47			Samp	ole #:	8	66	W	43	- 5	5			_		COC#: 1	15596
Client: C.T. Male Associates					ì	Matr	rix						Ar	alys	ses F	Requ	uest	ed	•			For Lab Us	e Only
Project Name/#: SGPP - Merrimack	Site ID:												Pr	ese	rvati	on (Code	es				SF#: <u>285327</u>	
Project Manager: Kirk Moline	P.O. #: 1(.6126			ŧ	pur	age	167		Н	Ν		S									SCR#: <u>196070</u>	<u>)</u>
Sampler: Jenethon Carter, Pat McHugh					Sediment	Ground	Surface	PH PH					water to the same									Preservati	ion Codes
Phone #: 608-354 - 5253	Quote #:	214135			Sed			3	ers		်	ą	2		<u></u>	٦.)						H = HCI	T = Thiosulfate
State where sample(s) were collected: NH			•			ple Ple	S	4	Containers	() ()	(6010C)	And and and and and and and and and and a	5	()	320E	7 mod.)						N = HNO ₃	B ≃ NaOH
	Colle	otion		ţ.		Potable	NPDES	当		VOAs (8260C)		2	(353.2)∻№	(300.0)	SM 2	A 537						S = H ₂ SO ₄	P = H ₃ P O ₄
	Cone	CLIOII		posi		L		0	# of	'OAs	g, N	(353.2)	(353.	-40) thi	(EPA						O = Other	
Sample Identification	Date	Time	Grab	Composite	Soil	Water		Other:	Total	TCL V	Ca, Mg, Na, K	NO2	NO3	CI-, S	Alkalinity (SM 2320B)	PFCs						Rem	arks
SG2 -APO7 -85-161024 16 POP)	10/14/16	1035	X			X			appoint.	X	×		X	X	4	4						(
SG 2 -APLTB - 161024 18 THE	10/24/16		Х					X	3	X					,	X						-500 M	imach.
SG 2 -AP FT89- 161024 18/090	10/24/16	1520	X					X	1							Х						· •	List
SG 2 -APE801 - 1610 24 1650	10/24/16	1430	Χ					×	2							X							
SG2 -APO5 - 21-161024 16000	10/24/16	1630	X			X			-	X	X		X	X	X	Х							
SG 2 -AP05 - 31-161024 1800	10/24/16	1750	Χ			Х			*	X	Χ		×	X	×	Х							
SG 2 -AP05 - 41-161025 18000	10/25/16	0825	Χ			X			33	X	×		Χ	×	Х	Χ						WZWZD	
SG 2 -AP 05 - 51 - 161025 18 STE	10/25/16	1100	Х			X			e-cappeau	χ	X		X	X	×	Х							
SG 2 -AP 05 - 61-161025 16 070			Χ.			X			11	×	Х		X	X	X	Х							
SG 2 -AP 05 - 69 - 161025 18 OTE			χ			Χ			11	Х	Χ		X	X	χ	Χ							
Turnaround Time Requested (TAT) (please c	·		RUSH	∐ ļ	Relir	nquish	ed b	and the same of th			annessanessan	Date '		HOMESTON OF THE PERSON OF THE	Time	of	Rec	A Committee of the Parket				Date	Time
(RUSH TAT is subject to Eurofins Lancaster Laboratoric Date results are needed:	es approval a	and surchar	ges.)	4	Relig	Ada rquish	ed b		100m)	eby.		Date	6	-) <u>/ (</u> /2 Time		Rece	my) eived			\dashv	Date	Time
E-mail address to send RUSH results: K. molin	· octo	ala com		\dashv	À	1		10	1	\circ	•	1257	,		700		^	\	y.			Date	111110
Data Package Options (please check if requir		CATO ICCI			Relir	nquish	ed b	y:				Date			Time		Rece	eivec	l`by:		1	Date	Time
Type I (Validation/non-CLP)		TX TRRP	- 13 [
Type III (Reduced non-CLP)	P []				Relir	nquish	ed b	y:				Date			Time		Rece	eivec	by:		$ \overline{} $	Date	Time
-, , , , , , , , , , , , , , , , , , ,	ype A 🔲				B !!																		
	ype B 📋				Relir	nquish	ed by	y:				Date			Time		Rece			A)]	~ (Date / 0/24 //	Time
EDD Format: EQuIS		•		\dashv	Airbil	l No.:		····		!								w	> Q	016	4		,0930
If site-specific QC (MS/MSD/Dup) required, in	ndicate Q0	C samples	s and		Relin	quished	•					_					T		4,,,,,		, ,	0.8	·
submit triplicate volume.					UPS		r	·eat)	<u> </u>	<u> </u>	Utne						ıem	pera	lure	upon r	ece	ipt	<u>2</u> °c



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

166306

Group Number(s):

1725147

Client: C.T. Male

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

10/26/2016 9:30

Number of Packages:

<u>2</u>

Number of Projects:

1

State/Province of Origin:

<u>NH</u>

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

Yes

Custody Seal Present:

Yes

Sample Date/Times match COC:

Yes

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

No

Samples Chilled:

Yes

Total Trip Blank Qty:

3

Paperwork Enclosed:

Yes

Trip Blank Type:

See Below

Samples Intact:

Yes

Air Quality Samples Present:

No

Missing Samples:

No

Extra Samples:

No

Discrepancy in Container Qty on COC:

No

Trip Blank Type(s): 2 HCL 1 Unpres.

Unpacked by Krista Abel (3058) at 10:13 on 10/26/2016

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler#	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	0.8	DT	Wet	Υ	Bagged	N
2	DT146	0.7	DT	Wet	Υ	Bagged	N



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RLReporting Limit kg **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: January 30, 2017

Project: SGPP - Merrimack

Submittal Date: 10/28/2016 Group Number: 1726627 SDG: MMK04 PO Number: 16.6126 State of Sample Origin: NH

	Lancaster Lab
Client Sample Description	<u>(LL) #</u>
SG2-APEB01-161026 Grab Blank Water	8668861
SG2-AP06-19-161026 Grab Groundwater	8668862
SG2-AP06-29-161026 Grab Groundwater	8668863
SG2-AP06-39-161026 Grab Groundwater	8668864
SG2-AP06-49-161026 Grab Groundwater	8668865
SG2-AP06-59-161027 Grab Groundwater	8668866
SG2-LTB01-161027 Blank Water	8668867
SG2-FTB01-161027 Grab Blank Water	8668868
SG2-AP06-68-161027 Grab Groundwater	8668869
SG2-AP06-73-161027 Grab Groundwater	8668870
SG2-APEB01-161027 Grab Blank Water	8668871

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	C. T. Male Associates	Attn: Jeff Marx
Electronic Copy To	C. T. Male Associates	Attn: Dan Reilly
Electronic Copy To	C. T. Male Associates	Attn: Kirk Moline



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250



Project Name: SGPP - Merrimack LL Group #: 1726627

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260C, GC/MS Volatiles

Sample #s: 8668871

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

EPA 537 Rev. 1.1 modified, Misc. Organics

sample #s: 8668861, 8668862, 8668863, 8668864, 8668865, 8668866, 8668867, 8668868.

8668869, 8668870, 8668871

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Batch #: 16314003 (Sample number(s): 8668861-8668871 UNSPK: 8668870)

The recovery(ies) for the following analyte(s) in the LCS and/or LCSD exceeded the acceptance window indicating a positive bias: Perfluorotridecanoic acid

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8668861, 8668862, 8668867, 8668870, 8668871, Blank, LCSD EPA 300.0, Wet Chemistry

Sample #s: 8668871

Sample was originally analyzed within the 28 day holding time, however the result exceeded the calibration range. Sample was reanalyzed at a greater dilution past hold on 12/01/2016 with a result of 22.5 mg/l.

Sample #s: 8668871

Smple was analyzed in duplicate to comfirm the result.

<u>Batch #: 16315120601B (sample number(s): 8668862-8668866, 8668869-8668871 UNSPK: 8668862 BKG: 8668862)</u>

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Chloride

SM 2320 B-1997, Wet Chemistry

<u>Sample #s: 8668871</u>

This sample was analyzed for alkalinity on 11/01/16 and yielded a result of 26.9 mg/L as CaCO3. The sample was repeat for alkalinity on 11/08/16 and yielded a result of 25.7 mg/L as CaCO3, confirming the inital result.

<u>Batch #: 16305006203A (Sample number(s): 8668862-8668866, 8668869, 8668871 UNSPK: P668954 BKG: P668870, P668954)</u>

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Alkalinity to pH 4.5

<u>Batch #: 16305006203B (Sample number(s): 8668870 UNSPK: P668954 BKG: P8668870-P668954)</u>

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Alkalinity to pH $4.5\,$

v 1.9.4



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-APEB01-161026 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8668861 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/26/2016 08:15 by JC

C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4-01 SDG#: MMK04-01EB

CAT No.	Analysis Name	CAS Number	Resu	lt	Method Detection Limit	Limit of t* Quantitation	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	1	U	1	2	1
10954	Perfluorononanoic acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid	307-24-4	1	U	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	1	U	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	5	U	5	10	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	1	U	1	3	1
10954	NETFOSAA	2991-50-6	5	U	5	8	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroc	ctanes	ulfonamido	acetic Acid.		
10954	NMeFOSAA	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acronym for N-me	ethyl perfluoro	octane	sulfonamid	oacetic Acid.		
The	stated OC limits are advisory onl	v until suffic	ient da	ata noints			

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16314003	12/02/2016 11:58	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16314003	11/09/2016 14:30	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP06-19-161026 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668862 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/26/2016 10:10 by JC

C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4-02 SDG#: MMK04-02

CAT No.	Analysis Name	CAS Number	As Rec Result	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 82	260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	Ū	0.5	1	1
11997	Bromochloromethane	74-97-5	1	IJ	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	Ū	0.5	1	1
11997	Bromoform	75-25-2	0.5	IJ	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	Ū	0.5	1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1	1
11997	Chloroform	67-66-3	0.5	Ū	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	IJ	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	IJ	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	Ū	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	IJ	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-01-5	0.5	IJ	0.5	1	1
11997	Ethylbenzene	10061-02-6	0.5	IJ	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
11997	2-Hexanone	591-78-6	3	IJ	3	10	1
11997			3 1	U	1	5	1
11997	Isopropylbenzene	98-82-8 79-20-9	1	IJ	1	5	1
	Methyl Acetate		0.5	IJ			
11997	Methyl Tertiary Butyl Ether	1634-04-4	3	U	0.5 3	1 10	1 1
11997 11997	4-Methyl-2-pentanone	108-10-1 108-87-2	3 1	IJ	1	5	1
	Methylcyclohexane		_	•			=
11997	Methylene Chloride	75-09-2	2 1	U U	2 1	4 5	1
11997	Styrene	100-42-5		U II			1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	0	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1 1	1
11997	Toluene	108-88-3	0.5	U	0.5	_	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U 	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ŭ	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP06-19-161026 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668862 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/26/2016 10:10 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30

Reported: 01/30/2017 13:27

M4-02 SDG#: MMK04-02

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles o-Xylene	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/l 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EP	A 537 Re	v. 1.1	ng/l		ng/l	ng/l	
	mo	dified						
10954	Perfluorooctanoic acid		335-67-1	41		1	2	1
10954	Perfluorononanoic acid		375-95-1	1	U	1	2	1
10954	Perfluorodecanoic acid		335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic aci	d	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic aci	ld	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoic ad	cid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic	acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid		307-24-4	10		1	2	1
10954	Perfluoroheptanoic acid	1	375-85-9	7		1	2	1
10954	Perfluorobutanesulfonat	e	375-73-5	4	U	4	10	1
10954	Perfluorohexanesulfonat	e	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfona	ate	1763-23-1	5	U	5	10	1
10954	Perfluorobutanoic Acid		375-22-4	4	J	3	10	1
10954	Perfluoropentanoic Acid	1	2706-90-3	8		1	3	1
10954	NETFOSAA		2991-50-6	5	U	5	8	1
	NEtFOSAA is the acrony	n for N-eth	yl perfluoro	octanesi	ulfonamid	oacetic Acid.		
10954	NMeFOSAA		2355-31-9	4	U	4	8	1
	NMeFOSAA is the acrony	n for N-met	hyl perfluor	ooctanes	sulfonamio	doacetic Acid.		

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Ac

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

SW-846 6010C mg/1mg/1mg/1Metals 01750 Calcium 7440-70-2 15.0 0.0382 0.400 01757 Magnesium 7439-95-4 2.64 0.0190 0.200 01762 Potassium 7440-09-7 2.19 0.160 1.00 01767 Sodium 7440-23-5 2.00 64.3 0.173 mg/1EPA 300.0 mg/1mg/l Wet Chemistry 00224 Chloride 16887-00-6 8.0 4.0 20 00228 Sulfate 14808-79-8 11.3 1.5 5.0 5 mg/l mg/l mg/l EPA 353.2 07882 Total Nitrite/Nitrate Nitrogen n.a. 0.040 0.10 2.3 mg/l as CaCO3 mg/l as CaCO3 mg/l as CaCO3 SM 2320 B-1997 12150 Total Alkalinity to pH 4.5 n.a. 20.8 1.7 5.0 1 Bicarbonate Alkalinity 5.0 12149 20.8 n.a. 1.7 1 IJ 12148 Carbonate Alkalinity n.a. 1.7 1.7 5.0 1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP06-19-161026 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668862 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/26/2016 10:10 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4-02 SDG#: MMK04-02

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163101AA	11/05/2016	16:23	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163101AA	11/05/2016	16:23	Matthew S Krause	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16314003	12/02/2016	12:18	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16314003	11/09/2016	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163080635001	11/04/2016	21:18	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163080635001	11/04/2016	21:18	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163080635001	11/04/2016	21:18	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163080635001	11/04/2016	21:18	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163080635001	11/04/2016	07:00	Lisa J Cooke	1
00224	Chloride	EPA 300.0	1	16315120601B	11/10/2016	22:29	Hallie Burnett	20
00228	Sulfate	EPA 300.0	1	16315120601B	11/10/2016	22:13	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16314118101B	11/09/2016	02:04	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16305006203A	11/01/2016	04:01	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16305006203A	11/01/2016	04:01	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16305006203A	11/01/2016	04:01	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E VOLATILE ORGANICS ANA	LYSIS DATA SHEET	EPA SAM	PLE NO.
	TENTATIVELY IDENTIF		! ! M4-	. ! 02 !
	ster Laboratories S Case No.: ater) WATER 5.0 (g/mL)mL		SDG No.	
evel: (low/med Moisture: not olumn: (pack/ Number TICs fo	dec. cap) CAP	Date Received: Date Analyzed: Dilution Facto CONCENTRATIO (ug/L or ug/	11/05/16 r: 1.0 N UNITS:	
	! ! COMPOUND NAME =!=========			~
1. VOCTIC 2.	!Total VOC TICs _!	! !!	! 0 !	! U !
4	_! _!	!	!	!!
6	_ ! !	!!	; ! !	!!
8	i	!!		!!
.0	_!!	! !	! !	!!
.3.	_! _!	!	!	!!
.5	! ! !	!!	!	!!
.7		!		::
.9. 20	_!! _!	! !		
22	_!	!	!	!!
24	_!	!	!	!!
26	_ ! _ ! _ !	!!		:: ::
28 29	_! !	! !	! !	!!
30	_!! _!	!! !	!! !	!! !!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP06-29-161026 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668863 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/26/2016 11:45 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

SDG#: MMK04-03

M4 - 03

GC/MS Volatiles SW-846 8260C ug/l ug/l ug/l	1 1
11997 Acetone 67-64-1 6 U 6 20	1
11997 Benzene 71-43-2 0.5 U 0.5 1	1
11997 Bromochloromethane 74-97-5 1 U 1 5	1
11997 Bromodichloromethane 75-27-4 0.5 U 0.5 1	1
11997 Bromoform 75-25-2 0.5 U 0.5 4	1
11997 Bromomethane 74-83-9 0.5 U 0.5 1	1
11997 2-Butanone 78-93-3 3 U 3 10	1
11997 Carbon Disulfide 75-15-0 1 U 1 5	1
11997 Carbon Tetrachloride 56-23-5 0.5 U 0.5 1	1
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1	1
11997 Chloroethane 75-00-3 0.5 U 0.5 1	1
11997 Chloroform 67-66-3 0.5 U 0.5 1	1
11997 Chloromethane 74-87-3 0.5 U 0.5 1	1
11997 Cyclohexane 110-82-7 2 U 2 5	1
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5	1
11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1	1
11997 1,2-Dibromoethane 106-93-4 0.5 U 0.5 1	1
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5	1
11997 1,3-Dichlorobenzene 541-73-1 1 U 1 5	1
11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5	1
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1	1
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1	1
11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1	1
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1	1
11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1	1
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1	1
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1	1
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1	1
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1	1
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1	1
11997 Freon 113 76-13-1 2 U 2 10	1
11997 2-Hexanone 591-78-6 3 U 3 10	1
11997 Isopropylbenzene 98-82-8 1 U 1 5	1
11997 Methyl Acetate 79-20-9 1 U 1 5	1
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	1
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10	1
11997 Methylcyclohexane 108-87-2 1 U 1 5	1
11997 Methylene Chloride 75-09-2 2 U 2 4	1
11997 Styrene 100-42-5 1 U 1 5	1
11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1	1
11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1	1
11997 Toluene 108-88-3 0.5 U 0.5 1	1
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5	1
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5	1
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1	1
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1	1
11997 Trichloroethene 79-01-6 0.5 U 0.5 1	1
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1	1
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1	1
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP06-29-161026 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668863 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/26/2016 11:45 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4-03 SDG#: MMK04-03

CAT No. Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles 11997 o-Xylene	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/1 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modifie	ed.					
10954	Perfluorooctanoic acid	335-67-1	54		1	2	1
10954	Perfluorononanoic acid	375-95-1	1	J	1	2	1
10954	Perfluorodecanoic acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid	307-24-4	9		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	8		1	2	1
10954	Perfluorobutanesulfonate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	12		5	10	1
10954	Perfluorobutanoic Acid	375-22-4	4	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	6		1	3	1
10954	NETFOSAA	2991-50-6	5	U	5	8	1
	NEtFOSAA is the acronym for N	N-ethyl perfluoro	octanes	ulfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acronym for N	N-methyl perfluoro	octane	sulfonamido	acetic Acid.		

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Ac

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Metals	SW-84	46 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	14.6	0.0382	0.400	1
01757	Magnesium	7439-95-4	2.95	0.0190	0.200	1
01762	Potassium	7440-09-7	2.06	0.160	1.00	1
01767	Sodium	7440-23-5	47.0	0.173	2.00	1
Wet Ch	nemistry EPA 3	300.0	mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	73.7	4.0	8.0	20
00228	Sulfate	14808-79-8	15.2	1.5	5.0	5
	EPA 3	353.2	mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitr	rogen n.a.	3.0	0.040	0.10	1
	SM 23	320 в-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	15.7	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	15.7	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP06-29-161026 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668863 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/26/2016 11:45 by JC

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/28/2016 09:30 Latham NY 12110

Reported: 01/30/2017 13:27

M4-03 SDG#: MMK04-03

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163101AA	11/05/2016	16:44	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163101AA	11/05/2016	16:44	Matthew S Krause	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16314003	12/02/2016	12:39	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16314003	11/09/2016	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163080635001	11/04/2016	21:27	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163080635001	11/04/2016	21:27	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163080635001	11/04/2016	21:27	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163080635001	11/04/2016	21:27	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163080635001	11/04/2016	07:00	Lisa J Cooke	1
00224	Chloride	EPA 300.0	1	16315120601B	11/11/2016	00:03	Hallie Burnett	20
00228	Sulfate	EPA 300.0	1	16315120601B	11/10/2016	23:47	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16314118101B	11/09/2016	02:06	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16305006203A	11/01/2016	03:16	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16305006203A	11/01/2016	03:16	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16305006203A	11/01/2016	03:16	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Lab Name: Lanca Lab Code: LANCA Matrix: (soil/w	5.0 (g/mL)mL La	COMPOUNDS	9915.i/16nov05a	
% Moisture: not Column: (pack/		te Analyzed: 11 lution Factor:		
Number TICs fo		CONCENTRATION ((ug/L or ug/Kg)	JNITS:	
! ! CAS NUMBER	! ! COMPOUND NAME -!	! RT !	! ! EST. CONC.	! !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
I 1 VOCTIC	!Total VOC TICs	i	0	! TT !
! 3	_!	!!		!!
4	_!	!!		!!
	-! -!			
7	!	! !	!	!!
8 9.	_ ! !	<u>-</u>		:
10	_!	!!		!!
	!			
	_ :			
14	!	!!		!!
	- 			
17.	_ !	<u>;</u>		ii
18		!!	l	!!
	!			
	- !			
22		!		!!
23	- -	<u>!</u>		!!
44 25.	<u> </u>	::		<u>; </u>
26	_!	!!		!!
27	_!	!!	!	!!
28	! !	<u>-</u>		¦
30	_ !	ii		ii
-	1			

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP06-39-161026 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668864 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/26/2016 13:25 by JC

C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4-04 SDG#: MMK04-04

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

REVISED

Sample Description: SG2-AP06-39-161026 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668864 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/26/2016 13:25 by JC C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4 - 04SDG#: MMK04-04

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles o-Xylene	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/l 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	98		1	2	1
10954	Perfluorononanoic acid	375-95-1	1	J	1	2	1
10954	Perfluorodecanoic acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid	307-24-4	15		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	13		1	2	1
10954	Perfluorobutanesulfonate	375-73-5	5	J	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	7	J	5	10	1
10954	Perfluorobutanoic Acid	375-22-4	5	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	10		1	3	1
10954	NETFOSAA	2991-50-6	5	U	5	8	1
	NEtFOSAA is the acronym for N-6	thyl perfluoroo	ctanesi	ulfonamidoa	acetic Acid.		
10954	NMeFOSAA	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acronym for N-m	methyl perfluoro	octanes	sulfonamido	pacetic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Metals	s SW-8	46 601	.0C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	17.5	0.0382	0.400	1
01757	Magnesium		7439-95-4	3.46	0.0190	0.200	1
01762	Potassium		7440-09-7	2.49	0.160	1.00	1
01767	Sodium		7440-23-5	52.8	0.173	2.00	1
Wet Ch	nemistry EPA	300.0		mg/l	mg/l	mg/l	
00224	Chloride		16887-00-6	90.6	4.0	8.0	20
00228	Sulfate		14808-79-8	13.5	1.5	5.0	5
	EPA	353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nit	rogen	n.a.	4.0	0.040	0.10	1
	SM 2	2320 B-	1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.	5	n.a.	16.6	1.7	5.0	1
12149	Bicarbonate Alkalinity		n.a.	16.6	1.7	5.0	1
12148	Carbonate Alkalinity		n.a.	1.7 U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP06-39-161026 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668864 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/26/2016 13:25 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30

Reported: 01/30/2017 13:27

M4-04 SDG#: MMK04-04

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163101AA	11/05/2016	17:06	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163101AA	11/05/2016	17:06	Matthew S Krause	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16314003	12/02/2016	12:59	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16314003	11/09/2016	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163080635001	11/04/2016	21:30	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163080635001	11/04/2016	21:30	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163080635001	11/04/2016	21:30	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163080635001	11/04/2016	21:30	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163080635001	11/04/2016	07:00	Lisa J Cooke	1
00224	Chloride	EPA 300.0	1	16315120601B	11/11/2016	01:06	Hallie Burnett	20
00228	Sulfate	EPA 300.0	1	16315120601B	11/11/2016	00:50	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16314118101B	11/09/2016	02:08	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16305006203A	11/01/2016	05:13	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16305006203A	11/01/2016	05:13	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16305006203A	11/01/2016	05:13	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

1E		EPA SAMI	PLE NO.
		! ! ! M4-(!
Case No.: ter) WATER 5.0 (g/mL)mL LOW dec. tap) CAP	SAS No.: Lab Sample ID: 80 Lab File ID:HP00 Date Received: 10 Date Analyzed: 10 Dilution Factor: CONCENTRATION	SDG No. 668864 9915.i/16nov05a 0/28/16 1/05/16 1.0 UNITS:	!
		! EST. CONC.	
! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! !		!	
	TOLATILE ORGANICS ANAI TENTATIVELY IDENTIFI STEP Laboratories Case No.:	TOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS SET Laboratories	TOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS M4-0

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP06-49-161026 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668865 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/26/2016 15:05 by JC

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 10/28/2016 09:30

Reported: 01/30/2017 13:27

M4-05 SDG#: MMK04-05

GC/MS Volatiles SW-846 8260C ug/l ug/l ug/l 11997 Acetone 67-64-1 6 U 6 20	1
11007 Agetons	1
11997 Acetone 67-64-1 6 U 6 20	1
11997 Benzene 71-43-2 0.5 U 0.5 1	1
11997 Bromochloromethane 74-97-5 1 U 1 5	1
11997 Bromodichloromethane 75-27-4 0.5 U 0.5 1	1
11997 Bromoform 75-25-2 0.5 U 0.5 4	_ 1
11997 Bromomethane 74-83-9 0.5 U 0.5 1	1
11997 2-Butanone 78-93-3 3 U 3 10	1
11997 Carbon Disulfide 75-15-0 1 U 1 5	1
11997 Carbon Tetrachloride 56-23-5 0.5 U 0.5 1	1
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1	1
11997 Chloroethane 75-00-3 0.5 U 0.5 1	1
11997 Chloroform 67-66-3 0.5 U 0.5 1	1
11997 Chloromethane 74-87-3 0.5 U 0.5 1	1
11997 Cyclohexane 110-82-7 2 U 2 5	1
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5	1
11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1	1
11997 1,2-Dibromoethane 106-93-4 0.5 U 0.5 1	1
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5	1
11997 1,3-Dichlorobenzene 541-73-1 1 U 1 5	1
11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5	1
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1	1
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1	1
11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1	1
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1	1
11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1	1
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1	1
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1	1
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1	1
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1	1
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1	1
11997 Freon 113 76-13-1 2 U 2 10	1
11997 2-Hexanone 591-78-6 3 U 3 10	1
11997 Isopropylbenzene 98-82-8 1 U 1 5	1
11997 Methyl Acetate 79-20-9 1 U 1 5	1
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	1
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10	1
11997 Methylcyclohexane 108-87-2 1 U 1 5	1
11997 Methylene Chloride 75-09-2 2 U 2 4	1
11997 Styrene 100-42-5 1 U 1 5	1
11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1	1
11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1	1
11997 Toluene 108-88-3 0.5 U 0.5 1	1
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5	1
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5	1
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1	1
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1	1
11997 Trichloroethene 79-01-6 0.5 U 0.5 1	1
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1	1
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1	1
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1	1

^{*=}This limit was used in the evaluation of the final result



As Received

Limit of

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

14808-79-8

n.a.

n.a.

n.a.

EPA 353.2

SM 2320 B-1997

07882 Total Nitrite/Nitrate Nitrogen n.a.

12150 Total Alkalinity to pH 4.5

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

REVISED

Dilution

Sample Description: SG2-AP06-49-161026 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668865 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/26/2016 15:05 by JC C. T. Male Associates 50 Century Hill Drive

As Received

Method

1.5

mg/l

1.7

1.7

1.7

0.040

mg/l as CaCO3

5.0

0.10

5.0

5.0

5.0

mg/l as CaCO3

1

1

Latham NY 12110

Submitted: 10/28/2016 09:30

Reported: 01/30/2017 13:27

M4 - 05SDG#: MMK04-05

CAT

00228 Sulfate

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8	260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library	Search						
	The results from FORM 1 - VOA-TION on the back of the	C. The qualifie						
Misc.	Organics	EPA 537		ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctano:	ic acid	335-67-1	65		1	2	1
L0954	Perfluorononano:	ic acid	375-95-1	1	U	1	2	1
10954	Perfluorodecano:	ic acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecar	noic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecan	noic acid	307-55-1	3	U	3	5	1
10954	Perfluorotrideca	anoic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetrade	ecanoic acid	376-06-7	3	U	3	5	1
L0954	Perfluorohexano:	ic acid	307-24-4	12		1	2	1
10954	Perfluoroheptano	oic acid	375-85-9	10		1	2	1
10954	Perfluorobutanes	sulfonate	375-73-5	5	J	4	10	1
10954	Perfluorohexanes	sulfonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octane	esulfonate	1763-23-1	7	J	5	10	1
10954	Perfluorobutano:	ic Acid	375-22-4	4	J	3	10	1
10954	Perfluoropentano	oic Acid	2706-90-3	8		1	3	1
10954	NEtFOSAA		2991-50-6	5	U	5	8	1
	NEtFOSAA is the	acronym for N-	ethyl perfluoro	octanesu	lfonamidoac	etic Acid.		
10954	NMeFOSAA	_	2355-31-9	4	U	4	8	1
	NMeFOSAA is the	acronym for N-1	methyl perfluor	octanes	ulfonamidoa	cetic Acid.		
	stated QC limits be obtained to ca			eient da	ta points			
fetals	5	SW-846 6	010C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	16.0		0.0382	0.400	1
01757	Magnesium		7439-95-4	3.07		0.0190	0.200	1
01762	Potassium		7440-09-7	2.54		0.160	1.00	1
01767	Sodium		7440-23-5	47.9		0.173	2.00	1
Wet Cl	nemistry	EPA 300.	0	mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	81.8		4.0	8.0	20
00221	a la		140007 00 0	12.0		1.0		-

As Received

IJ

mg/l as CaCO3

13.8

3.6

23.0

23.0

1.7

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP06-49-161026 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668865 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/26/2016 15:05 by JC C. T. Male Associates 50 Century Hill Drive

Submitted: 10/28/2016 09:30 Latham NY 12110

Reported: 01/30/2017 13:27

M4-05 SDG#: MMK04-05

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163101AA	11/05/2016	17:28	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163101AA	11/05/2016	17:28	Matthew S Krause	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16314003	12/02/2016	13:20	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16314003	11/09/2016	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163080635001	11/04/2016	20:20	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163080635001	11/04/2016	20:20	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163080635001	11/04/2016	20:20	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163080635001	11/04/2016	20:20	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163080635001	11/04/2016	07:00	Lisa J Cooke	1
00224	Chloride	EPA 300.0	1	16315120601B	11/11/2016	01:38	Hallie Burnett	20
00228	Sulfate	EPA 300.0	1	16315120601B	11/11/2016	01:22	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16314118101B	11/09/2016	02:13	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16305006203A	11/01/2016	05:07	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16305006203A	11/01/2016	05:07	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16305006203A	11/01/2016	05:07	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E		EPA SAM	PLE NO.
	VOLATILE ORGANICS ANA TENTATIVELY IDENTIF	IED COMPOUNDS	! ! ! M4-	! !
ab Code: LANCA atrix: (soil/w	water) WATER 5.0 (g/mL)mL 1) LOW dec. cap) CAP	Contract: SAS No.: Lab Sample ID: 86 Lab File ID:HP09 Date Received: 10 Date Analyzed: 11 Dilution Factor: CONCENTRATION ((ug/L or ug/Kg)	SDG No. 568865 9915.i/16nov056 0/28/16 1.0 JNITS:	:i
CAS NUMBER	! ! COMPOUND NAME		EST. CONC.	
2	!Total VOC TICS ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! !			
78	_ ! ! ! ! !	!! !!		!! !! !!
30age 1 of 1	_!!	!!		!!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP06-59-161027 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668866 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/27/2016 09:05 by JC

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4-06 SDG#: MMK04-06

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	Li	Received mit of mantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug	r/l	
11997	Acetone	67-64-1	6	U	6	20)	1
11997	Benzene	71-43-2	0.5	IJ	0.5	1		1
11997	Bromochloromethane	74-97-5	1	IJ	1	5		1
11997	Bromodichloromethane	75-27-4	0.5	IJ	0.5	1		1
11997	Bromoform	75-25-2	0.5	U	0.5	4		1
11997	Bromomethane	74-83-9	0.5	U	0.5	1		1
11997	2-Butanone	78-93-3	3	IJ	3	10)	1
11997	Carbon Disulfide	75-15-0	1	U	1	5		1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1		1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1		1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1		1
11997	Chloroform	67-66-3	0.5	U	0.5	1		1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1		1
11997	Cyclohexane	110-82-7	2	IJ	2	5		1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5		1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5	1		1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5	1		1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5		1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1	5		1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1	5		1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5	1		1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5	1		1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1		1
11997	,	75-35-4	0.5	U	0.5	1		1
11997	1,1-Dichloroethene		0.5	Ū	0.5	1		1
	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1		1
11997	trans-1,2-Dichloroethene	156-60-5		IJ		1		
11997	1,2-Dichloropropane	78-87-5	0.5	-	0.5	_		1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1		1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1		1
11997	Ethylbenzene	100-41-4	0.5	U 	0.5	1		1
11997	Freon 113	76-13-1	2	U 	2	10		1
11997	2-Hexanone	591-78-6	3	U 	3	10)	1
11997	Isopropylbenzene	98-82-8	1	Ū	1	5		1
11997	Methyl Acetate	79-20-9	1	U	1	5		1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1		1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10)	1
11997	Methylcyclohexane	108-87-2	1	U	1	5		1
11997	Methylene Chloride	75-09-2	2	U	2	4		1
11997	Styrene	100-42-5	1	U	1	5		1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1		1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1		1
11997	Toluene	108-88-3	0.5	U	0.5	1		1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5		1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5		1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1		1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1		1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1		1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1		1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1		1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1		1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

REVISED

Sample Description: SG2-AP06-59-161027 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668866 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/27/2016 09:05 by JC C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4 - 06SDG#: MMK04-06

CAT No. Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles 11997 o-Xylene	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/1 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined

Misc.	• •	PA 537 Rev	. 1.1	ng/l		ng/l	ng/l	
	mo	odified						
10954	Perfluorooctanoic acid		335-67-1	62		1	2	1
10954	Perfluorononanoic acid		375-95-1	1	U	1	2	1
10954	Perfluorodecanoic acid		335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic ac	id 2	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic ac	id :	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoic a	cid '	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic	acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid		307-24-4	12		1	2	1
10954	Perfluoroheptanoic aci	d 3	375-85-9	9		1	2	1
10954	Perfluorobutanesulfona	te :	375-73-5	4	J	4	10	1
10954	Perfluorohexanesulfona	te :	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfon	ate :	763-23-1	6	J	5	10	1
10954	Perfluorobutanoic Acid		375-22-4	4	J	3	10	1
10954	Perfluoropentanoic Aci	.d 2	2706-90-3	8		1	3	1
10954	NETFOSAA	2	2991-50-6	5	U	5	8	1
	NEtFOSAA is the acrony	m for N-ethy	l perfluoro	octanesu	lfonamido	acetic Acid.		
10954	NMeFOSAA	2	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acrony	m for N-meth	yl perfluor	ooctanes	ulfonamid	oacetic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Metals	s SW-84	6 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	15.6	0.0382	0.400	1
01757	Magnesium	7439-95-4	3.03	0.0190	0.200	1
01762	Potassium	7440-09-7	2.82	0.160	1.00	1
01767	Sodium	7440-23-5	48.7	0.173	2.00	1
Wet Ch	nemistry EPA 3	00.0	mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	76.5	4.0	8.0	20
00228	Sulfate	14808-79-8	12.9	1.5	5.0	5
	EPA 3	553.2	mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitre	ogen n.a.	3.5	0.040	0.10	1
	SM 23	20 B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	15.1	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	15.1	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP06-59-161027 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668866 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/27/2016 09:05 by JC

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/28/2016 09:30 Latham NY 12110

Reported: 01/30/2017 13:27

M4-06 SDG#: MMK04-06

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163101AA	11/05/2016	17:50	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163101AA	11/05/2016	17:50	Matthew S Krause	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16314003	12/02/2016	13:41	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16314003	11/09/2016	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163080635001	11/04/2016	21:33	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163080635001	11/04/2016	21:33	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163080635001	11/04/2016	21:33	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163080635001	11/04/2016	21:33	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163080635001	11/04/2016	07:00	Lisa J Cooke	1
00224	Chloride	EPA 300.0	1	16315120601B	11/11/2016	02:09	Hallie Burnett	20
00228	Sulfate	EPA 300.0	1	16315120601B	11/11/2016	01:53	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16314118101B	11/09/2016	02:15	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16305006203A	11/01/2016	03:40	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16305006203A	11/01/2016	03:40	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16305006203A	11/01/2016	03:40	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E /OLATILE ORGANICS ANAI TENTATIVELY IDENTIFI	LED COMPOUNDS	EPA SAMI ! ! M4-0	
	Case No.: tter) WATER 5.0 (g/mL)mL LOW dec. cap) CAP	Contract: SAS No.: Lab Sample ID: 80 Lab File ID:HPO Date Received: 1 Date Analyzed: 1 Dilution Factor: CONCENTRATION (ug/L or ug/Kg	SDG No. 668866 9915.i/16nov05a 0/28/16 1/05/16 1.0 UNITS:	
	! ! COMPOUND NAME		EST. CONC.	
! 1. VOCTIC ! 2. ! 3. ! 4. ! 5. ! 6. ! 7. ! 8. ! 9. ! 10. ! 11. ! 12. ! 13. ! 14. ! 15. ! 16.	Total VOC TICS			U !
! 20 ! 21		!!	! !	!!
! 23 ! 24 ! 25	_	!! !	! ! !	!! !! !!
! 27 ! 28 ! 29	1 1 1 1			!!
!	!	!!	!	!!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-LTB01-161027 Blank Water

SGPP - Merrimack

LL Sample # WW 8668867 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/27/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4-07 SDG#: MMK04-07TB

CAT No.	Analysis Name	CAS Number	Resul	Ė	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	Ū	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	Ū	1	5	1
11997	Methyl Acetate	79-20-9	1	Ū	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	<u>υ</u>	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U 	3	10	1
11997	Methylcyclohexane	108-87-2	1	Ū	1	5	1
11997	Methylene Chloride	75-09-2	2	<u>υ</u>	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U 	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1 1
11997 11997	Trichlorofluoromethane	75-69-4 75-01-4	0.5 0.5	U	0.5	1	1
	Vinyl Chloride			-	0.5		
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-LTB01-161027 Blank Water

SGPP - Merrimack

LL Sample # WW 8668867 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/27/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4-07 SDG#: MMK04-07TB

CAT No.	Analysis Name		CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles o-Xylene	SW-846 826	50C 95-47-6	ug/l 0.5	U	ug/l 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modifie	ed					
10954	Perfluorooctanoic acid	335-67-1	1	U	1	2	1
10954	Perfluorononanoic acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid	307-24-4	1	U	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	1	U	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	5	U	5	10	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	1	U	1	3	1
10954	NETFOSAA	2991-50-6	5	U	5	8	1
	NEtFOSAA is the acronym for N	N-ethyl perfluoro	octanes	ulfonamid	oacetic Acid.		
10954	NMeFOSAA	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acronym for N	N-methyl perfluoro	octane	sulfonami	doacetic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163101AA	11/05/2016	18:12	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163101AA	11/05/2016	18:12	Matthew S Krause	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16314003	12/02/2016	14:01	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16314003	11/09/2016	14:30	Devon M Whooley	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E VOLATILE ORGANICS ANA	דקקעט מדמת פוסע.ו	EPA SAM	PLE NO.
	TENTATIVELY IDENTIF		! ! M4-	
	dec. (cap) CAP		SDG No. 3668867 39915.i/16nov05; 10/28/16 11/05/16 : 1.0 UNITS:	:!
	! ! COMPOUND NAME			
! 1. VOCTIC	!Total VOC TICs	į	•	!=====! ! U !
3	!! _!!	i	_i	i <u></u> i
	_!	!	!	!!
	_ <u></u> !			
	_!		-!	!!
	! !		-¦	!
	!			
	_ i			
			- <u>i</u>	ii
				<u>:</u>
13.	!	!	1	!!
14.	!	!	!	!!
15	_!	!	_!	!!
16	_!	!!	_!	!!
17	_!	!!	_!	!!
18	_!	<u>-</u>	- !	!!
	_ !			!:
	_ ! !			::
			- ;	::
	i		_!	ii
	_!		-	ii
			- · !	ii
26.	!	!	- <u> </u>	ii
27		ļ .	!	!i
28	!	!!	!	!!
29	!	!!		!!
	_!		!	!!
	_!	!!	_!	!!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-FTB01-161027 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8668868 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/27/2016 11:25

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4-08	SDG#:	MMK04-081	В

CAT No.	Analysis Name	CAS Number	Resu	1t	Method Detection Limit	Limit of t* Quantitat:	Dilution ion Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	1	U	1	2	1
10954	Perfluorononanoic acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid	307-24-4	1	U	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	1	U	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	5	U	5	10	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	1	U	1	3	1
10954	NETFOSAA	2991-50-6	5	U	5	8	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroc	ctanes	ulfonamido	pacetic Acid.		
10954	NMeFOSAA	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acronym for N-m	ethyl perfluoro	octane	sulfonamio	doacetic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time		Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16314003	12/02/2016 14	1:22	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16314003	11/09/2016 14	1:30	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP06-68-161027 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668869 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/27/2016 11:35 by JC

C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4-09 SDG#: MMK04-09

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Lim	it*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l		ug/l	
11997	Acetone	67-64-1	6	U	6		20	1
11997	Benzene	71-43-2	0.5	IJ	0.5		1	1
11997	Bromochloromethane	74-97-5	1	IJ	1		5	1
11997	Bromodichloromethane	75-27-4	0.5	IJ	0.5		1	1
11997	Bromoform	75-25-2	0.5	U	0.5		4	1
11997	Bromomethane	74-83-9	0.5	U	0.5		1	1
11997	2-Butanone	78-93-3	3	IJ	3		10	1
11997	Carbon Disulfide	75-15-0	1	U	1		5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5		1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5		1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5		1	1
11997	Chloroform	67-66-3	0.5	U	0.5		1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5		1	1
11997	Cyclohexane	110-82-7	2	IJ	2		5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2		5	1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5		1	1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5		1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1		5	1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1		5	1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1		5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5		1	1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5		1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5		1	1
11997	1,1-Dichloroethene	75-35-4	0.5	Ū	0.5		1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	Ū	0.5		1	1
11997	trans-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5		1	1
11997	1,2-Dichloropropane	78-87-5	0.5	IJ	0.5		1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5		1	1
11997	trans-1,3-Dichloropropene	10061-01-5	0.5	IJ	0.5		1	1
11997	Ethylbenzene	10061-02-6	0.5	IJ	0.5		1	1
11997	Freon 113	76-13-1	2	IJ	2		10	1
			3	IJ			10	=
11997	2-Hexanone	591-78-6	3 1	U	3 1		5	1 1
11997	Isopropylbenzene	98-82-8	1	U	1		5	1
11997	Methyl Acetate	79-20-9	0.5	IJ	0.5			
11997	Methyl Tertiary Butyl Ether	1634-04-4		-			1	1
11997	4-Methyl-2-pentanone	108-10-1	3 1	U U	3 1		10 5	1 1
11997	Methylcyclohexane	108-87-2	2	IJ	2			
11997	Methylene Chloride	75-09-2		-			4	1
11997	Styrene	100-42-5	1	U	1		5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U 	0.5		1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5		1	1
11997	Toluene	108-88-3	0.5	U 	0.5		1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U 	1		5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U 	1		5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5		1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ū	0.5		1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5		1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5		1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5		1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5		1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

REVISED

Sample Description: SG2-AP06-68-161027 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668869 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/27/2016 11:35 by JC C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4 - 09SDG#: MMK04-09

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles o-Xylene	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/l 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined

Misc.	Organics EPA	537 Rev.	1.1	ng/l		ng/l	ng/l	
	mod	ified						
10954	Perfluorooctanoic acid	33	5-67-1	63		1	2	1
10954	Perfluorononanoic acid	37	5-95-1	1	U	1	2	1
10954	Perfluorodecanoic acid	33	5-76-2	1	U	1	2	1
10954	Perfluoroundecanoic acid	l 20	58-94-8	2	U	2	4	1
10954	Perfluorododecanoic acid	1 30	7-55-1	3	U	3	5	1
10954	Perfluorotridecanoic aci	.d 72	629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic a	cid 37	6-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid	30	7-24-4	11		1	2	1
10954	Perfluoroheptanoic acid	37	5-85-9	9		1	2	1
10954	Perfluorobutanesulfonate	2 37	5-73-5	4	U	4	10	1
10954	Perfluorohexanesulfonate	35	5-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfonat	e 17	63-23-1	5	U	5	10	1
10954	Perfluorobutanoic Acid	37	5-22-4	4	J	3	10	1
10954	Perfluoropentanoic Acid	27	06-90-3	7		1	3	1
10954	NETFOSAA	29	91-50-6	5	U	5	8	1
	NEtFOSAA is the acronym	for N-ethyl	perfluoro	octanesu	lfonamido	pacetic Acid.		
10954	NMeFOSAA	23	55-31-9	4	U	4	8	1
	NMeFOSAA is the acronym	for N-methy	l perfluor	ooctanes	ulfonamio	doacetic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Metals	SW-846	6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	15.2	0.0382	0.400	1
01757	Magnesium	7439-95-4	3.19	0.0190	0.200	1
01762	Potassium	7440-09-7	2.28	0.160	1.00	1
01767	Sodium	7440-23-5	47.3	0.173	2.00	1
Wet Ch	nemistry EPA 30	0.0	mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	77.8	4.0	8.0	20
00228	Sulfate	14808-79-8	12.8	1.5	5.0	5
	EPA 35	53.2	mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitro	gen n.a.	3.7	0.040	0.10	1
	SM 232	20 B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	21.5	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	21.5	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP06-68-161027 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668869 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/27/2016 11:35 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4-09 SDG#: MMK04-09

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163101AA	11/05/2016	18:34	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163101AA	11/05/2016	18:34	Matthew S Krause	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16314003	12/02/2016	15:44	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16314003	11/09/2016	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163080635001	11/04/2016	21:36	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163080635001	11/04/2016	21:36	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163080635001	11/04/2016	21:36	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163080635001	11/04/2016	21:36	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163080635001	11/04/2016	07:00	Lisa J Cooke	1
00224	Chloride	EPA 300.0	1	16315120601B	11/11/2016	02:41	Hallie Burnett	20
00228	Sulfate	EPA 300.0	1	16315120601B	11/11/2016	02:25	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16314118101B	11/09/2016	02:17	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16305006203A	11/01/2016	04:23	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16305006203A	11/01/2016	04:23	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16305006203A	11/01/2016	04:23	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E		EPA SAM	PLE NO.
	VOLATILE ORGANICS ANA TENTATIVELY IDENTIF	IED COMPOUNDS	! ! ! M4-	! 0.9 !
ab Code: LANCA atrix: (soil/v	water) WATER 5.0 (g/mL)mL 1) LOW c dec. cap) CAP	Contract: SAS No.: Lab Sample ID: 86 Lab File ID:HP09 Date Received: 10 Date Analyzed: 11 Dilution Factor: CONCENTRATION ((ug/L or ug/Kg)	SDG No. 568869 9915.i/16nov056 0/28/16 1/05/16 1.0 JNITS:	:!
CAS NUMBER	! ! COMPOUND NAME !		EST. CONC.	
2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 22. 23. 24. 25.	!Total VOC TICS !! !! !! !! !! !! !! !! !! !! !! !! !!			
29	_!	!!	!	!!
age 1 of 1	·		·	

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP06-73-161027 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668870 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/27/2016 13:55 by JC

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4-10 SDG#: MMK04-10

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

REVISED

Sample Description: SG2-AP06-73-161027 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668870 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/27/2016 13:55 by JC C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4 - 10SDG#: MMK04-10

CAT No. Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles 11997 o-Xylene	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/l 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined

Misc.	Organics EPA	537 Rev.	1.1	ng/l		ng/l	ng/l	
	mod	ified						
10954	Perfluorooctanoic acid	33	35-67-1	63		1	2	1
10954	Perfluorononanoic acid	37	75-95-1	1	U	1	2	1
10954	Perfluorodecanoic acid	33	35-76-2	1	U	1	2	1
10954	Perfluoroundecanoic acid	1 20	58-94-8	2	U	2	4	1
10954	Perfluorododecanoic acid	l 30	7-55-1	3	U	3	5	1
10954	Perfluorotridecanoic aci	.d 72	2629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic a	cid 37	76-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid	30	7-24-4	11		1	2	1
10954	Perfluoroheptanoic acid	37	75-85-9	9		1	2	1
10954	Perfluorobutanesulfonate	37	75-73-5	4	J	4	10	1
10954	Perfluorohexanesulfonate	35	55-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfonat	e 17	763-23-1	5	U	5	10	1
10954	Perfluorobutanoic Acid	37	75-22-4	4	J	3	10	1
10954	Perfluoropentanoic Acid	27	706-90-3	7		1	3	1
10954	NETFOSAA	29	91-50-6	5	U	5	8	1
	NEtFOSAA is the acronym	for N-ethyl	perfluoro	octanesu	lfonamido	pacetic Acid.		
10954	NMeFOSAA	23	355-31-9	4	U	4	8	1
	NMeFOSAA is the acronym	for N-methy	l perfluor	ooctanes	ulfonamid	doacetic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Metals	5	SW-846	6010C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	16.3	0.0382	0.400	1
01757	Magnesium		7439-95-4	3.80	0.0190	0.200	1
01762	Potassium		7440-09-7	2.62	0.160	1.00	1
01767	Sodium		7440-23-5	48.0	0.173	2.00	1
Wet Ch	nemistry	EPA 300	.0	mg/l	mg/l	mg/l	
00224	Chloride		16887-00-6	75.7	4.0	8.0	20
00228	Sulfate		14808-79-8	12.8	1.5	5.0	5
		EPA 353	. 2	mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitra	te Nitroge	n n.a.	3.6	0.040	0.10	1
		SM 2320	B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	рн 4.5	n.a.	24.7	1.7	5.0	1
12149	Bicarbonate Alkalin		n.a.	24.7	1.7	5.0	1
12148	Carbonate Alkalinity	Y	n.a.	1.7 U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP06-73-161027 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8668870 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/27/2016 13:55 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30

Reported: 01/30/2017 13:27

M4-10 SDG#: MMK04-10

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163101AA	11/05/2016	18:56	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163101AA	11/05/2016	18:56	Matthew S Krause	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16314003	12/02/2016	10:15	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16314003	11/09/2016	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163080635001	11/04/2016	21:39	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163080635001	11/04/2016	21:39	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163080635001	11/04/2016	21:39	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163080635001	11/04/2016	21:39	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163080635001	11/04/2016	07:00	Lisa J Cooke	1
00224	Chloride	EPA 300.0	1	16315120601B	11/11/2016	03:12	Hallie Burnett	20
00228	Sulfate	EPA 300.0	1	16315120601B	11/11/2016	02:56	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16314118101B	11/09/2016	02:18	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16305006203B	11/01/2016	02:41	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16305006203B	11/01/2016	02:41	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16305006203B	11/01/2016	02:41	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E		EPA SAM	PLE NO.
	VOLATILE ORGANICS ANAI TENTATIVELY IDENTIFI	IED COMPOUNDS	! ! ! M4-:	
ab Code: LANCA atrix: (soil/w	S Case No.: cater) WATER 5.0 (g/mL)mL) LOW dec. cap) CAP	Contract: SAS No.: Lab Sample ID: 8 Lab File ID: HPO Date Received: 1 Date Analyzed: 1 Dilution Factor: CONCENTRATION (ug/L or ug/Kg	SDG No. 1668870 19915.i/16nov05a 0/28/16 1.05/16 1.0 UNITS:	
CAS NUMBER	! ! COMPOUND NAME =!===========	! ! RT	! ! EST. CONC.	! !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
2	!Total VOC TICS ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! !			
30	_ i _ i _ !	! ! !	i	

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-APEB01-161027 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8668871 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/27/2016 16:20 by JC

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4-11 SDG#: MMK04-11EB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U U	2 1	4 5	1 1
11997	Styrene	100-42-5	1 0.5	U	0.5	1	1
11997	1,1,2,2-Tetrachloroethane Tetrachloroethene	79-34-5	0.5	U		1	
11997 11997	Toluene	127-18-4 108-88-3	0.5	U	0.5 0.5	1	1 1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-00-5 79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-09-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1
11221	W. P WATCHE	1,7001-23-1	0.5	U	0.5	-	±

^{*=}This limit was used in the evaluation of the final result



Limit of

1.0

Detection Limit* Quantitation

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

CAS Number

REVISED

Dilution

Factor

Sample Description: SG2-APEB01-161027 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8668871 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/27/2016 16:20 by JC

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Method

Submitted: 10/28/2016 09:30

Reported: 01/30/2017 13:27

M4-11 SDG#: MMK04-11EB

Analysis Name

CAT

No.

00228

No.	inidia di di inidia di ini		CID NUMBER	Result	:		•	ractor
GC/MS	Volatiles	SW-846 82	260C	ug/l		ug/l	ug/l	
•	o-Xylene		95-47-6	0.5	U	0.5	1	1
	thod Detection Limit	(MDI) stand					-	-
	instrument for sample					cy or		
	inuing calibration v		-			+aido		
	20%D criteria). The			_	_			
	reporting limit.	MDL Standar	a snows adequat	e sensit	IVILY AL OF D	elow		
CITE	reporting rimit.							
00882	VOA Library Sea	rch						
	The results from th	e volatile 1	ibrary search :	are liste	ed on the atta	ched		
	FORM 1 - VOA-TIC.		-					
	on the back of this		is appearing in	ii ciic Q	cordinir arc c	icrinca		
	on one baon or ones	101						
Misc.	Organics	EPA 537 F	Rev. 1.1	ng/l		ng/l	ng/l	
	-	modified						
10954	Perfluorooctanoic a		335-67-1	1	U	1	2	1
	Perfluorononanoic a		375-95-1	1	IJ	1	2	1
	Perfluorodecanoic a		335-76-2	1	U	1	2	1
	Perfluoroundecanoic		2058-94-8	2	U	2	4	1
	Perfluorododecanoic		307-55-1	3	IJ	3	5	1
	Perfluorotridecanoi		72629-94-8	2	IJ	2	4	1
	Perfluorotetradecan		376-06-7	3	U	3	5	1
	Perfluorohexanoic a		307-24-4	1	U	1	2	1
	Perfluoroheptanoic		375-85-9	1	U	1	2	1
	Perfluorobutanesulf		375-73-5	4	U	4	10	1
	Perfluorohexanesulf		355-46-4	4	U	4	10	1
	Perfluoro-octanesul		1763-23-1	5	U	5	10	1
	Perfluorobutanoic A		375-22-4	3	IJ	3	10	1
	Perfluoropentanoic		2706-90-3	1	U	1	3	1
	NEtFOSAA	ACIG	2991-50-6	5	U	5	8	1
10004	NEtFOSAA is the acr	onum for N-e				9	O	1
10954		Olly III TOL IN C	2355-31-9	4	U	4	8	1
10004	NMeFOSAA is the acr	onym for N-m				-	O	1
The	stated OC limits are					ic noia.		
	be obtained to calcul	-	-	lenc dat	a points			
can	be obtained to cared	Tacc Scatist	icai iimics.					
Metal	s	SW-846 60	10C	mg/1		mg/l	mg/l	
01750	Calcium		7440-70-2	7.83		0.0382	0.400	1
01757	Magnesium		7439-95-4	1.49		0.0190	0.200	1
01762	_		7440-09-7	0.829	J	0.160	1.00	1
01767			7440-23-5	19.3		0.173	2.00	1
Wet C	hemistry	EPA 300.0)	mg/l		mg/l	mg/l	
00224	-		16887-00-6	23.2		0.20	0.40	1
	Sample was original	lv analyzed			ng time, howe		- · · · ·	•
	the result exceeded							
	greater dilution pa							
00220			1/000 70 0			0.30	1 0	1

^{*=}This limit was used in the evaluation of the final result

14808-79-8

Smple was analyzed in duplicate to comfirm the result.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-APEB01-161027 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8668871 LL Group # 1726627 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/27/2016 16:20 by JC

C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 10/28/2016 09:30 Reported: 01/30/2017 13:27

M4-11 SDG#: MMK04-11EB

CAT No.	Analysis Name		CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Wet Ch	nemistry	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitra	te Nitrogen	n.a.	0.20	0.040	0.10	1
		SM 2320 B-	1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	pH 4.5	n.a.	26.9	1.7	5.0	1
	_	-	-	1/16 and yielded a re			
	_	-	-	inity on 11/08/16 and	yielded a		
	result of 25.7 mg/L	•	nfirming the in				
12149	Bicarbonate Alkalin	ity	n.a.	26.9	1.7	5.0	1
12148	Carbonate Alkalinit	У	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Camplo	Analwaia	Pogord
Laboratory	Sample	Anaivsis	Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163143AA	11/09/2016	14:54	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163143AA	11/09/2016	14:54	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16314003	12/02/2016	16:04	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16314003	11/09/2016	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163080635001	11/04/2016	21:42	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163080635001	11/04/2016	21:42	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163080635001	11/04/2016	21:42	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163080635001	11/04/2016	21:42	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163080635001	11/04/2016	07:00	Lisa J Cooke	1
00224	Chloride	EPA 300.0	2	16315120601B	11/12/2016	02:42	Clinton M Wilson	1
00228	Sulfate	EPA 300.0	2	16315120601B	11/12/2016	02:42	Clinton M Wilson	1
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16314118101B	11/09/2016	02:20	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16305006203A	11/01/2016	05:00	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16305006203A	11/01/2016	05:00	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16305006203A	11/01/2016	05:00	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

ILE ORGANICS ANAL TATIVELY IDENTIFI Laboratories Case No.: WATER (g/mL)mL CAP 0 COMPOUND NAME ====================================	Contr SAS Lab Samp Lab Fil Date Rec Date Ana Dilution CONCEN (ug/L	ract:No.:_No.:_No.:_No.:_No.:_No.:_No.:	68871 915.i/16nov09 /28/16 /09/16 1.0 NITS: ug/L EST. CONC.	:! !a.b/ln09s
WATER (g/mL)mL CAP COMPOUND NAME al VOC TICS	Lab Samp Lab Fil Date Rec Date Ana Dilution CONCEN (ug/L ! ! !! !!	ple ID: 86 e ID:HP09 eeived: 10 llyzed: 11 h Factor: ITRATION U or ug/Kg) RT ! =======!	SDG No. 68871 915.i/16nov09 / 28/16 / 09/16 1.0 NITS: ug/L EST. CONC.	:! !a.b/ln09s
al VOC TICs	:=====! ! !	======! !	=========	! Q !
al VOC TICs	! !			::=====::
	! ! !	! !		.!! .!!
	! ! !	! !		_!! _!! _!!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726627

Reported: 01/30/2017 13:27

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Batch number: L163101AA	Sample	number	(s): 86688	62-8668867,8668869-8668870
Acetone	6	U	6	20
Benzene	0.5	U	0.5	1
Bromochloromethane	1	Ū	1	5
Bromodichloromethane	0.5	U	0.5	1
Bromoform	0.5	U	0.5	4
Bromomethane	0.5	Ū	0.5	1
2-Butanone	3	U	3	10
Carbon Disulfide	1	U	1	5
Carbon Tetrachloride	0.5	Ū	0.5	1
Chlorobenzene	0.5	U	0.5	1
Chloroethane	0.5	U	0.5	1
Chloroform	0.5	Ū	0.5	1
Chloromethane	0.5	U	0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	Ū	2	5
Dibromochloromethane	0.5	U	0.5	1
1,2-Dibromoethane	0.5	U	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5
Dichlorodifluoromethane	0.5	U	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	U	0.5	1
trans-1,2-Dichloroethene	0.5	U	0.5	1
1,2-Dichloropropane	0.5	U	0.5	1
cis-1,3-Dichloropropene	0.5	U	0.5	1
trans-1,3-Dichloropropene	0.5	U	0.5	1
Ethylbenzene	0.5	U	0.5	1
Freon 113	2	U	2	10
2-Hexanone	3	U	3	10
Isopropylbenzene	1	U	1	5
Methyl Acetate	1	U	1	5
Methyl Tertiary Butyl Ether	0.5	U	0.5	1
4-Methyl-2-pentanone	3	U	3	10
Methylcyclohexane	1	U	1	5
Methylene Chloride	2	U	2	4
Styrene	1	U	1	5
1,1,2,2-Tetrachloroethane	0.5	U	0.5	1

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726627

Reported: 01/30/2017 13:27

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ
_	ug/l		ug/l	ug/l
Tetrachloroethene	0.5	IJ	0.5	1
Toluene	0.5	IJ	0.5	1
1,2,3-Trichlorobenzene	1	Ū	1	5
1,2,4-Trichlorobenzene	1	Ū	1	5
1,1,1-Trichloroethane	0.5	IJ	0.5	1
1,1,2-Trichloroethane	0.5	Ū	0.5	1
Trichloroethene	0.5	U	0.5	1
Trichlorofluoromethane	0.5	U	0.5	1
Vinyl Chloride	0.5	Ū	0.5	1
m+p-Xylene	0.5	U	0.5	1
o-Xylene	0.5	U	0.5	1
Batch number: L163143AA	Sample	number	r(s): 86688	171
Acetone	6	IJ	6	20
Benzene	0.5	Ū	0.5	1
Bromochloromethane	1	Ū	1	5
Bromodichloromethane	0.5	Ū	0.5	1
Bromoform	0.5	IJ	0.5	4
Bromomethane	0.5	Ū	0.5	1
2-Butanone	3	U	3	10
Carbon Disulfide	1	U	1	5
Carbon Tetrachloride	0.5	U	0.5	1
Chlorobenzene	0.5	U	0.5	1
Chloroethane	0.5	U	0.5	1
Chloroform	0.5	U	0.5	1
Chloromethane	0.5	U	0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	U	2	5
Dibromochloromethane	0.5	U	0.5	1
1,2-Dibromoethane	0.5	U	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5 1
Dichlorodifluoromethane	0.5 0.5	U	0.5 0.5	1
1,1-Dichloroethane 1,2-Dichloroethane	0.5	U U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	Ū	0.5	1
trans-1,2-Dichloroethene	0.5	Ū	0.5	1
1,2-Dichloropropane	0.5	Ū	0.5	1
cis-1,3-Dichloropropene	0.5	Ū	0.5	1
trans-1,3-Dichloropropene	0.5	Ū	0.5	1
Ethylbenzene	0.5	Ū	0.5	1
Freon 113	2	U	2	10
2-Hexanone	3	Ū	3	10
Isopropylbenzene	1	Ū	1	5
Methyl Acetate	1	U	1	5
Methyl Tertiary Butyl Ether	0.5	U	0.5	1
4-Methyl-2-pentanone	3	U	3	10

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726627

Reported: 01/30/2017 13:27

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Methylcyclohexane	1	U	1	5
Methylene Chloride	2	U	2	4
Styrene	1	U	1	5
1,1,2,2-Tetrachloroethane	0.5	U	0.5	1
Tetrachloroethene	0.5	U	0.5	1
Toluene	0.5	U	0.5	1
1,2,3-Trichlorobenzene	1	U	1	5
1,2,4-Trichlorobenzene	1	U	1	5
1,1,1-Trichloroethane	0.5	U	0.5	1
1,1,2-Trichloroethane	0.5	U	0.5	1
Trichloroethene	0.5	U	0.5	1
Trichlorofluoromethane	0.5	U	0.5	1
Vinyl Chloride	0.5	U	0.5	1
m+p-Xylene	0.5	U	0.5	1
o-Xylene	0.5	U	0.5	1
	na /1		ng/1	ng/1
	ng/l		ng/l	ng/l
Batch number: 16314003	_			861-8668871
Perfluorooctanoic acid	1	U	1	2
Perfluorononanoic acid	1	U	1	2
Perfluorodecanoic acid	1	U	1	2
Perfluoroundecanoic acid	2	U	2	4
Perfluorododecanoic acid	3	U	3	5
Perfluorotridecanoic acid	2	U	2	4
Perfluorotetradecanoic acid	3	U	3	5
Perfluorohexanoic acid	1	U	1	2
Perfluoroheptanoic acid	1	U	1	2
Perfluorobutanesulfonate	4	U	4	10
Perfluorohexanesulfonate	4	U	4	10
Perfluoro-octanesulfonate	5	U	5	10
Perfluorobutanoic Acid	3	U	3	10
Perfluoropentanoic Acid	1	U	1	3
NETFOSAA	5	U	5	8
NMeFOSAA	4	U	4	8
	mg/l		mg/l	mg/l
Batch number: 163080635001	Sample	number	(s): 86688	862-8668866,8668869-8668871
Calcium	0.0382		0.0382	0.400
Magnesium	0.0190		0.0190	0.200
Potassium	0.160		0.160	1.00
Sodium	0.173		0.173	2.00
D-t-b 16214110101D	0 1 -		./). 06606	062 0660066 0660060 0660071
Batch number: 16314118101B Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	362-8668866,8668869-8668871 0.10
Patah number: 1621E120601P	Campla	numbar	(a). 06600	060 0660066 0660060 0660071
Batch number: 16315120601B Chloride	0.20	number U		862-8668866,8668869-8668871
Sulfate	0.20		0.20	0.40
pullate	0.30	U	0.30	1.0

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726627

Reported: 01/30/2017 13:27

Method Blank (continued)

Analysis Name Result MDL** LOQ mg/l as CaCO3 mg/l as mg/l as CaCO3 CaCO3 Batch number: 16305006203A Sample number(s): 8668862-8668866,8668869,8668871 Total Alkalinity to pH 4.5 J 1.7 Batch number: 16305006203B Sample number(s): 8668870 Total Alkalinity to pH 4.5 1.8 J 1.7

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: L163101AA	Sample numbe	r(s): 86688	862-8668867,86	68869-8668	870				
Acetone	150	249.47	150	251.14	166	167	50-168	1	30
Benzene	20	18.34	20	18.54	92	93	78-120	1	30
Bromochloromethane	20	19.82	20	20.39	99	102	80-125	3	30
Bromodichloromethane	20	18.07	20	18.18	90	91	80-120	1	30
Bromoform	20	16.83	20	16.61	84	83	59-120	1	30
Bromomethane	20	17.6	20	17.97	88	90	55-123	2	30
2-Butanone	150	179.68	150	185.06	120	123	57-145	3	30
Carbon Disulfide	20	17.27	20	17.2	86	86	58-120	0	30
Carbon Tetrachloride	20	19.19	20	19.22	96	96	74-130	0	30
Chlorobenzene	20	18.46	20	18.21	92	91	80-120	1	30
Chloroethane	20	16.79	20	16.95	84	85	56-120	1	30
Chloroform	20	18.72	20	18.89	94	94	80-120	1	30
Chloromethane	20	15.6	20	15.64	78	78	59-127	0	30
Cyclohexane	20	19.02	20	19.23	95	96	65-131	1	30
1,2-Dibromo-3-chloropropane	20	17.14	20	16.46	86	82	59-120	4	30
Dibromochloromethane	20	17.97	20	17.66	90	88	78-120	2	30
1,2-Dibromoethane	20	18.92	20	18.58	95	93	80-120	2	30
1,2-Dichlorobenzene	20	18.67	20	18.58	93	93	80-120	1	30
1,3-Dichlorobenzene	20	18.46	20	18.24	92	91	80-120	1	30
1,4-Dichlorobenzene	20	18.39	20	18.42	92	92	80-120	0	30
Dichlorodifluoromethane	20	17.3	20	16.94	86	85	49-134	2	30
1,1-Dichloroethane	20	18.33	20	18.7	92	93	80-120	2	30
1,2-Dichloroethane	20	18.92	20	19.36	95	97	66-128	2	30
1,1-Dichloroethene	20	18.85	20	19.05	94	95	76-124	1	30
cis-1,2-Dichloroethene	20	18.67	20	18.68	93	93	80-120	0	30
trans-1,2-Dichloroethene	20	18.7	20	18.98	94	95	80-120	1	30
1,2-Dichloropropane	20	18.43	20	18.38	92	92	80-120	0	30
cis-1,3-Dichloropropene	20	18.05	20	18.21	90	91	80-120	1	30
trans-1,3-Dichloropropene	20	18.26	20	17.94	91	90	76-120	2	30
Ethylbenzene	20	18.19	20	18.03	91	90	78-120	1	30
Freon 113	20	20.29	20	20.27	101	101	64-136	0	30
2-Hexanone	100	95.66	100	94.16	96	94	49-146	2	30
Isopropylbenzene	20	18.6	20	18.32	93	92	80-120	2	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726627

Reported: 01/30/2017 13:27

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Methyl Acetate	20	19.28	20	19.69	96	98	61-137	2	30
Methyl Tertiary Butyl Ether	20	18.89	20	19.04	94	95	75-120	1	30
4-Methyl-2-pentanone	100	85.31	100	87.11	85	87	55-141	2	30
Methylcyclohexane	20	20.11	20	20.37	101	102	66-126	1	30
Methylene Chloride	20	18.25	20	18.74	91	94	80-120	3	30
Styrene	20	18.83	20	18.66	94	93	80-120	1	30
1,1,2,2-Tetrachloroethane	20	17.99	20	17.83	90	89	72-120	1	30
Tetrachloroethene	20	19.48	20	19.26	97	96	80-129	1	30
Toluene	20	18.36	20	18.35	92	92	80-120	0	30
1,2,3-Trichlorobenzene	20	18.01	20	17.66	90	88	69-120	2	30
1,2,4-Trichlorobenzene	20	17.98	20	17.82	90	89	72-120	1	30
1,1,1-Trichloroethane	20	16.04	20	16.36	80	82	66-126	2	30
1,1,2-Trichloroethane	20	18.22	20	17.95	91	90	80-120	1	30
Trichloroethene	20	18.45	20	18.77	92	94	80-120	2	30
Trichlorofluoromethane	20	20.62	20	20.71	103	104	67-129	0	30
Vinyl Chloride	20	17.15	20	16.98	86	85	63-121	1	30
m+p-Xylene	40	36.96	40	36.76	92	92	80-120	1	30
o-Xylene	20	18.22	20	18.2	91	91	80-120	0	30
Batch number: L163143AA	Sample numbe								
Acetone	150	153.59	150	154.57	102	103	50-168	1	30
Benzene	20	18.9	20	18.78	95	94	78-120	1	30
Bromochloromethane	20	20.51	20	20.06	103	100	80-125	2	30
Bromodichloromethane	20	18.54	20	18.32	93	92	80-120	1	30
Bromoform	20	16.4	20	16.37	82	82	59-120	0	30
Bromomethane	20	17.84	20	18.08	89	90	55-123	1	30
2-Butanone	150	139.9	150	136.52	93	91	57-145	2	30
Carbon Disulfide	20	18.76	20	18.59	94	93	58-120	1	30
Carbon Tetrachloride	20	20.18	20	19.94	101	100	74-130	1	30
Chlorobenzene	20	18.4	20	18.39	92	92	80-120	0	30
Chloroethane	20	16.6	20	16.73	83	84	56-120	1	30
Chloroform	20	19.47	20	19.34	97	97	80-120	1	30
Chloromethane	20	15.82	20	15.89	79	79	59-127	0	30
Cyclohexane	20	19.81	20	19.33	99	97	65-131	2	30
1,2-Dibromo-3-chloropropane	20	16.47	20	16.3	82	82	59-120	1	30
Dibromochloromethane	20	17.59	20	17.49	88	87	78-120	1	30
1,2-Dibromoethane	20	18.8	20	18.57	94	93	80-120	1	30
1,2-Dichlorobenzene	20	18.48	20	18.25	92	91	80-120	1	30
1,3-Dichlorobenzene	20	18.42	20	18.14	92	91	80-120	2	30
1,4-Dichlorobenzene	20	18.64	20	18.28	93	91	80-120	2	30
Dichlorodifluoromethane	20	16.64	20	16.77	83	84	49-134	1	30
1,1-Dichloroethane	20	18.98	20	18.73	95	94	80-120	1	30
1,2-Dichloroethane	20	20.1	20	19.45	101	97	66-128	3	30
1,1-Dichloroethene	20	20.35	20	19.96	102	100	76-124	2	30
cis-1,2-Dichloroethene	20	19.42	20	19.07	97	95	80-120	2	30
trans-1,2-Dichloroethene	20	19.81	20	19.65	99	98	80-120	1	30
1,2-Dichloropropane cis-1,3-Dichloropropene	20 20	18.42 17.98	20 20	18.11 17.74	92 90	91 89	80-120 80-120	2 1	30 30
CIS I, 3-DICHIOLOPLOPENE	20	11.90	20	11.11	90	U J	00-120	_	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726627

Reported: 01/30/2017 13:27

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
trans-1,3-Dichloropropene	20	17.48	20	17.53	87	88	76-120	0	30
Ethylbenzene	20	18.08	20	18.16	90	91	78-120	0	30
Freon 113	20	21.26	20	21.32	106	107	64-136	0	30
2-Hexanone	100	81.11	100	80	81	80	49-146	1	30
Isopropylbenzene	20	18.4	20	18.41	92	92	80-120	0	30
Methyl Acetate	20	19.04	20	18.95	95	95	61-137	0	30
Methyl Tertiary Butyl Ether	20	19.06	20	19.11	95	96	75-120	0	30
4-Methyl-2-pentanone	100	85.36	100	83.43	85	83	55-141	2	30
Methylcyclohexane	20	20.21	20	20.1	101	100	66-126	1	30
Methylene Chloride	20	19.26	20	18.89	96	94	80-120	2	30
Styrene	20	18.77	20	18.61	94	93	80-120	1	30
1,1,2,2-Tetrachloroethane	20	17.73	20	16.69	89	83	72-120	6	30
Tetrachloroethene	20	19.19	20	19.36	96	97	80-129	1	30
Toluene	20	18.51	20	18.29	93	91	80-120	1	30
1,2,3-Trichlorobenzene	20	17.49	20	17.45	87	87	69-120	0	30
1,2,4-Trichlorobenzene	20	17.75	20	17.44	89	87	72-120	2	30
1,1,1-Trichloroethane	20	17.01	20	16.77	85	84	66-126	1	30
1,1,2-Trichloroethane	20	18.3	20	18.12	91	91	80-120	1	30
Trichloroethene	20	19.19	20	18.97	96	95	80-120	1	30
Trichlorofluoromethane	20	21.66	20	21.44	108	107	67-129	1	30
Vinyl Chloride	20	17.01	20	16.97	85	85	63-121	0	30
m+p-Xylene	40	36.81	40	36.51	92	91	80-120	1	30
o-Xylene	20	18.25	20	18.19	91	91	80-120	0	30
	ng/l	ng/l	ng/l	ng/l					
Batch number: 16314003	Sample numbe	er(s): 86688	61-8668871						
Perfluorooctanoic acid	200	191.68	200	182.28	96	91	70-130	5	30
Perfluorononanoic acid	200	224.62	200	216.5	112	108	70-130	4	30
Perfluorodecanoic acid	200	186.89	200	182.45	93	91	70-130	2	30
Perfluoroundecanoic acid	200	215.52	200	196.38	108	98	70-130	9	30
Perfluorododecanoic acid	200	193.02	200	205.33	97	103	70-130	6	30
Perfluorotridecanoic acid	200	237.07	200	262.62	119	131*	70-130	10	30
Perfluorotetradecanoic acid	200	202.61	200	206.29	101	103	70-130	2	30
Perfluorohexanoic acid	200	187.81	200	190.53	94	95	70-130	1	30
Perfluoroheptanoic acid	200	192.39	200	190.74	96	95	70-130	1	30
Perfluorobutanesulfonate	176.8	180.26	176.8	180.41	102	102	70-130	0	30
Perfluorohexanesulfonate	189.2	182.76	189.2	203.01	97	107	70-130	11	30
Perfluoro-octanesulfonate	191.2	171.86	191.2	171.58	90	90	70-130	0	30
Perfluorobutanoic Acid	200	200.65	200	192.92	100	96	70-130	4	30
Perfluoropentanoic Acid	200	196.2	200	203.98	98	102	70-130	4	30
NETFOSAA	200	194.37	200	191.72	97	96	70-130	1	30
NMeFOSAA	200	194.03	200	184.13	97	92	70-130	5	30
	mg/l	mg/l	mg/l	mg/l					
Batch number: 163080635001	Sample number	er(s): 86688	62-8668866,86	68869-8668	871				
Calcium	4.00	4.13			103		80-120		
Magnesium	2.00	2.08			104		80-120		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726627

Reported: 01/30/2017 13:27

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/l	LCS Conc mg/l	LCSD Spike Added mg/l	LCSD Conc mg/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Potassium	10	10.38			104		80-120		
Sodium	10	10.23			102		80-120		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 16314118101B	Sample numb	er(s): 86688	862-8668866,86	68869-8668	8871				
Total Nitrite/Nitrate Nitrogen	2.50	2.56			102		90-110		
Batch number: 16315120601B	Sample numb	er(s): 86688	862-8668866,86	68869-8668	8871				
Chloride	3.00	2.94			98		90-110		
Sulfate	7.50	7.59			101		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16305006203A	Sample numb	er(s): 86688	862-8668866,86	68869,8668	8871				
Total Alkalinity to pH 4.5	188	182.66			97		84-110		
Batch number: 16305006203B	Sample numb	er(s): 86688	370						
Total Alkalinity to pH 4.5	188	182.66			97		84-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspi Cor ug/	ıc	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: L163101AA	Sample	numb	er(s): 8668	3862-8668	867,8668869	-8668870 t	JNSPK: P6	657871			
Acetone	120	U	3000	2870.83	3000	2916.83	96	97	50-168	2	30
Benzene	10	U	400	393.47	400	397.71	98	99	78-120	1	30
Bromochloromethane	20	U	400	418.02	400	427.69	105	107	80-125	2	30
Bromodichloromethane	10	U	400	373.13	400	383.24	93	96	80-120	3	30
Bromoform	10	U	400	318.8	400	324.61	80	81	59-120	2	30
Bromomethane	10	U	400	380.21	400	396.12	95	99	55-123	4	30
2-Butanone	60	U	3000	2660.78	3000	2706.42	89	90	57-145	2	30
Carbon Disulfide	20	U	400	402.87	400	414.13	101	104	58-120	3	30
Carbon Tetrachloride	10	U	400	420.54	400	442.48	105	111	74-130	5	30
Chlorobenzene	10	U	400	383.97	400	386.56	96	97	80-120	1	30
Chloroethane	10	U	400	351.3	400	371.5	88	93	56-120	6	30
Chloroform	10	U	400	402.77	400	411.99	101	103	80-120	2	30
Chloromethane	10	U	400	327.02	400	344.64	82	86	59-127	5	30
Cyclohexane	40	U	400	436.33	400	443.22	109	111	65-131	2	30
1,2-Dibromo-3-chloropropane	40	U	400	313.03	400	326.58	78	82	59-120	4	30
Dibromochloromethane	10	U	400	353.77	400	352.6	88	88	78-120	0	30
1,2-Dibromoethane	10	U	400	373.39	400	378.7	93	95	80-120	1	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726627

Reported: 01/30/2017 13:27

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unsp: Co: ug,	nc	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
1,2-Dichlorobenzene	20	U	400	378.88	400	385.39	95	96	80-120	2	30
1,3-Dichlorobenzene	20	Ū	400	370.38	400	382.71	93	96	80-120	3	30
1,4-Dichlorobenzene	20	IJ	400	374.97	400	381.87	94	95	80-120	2	30
Dichlorodifluoromethane	10	Ū	400	369.63	400	382.58	92	96	49-134	3	30
1,1-Dichloroethane	10	Ū	400	392.9	400	408.29	98	102	80-120	4	30
1,2-Dichloroethane	10	Ū	400	393.75	400	400.19	98	100	66-128	2	30
1,1-Dichloroethene	10	Ū	400	430.72	400	439.55	108	110	76-124	2	30
cis-1,2-Dichloroethene	10	Ū	400	403.83	400	409.48	101	102	80-120	1	30
trans-1,2-Dichloroethene	10	Ū	400	416.06	400	424.36	104	106	80-120	2	30
1,2-Dichloropropane	10	Ū	400	380.01	400	389.76	95	97	80-120	3	30
cis-1,3-Dichloropropene	10	Ū	400	361.31	400	367.48	90	92	80-120	2	30
trans-1,3-Dichloropropene	10	Ū	400	351.97	400	353.67	88	88	76-120	0	30
Ethylbenzene	10	Ū	400	383.32	400	386.97	96	97	78-120	1	30
Freon 113	40	Ū	400	452.36	400	472.83	113	118	64-136	4	30
2-Hexanone	60	U	2000	1566.63	2000	1575.66	78	79	49-146	1	30
Isopropylbenzene	20	Ū	400	396.16	400	401.39	99	100	80-120	1	30
Methyl Acetate	26.		400	407.63	400	413.48	95	97	61-137	1	30
Methyl Tertiary Butyl Ether	10	U	400	383.64	400	392.41	96	98	75-120	2	30
4-Methyl-2-pentanone	60	Ū	2000	1655.65	2000	1685.92	83	84	55-141	2	30
Methylcyclohexane	20	U	400	459.21	400	470.63	115	118	66-126	2	30
Methylene Chloride	40	Ū	400	403.7	400	412.33	101	103	80-120	2	30
Styrene	20	Ū	400	384.41	400	388.72	96	97	80-120	1	30
1,1,2,2-Tetrachloroethane	10	Ū	400	336.32	400	344.9	84	86	72-120	3	30
Tetrachloroethene	10	U	400	411.35	400	412.46	103	103	80-129	0	30
Toluene	10	U	400	392.56	400	391.62	98	98	80-120	0	30
1,2,3-Trichlorobenzene	20	Ū	400	349.95	400	364.67	87	91	69-120	4	30
1,2,4-Trichlorobenzene	20	Ū	400	358.96	400	372.75	90	93	72-120	4	30
1,1,1-Trichloroethane	10	U	400	358.6	400	363.56	90	91	66-126	1	30
1,1,2-Trichloroethane	10	Ū	400	363.4	400	370.08	91	93	80-120	2	30
Trichloroethene	10	U	400	401.91	400	409.26	100	102	80-120	2	30
Trichlorofluoromethane	10	Ū	400	453.5	400	473.83	113	118	67-129	4	30
Vinyl Chloride	10	U	400	364.99	400	389.89	91	97	63-121	7	30
m+p-Xylene	10	U	800	773.44	800	783.68	97	98	80-120	1	30
o-Xylene	10	U	400	384.4	400	387.79	96	97	80-120	1	30
	ng	/1	ng/l	ng/l	ng/l	ng/l					
Batch number: 16314003	Sample	numb	er(s): 8668	8861-8668	871 UNSPK:	8668870					
Perfluorooctanoic acid	63.		200.7	262.13	071 0110110	000070	99		70-130		
Perfluorononanoic acid	1	U	200.7	189.54			94		70-130		
Perfluorodecanoic acid	1	Ū	200.7	204.81			102		70-130		
Perfluoroundecanoic acid	2	Ū	200.7	196.14			98		70-130		
Perfluorododecanoic acid	3	U	200.7	195.99			98		70-130		
Perfluorotridecanoic acid	2	Ū	200.7	209.04			104		70-130		
Perfluorotetradecanoic acid	3	Ū	200.7	196.52			98		70-130		
Perfluorohexanoic acid	10.		200.7	207.64			98		70-130		
Perfluoroheptanoic acid	9.0		200.7	207.04			100		70-130		
retriuoronepeanore acra	٦.(, ,	200.7	207.12			±00		10 T30		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726627

Reported: 01/30/2017 13:27

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ng/l	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Perfluorobutanesulfonate	4.40	177.42	187.63			103		70-130		
Perfluorohexanesulfonate	4 U	189.87	194.37			102		70-130		
Perfluoro-octanesulfonate	5 U	191.87	190.43			99		70-130		
Perfluorobutanoic Acid	4.07	200.7	204.68			100		70-130		
Perfluoropentanoic Acid	6.70	200.7	191.38			92		70-130		
NETFOSAA	5 U	200.7	194.12			97		70-130		
NMeFOSAA	4 U	200.7	210.12			105		70-130		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 163080635001	Sample numb	er(s): 8668	8862-8668	866,8668869	-8668871	UNSPK: 86	568865			
Calcium	15.96	4.00	19.64	4.00	19.67	92	93	75-125	0	20
Magnesium	3.07	2.00	5.02	2.00	5.05	98	99	75-125	1	20
Potassium	2.54	10	12.56	10	12.68	100	101	75-125	1	20
Sodium	47.95	10	56.89	10	56.94	89 (2)	90 (2)	75-125	0	20
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 16314118101B Total Nitrite/Nitrate Nitrogen	Sample numb 0.040 U	er(s): 8668 1.00	3862-8668 1.07	866,8668869	-8668871	UNSPK: P6	568762	90-110		
Batch number: 16315120601B	Sample numb	er(s): 8668	3862-8668	866,8668869	-8668871	UNSPK: 86	568862			
Chloride	108.78	40	156.18			118*		90-110		
Sulfate	11.29	25	36.39			100		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	ı				
Batch number: 16305006203A Total Alkalinity to pH 4.5	Sample numb 287.93	er(s): 8668 188	3862-8668 347.4	866,8668869	,8668871	UNSPK: PG	568954	84-110		
Batch number: 16305006203B Total Alkalinity to pH 4.5	Sample numb 287.93	er(s): 8668 188	3870 UNSP 347.4	K: P668954		32*		84-110		

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD	DUP RPD Max
	mg/l	mg/l		
Batch number: 163080635001	Sample number(s):	8668862-8668866	,8668869-8668871	BKG: 8668865
Calcium	15.96	15.81	1	20
Magnesium	3.07	3.06	0	20
Potassium	2.54	2.55	0 (1)	20
Sodium	47.95	47.68	1	20

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726627

Reported: 01/30/2017 13:27

Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD	DUP RPD Max
	mg/l	mg/l		
	mg/l	mg/l		
Batch number: 16314118101B	Sample number(s):	8668862-8668866,86	68869-866887	L BKG: P668762
Total Nitrite/Nitrate Nitrogen	0.040 U	0.040 U	0 (1)	2
Batch number: 16315120601B	Sample number(s):	8668862-8668866,86	68869-866887	L BKG: 8668862
Chloride	108.78	108.33	0	15
Sulfate	11.29	11.23	1 (1)	15
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 16305006203A	Sample number(s):	8668862-8668866,86	68869,866887	L BKG: P668954
Total Alkalinity to pH 4.5	287.93	287.34	0	5
Batch number: 16305006203B	Sample number(s):	8668870 BKG: 86688	370	
Total Alkalinity to pH 4.5	24.71	24.29	2 (1)	5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: L163101AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8668862	102	101	99	98
8668863	101	100	99	98
8668864	101	102	99	98
8668865	102	101	98	98
8668866	102	101	99	98
8668867	103	102	99	98
8668869	102	100	99	98
8668870	102	101	99	97
Blank	101	100	98	98
LCS	100	99	100	98
LCSD	103	100	99	99
MS	103	100	99	100
MSD	104	102	98	99
Limits:	80-116	77-113	80-113	78-113

Analysis Name: SOM02.2 Volatiles

Batch number: L163143AA

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726627

Reported: 01/30/2017 13:27

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: L163143AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8668871	102	101	99	99
Blank	101	102	98	97
LCS	103	101	98	98
LCSD	102	99	99	99
Limits:	80-116	77-113	80-113	78-113

Analysis Name: 16 PFCs Batch number: 16314003

Batch num	ber: 16314003						
	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA	
8668861	76	101	96	73	67*	78	
8668862	74	87	92	67*	69*	72	
8668863	82	111	115	76	76	81	
8668864	77	103	103	75	73	86	
8668865	85	108	116	77	86	85	
8668866	80	109	115	79	78	85	
8668867	74	75	78	81	67*	79	
8668868	90	94	86	89	79	94	
8668869	84	118	120	86	78	93	
8668870	61*	84	90	70	67*	75	
8668871	69*	77	77	70	66*	71	
Blank	65*	66*	68*	69*	60*	71	
LCS	73	77	74	78	76	81	
LCSD	69*	69*	71	69*	56*	73	
MS	81	108	102	84	82	89	
Limits:	70-130	70-130	70-130	70-130	70-130	70-130	
	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA	
8668861	82	91	105	85	67*	44*	
8668862	74	76	78	80	71	73	
8668863	88	85	99	81	78	74	
8668864	75	87	88	80	73	70	
8668865	83	78	90	84	86	88	
8668866	86	92	98	86	77	79	
8668867	77	85	96	79	73	72	
8668868	101	85	103	90	77	82	
8668869	89	100	105	89	81	78	
8668870	73	72	73	78	64*	65*	
8668871	74	79	87	80	59*	31*	

71

83

72

83

78

93

91

80

73

79

72

81

67*

76

71

88

Blank

LCS

MS

LCSD

75

82

79

95

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

77

78

73

106

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



70-130

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

70-130

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726627

70-130

Reported: 01/30/2017 13:27

Surrogate Quality Control (continued)

70-130

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

70-130

Analysis Name: 16 PFCs Batch number: 16314003

70-130

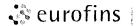
	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
8668861	38*	38*	51*	_
8668862	78	72	68*	
8668863	85	77	73	
8668864	71	74	73	
8668865	94	86	77	
8668866	91	82	75	
8668867	72	70	70	
8668868	81	80	87	
8668869	92	78	83	
8668870	62*	63*	61*	
8668871	27*	18*	47*	
Blank	78	67*	67*	
LCS	102	81	77	
LCSD	91	71	69*	
MS	83	81	75	
Limits:	70-130	70-130	70-130	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

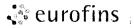
⁽²⁾ The unspiked result was more than four times the spike added.



Lancaster Environmental Services Analysis Request/Chain of Custody

v	Page	10/2	
---	------	------	--

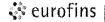
Acct. #:	37191		Group	#:	17	2 (de	9-	7	Sam	ole#:	8L	2/2	88	6	yeve	71					COC#:	15588
Client: C.T. Male Associates						Matrix										uest	ed				For Lab Us	se Only
Project Name/#: SGPP - Merrimack	Site ID:					[X] [Pı	ese	rvat	ion	Code	es				SF#: <u>285327</u>	
Project Manager: Kirk Moline	P.O. #: (0.6126			뉱	ace ace	.,		Н	N		s									SCR#: <u>19606</u> 2	2
Sampler: Jonathan Couter, Jonathan Diggert					Sediment	Ground Surface	WATER					2									Preservat	ion Codes
**	Quote #:	214135			Sed		3	ers		ပ္		G.S.		<u>@</u>	(F						H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						ble ES	×	Containers	()	(6010C)		6 0 1	(0	(SM 2320B)	7 mod.)						N = HNO ₃	B = NaOH
	0.11-	-4:		e E		Potable NPDES	1AN		(826		뉴	.2) +	(300.0)	SM 2	4 537						S = H ₂ SO ₄	P = H ₃ PO ₄
	Colle	ction		oosi			100	# of	VOAs (8260C)	g, Na	(353.2)	(353.	SO4- ((EP,						O = Other	
Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other:	Total	TCL V	Ca, Mg, Na, K	NO2	NO3	CI-, S(Alkalinity	PFCs						Rem	arks
SG 2 -APEBOI - 161026 185 510	10/26/16	0815	Χ				Χ	2							Х						Merrima	ck
SG 2 -APC6 - 19-161026 1000	10/26/16	1010 110956	×			Х		11	Х	Х		Х	X	Х	X						GAPP L	ist
SG Z -APO6 - 29 - 161026 16076	10/26/16	1145	Х			Х			Х	X		X	X	K	Х							
SG 2 -AP 06 - 39 - 161026 18(T)	10/26/16	1325	X			Х		-	Х	Х		X	X	X	X							
SGZ -AP06 - 49-161026 180	10/26/16	1505	X			X		12	×	Χ		X	X	X	X						Metals Ba	the QC
SG 2 -AP06 - 59 - 161027 18@	10/27/16	0905	X			X		11	Х	X		X	X	X	X							
SG 2 9 LTBU- 161027 1869	MATHE	encostrates					X	3	X						X							
SG 2 -249FTB01 - 161027 18(00)	10/27/14	1125	X				X	1_							X							
SG2 - PAPOG-68-161021 1860	10/27/16	1135	X			×	ļ	11	X	Ύ		X	X	X	X							
SG 2 -APOG - 793-161027 1850	10/27/14	1355	X			X		11	X	X		X	Х	×	×		<u> </u>					
Turnaround Time Requested (TAT) (please of			RUSH	Ш	I ∕^	nquished		1.			Date		1.1	Time 5	Tw	Rec	eived	by:			Date	Time
(RUSH TAT is subject to Eurofins Lancaster Laboratori Date results are needed:	es approval a	and surcharg	ges.)			nquished			DUI X		2// Date		14	Time	<u> </u>	Rec	eived	d bv:			Date	Time
E-mail address to send RUSH results: k.melin	e Q ctm	ala com			0		arangariya wangariya	C series and a ser	, O	i	27	E		00				,				
Data Package Options (please check if require				,	Rélii	nquished	by:				Date			Time		Rec	eived	by:		$\overline{/}$	Date	Time
Type I (Validation/non-CLP) 📈 MA MC	Р 🗌	TX TRRP	- 13										and the same of th	حر					\angle			
Type III (Reduced non-CLP)	- <u> </u>				Reli	nquished	by:				Date	and the same		Time	:	Rec	eived	d bye			Date	Time
/pe IV (CLP SOW) ASP Type A					D 1		1				D 1			700			,,,	1 1			Dete	
	ype B 🗌				Kelli	nquished	py:	and the same			Date			Time	!	кес	ejved	a by:			Date نەرى	Time পুর্চ
EDD Format: EQuIS					Airbi	I No.											V.,				C8.(6	
If site-specific QC (MS/MSD/Dup) required, i submit triplicate volume.	ndicate Q	C samples	s and			quished b				rrier: Othe	r					Tom	nero	iture	unon	roco	ipt <u>۲۰</u> ۲ - ح	√3 °C
Submit triplicate volunie.					UPS		reut	x>		Othe	<u> </u>					1 611	iheig	iture	upon	CCC	ihr	



Laboratories

Environmental Services Analysis Request/Chain of Custody 2 of 2 Laboratories

Acct. #	37191		Group	#:	17	266	2	<u> 1 </u>	Sam	ple #:	8	66	089	36	-	71					COC#: 1	15591
Client: C.T. Male Associates						Matrix			Analyses Rec							uest	ed				For Lab Us	e Only
Project Name/#: SGPP - Merrimack	Site ID:											Pı	rese	rvati	on (Code	es				SF#: <u>285327</u>	
Project Manager: Kirk Moline	P.O.#:	6.612	G		世	ace			Н	N		S									SCR#: <u>196065</u>	<u>i</u>
Sampler: Josephon Carter, Josephon Dyper					Sediment	Ground						N									Preservati	on Codes
Phone #: 608 - 354-5253 5/8-76-7400	Quote #:	214135			Sed		Urto	Jers		်				<u>⋒</u>	d.)						H = HCl	T = Thiosulfate
State where sample(s) were collected: NH						ble	3	Containers	(OC)	(6010C)		N_{0_2}	6	320	7 mod.)						N = HNO ₃	B = NaOH
	Colle	ction		te		Potable NPDES	16.06		VOAs (8260C)		和	2) 🗲	(300.0)	(SM 2320B)	A 537						S = H ₂ SO ₄	P = H ₃ PO ₄
	Cone	Ction		posi		<u>_</u>	I.	# of	/OAs	ğ,	(333	(353.2)	40	nity ((EPA						O = Other	
Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other:	Total	TCL \	Ca, Mg, Na, K	NO2 (553.2)	NO3	CI-, S	Alkalinity	PFCs						Rem	arks
SG2 -APEBN - /6/027 38	10/27/16	1620	X				X	11	X	X	Ţ	X	X	X	Χ						Merrina	.K
SG -AP - 16																						List
SG -AP - 16																						
SG -AP - 16																						
SG -AP - 16																						
SG -AP - 16											•											
SG -AP - 16																				_		
SG -AP - 16																						
SG -AP - 16																						
SG -AP - 16																					· · · · · · · · · · · · · · · · · · ·	
Turnaround Time Requested (TAT) (please		/ -	RUSH		Reli	nquished	by:	6	8		Date	/	د	Time	- a	Rec	eived	l by:			Date	Time
RUSH TAT is subject to Eurofins Lancaster Laborator Date results are needed:	ies approval	and surchar	ges.)		Reli	ノーン nquished	bv:	-	7	14	Date	Me	/() <u>心</u> Time		Rece	eivec	l bv:			Date	Time
	whie C	e Forale	1 6 2 Fm		2.00	mangat light our	, here	manifest and analysis of the		l	47/	1		sa)				. ~ , .				
Data Package Options (please check if requ		C/ 3.1-5-	- 47/1		Reli	nquished	by:	and the second		/-	Date	-	/	Time		Rece	eivec	by:		71	Date	Time
Гуре I (Validation/non-CLP) 📈 МА М	CP 🗌	TX TRRP	- 13								•			Town or the second								
Type III (Reduced non-CLP) 🔲 CT RC	P []				Reli	nquished	by:				Date	!		Time		Rec	eivec	l'by:			Date	Time
	Гуре А 🗌				D 1		,		_		<u> </u>			T*'								****
	Гуре В 🗌				Kelii	nquished	by:				Date	!		Time		Rec	eivec				Date סייד אינע	Time વડે
EDD Format: EQuIS				***********	Airbi	II No.:														j	· · · · · ·	•
If site-specific QC (MS/MSD/Dup) required,	indicate Q	C sample	s and			quished b			ial Cai <		r					Tem	nera	fure i	unon	rece	int 2-2-2-3	s °C



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

166586

Group Number(s): 179 6601

Client: C.T. Male

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

10/28/2016 9:30

Number of Packages:

2

Number of Projects:

1

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

Yes

Custody Seal Present:

Yes

Sample Date/Times match COC:

Yes

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

N/A

Samples Chilled:

Yes

Total Trip Blank Qty:

0

Paperwork Enclosed:

Discrepancy in Container Qty on COC:

Yes

Air Quality Samples Present:

No

Samples Intact:

Yes No

Missing Samples:

No

Extra Samples:

No

Unpacked by Timothy Cubberley (6520) at 10:56 on 10/28/2016

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler#	Thermometer ID	Corrected Temp	Therm, Type	<u>lce Type</u>	Ice Present?	Ice Container	Elevated Temp?
1	DT131	2.2	DT	Wet	Υ	Bagged	N
2	DT131	2.3	DT	Wet	Υ	Bagged	N



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RLReporting Limit kg **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: December 30, 2016

Project: SGPP - Merrimack

Submittal Date: 10/31/2016 Group Number: 1726931 SDG: MMK05 PO Number: 16.6126 State of Sample Origin: NH

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To C. T. Male Associates Attn: Jeff Marx Electronic Copy To C. T. Male Associates Attn: Dan Reilly Electronic Copy To C. T. Male Associates Attn: Kirk Moline

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250



Project Name: SGPP - Merrimack LL Group #: 1726931

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260C, GC/MS Volatiles

Sample #s: 8670454, 8670455, 8670457, 8670458

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

EPA 537 Rev. 1.1 modified, Misc. Organics

<u>Sample #s: 8670456</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

<u>Sample #s: 8670457</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.
Target analyte(s) was detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no reportable hits were observed in the method blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Sample #s: 8670458

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits. Target analyte(s) was detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no reportable hits were observed in the method blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Batch #: 16316001 (Sample number(s): 8670454-8670458 UNSPK: 8670457)

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8670456, 8670457, 8670458, MS

<u>SW-846 6010C, Metals</u>

Batch #: 163090635001 (Sample number(s): 8670454, 8670457-8670458 UNSPK: P677168 BKG: P677168)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Calcium, Magnesium

EPA 300.0, Wet Chemistry

Batch #: 16315120601B (Sample number(s): 8670454, 8670457 UNSPK: P668862 BKG: P668862)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Chloride

SM 2320 B-1997, Wet Chemistry

Batch #: 16312002102B (Sample number(s): 8670458 UNSPK: P670613 BKG: P8670458-P670613)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Total Alkalinity to pH 4.5

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Total Alkalinity to ph 4.5



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG-2-AP03-25-161028 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8670454 LL Group # 1726931 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/28/2016 09:50 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 10/31/2016 08:20 Latham NY 12110

Reported: 12/30/2016 15:16

MMK51 SDG#: MMK05-01

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	3260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	IJ	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	tī	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	τι	0.5	1	1
			0.5	Ū	0.5	1	1
11997 11997	1,2-Dibromoethane	106-93-4 95-50-1	0.5 1	ττ	0.5	5	1
	1,2-Dichlorobenzene			-			
11997	1,3-Dichlorobenzene	541-73-1	1	U 	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U 	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	Ū	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	Ū	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	Ū	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	IJ	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	tī	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	Ū	0.5	1	1
1122/	m+b-virene	1/9001-23-1	0.5	U	0.5	1	±

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG-2-AP03-25-161028 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8670454 LL Group # 1726931 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/28/2016 09:50 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 10/31/2016 08:20 Latham NY 12110

Reported: 12/30/2016 15:16

MMK51 SDG#: MMK05-01

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846	8260C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5 U	0.5	1	1
A Me	thod Detection Limit	(MDL) sta	ndard is analyzed	to confirm sensit	tivity of		
the	instrument for sample	es with no	n-detect analytes	associated with a	a		
cont	inuing calibration v	erificatio	n standard exhibi	ting low response	(outside		
the	20%D criteria). The	MDL stand	ard shows adequat	e sensitivity at o	or below		
the	reporting limit.						

00882 VOA Library Search

12150 Total Alkalinity to pH 4.5

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form

	on the back of this	form.						
Misc.	Organics	EPA 537 F	Rev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic ac	id	335-67-1	3		0.5	2	1
10954	Perfluorononanoic ac	id	375-95-1	0.6	U	0.6	2	1
10954			335-76-2	0.5	Ū	0.5	2	1
10954	Perfluoroundecanoic	acid	2058-94-8	1	U	1	3	1
10954		acid	307-55-1	0.5	U	0.5	2	1
10954		acid	72629-94-8	0.5	Ū	0.5	2	1
10954	Perfluorotetradecano	ic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic ac	id	307-24-4	0.7	J	0.5	2	1
10954	Perfluoroheptanoic a	cid	375-85-9	0.6	J	0.5	2	1
10954	Perfluorobutanesulfo		375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfo	nate	355-46-4	1	U	1	3	1
10954		onate	1763-23-1	2	Ū	2	6	1
10954	Perfluorobutanoic Ac	id	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic A	.cid	2706-90-3	0.6	J	0.5	2	1
10954			2991-50-6	1	Ū	1	3	1
	NEtFOSAA is the acro	nym for N-e	thyl perfluoroc	ctanesu	Lfonamidoace	tic Acid.		
10954	NMeFOSAA	1	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acro	nym for N-m	ethyl perfluoro	octanesi	ulfonamidoac	etic Acid.		
		_						
Metal	S	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	8.42		0.0382	0.400	1
01757	Magnesium		7439-95-4	0.875		0.0190	0.200	1
01762	Potassium		7440-09-7	0.954	J	0.160	1.00	1
01767	Sodium		7440-23-5	4.17		0.173	2.00	1
Wet Cl	hemistry	EPA 300.0)	mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	1.1	J	1.0	2.0	5
00228	Sulfate		14808-79-8	18.7		1.5	5.0	5
		EPA 353.2	2	mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitrat	e Nitrogen	n.a.	0.040	U	0.040	0.10	1
		SM 2320 E	3-1997	mg/l a	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
								_

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG-2-AP03-25-161028 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8670454 LL Group # 1726931 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/28/2016 09:50 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 10/31/2016 08:20 Latham NY 12110

Reported: 12/30/2016 15:16

MMK51 SDG#: MMK05-01

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet C	hemistry	SM 2320	B-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12149	Bicarbonate Alkalini	ty	n.a.	1.7	U	1.7	5.0	1
12148	Carbonate Alkalinity		n.a.	1.7	U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
Habot acor y	Sambre	MIGTABLE	Kecora

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163143AA	11/09/2016	15:38	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163143AA	11/09/2016	15:38	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16316001	12/02/2016	17:47	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16316001	11/11/2016	11:35	Robert Brown	1
01750	Calcium	SW-846 6010C	1	163090635001	11/06/2016	15:06	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	163090635001	11/09/2016	21:19	Cindy M Gehman	1
01762	Potassium	SW-846 6010C	1	163090635001	11/06/2016	15:06	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163090635001	11/09/2016	21:19	Cindy M Gehman	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163090635001	11/05/2016	07:43	Lisa J Cooke	1
00224	Chloride	EPA 300.0	1	16315120601B	11/11/2016	04:15	Hallie Burnett	5
00228	Sulfate	EPA 300.0	1	16315120601B	11/11/2016	04:15	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16314118103B	11/09/2016	03:48	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16312002103A	11/08/2016	00:03	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16312002103A	11/08/2016	00:03	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16312002103A	11/08/2016	00:03	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.
VOLATILE ORGANICS A		
TENTATIVELY IDEN	!!!	
		! MMK51 !
Lab Name: Lancaster Laboratories	Contract:	!
Lab Code: LANCAS Case No.:_	SAS No.:	_ SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID: 8670	1454
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0991	.5.i/16nov09a.b/ln09s43.d
Level: (low/med) LOW	Date Received: 10/3	31/16
Moisture: not dec.	Date Analyzed: 11/0	9/16
Column: (pack/cap) CAP	Dilution Factor: 1.	0
	CONCENTRATION UNI	TTS:
Number TICs found: 0	(ug/L or ug/Kg) u	ıg/L

! ! CAS NUMBER	! ! COMPOUND NAME ==!==================================	! ! RT	! ! EST. CONC.	~
!=======! ! 1. VOCTIC	==:===================================	: !	•	!====== ! U
. 2	!	!	!	!
! 3	!!	!	!	!
		!	!	!
	!	!	!	!
	_!	!	!	!
	_!	!	!	!
	!	!	!	!
	<u></u> !	!	!	!
			!	!
		:	!	!
			!	<u>;</u>
14.		<u>-</u> i	!	:
	i	;	·	<u>;</u>
		:	·	i
		;	!	i
			 !	!
	<u> </u>	i	 !	i ———
20			!	!
21		!	!	!
22.	!		!	!
23	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!		!	!
	!	!	!	!
30	_!	!	!	!
page 1 of 1	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG-2-LTB01-161028 Blank Water

SGPP - Merrimack

LL Sample # WW 8670455 LL Group # 1726931 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/28/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/31/2016 08:20 Reported: 12/30/2016 15:16

MMK52 SDG#: MMK05-02TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	Ū	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	Ū	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	IJ	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	Ū	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
11997	2-Hexanone	591-78-6	3	IJ	3	10	1
11997	Isopropylbenzene	98-82-8	1	IJ	1	5	1
11997	Methyl Acetate	79-20-9	1	IJ	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	IJ	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	IJ	1	5	1
11997	Methylene Chloride	75-09-2	2	II	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	Ū	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	IJ	0.5	1	1
11997	Toluene	108-88-3	0.5	Ū	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	IJ	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-00-5	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	IJ	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U II	0.5	1	<u>⊥</u> 1
11997	m+b-vitene	1/2001-23-1	0.5	U	0.5	т.	±

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG-2-LTB01-161028 Blank Water

SGPP - Merrimack

LL Sample # WW 8670455 LL Group # 1726931 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/28/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/31/2016 08:20 Reported: 12/30/2016 15:16

MMK52 SDG#: MMK05-02TB

CAT No.	Analysis Name	CAS	S Number R	esult	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260C	u	ıg/l	ug/l	ug/l	
11997	o-Xylene	95-	47-6 0	.5 U	0.5	1	1
the cont the	thod Detection Limit instrument for sample inuing calibration vo 20%D criteria). The reporting limit.	es with non-detecterification standa	t analytes ass ard exhibiting	sociated with a g low response (outs	ide		

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537 F	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroo	ctanesu	lfonamidoacet	ic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-m $$	ethyl perfluoro	octanes	ulfonamidoace	tic Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
------------	--------	----------	--------

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163143AA	11/09/2016	15:16	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163143AA	11/09/2016	15:16	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16316001	11/22/2016	03:40	Jason W Knight	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG-2-LTB01-161028 Blank Water

SGPP - Merrimack

LL Sample # WW 8670455 LL Group # 1726931 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/28/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/31/2016 08:20 Reported: 12/30/2016 15:16

MMK52 SDG#: MMK05-02TB

Laboratory Sample Analysis Record

CAT Analysis Name Method Trial# Batch# Analysis Analyst Dilution No.

14091 PFAA Water Prep EPA 537 Rev. 1.1 1 16316001 11/11/2016 11:35 Robert Brown 1 modified



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE NO).
VOLATILE ORGANICS ANA:	LYSIS DATA SHEET	_		
TENTATIVELY IDENTIF	!		!	
		!	MMK52	!
Lab Name: Lancaster Laboratories	Contract:	_ !_		!
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 86704	55		
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09915	.i/16n	ov09a.b/lr	109s42
Level: (low/med) LOW	Date Received: 10/31	/16		

Date Received: 10/31/16
Date Analyzed: 11/09/16
Dilution Pactor: 1 % Moisture: not dec. Column: (pack/cap) CAP Dilution Factor: 1.0

CONCENTRATION UNITS: Number TICs found: 0 (ug/L or ug/Kg) ug/L

	! COMPOUND NAME		! EST. CONC.	~
	:=!======== !Total VOC TICs	====!======	!======================================	•
	!!	: !	;	. 0
		i	·	·
	<u>_</u>	i	·	i
	<u>_</u>	i	·	i
		i	·	·
	i	i	·	·
		i	·	·
	_ :!	i	·	·
	i		·	·
	i	i	·	i
	_ :!	i	·	·
	i	i	·	·
	 	i	i	i
		i	·	·
		i	i	:
		i	i	i
	i	i	·	·
		i	i	:
		i	i	:
		<u>i</u>	i	:
			! !	·
			! !	
	`	i	·	·
24 25		<u>:</u>	<u> </u>	<u> </u>
26.	_ ;	<u>-</u>	!	:
		:	<u> </u>	·
	!	<u>-</u>	<u>:</u>	!
		<u>-</u>	:	:
	!	<u>-</u>	<u>!</u>	!
· U •	_!	<u>-</u>	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG-2-FTB01-161028 Blank Water

SGPP - Merrimack

LL Sample # WW 8670456 LL Group # 1726931 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/28/2016 09:45

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/31/2016 08:20

Reported: 12/30/2016 15:16

MMK53 SDG#: MMK05-03TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit	Limit of t* Quantitation	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	hyl perfluoroo	ctanesu	lfonamido	acetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me	ethyl perfluoro	octanes	ulfonamid	oacetic Acid.		
mb o	atatad od limita ama admisamu aml		1 and 4 al	:			

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16316001	12/02/2016 18:08	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16316001	11/11/2016 11:35	Robert Brown	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG-2-AP03-35-161028 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8670457 LL Group # 1726931 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/28/2016 12:20 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 10/31/2016 08:20 Latham NY 12110

Reported: 12/30/2016 15:16

MMK54 SDG#: MMK05-04

GC/MS Volatiles SW-846 8260C Ug/1 CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor		
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 11997 Carbon Tetrachloride 56-23-5 0.5 U 0.5 1 1 1 1 11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 1 11997 Chlorobenzene 75-00-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebensone 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 <td>11997</td> <td>·</td> <td>75-35-4</td> <td>0.5</td> <td>Ū</td> <td></td> <td>1</td> <td>1</td> <td></td>	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG-2-AP03-35-161028 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8670457 LL Group # 1726931 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/28/2016 12:20 by JD C. T. Male Associates 50 Century Hill Drive

Latham NY 12110 Submitted: 10/31/2016 08:20

Reported: 12/30/2016 15:16

MMK54 SDG#: MMK05-04

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846	8260C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5 U	0.5	1	1
A Me	thod Detection Limit	(MDL) sta	andard is analyze	ed to confirm sens	itivity of		
	instrument for sample		-				

the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	45		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	9		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	8		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	3		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	3	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	4	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	8		0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-6	ethyl perfluorod	ctanesu	ılfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	377 F0G3 3 ' 13' C 37	. 1. 1. 61		16 '1			

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid. The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Target analyte(s) was detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no reportable hits were observed in the method blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	SW-846 6010C	mg/l	mg/l	mg/l	
01750 Calcium	7440-70-2	24.7	0.0382	0.400	1
01757 Magnesium	7439-95-4	4.68	0.0190	0.200	1
01762 Potassium	7440-09-7	2.42	0.160	1.00	1
01767 Sodium	7440-23-5	53.1	0.173	2.00	1
Wet Chemistry	EPA 300.0	mg/l	mg/l	mg/l	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG-2-AP03-35-161028 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8670457 LL Group # 1726931 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/28/2016 12:20 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/31/2016 08:20 Reported: 12/30/2016 15:16

MMK54 SDG#: MMK05-04

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet C	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	131	10.0	20.0	50
00228	Sulfate	14808-79-8	12.3	1.5	5.0	5
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	2.6	0.040	0.10	1
	SM 2320 B	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	17.0	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	17.0	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163143AA	11/09/2016	16:00	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163143AA	11/09/2016	16:00	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16316001	11/22/2016	01:37	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16316001	11/11/2016	11:35	Robert Brown	1
01750	Calcium	SW-846 6010C	1	163090635001	11/06/2016	15:10	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	163090635001	11/09/2016	21:22	Cindy M Gehman	1
01762	Potassium	SW-846 6010C	1	163090635001	11/06/2016	15:10	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163090635001	11/06/2016	15:10	Elaine F Stoltzfus	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163090635001	11/05/2016	07:43	Lisa J Cooke	1
00224	Chloride	EPA 300.0	1	16315120601B	11/12/2016	03:10	Clinton M Wilson	50
00228	Sulfate	EPA 300.0	1	16315120601B	11/11/2016	04:47	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16314118103B	11/09/2016	03:53	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16312002103A	11/08/2016	00:59	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16312002103A	11/08/2016	00:59	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16312002103A	11/08/2016	00:59	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1	E	EPA SAMPLE	E NO.
VOLATILE ORGANIC	S ANALYSIS DATA SHEET		
TENTATIVELY ID	ENTIFIED COMPOUNDS	!	!
		! MMK54	!
Lab Name: Lancaster Laboratorie	s Contract:	!	!
Lab Code: LANCAS Case No.	: SAS No.:	SDG No.:_	
Matrix: (soil/water) WATER	Lab Sample ID: 8670457		
Commolo /	Tab Dila TD:ID0001F i	/1 (0 0 - 1	- / 7 0 0 4

Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov09a.b/ln09s44.d Level: (low/med) LOW Date Received: 10/31/16
% Moisture: not dec. Date Analyzed: 11/09/16
Column: (pack/cap) CAP Dilution Factor: 1.0
CONCENTRATION UNITS:

CONCENTRATION UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

CIED HOUDDING .	COMPOUND NAME		EST. CONC.	~
•	Total VOC TICs	==!=====!		!===== ! []
	Total VOC TICS	: :	-	
		:i		:
4		;;		<u>;</u>
		ii		;———
		:i		;
		;i		;
8!		ii		!
9.				!
		ii		!
11!				!
12!		!!		!
13. !				!
14!		!!		!
15. !		!!!!		!
16!		!!		!
17!		!!		!
18!		!!		!
19!		!!		!
20!		!!		!
21!		!!		!
22!		!!		!
23!		!!		!
24!		!!		!
25!		!!		!
26!		!!		!
27!		!!		!
28!		!!		!
29!		!!		!
30. !				!

page 1 of 1

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG-2-APFD01-161028 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8670458 LL Group # 1726931 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/28/2016 by JD

C. T. Male Associates
50 Century Hill Drive

Submitted: 10/31/2016 08:20

Latham NY 12110

Reported: 12/30/2016 15:16

MMK55 SDG#: MMK05-05FD

	1
GC/MS Volatiles SW-846 8260C ug/l ug/l ug/l ug/l	1
11997 Acetone 67-64-1 6 U 6 20	
11997 Benzene 71-43-2 0.5 U 0.5 1	1
11997 Bromochloromethane 74-97-5 1 U 1 5	1
11997 Bromodichloromethane 75-27-4 0.5 U 0.5 1	1
11997 Bromoform 75-25-2 0.5 U 0.5 4	1
11997 Bromomethane 74-83-9 0.5 U 0.5 1	1
11997 2-Butanone 78-93-3 3 U 3 10	1
11997 Carbon Disulfide 75-15-0 1 U 1 5	1
11997 Carbon Tetrachloride 56-23-5 0.5 U 0.5 1	1
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1	1
11997 Chloroethane 75-00-3 0.5 U 0.5 1	1
11997 Chloroform 67-66-3 0.5 U 0.5 1	1
11997 Chloromethane 74-87-3 0.5 U 0.5 1	1
11997 Cyclohexane 110-82-7 2 U 2 5	1
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5	1
11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1	1
11997 1,2-Dibromoethane 106-93-4 0.5 U 0.5 1	1
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5	1
11997 1,3-Dichlorobenzene 541-73-1 1 U 1 5	1
11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5	1
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1	1
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1	1
11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1	1
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1	1
11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1	1
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1	1
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1	1
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1	1
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1	1
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1	1
11997 Freon 113 76-13-1 2 U 2 10	1
11997 2-Hexanone 591-78-6 3 U 3 10	1
11997 Isopropylbenzene 98-82-8 1 U 1 5	1
11997 Methyl Acetate 79-20-9 1 U 1 5	1
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	1
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10	1
11997 Methylcyclohexane 108-87-2 1 U 1 5	1
11997 Methylene Chloride 75-09-2 2 U 2 4	1
11997 Styrene 100-42-5 1 U 1 5	1
11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1	1
11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1	1
11997 Toluene 108-88-3 0.5 U 0.5 1	1
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5	1
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5	1
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1	1
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1	1
11997 Trichloroethene 79-01-6 0.5 U 0.5 1	1
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1	1
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1	1
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG-2-APFD01-161028 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8670458 LL Group # 1726931 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/28/2016 by JD C. T. Male Associates 50 Century Hill Drive

Latham NY 12110 Submitted: 10/31/2016 08:20

Reported: 12/30/2016 15:16

MMK55 SDG#: MMK05-05FD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260C	ug/l	ug/l	ug/l	
11997	o-Xylene	95-47-6	0.5 υ	0.5	1	1
A Me	thod Detection Limit	(MDL) standard is analyzed	d to confirm sensitiv	vity of		
the	instrument for sampl	les with non-detect analytes	associated with a			

continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modifie	đ.					
10954	Perfluorooctanoic acid	335-67-1	52		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	8		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	8		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	3		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	2	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	4	JB	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	7		0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N	ethyl perfluoro	octanesu	lfonamido	acetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid. The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Target analyte(s) was detected in the method blank associated with the samples as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and no reportable hits were observed in the

method blank. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	SW-846 6010C	mg/l	mg/l	mg/l	
01750 Calcium	7440-70-2	24.6	0.0382	0.400	1
01757 Magnesium	7439-95-4	4.68	0.0190	0.200	1
01762 Potassium	7440-09-7	2.37	0.160	1.00	1
01767 Sodium	7440-23-5	52.5	0.173	2.00	1
Wet Chemistry	EPA 300.0	mg/l	mg/l	mg/l	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG-2-APFD01-161028 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8670458 LL Group # 1726931 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/28/2016 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 10/31/2016 08:20

Reported: 12/30/2016 15:16

MMK55 SDG#: MMK05-05FD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Cl	nemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	124	10.0	20.0	50
00228	Sulfate	14808-79-8	13.7	1.5	5.0	5
07882	EPA 353.2 Total Nitrite/Nitrate Nitrogen	n.a.	mg/l 3.0	mg/1 0.040	mg/l 0.10	1
	SM 2320 B	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	22.2	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	22.2	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti		Analyst	Dilution
No.								Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163143AA	11/09/2016	16:22	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163143AA	11/09/2016	16:22	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16316001	12/02/2016	18:28	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16316001	11/11/2016	11:35	Robert Brown	1
01750	Calcium	SW-846 6010C	1	163090635001	11/06/2016	15:13	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	163090635001	11/09/2016	21:31	Cindy M Gehman	1
01762	Potassium	SW-846 6010C	1	163090635001	11/06/2016	15:13	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163090635001	11/06/2016	15:13	Elaine F Stoltzfus	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163090635001	11/05/2016	07:43	Lisa J Cooke	1
00224	Chloride	EPA 300.0	1	16315120601A	11/12/2016	02:29	Clinton M Wilson	50
00228	Sulfate	EPA 300.0	1	16315120601A	11/10/2016	21:41	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16314118103B	11/09/2016	03:58	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16312002102B	11/07/2016	19:58	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16312002102B	11/07/2016	19:58	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16312002102B	11/07/2016	19:58	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE	NO.
VOLATILE ORGANICS ANAI			
TENTATIVELY IDENTIFI	!	!	
		! MMK55	!
Lab Name: Lancaster Laboratories	Contract:	. !	!
Lab Code: LANCAS Case No.:	SAS No.:	SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 867045	8	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09915.	i/16nov09a.b/	/ln09s45.d
Level: (low/med) LOW	Date Received: 10/31/	16	

Date Received: 10/31/16 Date Analyzed: 11/09/16 % Moisture: not dec. Column: (pack/cap) CAP Dilution Factor: 1.0 CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) ug/L

	! COMPOUND NAME ==!============		! EST. CONC.	
	==!===================================	!	! =====================================	•
2		i	İ	!
	!		!	1
4.	<u> </u>	i	!	!
5	_ !	!	!	!
6	!	!	!	!
	!	!	!	!
8	!		!	!
9	!!	!	!	!
10	!	!	!	!
11	!	!	!	!
12		!	!	!
13	!	!	!	!
14		!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
19	!	!	!	!
20	!	!	!	!
21	!	!	!	!
	!	!	!	!
	!		!	
24		!	!	!
25	!	!	!	!
26	!	!	!	!
	!	!	!	!
	_!	!	!	!
29	!	!	!	!
30	!	!	!	!
	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726931

Reported: 12/30/2016 15:16

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Batch number: L163143AA	Sample	number	(s): 867045	54-8670455,8670457-8670458
Acetone	6	U	6	20
Benzene	0.5	U	0.5	1
Bromochloromethane	1	U	1	5
Bromodichloromethane	0.5	U	0.5	1
Bromoform	0.5	U	0.5	4
Bromomethane	0.5	Ū	0.5	1
2-Butanone	3	Ū	3	10
Carbon Disulfide	1	Ū	1	5
Carbon Tetrachloride	0.5	Ū	0.5	1
Chlorobenzene	0.5	Ū	0.5	1
Chloroethane	0.5	Ū	0.5	1
Chloroform	0.5	Ū	0.5	1
Chloromethane	0.5	Ū	0.5	1
Cyclohexane	2	Ū	2	5
1,2-Dibromo-3-chloropropane	2	Ū	2	5
Dibromochloromethane	0.5	Ū	0.5	1
1,2-Dibromoethane	0.5	Ū	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5
Dichlorodifluoromethane	0.5	Ū	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	U	0.5	1
trans-1,2-Dichloroethene	0.5	U	0.5	1
1,2-Dichloropropane	0.5	U	0.5	1
cis-1,3-Dichloropropene	0.5	U	0.5	1
trans-1,3-Dichloropropene	0.5	U	0.5	1
Ethylbenzene	0.5	U	0.5	1
Freon 113	2	U	2	10
2-Hexanone	3	U	3	10
Isopropylbenzene	1	U	1	5
Methyl Acetate	1	U	1	5
Methyl Tertiary Butyl Ether	0.5	U	0.5	1
4-Methyl-2-pentanone	3	U	3	10
Methylcyclohexane	1	U	1	5
Methylene Chloride	2	U	2	4
Styrene	1	U	1	5
1,1,2,2-Tetrachloroethane	0.5	U	0.5	1

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726931

Reported: 12/30/2016 15:16

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Tetrachloroethene Toluene 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Trichlorofluoromethane Vinyl Chloride m+p-Xylene o-Xylene	0.5 0.5 1 1 0.5 0.5 0.5 0.5 0.5	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.5 0.5 1 1 0.5 0.5 0.5 0.5 0.5	1 1 5 5 5 1 1 1 1 1 1 1
	ng/l		ng/l	ng/l
Batch number: 16316001 Perfluorooctanoic acid Perfluorononanoic acid Perfluorodecanoic acid Perfluoroundecanoic acid Perfluoroundecanoic acid Perfluorotetridecanoic acid Perfluorotetradecanoic acid Perfluorotetradecanoic acid Perfluorohexanoic acid Perfluorohexanoic acid Perfluorobutanesulfonate Perfluoro-exanesulfonate Perfluoro-octanesulfonate Perfluoroputanoic Acid Perfluoropentanoic Acid NEtFOSAA NMeFOSAA	Sample 0.5 0.6 0.5 1 0.5 0.5 0.5 0.5 0.5 1 2 4 0.5 1 1	number U U U U U U U U U U U U U U U U U U U	(s): 86704! 0.5 0.6 0.5 1 0.5 0.5 0.5 0.5 0.7 1 2 3 0.5	54-8670458 2 2 2 2 2 2 2 2 2 2 2 2 3 6 10 2 3 3
	mg/l		mg/l	mg/l
Batch number: 163090635001 Calcium Magnesium Potassium Sodium	0.0383 0.0334 0.160 0.291	J U J	0.0382 0.0190 0.160 0.173	54,8670457-8670458 0.400 0.200 1.00 2.00
Batch number: 16314118103B Total Nitrite/Nitrate Nitrogen	0.040		0.040	54,8670457-8670458 0.10
Batch number: 16315120601A Chloride Sulfate	Sample 0.20 0.30	number U U	(s): 867045 0.20 0.30	0.40 1.0
Batch number: 16315120601B Chloride Sulfate	Sample 0.20 0.30	number U U	(s): 867045 0.20 0.30	54,8670457 0.40 1.0

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726931

Reported: 12/30/2016 15:16

Method Blank (continued)

Analysis Name	Result MDL**	LOQ
	mg/l as CaCO3 mg/l a	
Batch number: 16312002102B Total Alkalinity to pH 4.5	Sample number(s): 8 2.9 J 1.7	670458 5.0
Batch number: 16312002103A Total Alkalinity to pH 4.5	Sample number(s): 8 2.8 J 1.7	670454,867045 5.0

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l	OKIEC	OKLIC	LIMICS		nax
Batch number: L163143AA	Sample number	r(s): 86704	54-8670455,86	70457-8670	458				
Acetone	150	153.59	150	154.57	102	103	50-168	1	30
Benzene	20	18.9	20	18.78	95	94	78-120	1	30
Bromochloromethane	20	20.51	20	20.06	103	100	80-125	2	30
Bromodichloromethane	20	18.54	20	18.32	93	92	80-120	1	30
Bromoform	20	16.4	20	16.37	82	82	59-120	0	30
Bromomethane	20	17.84	20	18.08	89	90	55-123	1	30
2-Butanone	150	139.9	150	136.52	93	91	57-145	2	30
Carbon Disulfide	20	18.76	20	18.59	94	93	58-120	1	30
Carbon Tetrachloride	20	20.18	20	19.94	101	100	74-130	1	30
Chlorobenzene	20	18.4	20	18.39	92	92	80-120	0	30
Chloroethane	20	16.6	20	16.73	83	84	56-120	1	30
Chloroform	20	19.47	20	19.34	97	97	80-120	1	30
Chloromethane	20	15.82	20	15.89	79	79	59-127	0	30
Cyclohexane	20	19.81	20	19.33	99	97	65-131	2	30
1,2-Dibromo-3-chloropropane	20	16.47	20	16.3	82	82	59-120	1	30
Dibromochloromethane	20	17.59	20	17.49	88	87	78-120	1	30
1,2-Dibromoethane	20	18.8	20	18.57	94	93	80-120	1	30
1,2-Dichlorobenzene	20	18.48	20	18.25	92	91	80-120	1	30
1,3-Dichlorobenzene	20	18.42	20	18.14	92	91	80-120	2	30
1,4-Dichlorobenzene	20	18.64	20	18.28	93	91	80-120	2	30
Dichlorodifluoromethane	20	16.64	20	16.77	83	84	49-134	1	30
1,1-Dichloroethane	20	18.98	20	18.73	95	94	80-120	1	30
1,2-Dichloroethane	20	20.1	20	19.45	101	97	66-128	3	30
1,1-Dichloroethene	20	20.35	20	19.96	102	100	76-124	2	30
cis-1,2-Dichloroethene	20	19.42	20	19.07	97	95	80-120	2	30
trans-1,2-Dichloroethene	20	19.81	20	19.65	99	98	80-120	1	30
1,2-Dichloropropane	20	18.42	20	18.11	92	91	80-120	2	30
cis-1,3-Dichloropropene	20	17.98	20	17.74	90	89	80-120	1	30
trans-1,3-Dichloropropene	20	17.48	20	17.53	87	88	76-120	0	30
Ethylbenzene	20	18.08	20	18.16	90	91	78-120	0	30
Freon 113	20	21.26	20	21.32	106	107	64-136	0	30
2-Hexanone	100	81.11	100	80	81	80	49-146	1	30
Isopropylbenzene	20	18.4	20	18.41	92	92	80-120	0	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726931

Reported: 12/30/2016 15:16

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Methyl Acetate	20	19.04	20	18.95	95	95	61-137	0	30
Methyl Tertiary Butyl Ether	20	19.06	20	19.11	95	96	75-120	0	30
4-Methyl-2-pentanone	100	85.36	100	83.43	85	83	55-141	2	30
Methylcyclohexane	20	20.21	20	20.1	101	100	66-126	1	30
Methylene Chloride	20	19.26	20	18.89	96	94	80-120	2	30
Styrene	20	18.77	20	18.61	94	93	80-120	1	30
1,1,2,2-Tetrachloroethane	20	17.73	20	16.69	89	83	72-120	6	30
Tetrachloroethene	20	19.19	20	19.36	96	97	80-129	1	30
Toluene	20	18.51	20	18.29	93	91	80-120	1	30
1,2,3-Trichlorobenzene	20	17.49	20	17.45	87	87	69-120	0	30
1,2,4-Trichlorobenzene	20	17.75	20	17.44	89	87	72-120	2	30
1,1,1-Trichloroethane	20	17.01	20	16.77	85	84	66-126	1	30
1,1,2-Trichloroethane	20	18.3	20	18.12	91	91	80-120	1	30
Trichloroethene	20	19.19	20	18.97	96	95	80-120	1	30
Trichlorofluoromethane	20	21.66	20	21.44	108	107	67-129	1	30
Vinvl Chloride	20	17.01	20	16.97	85	85	63-121	0	30
m+p-Xylene	40	36.81	40	36.51	92	91	80-120	1	30
o-Xylene	20	18.25	20	18.19	91	91	80-120	0	30
	ng/l	ng/l	ng/l	ng/l					
Batch number: 16316001	Sample numbe	er(s): 86704	54-8670458						
Perfluorooctanoic acid	200	190.69	200	149.3	95	75	70-130	24	30
Perfluorononanoic acid	200	182.45	200	163.14	91	82	70-130	11	30
Perfluorodecanoic acid	200	190.82	200	145.23	95	73	70-130	27	30
Perfluoroundecanoic acid	200	181.23	200	169.74	91	85	70-130	7	30
Perfluorododecanoic acid	200	167.72	200	164.94	84	82	70-130	2	30
Perfluorotridecanoic acid	200	175.03	200	163.97	88	82	70-130	7	30
Perfluorotetradecanoic acid	200	174.72	200	153.15	87	77	70-130	13	30
Perfluorohexanoic acid	200	173.35	200	170.18	87	85	70-130	2	30
Perfluoroheptanoic acid	200	189.04	200	167.11	95	84	70-130	12	30
Perfluorobutanesulfonate	176.8	156.65	176.8	143.76	89	81	70-130	9	30
Perfluorohexanesulfonate	189.2	150.22	189.2	149.75	79	79	70-130	0	30
Perfluoro-octanesulfonate	191.2	159.44	191.2	168.83	83	88	70-130	6	30
Perfluorobutanoic Acid	200	170.91	200	152.85	85	76	70-130	11	30
Perfluoropentanoic Acid	200	170.3	200	157.75	85	79	70-130	8	30
NETFOSAA	200	171.97	200	178.9	86	89	70-130	4	30
NMeFOSAA	200	197.45	200	179.92	99	90	70-130	9	30
	mg/l	mg/l	mg/l	mg/l					
Batch number: 163090635001	Sample numbe	er(s): 86704	54,8670457-86	70458					
Calcium	4.00	4.04			101		80-120		
Magnesium	2.00	2.07			103		80-120		
Potassium	10	9.51			95		80-120		
Sodium	10	10.27			103		80-120		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 16314118103B	Sample numbe	er(s): 86704	54,8670457-86	70458					

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726931

Reported: 12/30/2016 15:16

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/l	LCS Conc mg/l	LCSD Spike Added mg/l	LCSD Conc mg/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Total Nitrite/Nitrate Nitrogen	2.50	2.55			102		90-110		
Batch number: 16315120601A	Sample numb	ple number(s): 8670458							
Chloride	3.00	2.94			98		90-110		
Sulfate	7.50	7.59			101		90-110		
Batch number: 16315120601B	Sample numb	er(s): 86704	154,8670457						
Chloride	3.00	2.94			98		90-110		
Sulfate	7.50	7.59			101		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16312002102B	Sample numb	er(s): 86704	158						
Total Alkalinity to pH 4.5	188	177.97			95		84-110		
Batch number: 16312002103A	Sample numb	er(s): 86704	154,8670457						
Total Alkalinity to pH 4.5	188	175.07			93		84-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ng/l	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 16316001	Sample numb	er(s): 867	0454-8670	458 UNSPK: 8	8670457					
Perfluorooctanoic acid	44.67	200.42	220.45			88		70-130		
Perfluorononanoic acid	0.6 U	200.42	168.02			84		70-130		
Perfluorodecanoic acid	0.5 U	200.42	178			89		70-130		
Perfluoroundecanoic acid	1 U	200.42	193.77			97		70-130		
Perfluorododecanoic acid	0.5 U	200.42	166.91			83		70-130		
Perfluorotridecanoic acid	0.5 U	200.42	180.45			90		70-130		
Perfluorotetradecanoic acid	0.5 U	200.42	165.13			82		70-130		
Perfluorohexanoic acid	8.60	200.42	176.44			84		70-130		
Perfluoroheptanoic acid	8.50	200.42	184.25			88		70-130		
Perfluorobutanesulfonate	3.25	177.37	146.97			81		70-130		
Perfluorohexanesulfonate	2.80	189.4	154.74			80		70-130		
Perfluoro-octanesulfonate	2 U	191.4	157.39			82		70-130		
Perfluorobutanoic Acid	4.02	200.42	171			83		70-130		
Perfluoropentanoic Acid	7.68	200.42	182.24			87		70-130		
NETFOSAA	1 U	200.42	187.15			93		70-130		
NMeFOSAA	1 U	200.42	185.45			93		70-130		
	mg/l	mg/l	mg/l	mg/l	mg/l					

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726931

Reported: 12/30/2016 15:16

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/l	MS Spike Added mg/l	MS Conc mg/l	MSD Spike Added mg/l	MSD Conc mg/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 163090635001	Sample numb	er(s): 8670	0454,8670	457-8670458	UNSPK: E	2677168				
Calcium	46.77	4.00	53.4	4.00	51.7		123 (2)	75-125	3	20
Magnesium	27.23	2.00	30.67	2.00	29.72	172 (2)	124 (2)	75-125	3	20
Potassium	1.39	10	11.02	10	10.94	96	95	75-125	1	20
Sodium	9.98	10	20.93	10	20.48	110	105	75-125	2	20
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 16314118103B	Sample numb	er(s): 8670	0454.8670	457-8670458	UNSPK: 8	3670454				
Total Nitrite/Nitrate Nitrogen	0.040 U	1.00	1.10			110		90-110		
Batch number: 16315120601A	Sample numb	er(s): 8670	0458 UNSP	K: P671823						
Chloride	48.19	100	147.97			100		90-110		
Sulfate	24.01	25	48.14			97		90-110		
Batch number: 16315120601B	Sample numb	er(s): 8670	0454,8670	457 UNSPK:	P668862					
Chloride	108.78	40	156.18			118*		90-110		
Sulfate	11.29	25	36.39			100		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16312002102B	Sample numb			K: P670613						
Total Alkalinity to pH 4.5	167.47	188	302.37	188	300.28	72*	71*	84-110	1	5
Batch number: 16312002103A	Sample numb	er(s): 8670	0454,8670	457 UNSPK:	P672368					
Total Alkalinity to pH 4.5	52.23	188	224.72			92		84-110		

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc I	UP RPD	DUP RPD Max
	mg/l	mg/l		
Batch number: 163090635001	Sample number(s):	8670454,8670457-867045	8 BKG:	P677168
Calcium	46.77	47.91	2	20
Magnesium	27.23	27.84	2	20
Potassium	1.39	1.44	4 (1)	20
Sodium	9.98	10.15	2 (1)	20
	mg/l	mg/l		
Batch number: 16314118103B	Sample number(s):	8670454,8670457-867045	8 BKG:	8670454
Total Nitrite/Nitrate Nitrogen	0.040 U	0.040 U	0 (1)	2

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726931

Reported: 12/30/2016 15:16

Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD	DUP RPD Max
	mg/l	mg/l		
Batch number: 16315120601A	Sample number(s):	8670458 BKG: P671823		
Chloride	48.19	50.5	5 (1)	15
Sulfate	24.01	24.06	0 (1)	15
Batch number: 16315120601B	Sample number(s):	8670454,8670457 BKG:	P668862	
Chloride	108.78	108.33	0	15
Sulfate	11.29	11.23	1 (1)	15
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 16312002102B	Sample number(s):	8670458 BKG: 8670458		
Total Alkalinity to pH 4.5	22.17	20.95	6* (1)	5
Batch number: 16312002103A	Sample number(s):	8670454,8670457 BKG:	P672368	
Total Alkalinity to pH 4.5	52.23	53.9	3	5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: L163143AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8670454	102	100	99	97
8670455	102	102	99	98
8670457	102	101	98	98
8670458	103	103	98	98
Blank	101	102	98	97
LCS	103	101	98	98
LCSD	102	99	99	99
Limits:	80-116	77-113	80-113	78-113

Analysis Name: 16 PFCs

Batch number: 16316001

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA	
8670454	90	123	127	77	81	85	
8670455	96	93	89	92	96	93	
8670456	68*	71	65*	70	66*	72	
8670457	96	117	119	100	110	108	
8670458	93	114	126	90	82	90	
Blank	77	80	79	77	71	83	
LCS	77	77	79	76	85	75	
LCSD	90	85	91	92	101	93	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1726931

Reported: 12/30/2016 15:16

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 16316001

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
MS	100	124	141*	100	110	97
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8670454	90	102	102	88	99	86
8670455	99	110	99	103	94	94
8670456	68*	65*	73	74	53*	62*
8670457	105	106	84	79	77	81
8670458	86	92	94	90	79	80
Blank	79	82	78	85	89	83
LCS	74	80	71	77	79	82
LCSD	93	93	83	93	77	88
MS	94	111	90	86	87	80
Limits:	70-130	70-130	70-130	70-130	70-130	70-130

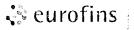
	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA
8670454	91	75	81
8670455	95	91	92
8670456	53*	62*	59*
8670457	64*	77	72
8670458	75	66*	73
Blank	93	73	79
LCS	84	82	83
LCSD	82	86	91
MS	85	85	89
Limits:	70-130	70-130	70-130

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

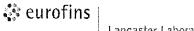
⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



Environmental Services Analysis Request/Chain of Custody

. Acc	#: <u>37191</u>		Grou	up #:	1~	7269	151		Sam	ple #:	80	070)UC	54	3Z	3					COC#:	15591
Client: C.T. Male Associates			·			Matrix Analyses Reques						uest	rested For Lab Use Only									
Project Name/#: SGPP - Merrimack	Site ID ⁻					X						Pi	rese	rvati	on	Code	es				SF#: <u>285327</u>	·
Project Manager: Kirk Moline	P.O. #:	16.612	6	,	Ħ	ace ace			Н	N		s									SCR#: <u>19606</u>	<u>5</u>
Sampler: Jonathan Diggert					Sediment	Ground						ĸ									Preserva	tion Codes
Phone #: 5/8-786-7400	Quote #:	214135			Sed		13	ers		ତୁ		as A		<u>@</u>	j.,						H = HCi	T = Thiosulfate
State where sample(s) were collected: NH			•			ble	3	ıtair	ပ္ပ	(6010C)		Noz	6	320E	rmod.)						N ≈ HNO ₃	B = NaOH
	Colle	ection		Composite		Potable NPDES	1. B/20 K	9	VOAs (8260C)	Ca, Mg, Na, K ((363.2)	(353.2) →	0.000)	rity (SM 2320B)	(EPA 537						$S = H_2SO_4$ $O = Other$	P = H ₃ PO ₄
Sample Identification	Date	Time	Grab	Com	Soil	Water	Other:	Total#	TCL V	Ca, M	ZCN	NO3	Cl-, S	Alkalinity	PFCs						Ren	narks
SG2 -AP03 -15-161028 1809	10/28/16	0950	X			X		1/	X	×		×	×	×	X							
SG 2 -ARLTBOI - 16/028 15®	10/23/16	4876 LOBERTON					Х	3	X			·			X							
SG2 PAFTEN - 161028 180	80/28/16	0945	×				Х	1							X							
SG 2 -AP 03 - 35 - 16 1028 1830	10/28/16	1220	X			X		11	×	X		X	X	X	X							
SG2 -APF101 - 16/028 18 6		tempod tile ver	X			×		11	X	X		×	×	×	X							
SG -AP - 16													·									
SG -AP - 16																						
SG -AP - 16																						
SG -AP - 16																						
SG -AP - 16																						
Turnaround Time Requested (TAT) (pleat (RUSH TAT is subject to Eurofins Lancaster Labora				Н	Relir	nquished	by:	· · · · · · · · · · · · · · · · · · ·			Date 28//	,		Time		Rece	eived	by:			Date	Time
Date results are needed:	tories approvai	and Surchar	ges.)		Relin	nquished	√oy:	· San War	Maria Caracana Caraca		<i>≱∌//</i> Date			Time		Rece	eived	by:		_	Date	Time
E-mail address to send RUSH results:	moline @	ctm	10-11	0,144										gar.	/						And the state of t	
Data Package Options (please check if re					Relir	nquished	by:				Date		samma a mark	Time		Rece	eived	by:		and the second	Date	Time
Type I (Validation/non-CLP) 📈 MA	MCP	TX TRRP	- 13								and the same of th	grid and the							.parente			
Type III (Reduced non-CLP)	RCP [Relir	nquished	by:		as were		Date			Time		Rece	eived	by:			Date	Time
	P Type A 🔲							- Andrews	and the second								<u>/</u>					
	P Type B 🗌				Kelir	nquished	by:				Date			Time		Rece	eived	by:			Date	Time
EDD Format: EQuIS	•		:		Airbit	l No :										<u> </u>		2			10.3.16	830
If site-specific QC (MS/MSD/Dup) require submit triplicate volume.	d, indicate Q	C sample:	s and			quished b		merc x			r			_		Tem	pera	ture u	ipon r	ece	ipt_1.0 ^ 4	°C



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

166759

Group Number(s): 172(43)

Client: C.T. Male

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

10/31/2016 8:20

Number of Packages:

2

Number of Projects:

1

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

Yes

Custody Seal Present:

Yes

Sample Date/Times match COC:

Yes

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

Air Quality Samples Present:

No

Samples Chilled:

Yes

Total Trip Blank Qty:

3

Paperwork Enclosed:

Yes

Trip Blank Type:

See Below No

Samples Intact:

Yes No

Missing Samples:

No

Extra Samples:

No

Trip Blank Type(s): 2 HCL, 1 250mL bottle

Discrepancy in Container Qty on COC:

Unpacked by Timothy Cubberley (6520) at 11:24 on 10/31/2016

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	<u>lce Type</u>	Ice Present?	Ice Container	Elevated Temp?
1	DT131	4.7	DT	Wet	N	Bagged	· N
2	DT131	2.0	DT	Wet	N	Bagged	N

T ± 717-656-2300 F ± 717-656-2681 www.LancasterLabs.com



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RL Reporting Limit kg **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: January 04, 2017

Project: SGPP - Merrimack

Submittal Date: 11/03/2016 Group Number: 1729119 SDG: MMK06 PO Number: 16.6126 State of Sample Origin: NH

	Lancaster Labs
Client Sample Description	<u>(LL) #</u>
SG2-RB01-161102 Grab Water	8679406
SG2-RB02-161102 Grab Water	8679407
SG2-RB02-161102MS Grab Water	8679408
SG2-RB02-161102MSD Grab Water	8679409
SG2-RB03-161102 Grab Water	8679410
SG2-RB04-161102 Grab Water	8679411
SG2-RB05-161102 Grab Water	8679412
SG2-RB06-161102 Grab Water	8679413
SG2-RBFD01-161102 Grab Water	8679414

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	C. T. Male Associates	Attn: Jeff Marx
Electronic Copy To	C. T. Male Associates	Attn: Dan Reilly
Electronic Copy To	C. T. Male Associates	Attn: Kirk Moline



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250



Project Name: SGPP - Merrimack LL Group #: 1729119

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

EPA 537 Rev. 1.1 modified, Misc. Organics

Sample #s: 8679411

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: the sample was reinjected and comparable results were observed.

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

<u>Sample #s: 8679407, 8679409, 8679410, 8679413, 8679414</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Batch #: 16321006 (Sample number(s): 8679406-8679414 UNSPK: 8679407)

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8679407, 8679409, 8679410, 8679411, 8679413, 8679414, MSD



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-RB01-161102 Grab Water

SGPP - Merrimack

LL Sample # GW 8679406 LL Group # 1729119 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 15:00 by JD

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 11/03/2016 09:30

Reported: 01/04/2017 11:25

2RB01 SDG#: MMK06-01

CAT No.	Analysis Name	CAS Number	As Rec Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	hyl perfluorood	ctanesul	fonamidoacetic	: Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanesi	ılfonamidoaceti	c Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	ı	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321006	11/22/2016 1	9:25	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321006	11/16/2016 1	4:20	Devon M Whooley	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-RB02-161102 Grab Water

SGPP - Merrimack

LL Sample # GW 8679407 LL Group # 1729119 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 15:02 by JD

C. T. Male Associates

50 Century Hill Drive Submitted: 11/03/2016 09:30 Latham NY 12110

Reported: 01/04/2017 11:25

2RB02 SDG#: MMK06-02BKG

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 Re	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	hyl perfluoroo	ctanesu	lfonamidoacet	ic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanes	ulfonamidoace	tic Acid.		
mb o	atatad OO limita ama admissamu aml						

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321006	11/22/2016 19:45	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321006	11/16/2016 14:20	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-RB02-161102MS Grab Water

SGPP - Merrimack

LL Sample # GW 8679408 LL Group # 1729119 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 15:02 by JD

C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/03/2016 09:30

Reported: 01/04/2017 11:25

2RB02 SDG#: MMK06-02MS

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l	ng/l	ng/l	
	modified					
10954	Perfluorooctanoic acid	335-67-1	170	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	180	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	170	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	200	1	3	1
10954	Perfluorododecanoic acid	307-55-1	180	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	180	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	190	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	180	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	190	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	150	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	180	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	180	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	180	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	190	0.5	2	1
10954	NETFOSAA	2991-50-6	160	1	3	1
	NEtFOSAA is the acronym for N-6	thyl perfluoroo	ctanesulfonamidoaceti	c Acid.		
10954	NMeFOSAA	2355-31-9	150	1	3	1
	NMeFOSAA is the acronym for N-r	methyl perfluoro	octanesulfonamidoacet	ic Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321006	11/22/2016	20:06	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321006	11/16/2016	14:20	Devon M Whooley	1



Account

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-RB02-161102MSD Grab Water

SGPP - Merrimack

LL Sample # GW 8679409 LL Group # 1729119

37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 15:02 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/03/2016 09:30 Latham NY 12110

Reported: 01/04/2017 11:25

2RB02 SDG#: MMK06-02MSD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l	ng/l	ng/l	
	modifie	đ.				
10954	Perfluorooctanoic acid	335-67-1	190	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	190	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	180	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	200	1	3	1
10954	Perfluorododecanoic acid	307-55-1	190	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	180	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	190	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	190	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	200	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	170	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	170	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	180	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	180	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	200	0.5	2	1
10954	NETFOSAA	2991-50-6	140	1	3	1
	NEtFOSAA is the acronym for N	ethyl perfluoroc	octanesulfonamidoac	etic Acid.		
10954	NMeFOSAA	2355-31-9	170	1	3	1
	NMeFOSAA is the acronym for N	-methyl perfluoro	octanesulfonamidoa	cetic Acid.		
The	stated OC limits are advisory	nly until suffic	ient data points			

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	.	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321006	11/22/2016 2	10:26	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321006	11/16/2016 1	4:20	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-RB03-161102 Grab Water

SGPP - Merrimack

LL Sample # GW 8679410 LL Group # 1729119 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 15:05 by JD

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 11/03/2016 09:30

Reported: 01/04/2017 11:25

2RB03 SDG#: MMK06-03

CAT No.	Analysis Name	CAS Number	As Rec Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 Re	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	2	J	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	5		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	2	J	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.6	J	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	hyl perfluorood	ctanesul	lfonamidoacetic	Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanesi	ılfonamidoaceti	c Acid.		
m1	interestat is one derengt real it the						

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321006	11/22/2016 21:48	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321006	11/16/2016 14:20	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-RB04-161102 Grab Water

SGPP - Merrimack

LL Sample # GW 8679411 LL Group # 1729119 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 15:07 by JD

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 11/03/2016 09:30 Reported: 01/04/2017 11:25

12, 11, 221

2RB04 SDG#: MMK06-04

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 H	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	9		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	4		0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	28		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	8		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	1	J	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	6		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	J	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	3		0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-e	ethyl perfluorod	octanesu	lfonamidoac	etic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-m	methyl perfluoro	octanes	ulfonamidoa	cetic Acid.		

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: the sample was reinjected and comparable results were observed.

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	ne	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321006	11/22/2016	22:09	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16321006	11/16/2016	14:20	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-RB05-161102 Grab Water

SGPP - Merrimack

LL Sample # GW 8679412 LL Group # 1729119 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 15:10 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/03/2016 09:30 Reported: 01/04/2017 11:25

2RB05 SDG#: MMK06-05

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Misc.	Organics EPA	537 Rev. 1.1	ng/l		ng/l	ng/l	
	mod	lified					
10954	Perfluorooctanoic acid	335-67-1	9		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	d 2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	d 307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic aci	id 72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic a	acid 376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	34		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	11		0.5	2	1
10954	Perfluorobutanesulfonate	e 375-73-5	1	J	0.7	2	1
10954	Perfluorohexanesulfonate	a 355-46-4	9		1	3	1
10954	Perfluoro-octanesulfonat	te 1763-23-1	3	J	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	3		0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym	for N-ethyl perfluoro	octanesu	lfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym	for N-methyl perfluor	octanes	ulfonamido	acetic Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	9	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321006	11/22/2016 2	22:30	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321006	11/16/2016 1	L4:20	Devon M Whooley	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-RB06-161102 Grab Water

SGPP - Merrimack

LL Sample # GW 8679413 LL Group # 1729119 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 15:12 by JD

C. T. Male Associates
50 Century Hill Drive

50 Century Hill Drive Latham NY 12110

Submitted: 11/03/2016 09:30 Reported: 01/04/2017 11:25

2RB06 SDG#: MMK06-06

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	23		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	84		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	25		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	4		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	21		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	6		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	7		0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	thyl perfluorod	octanesu	lfonamidoac	etic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me	ethyl perfluoro	octanes	ulfonamidoa	cetic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321006	11/22/2016 22:50	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321006	11/16/2016 14:20	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-RBFD01-161102 Grab Water

SGPP - Merrimack

LL Sample # GW 8679414 LL Group # 1729119 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 by JD

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 11/03/2016 09:30

Reported: 01/04/2017 11:25

2RB-D SDG#: MMK06-07FD

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 Re	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	6		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	21		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	6		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	1	J	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	7		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	hyl perfluoroc	ctanesu	lfonamidoac	etic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanes	ulfonamidoa	cetic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	e	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321006	12/02/2016 2	23:16	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321006	11/16/2016 1	14:20	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729119

Reported: 01/04/2017 11:25

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	ng/l		ng/l	ng/l
Batch number: 16321006	Sample	number	(s): 86794	06-8679414
Perfluorooctanoic acid	0.5	U	0.5	2
Perfluorononanoic acid	0.6	U	0.6	2
Perfluorodecanoic acid	0.5	U	0.5	2
Perfluoroundecanoic acid	1	U	1	3
Perfluorododecanoic acid	0.5	U	0.5	2
Perfluorotridecanoic acid	0.5	U	0.5	2
Perfluorotetradecanoic acid	0.5	U	0.5	2
Perfluorohexanoic acid	0.5	U	0.5	2
Perfluoroheptanoic acid	0.5	U	0.5	2
Perfluorobutanesulfonate	0.7	U	0.7	2
Perfluorohexanesulfonate	1	U	1	3
Perfluoro-octanesulfonate	2	U	2	6
Perfluorobutanoic Acid	3	U	3	10
Perfluoropentanoic Acid	0.5	U	0.5	2
NETFOSAA	1	U	1	3
NMeFOSAA	1	U	1	3

LCS/LCSD

Analysis Name	LCS Spike Added ng/l	LCS Conc ng/l	LCSD Spike Added ng/l	LCSD Conc ng/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 16321006	Sample number	r(s): 86794	106-8679414						
Perfluorooctanoic acid	200	168.64			84		70-130		
Perfluorononanoic acid	200	161.41			81		70-130		
Perfluorodecanoic acid	200	174.48			87		70-130		
Perfluoroundecanoic acid	200	194.69			97		70-130		
Perfluorododecanoic acid	200	195.27			98		70-130		
Perfluorotridecanoic acid	200	189.65			95		70-130		
Perfluorotetradecanoic acid	200	174.42			87		70-130		
Perfluorohexanoic acid	200	169.07			85		70-130		
Perfluoroheptanoic acid	200	186.34			93		70-130		
Perfluorobutanesulfonate	176.8	153.11			87		70-130		
Perfluorohexanesulfonate	189.2	153.15			81		70-130		
Perfluoro-octanesulfonate	191.2	174.99			92		70-130		
Perfluorobutanoic Acid	200	178.1			89		70-130		
Perfluoropentanoic Acid	200	179.47			90		70-130		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729119

Reported: 01/04/2017 11:25

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ng/l	LCS Conc ng/l	LCSD Spike Added ng/l	LCSD Conc ng/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
NETFOSAA	200	154.55			77		70-130		
NMeFOSAA	200	144.76			72		70-130		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspil Cond ng/	С	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 16321006	Sample	numb	er(s): 8679	9406-8679	414 UNSPK:	8679407					
Perfluorooctanoic acid	0.5	U	200.38	171.26	199.5	185.2	85	93	70-130	8	30
Perfluorononanoic acid	0.6	U	200.38	183.02	199.5	189.14	91	95	70-130	3	30
Perfluorodecanoic acid	0.5	U	200.38	172.2	199.5	178.62	86	90	70-130	4	30
Perfluoroundecanoic acid	1	U	200.38	201.39	199.5	199.55	101	100	70-130	1	30
Perfluorododecanoic acid	0.5	U	200.38	178.88	199.5	187.53	89	94	70-130	5	30
Perfluorotridecanoic acid	0.5	U	200.38	178.97	199.5	177.61	89	89	70-130	1	30
Perfluorotetradecanoic acid	0.5	U	200.38	186.98	199.5	189.1	93	95	70-130	1	30
Perfluorohexanoic acid	0.5	U	200.38	176.58	199.5	192.55	88	97	70-130	9	30
Perfluoroheptanoic acid	0.5	U	200.38	188.03	199.5	195.51	94	98	70-130	4	30
Perfluorobutanesulfonate	0.7	U	177.34	153.06	176.56	166.55	86	94	70-130	8	30
Perfluorohexanesulfonate	1	U	189.36	175.95	188.53	173.51	93	92	70-130	1	30
Perfluoro-octanesulfonate	2	U	191.36	175.09	190.52	178.32	91	94	70-130	2	30
Perfluorobutanoic Acid	3	U	200.38	179.84	199.5	176.29	90	88	70-130	2	30
Perfluoropentanoic Acid	0.5	U	200.38	188.92	199.5	195.21	94	98	70-130	3	30
NETFOSAA	1	U	200.38	160.94	199.5	139.45	80	70	70-130	14	30
NMeFOSAA	1	U	200.38	149.26	199.5	174.72	74	88	70-130	16	30

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 16321006

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA	
8679406	78	85	75	80	73	74	
8679407	126	128	120	118	109	120	
8679408	108	113	110	107	103	109	
8679409	93	86	88	92	98	97	
8679410	93	91	85	99	89	88	
8679411	71	81	71	72	61*	74	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729119

Reported: 01/04/2017 11:25

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 16321006

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8679412	86	87	80	86	80	81
8679413	105	109	101	102	101	103
8679414	89	88	88	87	72	94
Blank	105	106	107	109	103	109
LCS	105	105	107	110	118	109
MS	108	113	110	107	103	109
MSD	93	86	88	92	98	97
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8679406	84	82	82	75	79	82
8679407	113	120	133*	121	106	114
8679408	114	114	110	98	99	90
8679409	97	97	91	85	78	83
8679410	97	103	114	94	84	72
8679411	76	75	98	65*	124	62*
8679412	79	83	85	86	87	87
8679413	107	106	116	99	93	89
8679414	98	99	106	94	74	63*
Blank	114	105	97	103	102	99
LCS	112	105	114	100	122	97
MS	114	114	110	98	99	90
MSD	97	97	91	85	78	83
Limits:	70-130	70-130	70-130	70-130	70-130	70-130

	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
8679406	85	79	74	
8679407	115	108	88	
8679408	97	97	83	
8679409	92	82	69*	
8679410	92	60*	64*	
8679411	124	54*	40*	
8679412	104	87	72	
8679413	107	75	69*	
8679414	64*	56*	82	
Blank	110	102	93	
LCS	110	106	103	
MS	97	97	83	
MSD	92	82	69*	
Limits:	70-130	70-130	70-130	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

Environmental Analysis Request/Chain of Custody

eu	ro	fi	ns

For Eurofins Lancaster Laboratories Environmental use only

Lancaster Laboratories Acct. # 37191 Group # 1729119 Sample # 8679406 - 14

COC #512769

Client Information	assarios como a	Matrix					ì	5-36-300 E-025-0	anning and a	· ·	-212 [Doguostod					For Lab Use Only				
Client:			I Watrix			1 '	Analysis Requested Preservation Codes						AND ASSESSED ASSESSED.	FSC:							
Client: Acct. #:		χοι. π.		ľ	Tissue Ground Surface	\Box		'	Preserva				/FVau	ation codes				and the second	SCR#:		
Project Name/#: SGPP- Merrimack Project Manager: Kick Moline Sampler:	PWSID #:			7			l '											ARCHIVACINE MENGER STREET	ervation	Codes	
SGPP- Messimuk				ř		151	1 '	hrsd	.	1 1		i^{-1}						H =HCI	T =T	hiosulfate	
Project Manager:	P.O. #:			\neg \vdash		12		E		1 1		i 1						N =HNC) ₃ B=N	NaOH	
Kirk Moline	P.O. #: 16 - 6 2 6 Quote #:			┛ ╏	_ _	ПП	14	ler.	537		1 1		i^{-1}						S =H ₂ S(Other
out i proti	Quote #:		Sediment	<u>.</u>	o L	13/	Containers	1 1	1 1		i	, !							Remark		
State where samples were collected: For Compliance:				15		Potable NPDES	Stant	5	£133			i	i^{-1}						Pa	ye lov	f 1
<i>NH</i> Yes □	No 🔲	No □				12	5	27			1	, !									
Carrella Idontification	Collected		Grab Composite				1 '1	Total # of	574				, !								
Sample Identification	Date	Time	Grab	Soil	جُ ا	Water	Other:	Tota	9		, 1	1	, 1								
SG2-RB01-161102	11/2/16		×	İ			×	Ì	X	and the same and t											
SG2-RB02-161102		1502	X		I		X	3	X										1451	MISD	
562-8803-161102		1505	X				X	1	X										3		
S62-RB04-16110Z		1507	X	I			X		X				1								
SG2- RBO5 - 16/102		1510	X				X		X												
SG2-RB04 - 161102	V	1512	X				X		X												
SG2-RBFD01-161102	11/2/16	. Opposition co	X				X	1	X												
																Normal and the second					
Turnaround Time (TAT) Requested		ie)	Relinquishe	ad by	· A STATE OF THE S	,			_	Date	8 1	Time	1	Receiv	red by					Date	Time
	ush	!	Relinguish	and by		i de la companya del companya de la		***************************************		Date	2//6	18/		Receiv	and by		***************************************	***************************************		Date	Time
(Rush TAT is subject to laboratory approval and surcharge.)			Helindaland	за ву	and the same	2			J	Date		J-HTTE	ļ	Heceiv	eu by					Date	Time
Date results are needed:		. <u></u>	Relinquishe	ed by	-	MANAGEMENT AND ADDRESS OF THE PARTY OF THE P	***************************************	_		Date	\neg	Time		Receiv	red by	***************************************				Date	Time
				-																	
L man address.			Relinquishe	∌d by						Date		Time		Receiv	ed by					Date	Time
Data Package Options (circle if re	quired)	,	Relinquishe	ad for	Market .		ATTENDED OF THE STREET			Date	\longrightarrow	Time		Řeceiv	ed by					Date 1	Time
Type I/(EPA Level 3 Type VI (Raw Data Only)		Only)	Helinquisited by					Pale			"""		rathy Muy				ry	Pli	Date	19:32	
			EDD Required? Ye				Yes	es No				Relinquished by Commer							ال ال		
Type III (Reduced non-CLP) NJ DKQF	, TX T	TRRP-13		If yes, format:						1	UPS FedEx Other										
NYSDEC Category A or B MA MCP CT RCP									e upon receipt 1,2-1,5°C												
I WISDEO Category A of B	101	(If yes, indicate QC sample and submit triplicate sample volume.)								Temperature upon receipt 1,2-1,5°C											



Sample Administration Receipt Documentation Log

Doc Log ID:

167155

Group Number(s):

1729119

Client: C.T Male Associates

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

<u>11/03/2016 9:30</u>

Number of Packages:

2

Number of Projects:

1

State/Province of Origin:

<u>NH</u>

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

Y.es

Custody Seal Present:

Yes

Sample Date/Times match COC:

Yes

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

N/A

Samples Chilled:

Yes

Total Trip Blank Qty:

3

Paperwork Enclosed:

Yes

Trip Blank Type:

HCI

Samples Intact:

Yes No Air Quality Samples Present:

No

Missing Samples:

Extra Samples:

Discrepancy in Container Qty on COC:

No No

Unpacked by Cathy Murphy (10960) at 15:49 on 11/03/2016

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler#	Thermometer ID	Corrected Temp	Therm. Type	<u>ice Type</u>	Ice Present?	Ice Container	Elevated Temp?
Cooler II	DT146	1.2	DT	Wet	Υ	Bagged	. N
2	DT146	1:5	TD	Wet	Υ	Bagged	N



Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÙ International Units pg/L picogram/liter kilogram(s) RLReporting Limit kg **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basisResults printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an analyte weight concentration to approximate the value present in a similar sample without moisture.

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: January 30, 2017

Project: SGPP - Merrimack

Submittal Date: 11/03/2016 Group Number: 1729126 SDG: MMK07 PO Number: 16.6126 State of Sample Origin: NH

	Lancaster Labs
Client Sample Description	<u>(LL) #</u>
SG2-AP03-45-161031 Grab Groundwater	8679489
SG2-LTB01-161031 Blank Water	8679490
SG2-FTB01-161031 Blank Water	8679491
SG2-AP03-55-161031 Grab Groundwater	8679492
SG2-AP03-65-161031 Grab Groundwater	8679493
SG2-APRB01-161101 Grab Blank Water	8679494
SG2-AP10-20-161102 Grab Groundwater	8679495
SG2-AP10-30-161102 Grab Groundwater	8679496
SG2-AP10-40-161102 Grab Groundwater	8679497

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	C. T. Male Associates	Attn: Jeff Marx
Electronic Copy To	C. T. Male Associates	Attn: Jeff Marx
Electronic Copy To	C. T. Male Associates	Attn: Dan Reilly
Electronic Copy To	C. T. Male Associates	Attn: Kirk Moline



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250



Project Name: SGPP - Merrimack LL Group #: 1729126

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

EPA 537 Rev. 1.1 modified, Misc. Organics

Sample #s: 8679494, 8679495, 8679496, 8679497

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

<u>Sample #s: 8679492</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary.

The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed.

The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Batch #: 16318002 (Sample number(s): 8679489-8679494 UNSPK: 8679493)

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8679489, 8679492, 8679494, MS
Batch #: 16321006 (Sample number(s): 8679495-8679497 UNSPK: P679407)

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8679495, 8679496, 8679497, MSD

EPA 353.2, Wet Chemistry

<u>Batch #: 16314118104B (sample number(s): 8679492-8679493, 8679495-8679497 UNSPK: 8679492 BKG: 8679492)</u>

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Total Nitrite/Nitrate Nitrogen

SM 2320 B-1997, Wet Chemistry

Batch #: 16316002105A (Sample number(s): 8679489, 8679492-8679493 UNSPK: P688452 BKG: P688452, P688845)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Alkalinity to pH 4.5

Batch #: 16316002106A (Sample number(s): 8679495-8679496 UNSPK: 8679496 BKG: P8679496-P679497)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Alkalinity to pH $4.5\,$

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Total Alkalinity to pH 4.5

Batch #: 16316002106B (Sample number(s): 8679497 UNSPK: P679496 BKG: P679496, P8679497)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Alkalinity to pH $4.5\,$

v 1.9.4



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP03-45-161031 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8679489 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/31/2016 10:10

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/03/2016 09:30 Reported: 01/30/2017 13:27

03-45 SDG#: MMK07-01

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 1 1 1 1	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP03-45-161031 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8679489 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/31/2016 10:10

C. T. Male Associates
50 Century Hill Drive

As Received

Submitted: 11/03/2016 09:30

Latham NY 12110

Reported: 01/30/2017 13:27

03-45 SDG#: MMK07-01

12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	AS Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea		ibrary search a	are list	ed on the at	tached		
	FORM 1 - VOA-TIC. on the back of this		rs appearing in	n the "Q	" column are	defined		
Misc.	Organics	EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
		${ t modified}$						
10954	Perfluorooctanoic a	acid	335-67-1	44		1	2	1
10954	Perfluorononanoic a	acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic a	acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoio	c acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoio	c acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecano	ic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecar	noic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic a	acid	307-24-4	8		1	2	1
10954	Perfluoroheptanoic	acid	375-85-9	7		1	2	1
10954	Perfluorobutanesulf	onate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesulf	onate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesul	lfonate	1763-23-1	5	U	5	10	1
10954	Perfluorobutanoic A	Acid	375-22-4	4	J	3	10	1
10954	Perfluoropentanoic	Acid	2706-90-3	6		1	3	1
10954	NEtFOSAA		2991-50-6	5	U	5	8	1
10054	NEtFOSAA is the acr	conym for N-et					•	
10954	NMeFOSAA		2355-31-9	4	U	4	8	1
	NMeFOSAA is the acr	conym for N-me	ethyl perfluoro	octanes	ulfonamidoac	etic Acid.		
Metal	S	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	19.6		0.0382	0.400	1
01757	Magnesium		7439-95-4	4.12		0.0190	0.200	1
01762	Potassium		7440-09-7	2.96		0.160	1.00	1
01767	Sodium		7440-23-5	55.1		0.173	2.00	1
Wet C	hemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	148		10.0	20.0	50
00228	Sulfate		14808-79-8	9.9		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitra	ate Nitrogen	n.a.	2.0		0.040	0.10	1
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to		n.a.	20.4		1.7	5.0	1
12149	Bicarbonate Alkalin		n.a.	20.4		1.7	5.0	1
10140	Bicarbonace Arkarii	1101	11.a.	20.1		1.0	5.0	1

^{*=}This limit was used in the evaluation of the final result

1.7

n.a.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP03-45-161031 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8679489 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/31/2016 10:10

C. T. Male Associates
50 Century Hill Drive

Submitted: 11/03/2016 09:30 Latham NY 12110

Reported: 01/30/2017 13:27

03-45 SDG#: MMK07-01

Sample Comments

The metals container was received at a pH of 5. After receipt the pH was adjusted to < 2.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Ti	me		Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163161AA	11/11/2016	11:44	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163161AA	11/11/2016	11:44	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16318002	12/02/2016	20:11	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	2	16318002	11/14/2016	15:40	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163120635002	11/10/2016	15:44	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163120635002	11/10/2016	15:44	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163120635002	11/10/2016	15:44	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163120635002	11/10/2016	15:44	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163120635002	11/09/2016	15:45	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16316972601A	11/11/2016	13:44	Alexandria M Lanager	50
00228	Sulfate	EPA 300.0	1	16316972601A	11/11/2016	13:28	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16314118104A	11/09/2016	04:40	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16316002105A	11/12/2016	11:59	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16316002105A	11/12/2016	11:59	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16316002105A	11/12/2016	11:59	Brandon P Costik	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E VOLATILE ORGANICS ANAI	YSIS DATA SHEET	EPA SAM	PLE NO.
	TENTATIVELY IDENTIFI	ED COMPOUNDS	! 03	 ! 45 !
Lab Name: Lanca Lab Code: LANCA Matrix: (soil/w Sample wt/vol: Level: (low/med % Moisture: not Column: (pack/) LOW dec. cap) CAP	Contract: SAS No.: Lab Sample ID: 8 Lab File ID:HPO Date Received: 1 Date Analyzed: 1 Dilution Factor: CONCENTRATION (ug/L or ug/Kg	SDG No. 1679489 19915.i/16nov11: 1/03/16 1/111/16 1.0 UNITS:	:·
	! ! COMPOUND NAME =!============		! EST. CONC.	
! 2	!Total VOC TICS ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! !			
! 23				

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-LTB01-161031 Blank Water

SGPP - Merrimack

LL Sample # WW 8679490 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/31/2016

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

Submitted: 11/03/2016 09:30

Reported: 01/30/2017 13:27

2-TB1 SDG#: MMK07-02TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	Ū	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	Ū	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	IJ	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	Ū	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
11997	2-Hexanone	591-78-6	3	IJ	3	10	1
11997	Isopropylbenzene	98-82-8	1	IJ	1	5	1
11997	Methyl Acetate	79-20-9	1	IJ	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	IJ	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	IJ	1	5	1
11997	Methylene Chloride	75-09-2	2	II	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	Ū	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	IJ	0.5	1	1
11997	Toluene	108-88-3	0.5	Ū	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	IJ	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-00-5	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	IJ	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U II	0.5	1	<u>⊥</u> 1
11997	m+b-vitene	1/2001-23-1	0.5	U	0.5	т.	±

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-LTB01-161031 Blank Water

SGPP - Merrimack

LL Sample # WW 8679490 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/31/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/03/2016 09:30 Reported: 01/30/2017 13:27

2-TB1 SDG#: MMK07-02TB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles o-Xylene	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/l 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form

Misc.	Organics EPA 5	37 Rev. 1.1	ng/l		ng/l	ng/l	
	modif	ied					
10954	Perfluorooctanoic acid	335-67-1	1	U	1	2	1
10954	Perfluorononanoic acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic acid	d 376-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid	307-24-4	1	U	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	1	U	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	5	U	5	10	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	1	U	1	3	1
10954	NETFOSAA	2991-50-6	5	U	5	8	1
	NEtFOSAA is the acronym for	r N-ethyl perfluoro	octanes	ulfonamid	oacetic Acid.		
10954	NMeFOSAA	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acronym for	r N-methyl perfluor	rooctane	sulfonami	doacetic Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163161AA	11/11/2016	10:16	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163161AA	11/11/2016	10:16	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16318002	11/22/2016	15:39	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	2	16318002	11/14/2016	15:40	Devon M Whooley	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E VOLATILE ORGANICS ANAL	YSIS DATA SHEET	EPA SAMI	PLE NO.
	TENTATIVELY IDENTIFI	ED COMPOUNDS		! 31 !
Lab Name: Lanca Lab Code: LANCA Matrix: (soil/w Sample wt/vol: Level: (low/med % Moisture: not Column: (pack/	5.0 (g/mL)mL) LOW dec. cap) CAP	Contract: SAS No.: Lab Sample ID: 8 Lab File ID:HPO Date Received: 1 Date Analyzed: 1 Dilution Factor: CONCENTRATION (ug/L or ug/Kg	SDG No. 679490 9915.i/16nov11a 1/03/16 1/11/16 1.0 UNITS:	! a.b/ln11s04
	! ! COMPOUND NAME =!==========	! RT	! EST. CONC.	
! 2	!Total VOC TICS			
! 25. ! 26. ! 27. ! 28.			! ! !	!! !!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-FTB01-161031 Blank Water

SGPP - Merrimack

LL Sample # WW 8679491 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/31/2016 10:25

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/03/2016 09:30

Reported: 01/30/2017 13:27

2FTB1 SDG#: MMK07-03TB

CAT No.	Analysis Name	CAS Number	Resu	lt	Method Detection Limit	Limit of * Quantitation	Dilution Factor
Misc.	Organics EPA 537 H	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	1	U	1	2	1
10954	Perfluorononanoic acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid	307-24-4	1	U	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	1	U	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	5	U	5	10	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	1	U	1	3	1
10954	NETFOSAA	2991-50-6	5	U	5	8	1
	NEtFOSAA is the acronym for N-6	thyl perfluorod	ctanes	ulfonamido	acetic Acid.		
10954	NMeFOSAA	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acronym for N-m	methyl perfluoro	octane	sulfonamid	oacetic Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	1	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16318002	11/22/2016 1	5:59	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	2	16318002	11/14/2016 1	5:40	Devon M Whooley	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP03-55-161031 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8679492 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/31/2016 12:55

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/03/2016 09:30 Reported: 01/30/2017 13:27

03-55 SDG#: MMK07-04

CAT No.	Analysis Name	CAS Number	As Rec Result	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 82	260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	Ū	0.5	1	1
11997	Bromochloromethane	74-97-5	1	IJ	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	Ū	0.5	1	1
11997	Bromoform	75-25-2	0.5	IJ	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	Ū	0.5	1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1	1
11997	Chloroform	67-66-3	0.5	Ū	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	IJ	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	IJ	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	Ū	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	IJ	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-01-5	0.5	IJ	0.5	1	1
11997	Ethylbenzene	10061-02-6	0.5	IJ	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
11997	2-Hexanone	591-78-6	3	IJ	3	10	1
11997			3 1	U	1	5	1
11997	Isopropylbenzene	98-82-8 79-20-9	1	IJ	1	5	1
	Methyl Acetate		0.5	IJ			
11997	Methyl Tertiary Butyl Ether	1634-04-4	3	U	0.5 3	1 10	1 1
11997 11997	4-Methyl-2-pentanone	108-10-1 108-87-2	3 1	IJ	1	5	1
	Methylcyclohexane		_	•			=
11997	Methylene Chloride	75-09-2	2 1	U U	2 1	4 5	1
11997	Styrene	100-42-5		U II			1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	0	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1 1	1
11997	Toluene	108-88-3	0.5	U	0.5	_	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U 	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ŭ	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP03-55-161031 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8679492 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/31/2016 12:55

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/03/2016 09:30

Reported: 01/30/2017 13:27

03-55 SDG#: MMK07-04

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260C	ug/l	ug/l	ug/l	
11997	o-Xylene	95-47-6	0.5 U	0.5	1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	47		1	2	1
10954	Perfluorononanoic acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid	307-24-4	7		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	8		1	2	1
10954	Perfluorobutanesulfonate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	5	U	5	10	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	5		1	3	1
10954	NETFOSAA	2991-50-6	5	U	5	8	1
	NEtFOSAA is the acronym for N-et	hyl perfluoroo	ctanesu	lfonamidoaceti	c Acid.		
10954	NMeFOSAA	2355-31-9	4	U	4	8	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	SW-846 6010C	mg/l	mg/l	mg/l	
01750 Calcium	7440-70-2	20.2	0.0382	0.400	1
01757 Magnesium	7439-95-4	4.27	0.0190	0.200	1
01762 Potassium	7440-09-7	3.21	0.160	1.00	1
01767 Sodium	7440-23-5	56.7	0.173	2.00	1
Wet Chemistry	EPA 300.0	mg/l	mg/l	mg/l	
Wet Chemistry 00224 Chloride	EPA 300.0 16887-00-6	mg/l 109	mg/1 4.0	mg/l 8.0	20
-		=	<u>-</u> -	<u>-</u> .	20 5

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP03-55-161031 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8679492 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/31/2016 12:55

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/03/2016 09:30 Reported: 01/30/2017 13:27

-

03-55 SDG#: MMK07-04

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Ch	nemistry	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrat	te Nitrogen	n.a.	3.6	0.040	0.10	1
Wet Ch	nemistry	SM 2320 B-	1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	pH 4.5	n.a.	24.1	1.7	5.0	1
12149	Bicarbonate Alkalin:	ity	n.a.	24.1	1.7	5.0	1
12148	Carbonate Alkalinity	7	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Gample	Analweie	Pecord
Habot acor y	Sambre	MIGTABLE	Kecora

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163161AA	11/11/2016	12:06	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163161AA	11/11/2016	12:06	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16318002	12/02/2016	20:32	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	2	16318002	11/14/2016	15:40	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163120635002	11/10/2016	15:47	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163120635002	11/10/2016	15:47	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163120635002	11/10/2016	15:47	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163120635002	11/10/2016	15:47	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163120635002	11/09/2016	15:45	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16316972601A	11/11/2016	14:47	Alexandria M Lanager	20
00228	Sulfate	EPA 300.0	1	16316972601A	11/11/2016	14:00	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16314118104B	11/09/2016	04:42	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16316002105A	11/12/2016	11:14	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16316002105A	11/12/2016	11:14	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16316002105A	11/12/2016	11:14	Brandon P Costik	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E			EPA SAM	PLE NO.
	VOLATILE ORGANICS ANA TENTATIVELY IDENTIF	IED COMPOU	JNDS	! 03-	 ! 55 !
b Name: Lanca b Code: LANCA trix: (soil/w mple wt/vol: vel: (low/med Moisture: not lumn: (pack/ umber TICs fo	Lab Samp Lab Fil Date Rec Date And Dilution CONCEN	ple ID: 86	79492 9915.i/16nov11 ./03/16 ./11/16 1.0 NNITS:		
	! ! COMPOUND NAME =!===================================				
2	!Total VOC TICS				
5			!! !! !!		!! !! !!
	_!! _!!		!!		! ! ! ! !

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP03-65-161031 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8679493 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/31/2016 16:10

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/03/2016 09:30 Reported: 01/30/2017 13:27

0365- SDG#: MMK07-05

CAT No.	Analysis Name	CAS Number	As Rec Result	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 82	260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	Ū	0.5	1	1
11997	Bromochloromethane	74-97-5	1	IJ	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	Ū	0.5	1	1
11997	Bromoform	75-25-2	0.5	IJ	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	Ū	0.5	1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1	1
11997	Chloroform	67-66-3	0.5	Ū	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	IJ	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	IJ	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	Ū	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	IJ	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-01-5	0.5	IJ	0.5	1	1
11997	Ethylbenzene	10061-02-6	0.5	IJ	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
11997	2-Hexanone	591-78-6	3	IJ	3	10	1
11997			3 1	U	1	5	1
11997	Isopropylbenzene	98-82-8 79-20-9	1	IJ	1	5	1
	Methyl Acetate		0.5	IJ			
11997	Methyl Tertiary Butyl Ether	1634-04-4	3	U	0.5 3	1 10	1 1
11997 11997	4-Methyl-2-pentanone	108-10-1 108-87-2	3 1	IJ	1	5	1
	Methylcyclohexane		_	•			=
11997	Methylene Chloride	75-09-2	2 1	U U	2 1	4 5	1
11997	Styrene	100-42-5		U II			1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	0	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1 1	1
11997	Toluene	108-88-3	0.5	U	0.5	_	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U 	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ŭ	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP03-65-161031 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8679493 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/31/2016 16:10

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/03/2016 09:30 Reported: 01/30/2017 13:27

0365- SDG#: MMK07-05

CAT No.	Analysis Name	CAS Number	As Re Resul	eceived Lt	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	o-Xylene	95-47-6	0.5	Ū	0.5	1	1
00882	VOA Library Search						
	The results from the volatil FORM 1 - VOA-TIC. The quali on the back of this form.						
Misc.	Organics EPA 53	7 Rev. 1.1	ng/l		ng/l	ng/l	
	modifie	ed					
10954	Perfluorooctanoic acid	335-67-1	77		1	2	1
10954	Perfluorononanoic acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	3	U	3	5	1
10954		307-24-4	9		1	2	1
10954		375-85-9	11		1	2	1
10954	Perfluorobutanesulfonate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	4	J	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	5	U	5	10	1
10954		375-22-4	3	J	3	10	1
10954		2706-90-3	5		1	3	1
10954	NETFOSAA	2991-50-6	5	U	5	8	1
	NEtFOSAA is the acronym for						
10954	NMeFOSAA	2355-31-9	4	Ū	4	8	1
	NMeFOSAA is the acronym for	N-methyl perfluor	ooctane	sulfonamidoa	acetic Acid.		
Metals	s SW-846	6010C	mg/l		mg/l	mg/l	
01750	Calcium	7440-70-2	37.7		0.0382	0.400	1
01757	Magnesium	7439-95-4	9.48		0.0190	0.200	1

Mecar	5W-040 00	100	37 -	5/ -	3, -	
01750	Calcium	7440-70-2	37.7	0.0382	0.400	1
01757	Magnesium	7439-95-4	9.48	0.0190	0.200	1
01762	Potassium	7440-09-7	3.53	0.160	1.00	1
01767	Sodium	7440-23-5	42.1	0.173	2.00	1
Wet C	hemistry EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	121	20.0	40.0	100
00228	Sulfate	14808-79-8	15.1	1.5	5.0	5
	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	3.7	0.040	0.10	1
	SM 2320 B	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	22.1	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	22.1	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP03-65-161031 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8679493 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 10/31/2016 16:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

Submitted: 11/03/2016 09:30

Reported: 01/30/2017 13:27

0365- SDG#: MMK07-05

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163161AA	11/11/2016	12:28	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163161AA	11/11/2016	12:28	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16318002	12/02/2016	20:52	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	2	16318002	11/14/2016	15:40	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163120635002	11/10/2016	15:57	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163120635002	11/10/2016	15:57	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163120635002	11/10/2016	15:57	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163120635002	11/10/2016	15:57	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163120635002	11/09/2016	15:45	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16316972601A	11/11/2016	15:18	Alexandria M Lanager	100
00228	Sulfate	EPA 300.0	1	16316972601A	11/11/2016	15:03	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16314118104B	11/09/2016	04:47	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16316002105A	11/12/2016	12:25	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16316002105A	11/12/2016	12:25	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16316002105A	11/12/2016	12:25	Brandon P Costik	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E		EPA SAM	PLE NO.
·	VOLATILE ORGANICS ANAI TENTATIVELY IDENTIFI	IED COMPOUNDS	! ! 036	
ab Code: LANCA atrix: (soil/w	S Case No.: ater) WATER 5.0 (g/mL)mL) LOW dec. cap) CAP	Lab Sample ID:	SDG No. 8679493 P09915.i/16nov11: 11/03/16 11/11/16 :: 1.0 UNITS:	
CAS NUMBER	! ! COMPOUND NAME =!===================================	! ! RT	! ! EST. CONC.	! !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
2	!Total VOC TICs			
30age 1 of 1	_! !	!! !	! _!	!! !!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-APRB01-161101 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8679494 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/01/2016 15:50

C. T. Male Associates 50 Century Hill Drive

Submitted: 11/03/2016 09:30

Latham NY 12110

Reported: 01/30/2017 13:27

2-RB1 SDG#: MMK07-06RB

CAT No.	Analysis Name	CAS Number	Resul	=	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 Re	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	2	J	1	2	1
10954	Perfluorononanoic acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid	307-24-4	1	U	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	1	U	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	5	U	5	10	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	1	U	1	3	1
10954	NETFOSAA	2991-50-6	5	U	5	8	1
	NEtFOSAA is the acronym for N-et	hyl perfluoroo	ctanesu	lfonamidoacetic	e Acid.		
10954	NMeFOSAA	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanes	ulfonamidoaceti	ic Acid.		
The	stated OC limits are advisory only	v until suffic	ent dat	a points			

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16318002	12/02/2016 21:13	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	2	16318002	11/14/2016 15:40	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP10-20-161102 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8679495 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 09:55

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/03/2016 09:30 Reported: 01/30/2017 13:27

SDG#: MMK07-07

21020

CAT No.	Analysis Name	CAS Number	As Rec Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 82	260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	IJ	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	IJ	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	II	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	τī	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	τī	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	τī	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	IJ	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	IJ	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997		10061-01-5	0.5	IJ	0.5	1	1
11997	trans-1,3-Dichloropropene Ethylbenzene	10061-02-6	0.5	IJ	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
11997	2-Hexanone	591-78-6	3	IJ	3	10	1
			3 1	U	1	5	1
11997 11997	Isopropylbenzene	98-82-8 79-20-9	1	IJ	1	5	1
	Methyl Acetate		0.5	IJ			
11997	Methyl Tertiary Butyl Ether	1634-04-4	3	U	0.5	1 10	1
11997	4-Methyl-2-pentanone	108-10-1 108-87-2	3 1	IJ	1	5	1
11997	Methylcyclohexane			•	2		1
11997	Methylene Chloride	75-09-2	2 1	n n	2 1	4 5	1
11997	Styrene	100-42-5					1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5		1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U 	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP10-20-161102 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8679495 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 09:55

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

Submitted: 11/03/2016 09:30

Reported: 01/30/2017 13:27

21020 SDG#: MMK07-07

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles o-Xylene	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/l 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	30		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	7		0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	3		0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	26		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	10		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	20		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	6		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	15		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	4	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	9		0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-6	ethyl perfluoroo	ctanesu	lfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-r	methyl perfluoro	octanes	ulfonamido	acetic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Metals	SW-84	16 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-	-2 1.15	0.0382	0.400	1
01757	Magnesium	7439-95-	-4 0.323	0.0190	0.200	1
01762	Potassium	7440-09-	-7 0.768 J	0.160	1.00	1
01767	Sodium	7440-23-	-5 25.2	0.173	2.00	1
Wet Ch	nemistry EPA 3	300.0	mg/l	mg/l	mg/l	
00224	Chloride	16887-00	0-6 17.9	1.0	2.0	5
00228	Sulfate	14808-79	9-8 4.3 J	1.5	5.0	5
	EPA 3	353.2	mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitr	ogen n.a.	0.040 U	0.040	0.10	1
	SM 23	320 B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	11.8	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	11.8	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP10-20-161102 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8679495 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 09:55

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/03/2016 09:30 Reported: 01/30/2017 13:27

21020 SDG#: MMK07-07

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163161AA	11/11/2016	12:50	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163161AA	11/11/2016	12:50	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321006	11/22/2016	23:31	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321006	11/16/2016	14:20	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163120635002	11/10/2016	16:00	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163120635002	11/10/2016	16:00	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163120635002	11/10/2016	16:00	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163120635002	11/10/2016	16:00	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163120635002	11/09/2016	15:45	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16316972601A	11/11/2016	12:41	Alexandria M Lanager	5
00228	Sulfate	EPA 300.0	1	16316972601A	11/11/2016	12:41	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16314118104B	11/09/2016	04:49	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16316002106A	11/12/2016	14:07	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16316002106A	11/12/2016	14:07	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16316002106A	11/12/2016	14:07	Brandon P Costik	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Lab Name: Lancas Lab Code: LANCAS Adtrix: (soil/wa Sample wt/vol: Level: (low/med) & Moisture: not Column: (pack/c Number TICs fou	5.0 (g/mL)mL Lak LOW Date dec. Date ap) CAP Dilk CO	Sample ID: 80 File ID:HP00 Received: 1 Analyzed: 1 Strong Factor: NMCENTRATION 1 Mg/L or ug/Kg	679495 9915.i/16nov11a 1/03/16 1/11/16 1.0 UNITS:) ug/L	a.b/ln11s11
: CAS NUMBER	! COMPOUND NAME	! RT	! EST. CONC.	! ! ! Q !
1. VOCTIC 2	Total VOC TICS ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! !			U ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! !

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP10-30-161102 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8679496 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 12:10

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/03/2016 09:30 Reported: 01/30/2017 13:27

21030 SDG#: MMK07-08

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 1 1 1 1	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP10-30-161102 Grab Groundwater

SGPP - Merrimack

SM 2320 B-1997

n.a.

n.a.

12150 Total Alkalinity to pH 4.5

12149 Bicarbonate Alkalinity 12148 Carbonate Alkalinity LL Sample # GW 8679496 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 12:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

As Received

mg/l as CaCO3

1.7

1.7

mg/l as CaCO3

1

5.0

5.0

5.0

Submitted: 11/03/2016 09:30

Reported: 01/30/2017 13:27

21030 SDG#: MMK07-08

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	:60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Se	earch						
	The results from the FORM 1 - VOA-TIC. on the back of the	The qualifie						
Misc.	Organics	EPA 537 F	ev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic	acid	335-67-1	66		0.5	2	1
10954	Perfluorononanoic	acid	375-95-1	3		0.6	2	1
10954	Perfluorodecanoic	acid	335-76-2	5		0.5	2	1
10954	Perfluoroundecano	ic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecano:	ic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecand	oic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradeca	anoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic	acid	307-24-4	48		0.5	2	1
10954	Perfluoroheptanoio	c acid	375-85-9	23		0.5	2	1
10954	Perfluorobutanesu:	lfonate	375-73-5	10		0.7	2	1
10954	Perfluorohexanesu:	lfonate	355-46-4	9		1	3	1
10954	Perfluoro-octanes	ulfonate	1763-23-1	37		2	6	1
10954	Perfluorobutanoic	Acid	375-22-4	7	J	3	10	1
10954	Perfluoropentanoio	c Acid	2706-90-3	17		0.5	2	1
10954	NEtFOSAA		2991-50-6	1	U	1	3	1
	NEtFOSAA is the ac	cronym for N-e	thyl perfluoro	octanesu	lfonamidoac	etic Acid.		
10954		-	2355-31-9	1	U	1	3	1
	NMeFOSAA is the ac	cronym for N-m	ethyl perfluor	octanes	ulfonamidoa	cetic Acid.		
The :	stated OC limits ar	-						
	be obtained to calc				F			
Metals	3	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	19.6		0.0382	0.400	1
01757	Magnesium		7439-95-4	3.15		0.0190	0.200	1
01762	Potassium		7440-09-7	3.95		0.160	1.00	1
01767	Sodium		7440-23-5	256		0.173	2.00	1
Wet Ch	nemistry	EPA 300.0	1	mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	439		20.0	40.0	100
00228	Sulfate		14808-79-8	12.7		1.5	5.0	5
		EPA 353.2	1	mg/l		mg/l	mg/l	
07882	Total Nitrite/Nit		n.a.	1.6		0.040	0.10	1
							/3	

mg/l as CaCO3

IJ

U

1.7

1.7

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP10-30-161102 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8679496 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 12:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

Submitted: 11/03/2016 09:30

Reported: 01/30/2017 13:27

21030 SDG#: MMK07-08

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163161AA	11/11/2016	13:11	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163161AA	11/11/2016	13:11	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321006	11/22/2016	23:52	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321006	11/16/2016	14:20	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163120635002	11/10/2016	16:04	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163120635002	11/10/2016	16:04	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163120635002	11/10/2016	16:04	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163120635002	11/10/2016	16:04	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163120635002	11/09/2016	15:45	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16316972601A	11/12/2016	20:09	Alexandria M Lanager	100
00228	Sulfate	EPA 300.0	1	16316972601A	11/11/2016	15:34	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16314118104B	11/09/2016	04:51	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16316002106A	11/12/2016	12:57	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16316002106A	11/12/2016	12:57	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16316002106A	11/12/2016	12:57	Brandon P Costik	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

-	1E		EPA SAM	PLE NO.	
	OLATILE ORGANICS ANAI TENTATIVELY IDENTIFI	ED COMPOUNDS	! ! ! ! 21030 !		
Lab Name: Lancas Lab Code: LANCAS Matrix: (soil/wa Sample wt/vol: Level: (low/med) % Moisture: not Column: (pack/c	5.0 (g/mL)mL LOW dec. ap) CAP	Contract: SAS No.: Lab Sample ID: 8 Lab File ID:HPO Date Received: 1 Date Analyzed: 1 Dilution Factor: CONCENTRATION (ug/L or ug/Kg	9915.i/16nov11. 1/03/16 1/11/16 1.0 UNITS:		
! ! CAS NUMBER	! ! COMPOUND NAME	! RT			
! 3	!Total VOC TICS ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! !				
! 29	!	!!	!	!!	

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP10-40-161102 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8679497 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 14:35

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/03/2016 09:30 Reported: 01/30/2017 13:27

21040 SDG#: MMK07-09

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 1 1 1 1	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

REVISED

Sample Description: SG2-AP10-40-161102 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8679497 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 14:35

C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 11/03/2016 09:30 Reported: 01/30/2017 13:27

21040 SDG#: MMK07-09

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260C	ug/l	ug/l	ug/l	
11997	o-Xylene	95-47-6	0.5 U	0.5	1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined

Misc.	Organics EPA 537	Rev. 1.1	ng/1		ng/l	ng/l	
	modifie	d					
10954	Perfluorooctanoic acid	335-67-1	45		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	3		0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.7	J	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.9	J	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	18		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	11		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	9		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	6		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	19		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	5	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	7		0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N	-ethyl perfluoroc	ctanesu	lfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N	-methyl perfluoro	octanes	ulfonamido	acetic Acid.		

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Metals	5	SW-846 601	LOC	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	13.2	0.0382	0.400	1
01757	Magnesium		7439-95-4	2.33	0.0190	0.200	1
01762	Potassium		7440-09-7	3.07	0.160	1.00	1
01767	Sodium		7440-23-5	134	0.173	2.00	1
Wet Ch	nemistry	EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride		16887-00-6	225	20.0	40.0	100
00228	Sulfate		14808-79-8	10.5	1.5	5.0	5
		EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitra	te Nitrogen	n.a.	1.2	0.040	0.10	1
		SM 2320 B-	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	pH 4.5	n.a.	20.9	1.7	5.0	1
12149	Bicarbonate Alkalin	ity	n.a.	20.9	1.7	5.0	1
12148	Carbonate Alkalinit	У	n.a.	1.7 U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-AP10-40-161102 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8679497 LL Group # 1729126 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 14:35

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/03/2016 09:30 Reported: 01/30/2017 13:27

21040 SDG#: MMK07-09

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Ti	me		Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163161AA	11/11/2016	13:33	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163161AA	11/11/2016	13:33	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321006	11/23/2016	00:12	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321006	11/16/2016	14:20	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163120635002	11/10/2016	16:07	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163120635002	11/10/2016	16:07	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163120635002	11/10/2016	16:07	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163120635002	11/10/2016	16:07	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	163120635002	11/09/2016	15:45	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16316972601A	11/12/2016	20:25	Alexandria M Lanager	100
00228	Sulfate	EPA 300.0	1	16316972601A	11/11/2016	16:06	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16314118104B	11/09/2016	04:53	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16316002106B	11/12/2016	13:27	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16316002106B	11/12/2016	13:27	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16316002106B	11/12/2016	13:27	Brandon P Costik	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E VOLATILE ORGANICS ANA	LYSIS DATA SHEET	EPA SAM	EPA SAMPLE NO.		
	TENTATIVELY IDENTIF		! ! 210	! 40 !		
	5.0 (g/mL)mL) LOW dec.	Contract:	SDG No. 3679497 09915.i/16nov11a 1/03/16 1/11/16			
Number TICs fo		CONCENTRATION (ug/L or ug/Kg	UNITS:			
	! ! COMPOUND NAME			~		
1. VOCTIC	!Total VOC TICs !!	!	! 0	! U !		
3	_! !	!!	_!	!!		
5		!	!	ii		
6	_ !	!		!!		
	_! !		·!	!		
.0	_!	!!	.!	!!		
1	!	!	-!	!!		
.2	_! _!	<u>-</u>		<u> </u>		
4	;	i	-;	ii		
.5.	i	i	·	i ——— i		
	_!		!	!!		
7	_!	!	!	!!		
.8	_!	!	.!	!!		
.9	!	!!	.!	!!		
20	_!	<u>!</u>		!!		
	_!		- !	!!		
	_!!		- -	!:		
	:		- 	::		
			- i	ii		
	i		·i	ii		
27.	i	<u>-</u>	·	i ——— i		
			!	·		
29		<u>-</u>	!	!i		
30	_!	!!	!			
	!		!	! !		

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729126

Reported: 01/30/2017 13:27

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Batch number: L163161AA	Sample	number	(s): 8679	489-8679490,8679492-8679493,8679495-8679497
Acetone	6	U	6	20
Benzene	0.5	U	0.5	1
Bromochloromethane	1	U	1	5
Bromodichloromethane	0.5	U	0.5	1
Bromoform	0.5	U	0.5	4
Bromomethane	0.5	U	0.5	1
2-Butanone	3	U	3	10
Carbon Disulfide	1	U	1	5
Carbon Tetrachloride	0.5	Ū	0.5	1
Chlorobenzene	0.5	U	0.5	1
Chloroethane	0.5	U	0.5	1
Chloroform	0.5	U	0.5	1
Chloromethane	0.5	U	0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	U	2	5
Dibromochloromethane	0.5	U	0.5	1
1,2-Dibromoethane	0.5	U	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5
Dichlorodifluoromethane	0.5	U	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	U	0.5	1
trans-1,2-Dichloroethene	0.5	U	0.5	1
1,2-Dichloropropane	0.5	U	0.5	1
cis-1,3-Dichloropropene	0.5	U	0.5	1
trans-1,3-Dichloropropene	0.5	U	0.5	1
Ethylbenzene	0.5	U	0.5	1
Freon 113	2	U	2	10
2-Hexanone	3	U	3	10
Isopropylbenzene	1	U	1	5
Methyl Acetate	1	U	1	5
Methyl Tertiary Butyl Ether	0.5	U	0.5	1
4-Methyl-2-pentanone	3	U	3	10
Methylcyclohexane	1	U	1	5
Methylene Chloride	2	U	2	4
Styrene	1	U	1	5
1,1,2,2-Tetrachloroethane	0.5	U	0.5	1

^{*-} Outside of specification

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729126

Reported: 01/30/2017 13:27

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ ug/l
Tetrachloroethene Toluene 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Trichlorofluoromethane Vinyl Chloride m+p-Xylene o-Xylene	0.5 0.5 1 1 0.5 0.5 0.5 0.5 0.5	U U U U U U U U U U	0.5 0.5 1 1 0.5 0.5 0.5 0.5 0.5 0.5	1 1 5 5 1 1 1 1 1 1
	ng/l		ng/l	ng/l
Batch number: 16318002 Perfluorooctanoic acid Perfluorononanoic acid Perfluorodecanoic acid Perfluoroundecanoic acid Perfluorotecanoic acid Perfluorotetridecanoic acid Perfluorotetradecanoic acid Perfluorohexanoic acid Perfluorohexanoic acid Perfluorobutanesulfonate Perfluoro-cotanesulfonate Perfluorobutanoic Acid Perfluoropentanoic Acid Perfluoropentanoic Acid NEtFOSAA NMEFOSAA	Sample 1 1 2 3 2 3 1 1 4 4 5 3 1 5	number U U U U U U U U U U U U U U U U U U U	(s): 86° 1 1 1 2 3 2 3 1 1 4 4 5 3 1 5 4	79489-8679494 2 2 2 2 4 5 4 5 2 2 2 10 10 10 10 3 8 8
Batch number: 16321006 Perfluorooctanoic acid Perfluorononanoic acid Perfluorodecanoic acid Perfluoroundecanoic acid Perfluoroundecanoic acid Perfluorotridecanoic acid Perfluorotetradecanoic acid Perfluorotetradecanoic acid Perfluorohexanoic acid Perfluorohexanoic acid Perfluorobutanesulfonate Perfluoro-octanesulfonate Perfluoro-octanesulfonate Perfluoropentanoic Acid Perfluoropentanoic Acid NETFOSAA NMEFOSAA	Sample 0.5 0.6 0.5 1 0.5 0.5 0.5 0.5 0.7 1 2 3 0.5 1	number U U U U U U U U U U U U U U U U U U U	(s): 86° 0.5 0.6 0.5 1 0.5 0.5 0.5 0.7 1 2 3 0.5 1 1	79495-8679497 2 2 2 2 3 3 2 2 2 2 2 2 3 6 10 2 3 3 3

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729126

Reported: 01/30/2017 13:27

Method Blank (continued)

Analysis Name	Result	MDL**	LOQ
	mg/l	mg/l	mg/l
Batch number: 163120635002 Calcium Magnesium Potassium Sodium	Sample number 0.0382 U 0.0190 U 0.160 U 0.173 U	0.0382 0.0190 0.160	1.00
Batch number: 16314118104A	Sample number 0.040 U	r(s): 86794	489
Total Nitrite/Nitrate Nitrogen		0.040	0.10
Batch number: 16314118104B	-	r(s): 86794	492-8679493,8679495-8679497
Total Nitrite/Nitrate Nitrogen		0.040	0.10
Batch number: 16316972601A Chloride Sulfate	Sample number 0.20 U 0.30 U	0.20	489,8679492-8679493,8679495-8679497 0.40 1.0
	mg/l as CaCO	3 mg/l as CaCO3	mg/l as CaCO3
Batch number: 16316002105A	Sample number	r(s): 86794	489,8679492-8679493
Total Alkalinity to pH 4.5		1.7	5.0
Batch number: 16316002106A	Sample number	r(s): 86794	495-8679496
Total Alkalinity to pH 4.5		1.7	5.0
Batch number: 16316002106B	Sample number 3.2 J	r(s): 86794	497
Total Alkalinity to pH 4.5		1.7	5.0

LCS/LCSD

Analysis Name	LCS Spike	LCS	LCSD Spike	LCSD	LCS	LCSD	LCS/LCSD	RPD	RPD
	Added	Conc	Added	Conc	%REC	%REC	Limits		Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: L163161AA	Sample numbe	r(s): 86794	89-8679490,86	79492-8679	493,8679	495-8679	497		
Acetone	150	147.28			98		50-168		
Benzene	20	18.5			93		78-120		
Bromochloromethane	20	20.5			103		80-125		
Bromodichloromethane	20	18.53			93		80-120		
Bromoform	20	16.21			81		59-120		
Bromomethane	20	17.35			87		55-123		
2-Butanone	150	135.95			91		57-145		
Carbon Disulfide	20	17.42			87		58-120		
Carbon Tetrachloride	20	19.71			99		74-130		
Chlorobenzene	20	18.08			90		80-120		
Chloroethane	20	16.59			83		56-120		
Chloroform	20	19.21			96		80-120		
Chloromethane	20	15.69			78		59-127		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729126

Reported: 01/30/2017 13:27

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Cyclohexane	20	19.05			95		65-131		
1,2-Dibromo-3-chloropropane	20	15.65			78		59-120		
Dibromochloromethane	20	17.49			87		78-120		
1,2-Dibromoethane	20	18.51			93		80-120		
1,2-Dichlorobenzene	20	18.14			91		80-120		
1,3-Dichlorobenzene	20	18.06			90		80-120		
1,4-Dichlorobenzene	20	18.13			91		80-120		
Dichlorodifluoromethane	20	17.66			88		49-134		
1,1-Dichloroethane	20	18.52			93		80-120		
1,2-Dichloroethane	20	19.57			98		66-128		
1,1-Dichloroethene	20	19.41			97		76-124		
cis-1,2-Dichloroethene	20	18.98			95		80-120		
trans-1,2-Dichloroethene	20	19.26			96		80-120		
1,2-Dichloropropane	20	18.33			92		80-120		
cis-1,3-Dichloropropene	20	18.07			90		80-120		
trans-1,3-Dichloropropene	20	17.86			89		76-120		
Ethylbenzene	20	17.87			89		78-120		
Freon 113	20	20.52			103		64-136		
2-Hexanone	100	78.53			79		49-146		
Isopropylbenzene	20	18.18			91		80-120		
Methyl Acetate	20	18.99			95		61-137		
Methyl Tertiary Butyl Ether	20	18.76			94		75-120		
4-Methyl-2-pentanone	100	83.28			83		55-141		
Methylcyclohexane	20	20.38			102		66-126		
Methylene Chloride	20	18.6			93		80-120		
Styrene Chioride	20	18.42			92		80-120		
1,1,2,2-Tetrachloroethane	20	16.52			83		72-120		
Tetrachloroethene	20	19.17			96		80-129		
Toluene	20	18.41			92		80-129		
1,2,3-Trichlorobenzene	20	16.71			84		69-120		
1,2,4-Trichlorobenzene	20	16.93			85		72-120		
1,1,1-Trichloroethane	20	16.53			83		66-126		
1,1,2-Trichloroethane	20	17.88			89		80-120		
Trichloroethene	20	18.64			93		80-120		
Trichlorofluoromethane	20	21.33			107		67-129		
Vinyl Chloride	20	16.63			83		63-121		
m+p-Xylene	40	36.52			91		80-120		
o-Xylene	20	17.69			88		80-120		
0-Ay Telle	20	17.09			00		00-120		
	ng/l	ng/l	ng/l	ng/l					
Batch number: 16318002	Sample numbe								
Perfluorooctanoic acid	200	174.38	200	169.25	87	85	70-130	3	30
Perfluorononanoic acid	200	173.62	200	174.92	87	87	70-130	1	30
Perfluorodecanoic acid	200	145.79	200	191.4	73	96	70-130	27	30
Perfluoroundecanoic acid	200	177.05	200	196.82	89	98	70-130	11	30
Perfluorododecanoic acid	200	172.09	200	188.1	86	94	70-130	9	30
Perfluorotridecanoic acid	200	188.92	200	193.96	94	97	70-130	3	30
Perfluorotetradecanoic acid	200	174.05	200	191.75	87	96	70-130	10	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729126

Reported: 01/30/2017 13:27

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ng/l	LCS Conc ng/l	LCSD Spike Added ng/l	LCSD Conc ng/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Perfluorohexanoic acid	200	159.21	200	185.01	80	93	70-130	15	30
Perfluoroheptanoic acid	200	172.62	200	199.21	86	100	70-130	14	30
Perfluorobutanesulfonate	176.8	151.43	176.8	172.87	86	98	70-130	13	30
Perfluorohexanesulfonate	189.2	156.22	189.2	167.4	83	88	70-130	7	30
Perfluoro-octanesulfonate	191.2	160.25	191.2	191.36	84	100	70-130	18	30
Perfluorobutanoic Acid	200	167.46	200	173.56	84	87	70-130	4	30
Perfluoropentanoic Acid	200	171	200	187.53	85	94	70-130	9	30
NETFOSAA	200	215.38	200	221.9	108	111	70-130	3	30
NMeFOSAA	200	190.12	200	197.34	95	99	70-130	4	30
Batch number: 16321006	Sample numbe	r(s): 86794	95-8679497						
Perfluorooctanoic acid	200	168.64			84		70-130		
Perfluorononanoic acid	200	161.41			81		70-130		
Perfluorodecanoic acid	200	174.48			87		70-130		
Perfluoroundecanoic acid	200	194.69			97		70-130		
Perfluorododecanoic acid	200	195.27			98		70-130		
Perfluorotridecanoic acid	200	189.65			95		70-130		
Perfluorotetradecanoic acid	200	174.42			87		70-130		
Perfluorohexanoic acid	200	169.07			85		70-130		
Perfluoroheptanoic acid	200	186.34			93		70-130		
Perfluorobutanesulfonate	176.8	153.11			87		70-130		
Perfluorohexanesulfonate	189.2	153.15			81		70-130		
Perfluoro-octanesulfonate	191.2	174.99			92		70-130		
Perfluorobutanoic Acid	200	178.1			89		70-130		
Perfluoropentanoic Acid	200	179.47			90		70-130		
NETFOSAA	200	154.55			77		70-130		
NMeFOSAA	200	144.76			72		70-130		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 163120635002	Sample numbe	r(s): 86794	89,8679492-86	79493,8679	495-8679	497			
Calcium	4.00	4.07			102		80-120		
Magnesium	2.00	2.05			103		80-120		
Potassium	10	10.07			101		80-120		
Sodium	10	10.03			100		80-120		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 16314118104A	Sample numbe	r(s): 86794	189						
Total Nitrite/Nitrate Nitrogen	2.50	2.51			100		90-110		
Batch number: 16314118104B	Sample numbe	r(s): 86794	192-8679493,86	79495-8679	497				
Total Nitrite/Nitrate Nitrogen	2.50	2.51			100		90-110		
Batch number: 16316972601A	Sample numbe	r(s): 86794	89,8679492-86	79493.8679	495-8679	497			
Chloride	3.00	3.01	,00.,,1,1		100	'	90-110		
Sulfate	7.50	7.59			101		90-110		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729126

Reported: 01/30/2017 13:27

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/l as CaCO3	LCS Conc mg/l as CaCO3	LCSD Spike Added mg/l as CaCO3	LCSD Conc mg/l as CaCO3	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 16316002105A Total Alkalinity to pH 4.5	Sample numbe	er(s): 86794 177.21	189,8679492-86	579493	94		84-110		
Batch number: 16316002106A Total Alkalinity to pH 4.5	Sample number 188	er(s): 86794 179.23	195-8679496		95		84-110		
Batch number: 16316002106B Total Alkalinity to pH 4.5	Sample number 188	er(s): 86794 179.23	197		95		84-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspi Con ug/	c	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: L163161AA	Sample	numb	er(s): 8679	489-8679	490,8679492-	-8679493,	3679495-8	3679497	UNSPK: P68	2722	
Acetone	6	U	150	141.9	150	143.33	95	96	50-168	1	30
Benzene	0.5	U	20	20.12	20	19.85	101	99	78-120	1	30
Bromochloromethane	1	U	20	21.59	20	21.53	108	108	80-125	0	30
Bromodichloromethane	0.5	U	20	19.3	20	18.75	96	94	80-120	3	30
Bromoform	0.5	U	20	16.13	20	16.01	81	80	59-120	1	30
Bromomethane	0.5	U	20	19.6	20	19.47	98	97	55-123	1	30
2-Butanone	3	U	150	135.73	150	134.17	90	89	57-145	1	30
Carbon Disulfide	1	U	20	20.45	20	19.87	102	99	58-120	3	30
Carbon Tetrachloride	0.5	U	20	22.53	20	22.4	113	112	74-130	1	30
Chlorobenzene	0.5	U	20	19.21	20	19.09	96	95	80-120	1	30
Chloroethane	0.5	U	20	19.27	20	19.23	96	96	56-120	0	30
Chloroform	0.5	U	20	21	20	20.62	105	103	80-120	2	30
Chloromethane	0.5	U	20	17.86	20	18.13	89	91	59-127	1	30
Cyclohexane	2	U	20	22.26	20	21.93	111	110	65-131	2	30
1,2-Dibromo-3-chloropropane	2	U	20	16.11	20	15.9	81	79	59-120	1	30
Dibromochloromethane	0.5	U	20	17.6	20	17.57	88	88	78-120	0	30
1,2-Dibromoethane	0.5	U	20	18.91	20	18.72	95	94	80-120	1	30
1,2-Dichlorobenzene	1	U	20	19	20	18.96	95	95	80-120	0	30
1,3-Dichlorobenzene	1	U	20	18.85	20	18.74	94	94	80-120	1	30
1,4-Dichlorobenzene	1	U	20	19.11	20	18.9	96	95	80-120	1	30
Dichlorodifluoromethane	0.5	U	20	21.32	20	21.52	107	108	49-134	1	30
1,1-Dichloroethane	0.5	U	20	20.4	20	20.04	102	100	80-120	2	30
1,2-Dichloroethane	0.5	U	20	20.66	20	20.42	103	102	66-128	1	30
1,1-Dichloroethene	0.5	U	20	22.6	20	22.02	113	110	76-124	3	30
cis-1,2-Dichloroethene	0.5	U	20	20.92	20	20.36	105	102	80-120	3	30
trans-1,2-Dichloroethene	0.5	U	20	21.68	20	20.98	108	105	80-120	3	30
1,2-Dichloropropane	0.5	U	20	19.49	20	19.28	97	96	80-120	1	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729126

Reported: 01/30/2017 13:27

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc	MS Spike Added	MS Conc	MSD Spike Added	MSD Conc	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l	ug/l					
cis-1,3-Dichloropropene	0.5 U	20	18.35	20	18.19	92	91	80-120	1	30
trans-1,3-Dichloropropene	0.5 U	20	17.47	20	17.72	87	89	76-120	1	30
Ethylbenzene	0.5 U	20	19.26	20	19.25	96	96	78-120	0	30
Freon 113	2 U	20	24.28	20	24.13	121	121	64-136	1	30
2-Hexanone	3 U	100	78.04	100	78.09	78	78	49-146	0	30
Isopropylbenzene	1 U	20	20.16	20	19.85	101	99	80-120	2	30
Methyl Acetate	1 U	20	19.33	20	18.79	97	94	61-137	3	30
Methyl Tertiary Butyl Ether	0.5 U	20	19.57	20	19.57	98	98	75-120	0	30
4-Methyl-2-pentanone	3 U	100	84.46	100	83.08	84	83	55-141	2	30
Methylcyclohexane	1 U	20	23.9	20	23.63	119	118	66-126	1	30
Methylene Chloride	2 U	20	20.53	20	19.82	103	99	80-120	4	30
Styrene	1 U	20	19.45	20	19.38	97	97	80-120	0	30
1,1,2,2-Tetrachloroethane	0.5 U	20	16.76	20	17.06	84	85	72-120	2	30
Tetrachloroethene	0.5 U	20	21.28	20	20.81	106	104	80-129	2	30
Toluene	0.5 U	20	19.71	20	19.48	99	97	80-120	1	30
1,2,3-Trichlorobenzene	1 U	20	17.89	20	17.84	89	89	69-120	0	30
1,2,4-Trichlorobenzene	1 U	20	18.37	20	18.07	92	90	72-120	2	30
1,1,1-Trichloroethane	0.5 U	20	18.89	20	18.58	94	93	66-126	2	30
1,1,2-Trichloroethane	0.5 U	20	18.04	20	18.19	90	91	80-120	1	30
Trichloroethene	0.5 U	20	20.91	20	20.19	105	101	80-120	4	30
Trichlorofluoromethane	0.5 U	20	25.41	20	24.89	127	124	67-129	2	30
Vinyl Chloride	0.5 U	20	19.69	20	19.58	98	98	63-121	1	30
m+p-Xylene	0.5 U	40	39.48	40	39.04	99	98	80-120	1	30
o-Xylene	0.5 U	20	19.38	20	19.25	97	96	80-120	1	30
•										
	ng/l	ng/l	ng/l	ng/l	ng/l					
Batch number: 16318002	-	ber(s): 867		494 UNSPK:	8679493					
Perfluorooctanoic acid	77.13	200.44	265.52			94		70-130		
Perfluorononanoic acid	1 U	200.44	180.87			90		70-130		
Perfluorodecanoic acid	1 U	200.44	165.68			83		70-130		
Perfluoroundecanoic acid	2 U	200.44	197.87			99		70-130		
Perfluorododecanoic acid	3 U	200.44	181.64			91		70-130		
Perfluorotridecanoic acid	2 U	200.44	196.39			98		70-130		
Perfluorotetradecanoic acid	3 U	200.44	175.26			87		70-130		
Perfluorohexanoic acid	8.70	200.44	184.12			88		70-130		
Perfluoroheptanoic acid	10.68	200.44	217.56			104		70-130		
Perfluorobutanesulfonate	4 U	177.39	162.92			92		70-130		
Perfluorohexanesulfonate	4.34	189.42	167.29			86		70-130		
Perfluoro-octanesulfonate	5 U	191.42	197.49			103		70-130		
Perfluorobutanoic Acid	3.03	200.44	175.89			86		70-130		
Perfluoropentanoic Acid	5.34	200.44	182.87			89		70-130		
NETFOSAA	5 U	200.44	196.69			98		70-130		
NMeFOSAA	4 U	200.44	196.19			98		70-130		
Pot sh numbers: 16221006	Commle	hom(a): 067	0405 0670	407 IMCDI:	D670407					
Batch number: 16321006 Perfluorooctanoic acid	0.5 U	ber(s): 867 200.38		199.5	185.2	85	93	70-130	8	30
Periluorooctanoic acid	0.5	∠00.38	171.26	199.5	185.2	85	93	/0-130	ŏ	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729126

Reported: 01/30/2017 13:27

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ng/l	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Perfluorononanoic acid	0.6 U	200.38	183.02	199.5	189.14	91	95	70-130	3	30
Perfluorodecanoic acid	0.5 U	200.38	172.2	199.5	178.62	86	90	70-130	4	30
Perfluoroundecanoic acid	1 U	200.38	201.39	199.5	199.55	101	100	70-130	1	30
Perfluorododecanoic acid	0.5 U	200.38	178.88	199.5	187.53	89	94	70-130	5	30
Perfluorotridecanoic acid	0.5 U	200.38	178.97	199.5	177.61	89	89	70-130	1	30
Perfluorotetradecanoic acid	0.5 U	200.38	186.98	199.5	189.1	93	95	70-130	1	30
Perfluorohexanoic acid	0.5 U	200.38	176.58	199.5	192.55	88	97	70-130	9	30
Perfluoroheptanoic acid	0.5 U	200.38	188.03	199.5	195.51	94	98	70-130	4	30
Perfluorobutanesulfonate	0.7 U	177.34	153.06	176.56	166.55	86	94	70-130	8	30
Perfluorohexanesulfonate	1 U	189.36	175.95	188.53	173.51	93	92	70-130	1	30
Perfluoro-octanesulfonate	2 U	191.36	175.09	190.52	178.32	91	94	70-130	2	30
Perfluorobutanoic Acid	3 U	200.38	179.84	199.5	176.29	90	88	70-130	2	30
Perfluoropentanoic Acid	0.5 U	200.38	188.92	199.5	195.21	94	98	70-130	3	30
NETFOSAA	1 U	200.38	160.94	199.5	139.45	80	70	70-130	14	30
NMeFOSAA	1 U	200.38	149.26	199.5	174.72	74	88	70-130	16	30
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 163120635002	Sample numl	ber(s): 8679	9489,8679	492-8679493	,8679495-	8679497 t	JNSPK: P6	82722		
Calcium	15.81	4.00	20.05	4.00	19.77	106	99	75-125	1	20
Magnesium	2.77	2.00	4.74	2.00	4.70	99	97	75-125	1	20
Potassium	2.74	10	12.55	10	12.37	98	96	75-125	1	20
Sodium	62.63	10	73.81	10	72.74	112 (2)	101 (2)	75-125	1	20
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 16314118104A	Sample numl	ber(s): 8679	9489 UNSP	K: P672528						
Total Nitrite/Nitrate Nitrogen	0.993	1.00	1.99			100		90-110		
Batch number: 16314118104B Total Nitrite/Nitrate Nitrogen	Sample numl	ber(s): 8679 5.00	9492-8679 8.79	493,8679495	-8679497	UNSPK: 86	679492	90-110		
Batch number: 16316972601A	Sample numl	ber(s): 8679	9489,8679	492-8679493	,8679495-	8679497 t	JNSPK: 86	79495		
Chloride	17.87	10	27.04			92		90-110		
Sulfate	4.29	25	27.87			94		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16316002105A Total Alkalinity to pH 4.5	Sample numl 204.66	ber(s): 8679 188	357 357	492-8679493	UNSPK: P	688452 81*		84-110		
Batch number: 16316002106A Total Alkalinity to pH 4.5	Sample numl	ber(s): 8679 188	9495-8679 150.83	496 UNSPK:	8679496	80*		84-110		
Batch number: 16316002106B Total Alkalinity to pH 4.5	Sample numl	ber(s): 8679 188	9497 UNSP 150.83	K: 8679496		80*		84-110		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729126

Reported: 01/30/2017 13:27

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Batch number: 163120635002 Calcium Magnesium Potassium Sodium	Sample number(s): 15.81 2.77 2.74 62.63	8679489,8679492-8679 15.84 2.78 2.78 62.75	0493,8679495 0 0 1 (1) 0	3-8679497 BKG: P682722 20 20 20 20 20
	mg/l	mg/l		
Batch number: 16314118104A Total Nitrite/Nitrate Nitrogen	Sample number(s): 0.993	8679489 BKG: P672528 0.982	1	2
Batch number: 16314118104B Total Nitrite/Nitrate Nitrogen	<pre>Sample number(s): 3.55</pre>	8679492-8679493,8679 3.38	495-8679497 5*	7 BKG: 8679492 2
Batch number: 16316972601A Chloride Sulfate	Sample number(s): 17.87 4.29	8679489,8679492-8679 17.35 4.14	3 3 3 (1)	5-8679497 BKG: 8679495 15 15
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 16316002105A Total Alkalinity to pH 4.5	Sample number(s): 204.66	8679489,8679492-8679 203.32	493 BKG: P6	588452 5
Batch number: 16316002106A Total Alkalinity to pH 4.5	Sample number(s): 1.7 U	8679495-8679496 BKG: 1.89	8679496 200* (1)	5
Batch number: 16316002106B Total Alkalinity to pH 4.5	Sample number(s): 20.92	8679497 BKG: 8679497 22.07	5 (1)	5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: L163161AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8679489	104	102	98	99
8679490	102	101	98	98
8679492	103	103	98	98
8679493	103	101	97	98
8679495	103	101	97	97
8679496	104	101	97	97

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729126

Reported: 01/30/2017 13:27

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: L163161AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8679497	104	102	98	99
Blank	102	102	97	98
LCS	101	101	99	99
MS	104	101	98	99
MSD	103	101	99	100
Limits:	80-116	77-113	80-113	78-113

Analysis Name: 16 PFCs Batch number: 16318002

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8679489	96	133*	130	95	93	106
8679490	90	104	101	103	100	101
8679491	117	117	106	117	113	119
8679492	80	198*	206*	77	76	85
8679493	91	115	122	92	87	99
8679494	78	91	97	75	75	76
Blank	86	86	83	87	79	85
LCS	102	100	100	111	114	107
LCSD	114	108	104	116	126	109
MS	99	125	132*	94	105	92
Limits:	70-130	70-130	70-130	70-130	70-130	70-130

	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8679489	95	104	86	99	75	94
8679490	106	93	105	106	105	100
8679491	122	114	114	106	101	108
8679492	83	92	91	81	61*	74
8679493	98	113	106	95	74	88
8679494	81	82	94	85	67*	50*
Blank	92	93	91	88	84	86
LCS	109	109	102	118	99	108
LCSD	120	110	103	100	100	100
MS	92	87	91	91	86	79
Limits:	70-130	70-130	70-130	70-130	70-130	70-130

	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA
8679489	90	90	96
8679490	93	105	90
8679491	101	102	94
8679492	70	70	70
8679493	82	83	92
8679494	43*	41*	59*

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729126

Reported: 01/30/2017 13:27

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 16318002

	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
Blank	96	85	90	
LCS	96	106	108	
LCSD	98	100	102	
MS	92	80	85	
Limits:	70-130	70-130	70-130	

Analysis Name: 16 PFCs Batch number: 16321006

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8679495	101	137*	130	106	110	113
8679496	93	128	133*	96	108	102
8679497	90	122	114	75	91	85
Blank	105	106	107	109	103	109
LCS	105	105	107	110	118	109
MS	108	113	110	107	103	109
MSD	93	86	88	92	98	97
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	12C0 DEOA	12C0 DEOS	12CO DENA	12C4 DEDA	42 NIMAEOSAA	12C7 DELIDDA

	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8679495	104	108	108	102	96	101
8679496	104	89	101	95	93	98
8679497	81	86	86	94	79	81
Blank	114	105	97	103	102	99
LCS	112	105	114	100	122	97
MS	114	114	110	98	99	90
MSD	97	97	91	85	78	83
Limits:	70-130	70-130	70-130	70-130	70-130	70-130

	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
8679495	95	100	80	
8679496	97	94	78	
8679497	70	73	64*	
Blank	110	102	93	
LCS	110	106	103	
MS	97	97	83	
MSD	92	82	69*	
Limits:	70-130	70-130	70-130	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

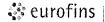
⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191					172	9126			Sam	ple #:	86	79	Y 8	9.	- 9	7				(COC#: 1	15589
Client: C.T. Male Associates		1888				Matrix			Analyses Requested							T	For Lab Use Only					
Project Name/#: SGPP - Merrimack	Site ID:											Pı	ese	rvati	ion (Code	s			$ $ $ $	SF#: <u>285327</u>	
Project Manager: Kirk Moline	P.O. #:	16.612	26		ᇦ	ace ace			Н	N		s								_{§	SCR#: <u>196063</u>	3
Sampler: Jonathan Digget					Sediment	Ground						N								T	Preservati	ion Codes
Phone #: 5/8-786 - 7400 Quote #: 214135			Sed		12 K	ners		(၁		44		œ	d.)						H = HCI	T = Thiosulfate		
State where sample(s) were collected: NH						able	3	Containers	(၃)	(6010C)		NOZ	(0.	(SM 2320B)	7 mod.)					١	N = HNO ₃	B = NaOH
	Colle	ection		te		Potable NPDES	day		(8250C)	(1	Ŕ	2)+	(300.	SMS	A 537					٤	S = H ₂ SO ₄	P = H ₃ PO ₄
	Cone	CLIOII		posi		<u></u>	L.	# of	/OAs	Mg, Na, K	(352.2)	(353	40		ŒΡ					C	O = Other	
Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other	Total	TCL	Ca, M	NC2	NO3	CI-, S	Alkalinity	PFCs						Rem	arks
SG2 -AP63 - 45 - 161631 1860	10/31/16	1010	×			Х		Checoust	X	X		Χ	X	X	X					I		
SG2 - 17801-161031 1600	¹ Chillipse of the state of t						X	3	X						Х							
SG2 - RPF181 - 161031 180	^Т РУЗДАН БАСТ	1025	Х				X	Chinage							X					floor		
SG2 -AP03 -55-161031 1860	\downarrow	1255	Х			×		11	×	X		X	Х	X	X							
SG2 -AP03 -65-/6/03/ 180	10/31/16	1610	Х			X		1)	X	Х		Х	X	X	X					\perp		
SG 2 -APREOI - 161101 1860)	ulifite	1530	X				X	2							X					\perp	***************************************	water water was
SG2 -AP10 -20-161102 185	11/2/16	0955	X			Х		11	X	X		Χ	X	X	X					1		
SG2 -AP10 - 30 - 161102 1939	11/2/16	1210	X		<u> </u>	Х		11	X	X		X	X	X	X					4	***************************************	
SG2 -AP10 - 40-161102 155	11/2/16	1435	X			×	ļ	12	X	X		X	X	X	X					1	Metals Box	K QC
SG -AP - 16					D. II		I							T:		D				4	Dete	T:
Turnaround Time Requested (TAT) (please	•	,		4	Reili	nguisnea Y	by: ⊿			10	Date ()	1.		Time ハ니		Rece	eivec	ı by:			Date	Time
(RUSH TAT is subject to Eurofins Lancaster Laborate Date results are needed:	ries approval	and surchar	ges.)		Reli	<i>→QM</i> / nguished	by:		Ne20Cym enius		Date			Time		Rece	eivec	by:	-	+	Date	Time
. /	moline e	ctmale.c	Dr.] -	- Anna				1//	/2//	16	18	7/0				-				
Data Package Options (please check if requ						nquished					Date			Time	programme and the second	Rece	eivec	by:		7	Date	Time
Type I (Validation/non-CLP) 🗵 MA N	CP 🗌	TX TRRP	- 13								- Parental State State St	S. S. S. S. S. S. S. S. S. S. S. S. S. S								\downarrow	<u> </u>	
Type III (Reduced non-CLP)					Reli	nquished	by:		Company of the last of the las		Date	i		Time		Rece	eivec	by			Date	Time
	Type A 🗌 Type B 🔲				Reli	nquished	hv	- d			Date			Time		Rece	eivec	Lhv		+	Date ;	Time
Type VI (Raw Data Only) ASP EDD Format: EQuIS	i Nhe D 🗂				```	- Adionoa					Dujo			,	*	1	ith	17	Hel		11/3/16	9:30
If site-specific QC (MS/MSD/Dup) required submit triplicate volume	indicate Q	C sample	s and			l No.: quished b	y Con FedE		ial Ca	rrier: Othe						Tem	f pera	ture i	upon re		pt 1,2 -	1.5°c



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

167155

Group Number(s):

1729126

Client: C.T Male Associates

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

11/03/2016 9:30

Number of Packages:

2

Number of Projects:

1

State/Province of Origin:

<u>NH</u>

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

Yes

Custody Seal Present:

Yes

Sample Date/Times match COC:

Yes

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

Air Quality Samples Present:

N/A

No

Samples Chilled:

Yes

Total Trip Blank Qty:

3

Paperwork Enclosed: Samples Intact:

Yes Yes

Trip Blank Type:

HCI

Missing Samples:

No

Extra Samples:

No

Discrepancy in Container Qty on COC:

No

Unpacked by Cathy Murphy (10960) at 15:49 on 11/03/2016

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	<u>Ice Type</u>	Ice Present?	<u>Ice Container</u>	Elevated Temp?
1	DT146	1.2	DT	Wet	Υ	Bagged	N
2	DT146	1.5	DT	Wet	Y	Bagged	N



Lancaster Laboratories
Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RL Reporting Limit kg **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: January 04, 2017

Project: SGPP - Merrimack

Submittal Date: 11/05/2016 Group Number: 1729841 SDG: MMK08 PO Number: 16.6126 State of Sample Origin: NH

	Lancaster Labs
Client Sample Description	<u>(LL) #</u>
SG2-AP10-50-161103 Grab Groundwater	8682715
SG2-AP10-60-161103 Grab Groundwater	8682716
SG2-LTB01-161103 Blank Water	8682717
SG2-FTB01-161103 Blank Water	8682718
SG2-AP10-70-161103 Grab Groundwater	8682719
SG2-AP10-80-161103 Grab Groundwater	8682720
SG2-AP10-84.5-161103 Grab Groundwater	8682721
SG2-AP09-28-161104 Grab Groundwater	8682722
SG2-AP09-28-161104 MS Grab Groundwater	8682723
SG2-AP09-28-161104 MSD Grab Groundwater	8682724
SG2-AP09-28-161104 Dupl Grab Groundwater	8682725
SG2-APRB01-161104 Blank Water	8682726

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	C. T. Male Associates	Attn: Jeff	Marx
Electronic Copy To	C. T. Male Associates	Attn: Dan	Reilly
Electronic Copy To	C. T. Male Associates	Attn: Kirk	Moline



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250



Project Name: SGPP - Merrimack LL Group #: 1729841

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

EPA 537 Rev. 1.1 modified, Misc. Organics

<u>Sample #s: 8682717, 8682722</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample #s: 8682718

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Target analytes were detected in this trip blank. The following corrective action was taken: the sample was re-extracted outside of the required holding time and a reportable hit was detected for PFOA. The data is reported from the initial in-hold extraction of the sample. Both sets of data are available in the data package.

Sample #s: 8682715, 8682716, 8682719, 8682720, 8682721, 8682723, 8682724

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary.

The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed.

The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Sample #s: 8682726

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in this rinse blank. The following corrective action was taken: the sample was re-extracted outside of the required holding time and comparable hits were detected.

The data is reported from the initial in-hold extraction of the sample. Both sets of data are available in the data package.

Batch #: 16321007 (Sample number(s): 8682715-8682724, 8682726 UNSPK: 8682722)

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8682715, 8682716, 8682719, 8682720, 8682721, 8682723, 8682724, 8682726, LCS, MS, MSD

EPA 353.2, Wet Chemistry

Batch #: 16321118102A (Sample number(s): 8682719 UNSPK: P687845 BKG: P687845)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Nitrite/Nitrate Nitrogen

SM 2320 B-1997, Wet Chemistry

Batch #: 16319006204B (Sample number(s): 8682720 UNSPK: P682722 BKG: P8682720-P682722)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Total Alkalinity to pH 4.5



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP10-50-161103 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682715 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016 07:55 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/05/2016 09:50 Reported: 01/04/2017 14:13

08MM1 SDG#: MMK08-01

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5 1 1 1 1 1 1 1 1	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP10-50-161103 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682715 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016 07:55 by JD C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 11/05/2016 09:50

Reported: 01/04/2017 14:13

08MM1 SDG#: MMK08-01

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles o-Xylene	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/l 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined

Misc.	Organics EPA 537	Rev. 1.1	ng/1		ng/l	ng/l	
	modified	l					
10954	Perfluorooctanoic acid	335-67-1	86		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.9	J	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	13		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	13		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	7		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	2	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	6	J	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	4	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	9		0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesu	lfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid. The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	SW-846 6010C	mg/l	mg/l	mg/l	
01750 Calcium	7440-70-2	14.6	0.0382	0.400	1
01757 Magnesium	7439-95-4	2.46	0.0190	0.200	1
01762 Potassium	7440-09-7	2.98	0.160	1.00	1
01767 Sodium	7440-23-5	47.7	0.173	2.00	1
Mat Chamistan	EPA 300.0	mg/l	mg/l	mg/l	
Wet Chemistry	EPA 300.0	g/ ±	g/ =		
00224 Chloride	16887-00-6	89.0	20.0	40.0	100
-		=	=	=	100 5

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP10-50-161103 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682715 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016 07:55 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/05/2016 09:50 Latham NY 12110

Reported: 01/04/2017 14:13

08MM1 SDG#: MMK08-01

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Ch	nemistry	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrat	te Nitrogen	n.a.	4.3	0.20	0.50	5
Wet Ch	nemistry	SM 2320 B-	1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	pH 4.5	n.a.	16.6	1.7	5.0	1
12149	Bicarbonate Alkalin:	ity	n.a.	16.6	1.7	5.0	1
12148	Carbonate Alkalinity	7	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Gample	Analweie	Pecord
Habor acory	Sambre	AHALYSIS	Kecora

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163161AA	11/11/2016	13:55	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163161AA	11/11/2016	13:55	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321007	11/23/2016	05:00	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321007	11/16/2016	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163120635002	11/10/2016	16:11	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163120635002	11/10/2016	16:11	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163120635002	11/10/2016	16:11	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163120635002	11/10/2016	16:11	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163120635002	11/09/2016	15:45	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16321120131A	11/16/2016	18:38	Hallie Burnett	100
00228	Sulfate	EPA 300.0	1	16321120131A	11/16/2016	18:24	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16319118101B	11/14/2016	15:21	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16319006204A	11/14/2016	22:35	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16319006204A	11/14/2016	22:35	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16319006204A	11/14/2016	22:35	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.	
VOLATILE ORGANICS	ANALYSIS DATA SHEET		_
TENTATIVELY IDEN	TIFIED COMPOUNDS	!	!
		! 08MM1	!
Lab Name: Lancaster Laboratories	Contract:	_ !	.!
Lab Code: LANCAS Case No.:_	SAS No.:	SDG No.:	_
Matrix: (soil/water) WATER	Lab Sample ID: 86827	15	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09915	.i/16nov11a.b/ln11	s14.
Level: (low/med) LOW	Date Received: 11/05	/16	
Moisture: not dec.	Date Analyzed: 11/11	/16	
Column: (pack/cap) CAP	Dilution Factor: 1.0		
	CONCENTRATION UNIT	S:	
Number TICs found: 0	(ug/L or ug/Kg) ug	/L	

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
	==!===================================	!		!===== ! U
	!	İ	!	!
	!			!
		1		!
				!
6.	!	1		1
	<u>.</u>			i
	!	1		!
		1		i
0				i
				i
	<u>.</u>	i	· ·	i
		i	i	i
				i
	<u>.</u>	i	· ·	i
	<u>.</u>			i
	!	1		!
	!	1		i
		1		!
	!	1		!
		1		i
	<u>.</u>			i
		1		!
	!			!
	!	1		!
	1	!		1
	!	!		!
				!
9.	!			!
	!	· ·		!
	· · · · · · · · · · · · · · · · · · ·	:		:

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP10-60-161103 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682716 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016 09:55 by JD C. T. Male Associates

50 Century Hill Drive

Submitted: 11/05/2016 09:50 Latham NY 12110 Reported: 01/04/2017 14:13

08MM2 SDG#: MMK08-02

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	11997	Acetone	67-64-1	6	U	6	20	1
11997 Bromoform 75-27-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 5 1 1 11997 Carbon Tetrachloride 56-23-5 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothane 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethane 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1 11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1 11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	Cyclohexane		2	U	2		1
11997 1,2-Dichlorobenzene 106-93-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1		-			Ū			
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 1 1 1 1	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997 1,4-Dichlorobenzene 106-46-7 1	11997	•	95-50-1	1	Ū	1		1
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū			
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5		1
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		•		0.5	U			1
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 </td <td>11997</td> <td>•</td> <td>75-35-4</td> <td>0.5</td> <td>Ū</td> <td></td> <td></td> <td></td>	11997	•	75-35-4	0.5	Ū			
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebrahone 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Perexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1 <tr< td=""><td></td><td></td><td></td><td></td><td>U</td><td></td><td></td><td></td></tr<>					U			
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylcyclohexane 100-42-5 1 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 <td>11997</td> <td></td> <td>10061-01-5</td> <td>0.5</td> <td>U</td> <td></td> <td>1</td> <td>1</td>	11997		10061-01-5	0.5	U		1	1
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U		1	1
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū			1
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	2-Hexanone	591-78-6		U	3	10	1
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylche Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū			
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1				0.5	U			
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1			108-10-1	3	Ū	3		1
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1
				1	Ū			
11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	Ū	0.5	1	1
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1	11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1					U			
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1								
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1								
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1					U			1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP10-60-161103 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682716 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016 09:55 by JD C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/05/2016 09:50 Reported: 01/04/2017 14:13

08MM2 SDG#: MMK08-02

CAT No. Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles 11997 o-Xylene	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/1 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	3	Rev. 1.1	ng/l		ng/l	ng/l	
	modified	l					
10954	Perfluorooctanoic acid	335-67-1	76		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.9	J	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	15		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	13		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	7		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	3	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	7		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	4	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	9		0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluoro	octanesu	ulfonamidoa	acetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	SW-846 6010C	mg/l	mg/l	mg/l	
01750 Calcium	7440-70-2	15.0	0.0382	0.400	1
01757 Magnesium	7439-95-4	2.48	0.0190	0.200	1
01762 Potassium	7440-09-7	2.79	0.160	1.00	1
01767 Sodium	7440-23-5	47.9	0.173	2.00	1
Wet Chemistry	EPA 300.0	mg/l	mg/l	mg/l	
00224 Chloride	16887-00-6	85.9	20.0	40.0	100
00224 Chloride 00228 Sulfate	16887-00-6 14808-79-8	85.9 13.1	20.0 1.5	40.0 5.0	100 5

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP10-60-161103 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682716 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016 09:55 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/05/2016 09:50 Latham NY 12110

Reported: 01/04/2017 14:13

08MM2 SDG#: MMK08-02

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Ch	nemistry	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrat	e Nitrogen	n.a.	4.3	0.20	0.50	5
Wet Ch	nemistry	SM 2320 B-	1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	pH 4.5	n.a.	20.5	1.7	5.0	1
12149	Bicarbonate Alkalini	.ty	n.a.	20.5	1.7	5.0	1
12148	Carbonate Alkalinity	,	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
Habot acor y	Sambre	MIGTABLE	Kecora

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163161AA	11/11/2016	14:17	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163161AA	11/11/2016	14:17	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321007	11/23/2016	05:20	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321007	11/16/2016	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163120635002	11/10/2016	16:14	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163120635002	11/10/2016	16:14	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163120635002	11/10/2016	16:14	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163120635002	11/10/2016	16:14	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163120635002	11/09/2016	15:45	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16321120131A	11/16/2016	19:05	Hallie Burnett	100
00228	Sulfate	EPA 300.0	1	16321120131A	11/16/2016	18:51	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16319118101B	11/14/2016	15:23	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16319006204A	11/14/2016	23:18	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16319006204A	11/14/2016	23:18	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16319006204A	11/14/2016	23:18	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA SAMPLE NO.			
VOLATILE ORGANICS A				
TENTATIVELY IDENT	IFIED COMPOUNDS	: ! 08MM	12	! !
ab Name: Lancaster Laboratories	Contract:	!		!
ab Code: LANCAS Case No.:	SAS No.:	SDG No.:		_
Matrix: (soil/water) WATER	Lab Sample ID: 8683	2716		
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP099	15.i/16nov11a	.b/ln11s	s15.d
evel: (low/med) LOW	Date Received: 11/	05/16		
Moisture: not dec.	Date Analyzed: 11/2	11/16		
column: (pack/cap) CAP	Dilution Factor: 1	.0		
- · · · · · · · · · · · · · · · · · · ·	CONCENTRATION UN	ITS:		
Number TICs found: 0	(lig/L or lig/Kg) i	1a / T.		

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
	==!===================================	===!=====! !		! =====: ! U
	!	i i		!
3.	· ·			!
	· ·			!
	· ·			!
6.	· ·	!		!
7.	!	!		!
8	!!	!		!
9	!!	!		!
0	!!	!		!
1	!	!		!
2	!	!!	!	!
3	!	!		!
4	!!	!!		!
5	!!	!!		!
6	!!	!!		!
7	!	!!		!
8	!!	!!		!
9	!	!!		!
0	!	!!		!
1	!	!!		!
	!	!!		!
3	!	!!		!
4	!	!!		!
5	!	!!		!
	!	!!	l	!
7	!	!!		!
8	!	!!		!
	!	!!		!
0	!	!!		!
	1	!!!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LTB01-161103 Blank Water

SGPP - Merrimack

LL Sample # WW 8682717 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/05/2016 09:50 Reported: 01/04/2017 14:13

08MM3 SDG#: MMK08-03TB

Column C	CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
11997 Renzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997 Bromochloromethane	11997	Acetone	67-64-1	6	U	6	20	1
11997 Bromoform 75-27-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997 Rromoferm	11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997 Strommethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997 Z-Butanone	11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1
11997 Chlorobersene	11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997 Chlorochame	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997 Chloroform	11997	Chlorobenzene	108-90-7	0.5	U	0.5		
11997 Chloromethane	11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997 Cyclohexane	11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997 1,2-Dithromo-3-chloropropane	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	Cyclohexane	110-82-7	2	U	2	5	1
11997 1,2-Dibromoethane	11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997 1,2-Dichlorobenzene	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997 1,3-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997 1,4-Dichlorobenzene	11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997 Dichlorodifluoromethane	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997 1,1-Dichloroethane	11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997 1,2-Dichloroethane	11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997 trans-1,2-Dichloroethene	11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 1 1 1 1 1 1 1	11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997 2-Hexanone 591-78-6 3	11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997 Isopropylbenzene	11997	Freon 113	76-13-1	2	U	2	10	1
11997 Methyl Acetate 79-20-9 1 U 1 5 1 1 1 1 1 1 1 1	11997	2-Hexanone	591-78-6	3	U	3	10	1
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997 4-Methyl-2-pentanone	11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethane 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichloroebenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichloroebenzene 120-82-1 1 U 1 5 1 11997 1,1,2-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethane 79-01-6 0.5 U 0.5 1 1	11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethane 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 <tr< td=""><td>11997</td><td>4-Methyl-2-pentanone</td><td>108-10-1</td><td>3</td><td>U</td><td>3</td><td>10</td><td>1</td></tr<>	11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethane 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethane 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Styrene	100-42-5	1	U	1	5	1
11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1			120-82-1	1	U	1		
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1			71-55-6	0.5	U	0.5		
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1			79-01-6	0.5	U		1	
					U			
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1	11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
	11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LTB01-161103 Blank Water

SGPP - Merrimack

LL Sample # WW 8682717 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/05/2016 09:50 Reported: 01/04/2017 14:13

08MM3 SDG#: MMK08-03TB

CAT No.	Analysis Name		CAS Number	Result	=	Method Detection Limit*	Limit of Quantitation	Dilution Factor
•	Volatiles o-Xylene	SW-846	8260C 95-47-6	ug/l 0.5	U	ug/l 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l		
	modified	<u>[</u>						
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1	
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1	
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1	
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1	
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1	
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1	
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1	
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1	
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1	
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1	
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1	
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1	
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1	
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1	
10954	NETFOSAA	2991-50-6	1	U	1	3	1	
	NEtFOSAA is the acronym for N-	ethyl perfluorod	ctanesu	lfonamido	acetic Acid.			
10954	NMeFOSAA	2355-31-9	1	U	1	3	1	
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.							

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163161AA	11/11/2016	09:54	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163161AA	11/11/2016	09:54	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321007	11/23/2016	05:41	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321007	11/16/2016	14:30	Devon M Whooley	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA SAMPLE NO.		
VOLATILE ORGANICS A			
TENTATIVELY IDENT	IFIED COMPOUNDS	!	!
		! 08MM3	!
ab Name: Lancaster Laboratories	Contract:	!	!
ab Code: LANCAS Case No.:	SAS No.:	SDG No.:	_
Matrix: (soil/water) WATER	Lab Sample ID: 868	2717	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP099	15.i/16nov11a.b/ln11	s03.d
evel: (low/med) LOW	Date Received: 11/	05/16	
Moisture: not dec.	Date Analyzed: 11/	11/16	
clumn: (pack/cap) CAP	Dilution Factor: 1	. 0	
	CONCENTRATION UN	ITS:	
Number TICs found: 0	(ua/I or ua/Ka)	ug /T.	

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
	==!===================================	!		!===== ! U
2.	!	!	!	!
	!			!
		!		!
i	!	!	!	!
5	!	!	!	!
·	!	!	!	!
3	!	!	!	!
		!!	!	!
)	!	!	!	!
· ·	!	!	<u> </u>	!
2	!	!		!
8	!	!	<u> </u>	!
! .	<u>!</u>	!	!	!
·	<u>!</u>	!	!	!
5	!	!		!
·	!	!!	!	!
	!	!!	!	!
	!	!:	!	!
)		!	! <u></u>	!
	!	!:	!	!
	!	!	! <u></u>	!
	!	!		!
	!	!	! <u></u>	!
	!	!		!
	!	!		!
	!	!	!	!
3	!	!	!	!
•	_!	!	!	!
٠	!	!!		!
	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-FTB01-161103 Blank Water

SGPP - Merrimack

LL Sample # WW 8682718 LL Group # 1729841

Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016 10:15

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 11/05/2016 09:50

Reported: 01/04/2017 14:13

08MM4 SDG#: MMK08-04TB

CAT No.	Analysis Name	CAS Number	Resul	.t	Method Detection Limit [*]	Limit of Quantitation	Dilution Factor		
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l			
	modified	,							
10954	Perfluorooctanoic acid	335-67-1	0.9	J	0.5	2	1		
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1		
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1		
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1		
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1		
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1		
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1		
10954	Perfluorohexanoic acid	307-24-4	3		0.5	2	1		
10954	Perfluoroheptanoic acid	375-85-9	1	J	0.5	2	1		
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1		
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1		
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1		
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1		
10954	Perfluoropentanoic Acid	2706-90-3	0.6	J	0.5	2	1		
10954	NETFOSAA	2991-50-6	1	U	1	3	1		
	NEtFOSAA is the acronym for N-	ethyl perfluoroc	ctanesu	lfonamid	oacetic Acid.				
10954	NMeFOSAA	2355-31-9	1	U	1	3	1		
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.								

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Target analytes were detected in this trip blank. The following corrective action was taken: the sample was re-extracted outside of the required holding time and a reportable hit was detected for PFOA. The data is reported from the initial in-hold extraction of the sample. Both sets of data are available in the data package.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321007	11/23/2016	06:02	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16321007	11/16/2016	14:30	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP10-70-161103 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682719 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016 12:05 by JD C. T. Male Associates

50 Century Hill Drive

Submitted: 11/05/2016 09:50 Latham NY 12110

Reported: 01/04/2017 14:13

08MM5 SDG#: MMK08-05

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	Ū	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	ττ	0.5	1	1
11997	1,2-Dibromoethane 1,2-Dichlorobenzene	95-50-1	0.5 1	U	1	5	1
11997	•		1	ττ	1	5 5	1
	1,3-Dichlorobenzene	541-73-1		-			
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U 	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ū	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	Ū	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ū	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	IJ	0.5	1	1
		1,,001 20 1	٠.٥		<u> </u>		

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP10-70-161103 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682719 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016 12:05 by JD C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 11/05/2016 09:50 Reported: 01/04/2017 14:13

08MM5 SDG#: MMK08-05

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles o-Xylene	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/1 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined

Misc.	Organics EPA 537 Re	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	130		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	1	J	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.7	J	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	20		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	16		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	7		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	4		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	10		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	6	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	12		0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	hyl perfluorood	ctanesu:	lfonamidoacetic	Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	SW-846 6010C	mg/l	mg/l	mg/l	
01750 Calcium	7440-70-2	16.4	0.0382	0.400	1
01757 Magnesium	7439-95-4	2.71	0.0190	0.200	1
01762 Potassium	7440-09-7	3.27	0.160	1.00	1
01767 Sodium	7440-23-5	66.8	0.173	2.00	1
Wat Ohamiatur	EPA 300.0	mg/l	mg/l	mg/l	
Wet Chemistry	EPA 300.0	mg/ i	g/ =	5/ -	
00224 Chloride	16887-00-6	116	20.0	40.0	100
-		_	_	=	100 5

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP10-70-161103 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682719 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016 12:05 by JD

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 11/05/2016 09:50

Reported: 01/04/2017 14:13

08MM5 SDG#: MMK08-05

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Ch	nemistry	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitra	e Nitrogen	n.a.	4.9	0.20	0.50	5
Wet Ch	nemistry	SM 2320 B-	1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	pH 4.5	n.a.	23.1	1.7	5.0	1
12149	Bicarbonate Alkalin	ty	n.a.	23.1	1.7	5.0	1
12148	Carbonate Alkalinity	7	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163161AA	11/11/2016	14:39	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163161AA	11/11/2016	14:39	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321007	11/23/2016	06:22	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321007	11/16/2016	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163120635002	11/10/2016	16:17	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163120635002	11/10/2016	16:17	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163120635002	11/10/2016	16:17	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163120635002	11/10/2016	16:17	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163120635002	11/09/2016	15:45	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16321120131A	11/16/2016	19:32	Hallie Burnett	100
00228	Sulfate	EPA 300.0	1	16321120131A	11/16/2016	19:18	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16321118102A	11/16/2016	06:43	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16319006204A	11/14/2016	23:51	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16319006204A	11/14/2016	23:51	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16319006204A	11/14/2016	23:51	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE	NO.
VOLATILE ORGANICS	ANALYSIS DATA SHEET		
TENTATIVELY IDEN	TIFIED COMPOUNDS	!	!
		! 08MM5	!
Lab Name: Lancaster Laboratories	Contract:	!	!
Lab Code: LANCAS Case No.:_	SAS No.:	SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8682719		
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09915.i	/16nov11a.b	/ln11s16.d
Level: (low/med) LOW	Date Received: 11/05/1	.6	
Moisture: not dec.	Date Analyzed: 11/11/1	.6	
Column: (pack/cap) CAP	Dilution Factor: 1.0		
	CONCENTRATION UNITS:		
Number TICs found: 0	(ug/L or ug/Kg) ug/L	ı	

CAS NUMBER	! COMPOUND NAME		EST. CONC.	~
	!Total VOC TICs	!		:===== ! U
2	_!	!!	!	!
3	!	!		!
4	1	!		!
5	!	!		!
6	!	!		!
7	!	!		!
8	!	!		!
9	!	!		!
	!	!		!
1	!	!		!
2	!	!		!
3	!	!		!
	!	!		!
	!	!		!
	!	!		!
7	!	!		!
8	!	!		!
.9	!	!		!
0	!	!		!
1	!	!		!
	!	!		!
3	_!	!		!
	!	!		!
	!	!		!
6	!	!		!
7	!	!		!
	!	!		!
	!	!	l	!
0	!	!		!
	!	!	l	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP10-80-161103 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682720 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016 14:20 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/05/2016 09:50

Reported: 01/04/2017 14:13

08MM6 SDG#: MMK08-06

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	Ū	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	Ū	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	Ū	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	IJ	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	IJ	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	IJ	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	IJ	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	10001-02-0	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	tī	2	10	1
11997	2-Hexanone	591-78-6	3	tī	3	10	1
11997	Isopropylbenzene	98-82-8	1	II O	1	5	1
11997	Methyl Acetate	79-20-9	1	tī	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	tī	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	IJ	3	10	1
11997	Methylcyclohexane	108-87-2	1	TT	1	5	1
11997	Methylene Chloride	75-09-2	2	τι	2	4	1
11997	Styrene Chioride	100-42-5	1	IJ	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	tī	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	Ū	0.5	1	1
11997	Toluene	108-88-3	0.5	Ū	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	τι	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	ττ	0.5	1	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	ττ	0.5	1	1
11997	Trichloroethene	79-00-5 79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	79-01-6 75-69-4	0.5	Ū	0.5	1	1
11997	Vinyl Chloride	75-69-4 75-01-4	0.5	ττ	0.5	1	1
11997	-	179601-23-1	0.5	U	0.5	1	1
1199/	m+p-Xylene	1/9001-23-1	0.5	U	0.5	T	Δ.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP10-80-161103 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682720 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016 14:20 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/05/2016 09:50 Reported: 01/04/2017 14:13

08MM6 SDG#: MMK08-06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
	Volatiles	SW-846 8260C	ug/l	ug/l	ug/l	
11997	o-Xylene	95-47-6	0.5 U	0.5	1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form

Misc.	Organics EPA 537 Re	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	110		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	1	J	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.7	J	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	21		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	20		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	7		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	4		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	11		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	6	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	12		0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	hyl perfluorood	ctanesul	lfonamidoacetic	Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	SW-846 6010C	mg/l	mg/l	mg/l	
01750 Calcium	7440-70-2	16.1	0.0382	0.400	1
01757 Magnesium	7439-95-4	2.84	0.0190	0.200	1
01762 Potassium	7440-09-7	3.39	0.160	1.00	1
01767 Sodium	7440-23-5	77.2	0.173	2.00	1
Wet Chemistry	EPA 300.0	mg/l	mg/l	mg/l	
Wet Chemistry 00224 Chloride	EPA 300.0 16887-00-6	mg/l 125	mg/l 20.0	mg/l 40.0	100
-		_	_	=	100 5

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP10-80-161103 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682720 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016 14:20 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/05/2016 09:50

Reported: 01/04/2017 14:13

08MM6 SDG#: MMK08-06

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Ch	nemistry	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrat	te Nitrogen	n.a.	4.8	0.20	0.50	5
Wet Ch	nemistry	SM 2320 B-	1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	pH 4.5	n.a.	23.1	1.7	5.0	1
12149	Bicarbonate Alkalin:	ity	n.a.	23.1	1.7	5.0	1
12148	Carbonate Alkalinity	Y	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163161AA	11/11/2016	15:01	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163161AA	11/11/2016	15:01	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321007	11/23/2016	06:43	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321007	11/16/2016	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163120635002	11/10/2016	16:20	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163120635002	11/10/2016	16:20	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163120635002	11/10/2016	16:20	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163120635002	11/10/2016	16:20	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163120635002	11/09/2016	15:45	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16321120131A	11/16/2016	19:59	Hallie Burnett	100
00228	Sulfate	EPA 300.0	1	16321120131A	11/16/2016	19:45	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16319118101B	11/14/2016	15:24	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16319006204B	11/14/2016	22:08	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16319006204B	11/14/2016	22:08	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16319006204B	11/14/2016	22:08	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.
VOLATILE ORGANICS AND	ALYSIS DATA SHEET	
TENTATIVELY IDENTI	FIED COMPOUNDS	!!!
		! 08MM6 !
Lab Name: Lancaster Laboratories	Contract:	!
Lab Code: LANCAS Case No.:	SAS No.:	SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID: 868	2720
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP099	15.i/16nov11a.b/ln11s17.d
Level: (low/med) LOW	Date Received: 11/	05/16
Moisture: not dec.	Date Analyzed: 11/	11/16
Column: (pack/cap) CAP	Dilution Factor: 1	0
	CONCENTRATION UN	IITS:
Number TICs found: 0	(ug/L or ug/Kg)	ug/L

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
	!Total VOC TICs	:: !		: ! U
	_!	i	•	!
	· ·			!
	į			!
	<u> </u>			!
6	!	!!		!
7.	!	!!		!
	!	!		!
9	!	!!		!
.0.	!	!		!
1	!	!!		!
	!	!!		!
.3	!	!!		!
4	!	!!		!
	!	!!		!
	!	!!		!
7	!	!!		!
.8	!	!!		!
.9	!	!!		!
	!	!!		!
1	!	!!		!
2	!	!!		!
3	!	!!		!
4	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
0	!	!!		!
	!	!!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP10-84.5-161103 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682721 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016 16:35 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/05/2016 09:50 Latham NY 12110

Reported: 01/04/2017 14:13

08MM7 SDG#: MMK08-07

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 11997 Carbon Tetrachloride 56-23-5 0.5 U 0.5 1 1 1 1 11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 1 11997 Chlorobenzene 75-00-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP10-84.5-161103 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682721 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016 16:35 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/05/2016 09:50 Latham NY 12110

Reported: 01/04/2017 14:13

08MM7 SDG#: MMK08-07

CAT No. Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles 11997 o-Xylene	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/1 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	110		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	1	J	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.6	J	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	19		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	18		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	6		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	3		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	10		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	5	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	11		0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-	ethyl perfluorod	octanesi	ılfonamido	acetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	SW-846 6010C	mg/l	mg/l	mg/l	
01750 Calcium	7440-70-2	14.5	0.0382	0.400	1
01757 Magnesium	7439-95-4	2.65	0.0190	0.200	1
01762 Potassium	7440-09-7	3.56	0.160	1.00	1
01767 Sodium	7440-23-5	77.2	0.173	2.00	1
Wet Chemistry	EPA 300.0	mg/l	mg/l	mg/l	
Wet Chemistry 00224 Chloride	EPA 300.0 16887-00-6	mg/l 128	mg/l 20.0	mg/l 40.0	100
-		=	=	=	100 5

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP10-84.5-161103 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682721 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/03/2016 16:35 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/05/2016 09:50 Latham NY 12110

Reported: 01/04/2017 14:13

08MM7 SDG#: MMK08-07

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Ch	nemistry	EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrat	e Nitrogen	n.a.	4.4	0.20	0.50	5
Wet Ch	nemistry	SM 2320 B-	1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	pH 4.5	n.a.	21.8	1.7	5.0	1
12149	Bicarbonate Alkalini	ty	n.a.	21.8	1.7	5.0	1
12148	Carbonate Alkalinity	7	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163161AA	11/11/2016	15:23	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163161AA	11/11/2016	15:23	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321007	11/23/2016	07:03	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321007	11/16/2016	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163120635002	11/10/2016	16:24	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163120635002	11/10/2016	16:24	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163120635002	11/10/2016	16:24	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163120635002	11/10/2016	16:24	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163120635002	11/09/2016	15:45	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16321120131A	11/16/2016	20:26	Hallie Burnett	100
00228	Sulfate	EPA 300.0	1	16321120131A	11/16/2016	20:12	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16319118101B	11/14/2016	15:26	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16319006204A	11/14/2016	22:54	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16319006204A	11/14/2016	22:54	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16319006204A	11/14/2016	22:54	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE NO.	
VOLATILE ORGANICS ANAL	YSIS DATA SHEET			
TENTATIVELY IDENTIFI	ED COMPOUNDS	!	!	
		!	08MM7 !	
Lab Name: Lancaster Laboratories	Contract:	!	!	
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8682721			
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09915.i	/16n	ov11a.b/ln11s18.d	
Level: (low/med) LOW	Date Received: 11/05/1	5		
Moisture: not dec.	Date Analyzed: 11/11/1	5		
Column: (pack/cap) CAP	Dilution Factor: 1.0			
	CONCENTRATION UNITS:			
Number TICs found: 0	(ug/L or ug/Kg) ug/L			

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
	==!===================================	!		!===== ! U
2.	!	!	!	!
	!			!
		!		!
i	!	!	!	!
5	!	!	!	!
·	!	!	!	!
3	!	!	!	!
		!!	!	!
)	!	!	!	!
· ·	!	!		!
2	!	!		!
8	!	!		!
! .	<u>!</u>	!	!	!
·	<u>!</u>	!	!	!
5	!	!		!
·	!	!!	!	!
	!	!!	!	!
	!	!:	!	!
)		!	! <u></u>	!
	!	!:	!	!
	!	!	! <u></u>	!
	!	!		!
	!	!	! <u></u>	!
	!	!		!
	!	!		!
	!	!	!	!
3	!	!	!	!
•	_!	!	!	!
٠	!	!		!
	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-28-161104 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682722 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/04/2016 09:50 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/05/2016 09:50 Latham NY 12110

Reported: 01/04/2017 14:13

08MM8 SDG#: MMK08-08BKG

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	Li	Received mit of mantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug	r/l	
11997	Acetone	67-64-1	6	U	6	20)	1
11997	Benzene	71-43-2	0.5	IJ	0.5	1		1
11997	Bromochloromethane	74-97-5	1	IJ	1	5		1
11997	Bromodichloromethane	75-27-4	0.5	IJ	0.5	1		1
11997	Bromoform	75-25-2	0.5	U	0.5	4		1
11997	Bromomethane	74-83-9	0.5	U	0.5	1		1
11997	2-Butanone	78-93-3	3	IJ	3	10)	1
11997	Carbon Disulfide	75-15-0	1	U	1	5		1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1		1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1		1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1		1
11997	Chloroform	67-66-3	0.5	U	0.5	1		1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1		1
11997	Cyclohexane	110-82-7	2	IJ	2	5		1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5		1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5	1		1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5	1		1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5		1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1	5		1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1	5		1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5	1		1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5	1		1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1		1
11997	,	75-35-4	0.5	Ū	0.5	1		1
11997	1,1-Dichloroethene		0.5	Ū	0.5	1		1
	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1		1
11997	trans-1,2-Dichloroethene	156-60-5		IJ		1		
11997	1,2-Dichloropropane	78-87-5	0.5	-	0.5	_		1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1		1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1		1
11997	Ethylbenzene	100-41-4	0.5	U 	0.5	1		1
11997	Freon 113	76-13-1	2	U 	2	10		1
11997	2-Hexanone	591-78-6	3	U 	3	10)	1
11997	Isopropylbenzene	98-82-8	1	Ū	1	5		1
11997	Methyl Acetate	79-20-9	1	U	1	5		1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1		1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10)	1
11997	Methylcyclohexane	108-87-2	1	U	1	5		1
11997	Methylene Chloride	75-09-2	2	U	2	4		1
11997	Styrene	100-42-5	1	U	1	5		1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1		1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1		1
11997	Toluene	108-88-3	0.5	U	0.5	1		1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5		1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5		1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1		1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1		1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1		1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1		1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1		1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1		1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-28-161104 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682722 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/04/2016 09:50 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/05/2016 09:50 Latham NY 12110

Reported: 01/04/2017 14:13

08MM8 SDG#: MMK08-08BKG

CAT No.	Analysis Name		CAS Number	As Re Resul	eceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8	260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library S	Search						
	The results from FORM 1 - VOA-TIC on the back of t	C. The qualifie	-					
Misc.	Organics	EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoi	c acid	335-67-1	150		0.5	2	1
10954	Perfluorononanoi	c acid	375-95-1	1	J	0.6	2	1
10954	Perfluorodecanoi	c acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecan	noic acid	2058-94-8	1	Ū	1	3	1
10954	Perfluorododecan	noic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotrideca	anoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetrade	ecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoi	c acid	307-24-4	20		0.5	2	1
10954	Perfluoroheptano	oic acid	375-85-9	17		0.5	2	1
10954	Perfluorobutanes	sulfonate	375-73-5	7		0.7	2	1
10954	Perfluorohexanes	sulfonate	355-46-4	4		1	3	1
10954	Perfluoro-octane	esulfonate	1763-23-1	11		2	6	1
10954	Perfluorobutanoi	c Acid	375-22-4	6	J	3	10	1
10954	Perfluoropentano	oic Acid	2706-90-3	13		0.5	2	1
10954	NEtFOSAA		2991-50-6	1	U	1	3	1
	NEtFOSAA is the	acronym for N-6	ethyl perfluoro	octanesu	lfonamidoace	etic Acid.		
10954	NMeFOSAA		2355-31-9	1	U	1	3	1
	NMeFOSAA is the	acronym for N-r	methyl perfluor	octanes	ulfonamidoad	etic Acid.		
	stated QC limits be obtained to ca			eient da	ta points			
Metals	5	SW-846 6	010C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	15.8		0.0382	0.400	1
01757	Magnesium		7439-95-4	2.77		0.0190	0.200	1
01762	Potassium		7440-09-7	2.74		0.160	1.00	1
01767	Sodium		7440-23-5	62.6		0.173	2.00	1
Wet Ch	nemistry	EPA 300.	0	mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	104		4.0	8.0	20
00228	Sulfate		14808-79-8	14.2		1.5	5.0	5
		EPA 353.	2	mg/l		mg/l	mg/l	
07882	Total Nitrite/Ni		n.a.	5.1		0.20	0.50	5
		SM 2320	B-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity		n.a.	27.5		1.7	5.0	1
12149	Bicarbonate Alka		n.a.	27.5		1.7	5.0	1
12149	Carbonate Alkali	-	n.a.	1.7	U	1.7	5.0	1
12110	Carponace Mindil	C Y	π.α.	± • /	U	± • /	5.0	±

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-28-161104 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682722 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/04/2016 09:50 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/05/2016 09:50 Latham NY 12110

Reported: 01/04/2017 14:13

08MM8 SDG#: MMK08-08BKG

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163161AA	11/11/2016	10:38	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163161AA	11/11/2016	10:38	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321007	11/23/2016	02:57	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321007	11/16/2016	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163120635002	11/10/2016	15:24	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163120635002	11/10/2016	15:24	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163120635002	11/10/2016	15:24	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163120635002	11/10/2016	15:24	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163120635002	11/09/2016	15:45	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16321120131A	11/16/2016	16:22	Hallie Burnett	20
00228	Sulfate	EPA 300.0	1	16321120131A	11/16/2016	16:09	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16319118101B	11/14/2016	15:16	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16319006204A	11/14/2016	21:43	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16319006204A	11/14/2016	21:43	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16319006204A	11/14/2016	21:43	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.
VOLATILE ORGANICS A		
TENTATIVELY IDENT	!!!	
		! 08MM8 !
Lab Name: Lancaster Laboratories	Contract:	!
Lab Code: LANCAS Case No.:	SAS No.:	SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID: 868	2722
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP099	15.i/16nov11a.b/ln11s05.d
Level: (low/med) LOW	Date Received: 11/	05/16
Moisture: not dec.	Date Analyzed: 11/	11/16
Column: (pack/cap) CAP	Dilution Factor: 1	.0
	CONCENTRATION UN	ITS:
Number TICs found: 0	(ug/L or ug/Kg)	ug/L

! ! CAS NUMBER	! ! COMPOUND NAME ==!==================================	! ! RT	! ! EST. CONC.	~
!=======! ! 1. VOCTIC	==:===================================	: !	•	!====== ! U
. 2	!	!	!	!
! 3	!!	!	!	!
		!	!	!
	!	!	!	!
	_!	!	!	!
	_!	!	!	!
	!	!	!	!
	<u></u> !	!	!	!
			!	!
		:	!	!
			!	<u>;</u>
14.		<u>-</u> i	!	:
	i	;	·	<u>;</u>
		:	·	i
		;	!	i
			 !	!
	<u> </u>	i	 !	i ———
20			!	!
21		!	!	!
22	!		!	!
23	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!		!	!
	!	!	!	!
30	_!	!	!	!
page 1 of 1	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-28-161104 MS Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682723 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/04/2016 09:50 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/05/2016 09:50 Latham NY 12110

Reported: 01/04/2017 14:13

08MM8 SDG#: MMK08-08MS

GC/MS Volatiles SW-846 8260C ug/l ug/l ug/l ug/l	
11997 Acetone 67-64-1 140 6 20	1
11997 Benzene 71-43-2 20 0.5 1	1
11997 Bromochloromethane 74-97-5 22 1 5	1
11997 Bromodichloromethane 75-27-4 19 0.5 1	1
11997 Bromoform 75-25-2 16 0.5 4	1
11997 Bromomethane 74-83-9 20 0.5 1	1
11997 2-Butanone 78-93-3 140 3 10	1
11997 Carbon Disulfide 75-15-0 20 1 5	1
11997 Carbon Tetrachloride 56-23-5 23 0.5 1	1
11997 Chlorobenzene 108-90-7 19 0.5 1	1
11997 Chloroethane 75-00-3 19 0.5 1	1
11997 Chloroform 67-66-3 21 0.5 1	1
11997 Chloromethane 74-87-3 18 0.5 1	1
11997 Cyclohexane 110-82-7 22 2 5	1
11997 1,2-Dibromo-3-chloropropane 96-12-8 16 2 5	1
11997 Dibromochloromethane 124-48-1 18 0.5 1	1
11997 1,2-Dibromoethane 106-93-4 19 0.5 1	1
11997 1,2-Dichlorobenzene 95-50-1 19 1 5	1
11997 1,3-Dichlorobenzene 541-73-1 19 1 5	1
11997 1,4-Dichlorobenzene 106-46-7 19 1 5	1
11997 Dichlorodifluoromethane 75-71-8 21 0.5 1	1
11997 1,1-Dichloroethane 75-34-3 20 0.5 1	1
11997 1,2-Dichloroethane 107-06-2 21 0.5 1	1
11997 1,1-Dichloroethene 75-35-4 23 0.5 1	1
11997 cis-1,2-Dichloroethene 156-59-2 21 0.5 1	1
11997 trans-1,2-Dichloroethene 156-60-5 22 0.5 1	1
11997 1,2-Dichloropropane 78-87-5 19 0.5 1	1
11997 cis-1,3-Dichloropropene 10061-01-5 18 0.5 1	1
11997 trans-1,3-Dichloropropene 10061-02-6 17 0.5 1	1
11997 Ethylbenzene 100-41-4 19 0.5 1	1
11997 Freon 113 76-13-1 24 2 10	1
11997 2-Hexanone 591-78-6 78 3 10	1
11997 Isopropylbenzene 98-82-8 20 1 5	1
11997 Methyl Acetate 79-20-9 19 1 5	1
11997 Methyl Tertiary Butyl Ether 1634-04-4 20 0.5 1	1
11997 4-Methyl-2-pentanone 108-10-1 84 3 10	1
11997 Methylcyclohexane 108-87-2 24 1 5	1
11997 Methylene Chloride 75-09-2 21 2 4	1
11997 Styrene 100-42-5 19 1 5	1
11997 1,1,2,2-Tetrachloroethane 79-34-5 17 0.5 1	1
11997 Tetrachloroethene 127-18-4 21 0.5 1	1
11997 Toluene 108-88-3 20 0.5 1	1
11997 1,2,3-Trichlorobenzene 87-61-6 18 1 5	1
11997 1,2,4-Trichlorobenzene 120-82-1 18 1 5	1
11997 1,1,1-Trichloroethane 71-55-6 19 0.5 1	1
11997 1,1,2-Trichloroethane 79-00-5 18 0.5 1	1
11997 Trichloroethene 79-01-6 21 0.5 1	1
11997 Trichlorofluoromethane 75-69-4 25 0.5 1	1
11997 Vinyl Chloride 75-01-4 20 0.5 1	1
11997 m+p-Xylene 179601-23-1 39 0.5 1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-28-161104 MS Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682723 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/04/2016 09:50 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/05/2016 09:50 Latham NY 12110

Reported: 01/04/2017 14:13

08MM8 SDG#: MMK08-08MS

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	19	0.5	1	1
Misc.	Organics	EPA 537 R	ev. 1.1	ng/l	ng/l	ng/l	
		modified					
10954	Perfluorooctanoic a	.cid	335-67-1	330	0.5	2	1
10954	Perfluorononanoic a	.cid	375-95-1	220	0.6	2	1
10954	Perfluorodecanoic a	.cid	335-76-2	170	0.5	2	1
10954	Perfluoroundecanoic	acid	2058-94-8	210	1	3	1
10954	Perfluorododecanoic	acid	307-55-1	190	0.5	2	1
10954	Perfluorotridecanoi	c acid	72629-94-8	190	0.5	2	1
10954	Perfluorotetradecan	oic acid	376-06-7	190	0.5	2	1
10954	Perfluorohexanoic a	.cid	307-24-4	210	0.5	2	1
10954	Perfluoroheptanoic	acid	375-85-9	230	0.5	2	1
10954	Perfluorobutanesulf	onate	375-73-5	180	0.7	2	1
10954	Perfluorohexanesulf	onate	355-46-4	180	1	3	1
10954	Perfluoro-octanesul	fonate	1763-23-1	170	2	6	1
10954	Perfluorobutanoic A	cid	375-22-4	190	3	10	1
10954	Perfluoropentanoic	Acid	2706-90-3	210	0.5	2	1
10954	NETFOSAA		2991-50-6	170	1	3	1
		onym for N-et		ctanesulfonamidoaceti	lc Acid.		
10954	NMeFOSAA		2355-31-9	160	1	3	1

NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	5	SW-846 603	LOC	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	20.0	0.0382	0.400	1
01757	Magnesium		7439-95-4	4.74	0.0190	0.200	1
01762	Potassium		7440-09-7	12.5	0.160	1.00	1
01767	Sodium		7440-23-5	73.8	0.173	2.00	1
Wet Cl	nemistry	EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride		16887-00-6	181	8.0	16.0	40
00228	Sulfate		14808-79-8	63.2	3.0	10.0	10
		EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrat	te Nitrogen	n.a.	10.4	0.20	0.50	5
		SM 2320 B	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	pH 4.5	n.a.	198	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-28-161104 MS Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682723 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/04/2016 09:50 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/05/2016 09:50 Latham NY 12110

Reported: 01/04/2017 14:13

08MM8 SDG#: MMK08-08MS

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163161AA	11/11/2016	10:59	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163161AA	11/11/2016	10:59	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321007	11/23/2016	03:17	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321007	11/16/2016	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163120635002	11/10/2016	15:34	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163120635002	11/10/2016	15:34	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163120635002	11/10/2016	15:34	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163120635002	11/10/2016	15:34	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163120635002	11/09/2016	15:45	JoElla L Rice	1
00224	Chloride	EPA 300.0	1	16321120131A	11/16/2016	17:43	Hallie Burnett	40
00228	Sulfate	EPA 300.0	1	16321120131A	11/16/2016	17:30	Hallie Burnett	10
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16319118101B	11/14/2016	15:17	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16319006204A	11/14/2016	21:55	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-28-161104 MSD Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682724 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/04/2016 09:50 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/05/2016 09:50 Latham NY 12110

Reported: 01/04/2017 14:13

08MM8 SDG#: MMK08-08MSD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l	ug/l	ug/l	
11997	Acetone	67-64-1	140	6	20	1
11997	Benzene	71-43-2	20	0.5	1	1
11997	Bromochloromethane	74-97-5	22	1	5	1
11997	Bromodichloromethane	75-27-4	19	0.5	1	1
11997	Bromoform	75-25-2	16	0.5	4	1
11997	Bromomethane	74-83-9	19	0.5	1	1
11997	2-Butanone	78-93-3	130	3	10	1
11997	Carbon Disulfide	75-15-0	20	1	5	1
11997	Carbon Tetrachloride	56-23-5	22	0.5	1	1
11997	Chlorobenzene	108-90-7	19	0.5	1	1
11997	Chloroethane	75-00-3	19	0.5	1	1
11997	Chloroform		21	0.5	1	1
11997	Chloromethane	67-66-3 74-87-3	18	0.5	1	1
11997		110-82-7	22	2	5	1
	Cyclohexane		16	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	18			
11997	Dibromochloromethane	124-48-1		0.5	1 1	1
11997	1,2-Dibromoethane	106-93-4	19 19	0.5	5	1 1
11997	1,2-Dichlorobenzene	95-50-1	19 19	1		
11997	1,3-Dichlorobenzene	541-73-1		1	5	1
11997	1,4-Dichlorobenzene	106-46-7	19	1	5	1
11997	Dichlorodifluoromethane	75-71-8	22	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	20	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	20	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	22	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	20	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	21	0.5	1	1
11997		78-87-5	19	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	18	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	18	0.5	1	1
11997	Ethylbenzene	100-41-4	19	0.5	1	1
11997	Freon 113	76-13-1	24	2	10	1
11997	2-Hexanone	591-78-6	78	3	10	1
11997	Isopropylbenzene	98-82-8	20	1	5	1
11997	Methyl Acetate	79-20-9	19	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	20	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	83	3	10	1
11997	Methylcyclohexane	108-87-2	24	1	5	1
11997	Methylene Chloride	75-09-2	20	2	4	1
11997	Styrene	100-42-5	19	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	17	0.5	1	1
11997	Tetrachloroethene	127-18-4	21	0.5	1	1
11997	Toluene	108-88-3	19	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	18	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	18	1	5	1
11997	• •	71-55-6	19	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	18	0.5	1	1
11997	Trichloroethene	79-01-6	20	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	25	0.5	1	1
11997	Vinyl Chloride	75-01-4	20	0.5	1	1
11997	m+p-Xylene	179601-23-1	39	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

Sample Description: SG2-AP09-28-161104 MSD Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682724 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/04/2016 09:50 by JD C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/05/2016 09:50 Reported: 01/04/2017 14:13

08MM8 SDG#: MMK08-08MSD

Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Volatiles	SW-846 82	60C	ug/l	ug/l	ug/l	
o-Xylene		95-47-6	19	0.5	1	1
Organics	EPA 537 R	ev. 1.1	ng/l	ng/l	ng/l	
	modified					
Perfluorooctanoic	acid	335-67-1	310	0.5	2	1
Perfluorononanoic	acid	375-95-1	190	0.6	2	1
Perfluorodecanoic	acid	335-76-2	170	0.5	2	1
Perfluoroundecanoi	c acid	2058-94-8	190	1	3	1
Perfluorododecanoi	c acid	307-55-1	180	0.5	2	1
Perfluorotridecano	ic acid	72629-94-8	180	0.5	2	1
Perfluorotetradeca:	noic acid	376-06-7	180	0.5	2	1
Perfluorohexanoic	acid	307-24-4	190	0.5	2	1
Perfluoroheptanoic	acid	375-85-9	210	0.5	2	1
Perfluorobutanesul	fonate	375-73-5	170	0.7	2	1
Perfluorohexanesul	fonate	355-46-4	190	1	3	1
Perfluoro-octanesu	lfonate	1763-23-1	180	2	6	1
Perfluorobutanoic	Acid	375-22-4	190	3	10	1
Perfluoropentanoic	Acid	2706-90-3	190	0.5		1
NEtFOSAA		2991-50-6	160	1	3	1
	ronym for N-et			etic Acid.		
NMeFOSAA		2355-31-9		1	3	1
	Volatiles o-Xylene Organics Perfluorooctanoic Perfluorononanoic Perfluorodecanoic Perfluorodecanoi Perfluorotridecanoi Perfluorotridecano Perfluorotetradeca Perfluorohexanoic Perfluorobutanesul Perfluorobutanesul Perfluoro-octanesu Perfluorooctanesu Perfluorobutanoic Perfluoropentanoic Perfluoropentanoic	Volatiles o-Xylene Organics EPA 537 R modified Perfluorooctanoic acid Perfluorononanoic acid Perfluorodecanoic acid Perfluorotridecanoic acid Perfluorotridecanoic acid Perfluorotetradecanoic acid Perfluorotetradecanoic acid Perfluorohexanoic acid Perfluorohexanoic acid Perfluorohexanoic acid Perfluorobetradecanoic acid	Volatiles o-Xylene 95-47-6 Organics EPA 537 Rev. 1.1 modified Perfluorooctanoic acid 335-67-1 Perfluorodecanoic acid 335-76-2 Perfluorodecanoic acid 2058-94-8 Perfluorododecanoic acid 307-55-1 Perfluorotridecanoic acid 307-55-1 Perfluorottradecanoic acid 72629-94-8 Perfluorotetradecanoic acid 376-06-7 Perfluorohexanoic acid 375-85-9 Perfluorohexanoic acid 375-85-9 Perfluorobutanesulfonate 375-73-5 Perfluorobexanesulfonate 375-73-1 Perfluorobutanesulfonate 375-22-4 Perfluoropentanoic Acid 375-22-4 Perfluoropentanoic Acid 2706-90-3 NETFOSAA 2991-50-6 NETFOSAA is the acronym for N-ethyl perfluoroco	Analysis Name CAS Number Result Volatiles SW-846 8260C ug/l o-Xylene 95-47-6 19 Organics EPA 537 Rev. 1.1 ng/l modified Perfluoroctanoic acid 335-67-1 310 Perfluorononanoic acid 375-95-1 190 Perfluorodecanoic acid 335-76-2 170 Perfluoroundecanoic acid 2058-94-8 190 Perfluorodecanoic acid 307-55-1 180 Perfluorotridecanoic acid 72629-94-8 180 Perfluorotetradecanoic acid 376-06-7 180 Perfluorohexanoic acid 307-24-4 190 Perfluorohexanoic acid 375-85-9 210 Perfluorobutanesulfonate 375-73-5 170 Perfluorohexanesulfonate 375-73-5 170 Perfluorobutanoic Acid 375-22-4 190 Perfluoropentanoic Acid 2706-90-3 190 NetFOSAA 2991-50-6 160 NMEFOSAA	Name Cas Number Result Method Detection Limit*	Analysis Name CAS Number Result Nolatiles SW-846 8260C ug/l ug/l ug/l ug/l ug/l ug/l ng/l NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid. The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Metals	5	SW-846 6	010C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	19.8	0.0382	0.400	1
01757	Magnesium		7439-95-4	4.70	0.0190	0.200	1
01762	Potassium		7440-09-7	12.4	0.160	1.00	1
01767	Sodium		7440-23-5	72.7	0.173	2.00	1
Wet Ch	nemistry	SM 2320 1	B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	рн 4.5	n.a.	200	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-28-161104 MSD Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682724 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/04/2016 09:50 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/05/2016 09:50 Latham NY 12110

Reported: 01/04/2017 14:13

08MM8 SDG#: MMK08-08MSD

Laboratory Sample Analysis Record

CAT	Analysis Name	Method	Trial#	Batch#	Analysis	Analyst	Dilution
No.	_				Date and Time	_	Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163161AA	11/11/2016 11:2	l Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163161AA	11/11/2016 11:2	l Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321007	11/23/2016 03:3	38 Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321007	11/16/2016 14:3	O Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163120635002	11/10/2016 15:3	37 Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163120635002	11/10/2016 15:3	37 Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163120635002	11/10/2016 15:3	37 Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163120635002	11/10/2016 15:3	37 Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163120635002	11/09/2016 15:4	5 JoElla L Rice	1
12150	Total Alkalinity to pH	SM 2320 B-1997	1	16319006204A	11/14/2016 22:0	2 Brandon P Costik	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-28-161104 Dupl Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8682725 LL Group # 1729841 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/04/2016 09:50 by JD C. T. Male Associates

50 Century Hill Drive

Submitted: 11/05/2016 09:50 Latham NY 12110

Reported: 01/04/2017 14:13

08MM8 SDG#: MMK08-08DUP

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metal	3	SW-846	6010C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	15.8	0.0382	0.400	1
01757	Magnesium		7439-95-4	2.78	0.0190	0.200	1
01762	Potassium		7440-09-7	2.78	0.160	1.00	1
01767	Sodium		7440-23-5	62.8	0.173	2.00	1
Wet Cl	nemistry	EPA 300	.0	mg/l	mg/l	mg/l	
00224	Chloride		16887-00-6	103	4.0	8.0	20
00228	Sulfate		14808-79-8	14.0	1.5	5.0	5
		EPA 353	.2	mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrat	e Nitroge	n n.a.	5.0	0.20	0.50	5
		SM 2320	B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	рн 4.5	n.a.	27.5	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
01750	Calcium	SW-846 6010C	1	163120635002	11/10/2016	15:31	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163120635002	11/10/2016	15:31	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163120635002	11/10/2016	15:31	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163120635002	11/10/2016	15:31	Suzanne M Will	1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	163120635002	11/09/2016	15:45	JoElla L Rice	1
	U4							
00224	Chloride	EPA 300.0	1	16321120131A	11/16/2016	17:16	Hallie Burnett	20
00228	Sulfate	EPA 300.0	1	16321120131A	11/16/2016	17:03	Hallie Burnett	5
07882	Total Nitrite/Nitrate	EPA 353.2	1	16319118101B	11/14/2016	15:19	Joseph E McKenzie	5
	Nitrogen							
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16319006204A	11/14/2016	21:49	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax; 717-656-2681 • www,LancasterLabs.com

Sample Description: SG2-APRB01-161104 Blank Water

SGPP - Merrimack

LL Sample # WW 8682726 LL Group # 1729841

Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/04/2016 07:40 by JD C. T. Male Associates

50 Century Hill Drive

Submitted: 11/05/2016 09:50 Latham NY 12110

Reported: 01/04/2017 14:13

08MM9 SDG#: MMK08-09RB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	3		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	2		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	1	J	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	2	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.7	J	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	hyl perfluoroo	ctanesu	lfonamidoaceti	c Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanes	ulfonamidoacet:	ic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample labeled compound(s) used as extraction standards is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was reextracted outside the holding time and comparable results were observed. The data is reported from the in-hold extraction. Both sets of data are included in the data package.

Target analytes were detected in this rinse blank. The following corrective action was taken: the sample was re-extracted outside of the required holding time and comparable hits were detected. The data is reported from the initial in-hold extraction of the sample. Both sets of data are available in the data package.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

		Laboratory Sample Analysis Record							
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor		
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321007	11/23/2016 07:24	Jason W Knight	1		
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16321007	11/16/2016 14:30	Devon M Whooley	1		

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729841

Reported: 01/04/2017 14:13

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Batch number: L163161AA	Sample	number	- (s): 868271	5-8682717,8682719-8682724
Acetone	6	U	6	20
Benzene	0.5	IJ	0.5	1
Bromochloromethane	1	Ū	1	5
Bromodichloromethane	0.5	Ū	0.5	1
Bromoform	0.5	Ū	0.5	4
Bromomethane	0.5	Ū	0.5	1
2-Butanone	3	Ū	3	10
Carbon Disulfide	1	Ū	1	5
Carbon Tetrachloride	0.5	U	0.5	1
Chlorobenzene	0.5	Ū	0.5	1
Chloroethane	0.5	U	0.5	1
Chloroform	0.5	U	0.5	1
Chloromethane	0.5	U	0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	U	2	5
Dibromochloromethane	0.5	U	0.5	1
1,2-Dibromoethane	0.5	U	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5
Dichlorodifluoromethane	0.5	IJ	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	Ū	0.5	1
trans-1,2-Dichloroethene	0.5	Ū	0.5	1
1,2-Dichloropropane	0.5	U	0.5	1
cis-1,3-Dichloropropene	0.5	Ū	0.5	1
trans-1,3-Dichloropropene	0.5	Ū	0.5	1
Ethylbenzene	0.5	Ū	0.5	1
Freon 113	2	Ū	2	10
2-Hexanone	3	Ū	3	10
Isopropylbenzene	1	Ū	1	5
Methyl Acetate	1	Ū	1	5
Methyl Tertiary Butyl Ether	0.5	Ū	0.5	1
4-Methyl-2-pentanone	3	Ū	3	10
Methylcyclohexane	1	Ū	1	5
Methylene Chloride	2	Ū	2	4
Styrene	1	Ū	1	5
1,1,2,2-Tetrachloroethane	0.5	Ū	0.5	1

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729841

Reported: 01/04/2017 14:13

Method Blank (continued)

Tetrachloroethene
Toluene 1,2,3-Trichlorobenzene 1 U 1 5 5 1 1,2,4-Trichlorobenzene 1 U 1 5 5 1,1,1-Trichloroethane 0.5 U 0.5 1 1,1,1-Trichloroethane 0.5 U 0.5 1 1,1,2-Trichloroethane 0.5 U 0.5 1 1 1,1,2-Trichloroethane 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1,2,3-Trichlorobenzene 1 U 1 5 1,2,4-Trichlorobenzene 1 U 1 5 1,1,1-Trichloroethane 0.5 U 0.5 1 1,1,2-Trichloroethane 0.5 U 0.5 1 Trichloroethene 0.5 U 0.5 1 Trichlorofluoromethane 0.5 U 0.5 1 Winyl Chloride 0.5 U 0.5 1 m-p-Xylene 0.5 U 0.5 1 o-Xylene 0.5 U 0.5 1 mp/l ng/l ng/l ng/l Batch number: 16321007 Sample number(s): 8682715-8682724,8682726 Perfluorocadaoic acid 0.5 U 0.5 2 Perfluorodecanoic acid 0.6 U 0.6 2 Perfluorodecanoic acid 0.5 U 0.5 2 Perfluoroteridecanoic acid 0.5 U 0.5 2 Perfluoroteradecanoic acid 0.5 U 0.5 2 Perfluorobexanoic acid 0.
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene
Trichlorofluoromethane Vinyl Chloride M+p-Xylene O.5 U O.5 1 M+p-Xylene O.5 U O.5 1 O-Xylene O.5 U O.5 2 O-Xylene O.5 U O.5 2 O-Xylene O.5 U O.5 2 O-Xylene O.5 U O.5 2 O-Xylene O.5 U O.5 2 O-Xylene O.5 U O.5 2 O-Xylene O.5 U O.5 2 O-Xylene O.5 U O.5 2 O-Xylene O.5 U O.5 2 O-Xylene O.5 U O.5 2 O-Xylene O.5 U O.5 2 O-Xylene O.5 U O.5 2 O-Xylene O.5 U O.5 2 O-Xylene O.5 U O.5 2 O-Xylene O-X
Vinyl Chloride 0.5 U 0.5 1 m+p-Xylene 0.5 U 0.5 1 o-Xylene 0.5 U 0.5 1 ng/l ng/l ng/l ng/l Batch number: 16321007 Sample number(s): 8682715-8682724,8682726 No.5 1 Perfluoroctanoic acid 0.5 U 0.5 2 Perfluoroonnanoic acid 0.5 U 0.5 2 Perfluorodecanoic acid 0.5 U 0.5 2 Perfluorodecanoic acid 0.5 U 0.5 2 Perfluorotetradecanoic acid 0.5 U 0.5 2 Perfluorotetradecanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluorohexanesulfonate 0.7 U 0.7 2 Perfluoro-octanesulfonate 1 U 1 3 <
m+p-Xylene 0.5 U 0.5 1 o-Xylene 0.5 U 0.5 1 ng/l ng/l ng/l Batch number: 16321007 Sample number(s): 8682715-8682724,8682726 Perfluoroctanoic acid 0.5 U 0.5 2 Perfluorononanoic acid 0.6 U 0.6 2 Perfluorodecanoic acid 0.5 U 0.5 2 Perfluoroddecanoic acid 0.5 U 0.5 2 Perfluoroddecanoic acid 0.5 U 0.5 2 Perfluoroddecanoic acid 0.5 U 0.5 2 Perfluorottridecanoic acid 0.5 U 0.5 2 Perfluorotetradecanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluorobetanesulfonate 0.7 U 0.7 2 Perfluoro-octanesulfonate 2 U 2 6 Perfluoropentanoic Acid
o-Xylene 0.5 U 0.5 1 ng/l ng/l ng/l Batch number: 16321007 Sample number(s): 8682715-8682724,8682726 Perfluoroctanoic acid 0.5 U 0.5 2 Perfluorononanoic acid 0.6 U 0.6 2 Perfluorodecanoic acid 0.5 U 0.5 2 Perfluorodecanoic acid 0.5 U 0.5 2 Perfluorotetradecanoic acid 0.5 U 0.5 2 Perfluorotetradecanoic acid 0.5 U 0.5 2 Perfluorohexanoic fonate 0.7 U 0.7 2 Perfluorobexanesulfonate 1 U 1 3 Perfluorobexanesul
ng/l ng/l ng/l Batch number: 16321007 Sample number(s): 8682715-8682724,8682726 Perfluoroctanoic acid 0.5 U 0.5 2 Perfluorononanoic acid 0.5 U 0.6 2 Perfluorodecanoic acid 0.5 U 0.5 2 Perfluorodecanoic acid 0.5 U 0.5 2 Perfluorodecanoic acid 0.5 U 0.5 2 Perfluorotridecanoic acid 0.5 U 0.5 2 Perfluorotetradecanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluorobutanesulfonate 0.7 U 0.7 2 Perfluoro-octanesulfonate 1 U 1 3 Perfluoropentanoic Acid 0.5 U 0.5 2 NETFOSAA 1 U 1 3 NMeFOSAA
Batch number: 16321007 Sample number(s): 8682715-8682724,8682726 Perfluorooctanoic acid 0.5 U 0.5 2 Perfluorononanoic acid 0.6 U 0.6 2 Perfluorodecanoic acid 0.5 U 0.5 2 Perfluorododecanoic acid 0.5 U 0.5 2 Perfluorotridecanoic acid 0.5 U 0.5 2 Perfluorotetradecanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluorobutanesulfonate 0.7 U 0.5 2 Perfluoro-octanesulfonate 1 U 1 3 Perfluoropentanoic Acid 3 U 3 10 Perfluoropentanoic Acid 0.5 U 0.5 2 NETFOSAA 1 U 1 3 NMeFOSAA 1 U 1 3
Perfluorooctanoic acid 0.5 U 0.5 2 Perfluorononanoic acid 0.6 U 0.6 2 Perfluorodecanoic acid 0.5 U 0.5 2 Perfluoroundecanoic acid 1 U 1 3 Perfluorodecanoic acid 0.5 U 0.5 2 Perfluorotetradecanoic acid 0.5 U 0.5 2 Perfluorotetradecanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluoroheytanoic acid 0.5 U 0.5 2 Perfluorobutanesulfonate 0.7 U 0.7 2 Perfluoro-octanesulfonate 1 U 1 3 Perfluoropentanoic Acid 3 U 3 10 Perfluoropentanoic Acid 0.5 U 0.5 2 NETFOSAA 1 U 1 3 NMeFOSAA 1 U 1 3 </th
Perfluorononanoic acid 0.6 U 0.6 2 Perfluorodecanoic acid 0.5 U 0.5 2 Perfluoroundecanoic acid 1 U 1 3 Perfluorodecanoic acid 0.5 U 0.5 2 Perfluorotetradecanoic acid 0.5 U 0.5 2 Perfluorotexanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluorobetanoic acid 0.5 U 0.5 2 Perfluorobutanesulfonate 0.7 U 0.7 2 Perfluoro-octanesulfonate 1 U 1 3 Perfluoropentanoic Acid 3 U 3 10 Perfluoropentanoic Acid 0.5 U 0.5 2 NETFOSAA 1 U 1 3 NMeFOSAA 1 U 1 3
Perfluorodecanoic acid 0.5 U 0.5 2 Perfluoroundecanoic acid 1 U 1 3 Perfluorododecanoic acid 0.5 U 0.5 2 Perfluorotridecanoic acid 0.5 U 0.5 2 Perfluorotetradecanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluorobutanesulfonate 0.7 U 0.7 2 Perfluoro-octanesulfonate 1 U 1 3 Perfluoropentanoic Acid 3 U 3 10 Perfluoropentanoic Acid 0.5 U 0.5 2 NEtFOSAA 1 U 1 3 NMeFOSAA 1 U 1 3
Perfluoroundecanoic acid 1 U 1 3 Perfluorododecanoic acid 0.5 U 0.5 2 Perfluorotridecanoic acid 0.5 U 0.5 2 Perfluorotetradecanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluorobutanesulfonate 0.7 U 0.7 2 Perfluoro-octanesulfonate 1 U 1 3 Perfluoropentanoic Acid 3 U 3 10 Perfluoropentanoic Acid 0.5 U 0.5 2 NETFOSAA 1 U 1 3 NMeFOSAA 1 U 1 3
Perfluorododecanoic acid 0.5 U 0.5 2 Perfluorotridecanoic acid 0.5 U 0.5 2 Perfluorotetradecanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluorobutanesulfonate 0.7 U 0.7 2 Perfluoro-octanesulfonate 1 U 1 3 Perfluorobutanoic Acid 3 U 3 10 Perfluoropentanoic Acid 0.5 U 0.5 2 NEtFOSAA 1 U 1 3 NMeFOSAA 1 U 1 3
Perfluorotridecanoic acid 0.5 U 0.5 2 Perfluorotetradecanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluorobutanesulfonate 0.7 U 0.7 2 Perfluoro-octanesulfonate 1 U 1 3 Perfluorobutanoic Acid 3 U 3 10 Perfluoropentanoic Acid 0.5 U 0.5 2 NEtFOSAA 1 U 1 3 NMeFOSAA 1 U 1 3
Perfluorotetradecanoic acid 0.5 U 0.5 2 Perfluorohexanoic acid 0.5 U 0.5 2 Perfluoroheptanoic acid 0.5 U 0.5 2 Perfluorohexanesulfonate 0.7 U 0.7 2 Perfluorohexanesulfonate 1 U 1 3 Perfluoro-octanesulfonate 2 U 2 6 Perfluorobutanoic Acid 3 U 3 10 Perfluoropentanoic Acid 0.5 U 0.5 2 NEtrosaa 1 U 1 3 NMeFosaa 1 U 1 3
Perfluorohexanoic acid 0.5 U 0.5 2 Perfluoroheptanoic acid 0.5 U 0.5 2 Perfluorobutanesulfonate 0.7 U 0.7 2 Perfluorohexanesulfonate 1 U 1 3 Perfluoro-octanesulfonate 2 U 2 6 Perfluorobutanoic Acid 3 U 3 10 Perfluoropentanoic Acid 0.5 U 0.5 2 NEtFOSAA 1 U 1 3 NMeFOSAA 1 U 1 3
Perfluoroheptanoic acid 0.5 U 0.5 2 Perfluorobutanesulfonate 0.7 U 0.7 2 Perfluorohexanesulfonate 1 U 1 3 Perfluoro-octanesulfonate 2 U 2 6 Perfluorobutanoic Acid 3 U 3 10 Perfluoropentanoic Acid 0.5 U 0.5 2 NEtFOSAA 1 U 1 3 NMeFOSAA 1 U 1 3
Perfluorobutanesulfonate 0.7 U 0.7 2 Perfluorohexanesulfonate 1 U 1 3 Perfluoro-octanesulfonate 2 U 2 6 Perfluorobutanoic Acid 3 U 3 10 Perfluoropentanoic Acid 0.5 U 0.5 2 NEtFOSAA 1 U 1 3 NMeFOSAA 1 U 1 3
Perfluorohexanesulfonate 1 U 1 3 Perfluoro-octanesulfonate 2 U 2 6 Perfluorobutanoic Acid 3 U 3 10 Perfluoropentanoic Acid 0.5 U 0.5 2 NETFOSAA 1 U 1 3 NMeFOSAA 1 U 1 3
Perfluoro-octanesulfonate 2 U 2 6 Perfluorobutanoic Acid 3 U 3 10 Perfluoropentanoic Acid 0.5 U 0.5 2 NEtFOSAA 1 U 1 3 NMeFOSAA 1 U 1 3
Perfluorobutanoic Acid 3 U 3 10 Perfluoropentanoic Acid 0.5 U 0.5 2 NEtFOSAA 1 U 1 3 NMeFOSAA 1 U 1 3
Perfluoropentanoic Acid 0.5 U 0.5 2 NEtFOSAA 1 U 1 3 NMeFOSAA 1 U 1 3
NETFOSAA 1 U 1 3 NMEFOSAA 1 U 1 3
NMeFosaa 1 U 1 3
mg/1 mg/1 mg/1
Batch number: 163120635002 Sample number(s): 8682715-8682716,8682719-8682725
Calcium 0.0382 U 0.0382 0.400
Magnesium 0.0190 U 0.0190 0.200
Potassium 0.160 U 0.160 1.00
Sodium 0.173 U 0.173 2.00
Batch number: 16319118101B Sample number(s): 8682715-8682716,8682720-8682723,8682725
Total Nitrite/Nitrate Nitrogen 0.040 U 0.040 0.10
Batch number: 16321118102A Sample number(s): 8682719
Total Nitrite/Nitrate Nitrogen 0.040 U 0.040 0.10
Batch number: 16321120131A Sample number(s): 8682715-8682716,8682719-8682723,8682725
Chloride 0.20 U 0.20 0.40

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729841

Reported: 01/04/2017 14:13

Method Blank (continued)

Analysis Name	Result	MDL**	LOQ
	mg/l as CaCO3	mg/l as	mg/l as CaCO3
Batch number: 16319006204A Total Alkalinity to pH 4.5	-		715-8682716,8682719,8682721-8682725 5.0
Batch number: 16319006204B Total Alkalinity to pH 4.5	Sample number	r(s): 86827	720 5.0

LCS/LCSD

Analysis Name	LCS Spike	LCS	LCSD Spike	LCSD	LCS	LCSD	LCS/LCSD	RPD	RPD
	Added ug/l	Conc	Added ug/l	Conc ug/l	%REC	%REC	Limits		Max
		ug/l		-					
Batch number: L163161AA	-		15-8682717,868	32719-8682					
Acetone	150	147.28			98		50-168		
Benzene	20	18.5			93		78-120		
Bromochloromethane	20	20.5			103		80-125		
Bromodichloromethane	20	18.53			93		80-120		
Bromoform	20	16.21			81		59-120		
Bromomethane	20	17.35			87		55-123		
2-Butanone	150	135.95			91		57-145		
Carbon Disulfide	20	17.42			87		58-120		
Carbon Tetrachloride	20	19.71			99		74-130		
Chlorobenzene	20	18.08			90		80-120		
Chloroethane	20	16.59			83		56-120		
Chloroform	20	19.21			96		80-120		
Chloromethane	20	15.69			78		59-127		
Cyclohexane	20	19.05			95		65-131		
1,2-Dibromo-3-chloropropane	20	15.65			78		59-120		
Dibromochloromethane	20	17.49			87		78-120		
1,2-Dibromoethane	20	18.51			93		80-120		
1,2-Dichlorobenzene	20	18.14			91		80-120		
1,3-Dichlorobenzene	20	18.06			90		80-120		
1,4-Dichlorobenzene	20	18.13			91		80-120		
Dichlorodifluoromethane	20	17.66			88		49-134		
1,1-Dichloroethane	20	18.52			93		80-120		
1,2-Dichloroethane	20	19.57			98		66-128		
1,1-Dichloroethene	20	19.41			97		76-124		
cis-1,2-Dichloroethene	20	18.98			95		80-120		
trans-1,2-Dichloroethene	20	19.26			96		80-120		
1,2-Dichloropropane	20	18.33			92		80-120		
cis-1,3-Dichloropropene	20	18.07			90		80-120		
trans-1,3-Dichloropropene	20	17.86			89		76-120		
Ethylbenzene	20	17.87			89		78-120		
Freon 113	20	20.52			103		64-136		
2-Hexanone	100	78.53			79		49-146		
Isopropylbenzene	20	18.18			91		80-120		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729841

Reported: 01/04/2017 14:13

LCS/LCSD (continued)

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Methyl Acetate	20	18.99			95		61-137		
Methyl Tertiary Butyl Ether	20	18.76			94		75-120		
4-Methyl-2-pentanone	100	83.28			83		55-141		
Methylcyclohexane	20	20.38			102		66-126		
Methylene Chloride	20	18.6			93		80-120		
Styrene	20	18.42			92		80-120		
1,1,2,2-Tetrachloroethane	20	16.52			83		72-120		
Tetrachloroethene	20	19.17			96		80-129		
Toluene	20	18.41			92		80-120		
1,2,3-Trichlorobenzene	20	16.71			84		69-120		
1,2,4-Trichlorobenzene	20	16.93			85		72-120		
1,1,1-Trichloroethane	20	16.52			83		66-126		
1,1,2-Trichloroethane	20	17.88			89		80-120		
Trichloroethene	20	18.64			93		80-120		
Trichlorofluoromethane	20	21.33			107		67-129		
Vinyl Chloride	20	16.63			83		63-121		
m+p-Xylene	40	36.52			91		80-120		
o-Xylene	20	17.69			88		80-120		
	ng/l	ng/l	ng/l	ng/l					
Batch number: 16321007	Sample numbe	er(s): 86827	715-8682724,86	82726					
Perfluorooctanoic acid	200	187.49			94		70-130		
Perfluorononanoic acid	200	185.54			93		70-130		
Perfluorodecanoic acid	200	175.82			88		70-130		
Perfluoroundecanoic acid	200	188.58			94		70-130		
Perfluorododecanoic acid	200	199.88			100		70-130		
Perfluorotridecanoic acid	200	196.07			98		70-130		
Perfluorotetradecanoic acid	200	183.75			92		70-130		
Perfluorohexanoic acid	200	184.13			92		70-130		
Perfluoroheptanoic acid	200	197.18			99		70-130		
Perfluorobutanesulfonate	176.8	163.66			93		70-130		
Perfluorohexanesulfonate	189.2	178.65			94		70-130		
Perfluoro-octanesulfonate	191.2	155.61			81		70-130		
Perfluorobutanoic Acid	200	185.03			93		70-130		
Perfluoropentanoic Acid	200	189.34			95		70-130		
NETFOSAA	200	153.75			77		70-130		
NMeFOSAA	200	145.49			73		70-130		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 163120635002	Sample numbe	er(s): 86827	715-8682716,86	82719-8682	2725				
Calcium	4.00	4.07			102		80-120		
Magnesium	2.00	2.05			103		80-120		
Potassium	10	10.07			101		80-120		
Sodium	10	10.03			100		80-120		
	mg/l	mg/l	mg/l	mg/l					
D-+-b 16310110101D	01	/> 0.000	715 0600716 06	.00700 060	2222 0602	705			

Batch number: 16319118101B Sampl

Sample number(s): 8682715-8682716,8682720-8682723,8682725

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729841

Reported: 01/04/2017 14:13

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/l	LCS Conc mg/l	LCSD Spike Added mg/l	LCSD Conc mg/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Total Nitrite/Nitrate Nitrogen	2.50	2.57			103		90-110		
Batch number: 16321118102A Total Nitrite/Nitrate Nitrogen	Sample number 2.50	er(s): 86827 2.26	19		90		90-110		
Batch number: 16321120131A Chloride Sulfate	3.00 7.50	er(s): 86827 2.93 7.30	15-8682716,86	582719-8682	723,8682 98 97	725	90-110 90-110		
Batch number: 16319006204A Total Alkalinity to pH 4.5	mg/l as CaCO3 Sample number	mg/l as CaCO3 er(s): 86827 188.07	mg/l as CaCO3 115-8682716,86	mg/l as CaCO3 582719,8682	721-8682 100	725	84-110		
Batch number: 16319006204B Total Alkalinity to pH 4.5	Sample number		20		100		84-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspi Cor ug/	ıc	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: L163161AA	Sample	numb	er(s): 8682	2715-8682	717,8682719-	-8682724	UNSPK: 8	682722			
Acetone	6	U	150	141.9	150	143.33	95	96	50-168	1	30
Benzene	0.5	U	20	20.12	20	19.85	101	99	78-120	1	30
Bromochloromethane	1	U	20	21.59	20	21.53	108	108	80-125	0	30
Bromodichloromethane	0.5	U	20	19.3	20	18.75	96	94	80-120	3	30
Bromoform	0.5	U	20	16.13	20	16.01	81	80	59-120	1	30
Bromomethane	0.5	U	20	19.6	20	19.47	98	97	55-123	1	30
2-Butanone	3	U	150	135.73	150	134.17	90	89	57-145	1	30
Carbon Disulfide	1	U	20	20.45	20	19.87	102	99	58-120	3	30
Carbon Tetrachloride	0.5	U	20	22.53	20	22.4	113	112	74-130	1	30
Chlorobenzene	0.5	U	20	19.21	20	19.09	96	95	80-120	1	30
Chloroethane	0.5	U	20	19.27	20	19.23	96	96	56-120	0	30
Chloroform	0.5	U	20	21	20	20.62	105	103	80-120	2	30
Chloromethane	0.5	U	20	17.86	20	18.13	89	91	59-127	1	30
Cyclohexane	2	U	20	22.26	20	21.93	111	110	65-131	2	30
1,2-Dibromo-3-chloropropane	2	U	20	16.11	20	15.9	81	79	59-120	1	30
Dibromochloromethane	0.5	U	20	17.6	20	17.57	88	88	78-120	0	30
1,2-Dibromoethane	0.5	U	20	18.91	20	18.72	95	94	80-120	1	30
1,2-Dichlorobenzene	1	U	20	19	20	18.96	95	95	80-120	0	30
1,3-Dichlorobenzene	1	U	20	18.85	20	18.74	94	94	80-120	1	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729841

Reported: 01/04/2017 14:13

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
1,4-Dichlorobenzene	1 U	20	19.11	20	18.9	96	95	80-120	1	30
Dichlorodifluoromethane	0.5 U	20	21.32	20	21.52	107	108	49-134	1	30
1,1-Dichloroethane	0.5 U	20	20.4	20	20.04	102	100	80-120	2	30
1,2-Dichloroethane	0.5 U	20	20.66	20	20.42	103	102	66-128	1	30
1,1-Dichloroethene	0.5 U	20	22.6	20	22.02	113	110	76-124	3	30
cis-1,2-Dichloroethene	0.5 U	20	20.92	20	20.36	105	102	80-120	3	30
trans-1,2-Dichloroethene	0.5 U	20	21.68	20	20.98	108	105	80-120	3	30
1,2-Dichloropropane	0.5 U	20	19.49	20	19.28	97	96	80-120	1	30
cis-1,3-Dichloropropene	0.5 U	20	18.35	20	18.19	92	91	80-120	1	30
trans-1,3-Dichloropropene	0.5 U	20	17.47	20	17.72	87	89	76-120	1	30
Ethylbenzene	0.5 U	20	19.26	20	19.25	96	96	78-120	0	30
Freon 113	2 U	20	24.28	20	24.13	121	121	64-136	1	30
2-Hexanone	3 U	100	78.04	100	78.09	78	78	49-146	0	30
Isopropylbenzene	1 U	20	20.16	20	19.85	101	99	80-120	2	30
Methyl Acetate	1 U	20	19.33	20	18.79	97	94	61-137	3	30
Methyl Tertiary Butyl Ether	0.5 U	20	19.57	20	19.57	98	98	75-120	0	30
4-Methyl-2-pentanone	3 U	100	84.46	100	83.08	84	83	55-141	2	30
Methylcyclohexane	1 U	20	23.9	20	23.63	119	118	66-126	1	30
Methylene Chloride	2 U	20	20.53	20	19.82	103	99	80-120	4	30
Styrene	1 U	20	19.45	20	19.38	97	97	80-120	0	30
1,1,2,2-Tetrachloroethane	0.5 U	20	16.76	20	17.06	84	85	72-120	2	30
Tetrachloroethene	0.5 U	20	21.28	20	20.81	106	104	80-129	2	30
Toluene	0.5 U	20	19.71	20	19.48	99	97	80-120	1	30
1,2,3-Trichlorobenzene	1 U	20	17.89	20	17.84	89	89	69-120	0	30
1,2,4-Trichlorobenzene	1 U	20	18.37	20	18.07	92	90	72-120	2	30
1,1,1-Trichloroethane	0.5 U	20	18.89	20	18.58	94	93	66-126	2	30
1,1,2-Trichloroethane	0.5 U	20	18.04	20	18.19	90	91	80-120	1	30
Trichloroethene	0.5 U	20	20.91	20	20.19	105	101	80-120	4	30
Trichlorofluoromethane	0.5 U	20	25.41	20	24.89	127	124	67-129	2	30
Vinyl Chloride	0.5 U	20	19.69	20	19.58	98	98	63-121	1	30
m+p-Xylene	0.5 U	40	39.48	40	39.04	99	98	80-120	1	30
o-Xylene	0.5 U	20	19.38	20	19.25	97	96	80-120	1	30
	ng/l	ng/l	ng/l	ng/l	ng/l					
Batch number: 16321007		ber(s): 868	2715-8682	724,8682726	UNSPK: 86	82722				
Perfluorooctanoic acid	149.01	200.06	333.92	199.72	308.79	92	80	70-130	8	30
Perfluorononanoic acid	1.44	200.06	222.19	199.72	193.62	110	96	70-130	14	30
Perfluorodecanoic acid	0.5 U	200.06	174.55	199.72	172.17	87	86	70-130	1	30
Perfluoroundecanoic acid	1 U	200.06	206.24	199.72	192.82	103	97	70-130	7	30
Perfluorododecanoic acid	0.5 U	200.06	187.8	199.72	176.35	94	88	70-130	6	30
Perfluorotridecanoic acid	0.5 U	200.06	194.33	199.72	183.64	97	92	70-130	6	30
Perfluorotetradecanoic acid	0.5 U	200.06	186.69	199.72	177.84	93	89	70-130	5	30
Perfluorohexanoic acid	20.15	200.06	211.88	199.72	190.07	96	85	70-130	11	30
Perfluoroheptanoic acid	17.19	200.06	225.31	199.72	207.23	104	95	70-130	8	30
Perfluorobutanesulfonate	6.88	177.05	180.19	176.75	173.95	98	95	70-130	4	30
Perfluorohexanesulfonate	3.69	189.06	183.18	188.74	187.27	95	97	70-130	2	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729841

Reported: 01/04/2017 14:13

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ng/l	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Perfluoro-octanesulfonate	10.62	191.06	170.11	190.73	181.03	83	89	70-130	6	30
Perfluorobutanoic Acid	5.98	200.06	188.35	199.72	189.67	91	92	70-130	1	30
Perfluoropentanoic Acid	12.85	200.06	209.73	199.72	190.05	98	89	70-130	10	30
NETFOSAA	1 U	200.06	170.6	199.72	157.18	85	79	70-130	8	30
NMeFOSAA	1 U	200.06	161.01	199.72	155.46	80	78	70-130	4	30
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 163120635002	Sample numb	er(s): 8682	2715-8682	716,8682719	-8682725	UNSPK: 8	682722			
Calcium	15.81	4.00	20.05	4.00	19.77	106	99	75-125	1	20
Magnesium	2.77	2.00	4.74	2.00	4.70	99	97	75-125	1	20
Potassium	2.74	10	12.55	10	12.37	98	96	75-125	1	20
Sodium	62.63	10	73.81	10	72.74	112 (2)	101 (2)	75-125	1	20
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 16319118101B	Sample numb	er(s): 8682	2715-8682	716,8682720	-8682723,	8682725	UNSPK: 86	82722		
Total Nitrite/Nitrate Nitrogen	5.07	5.00	10.36	·	·	106		90-110		
Batch number: 16321118102A	Sample numb	er(s): 8682	2719 UNSP	K: P687845						
Total Nitrite/Nitrate Nitrogen	3.59	5.00	6.43			57*		90-110		
Batch number: 16321120131A	Sample numb	er(s): 8681	2715-8682	716,8682719	-8682723	8682725 1	IINSDK: 86	582722		
Chloride	103.54	80	180.83	710,0002713	0002723,	97	ONDIK. OC	90-110		
Sulfate	14.23	50	63.17			98		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16319006204A	Sample numb	er(s): 8682	2715-8682	716,8682719	,8682721-	8682725	UNSPK: 86	82722		
Total Alkalinity to pH 4.5	27.53	188	198.17	188	200.17	91	92	84-110	1	5
Batch number: 16319006204B	Sample numb	er(s): 8683	2720 UNSP	K: 8682722						
Total Alkalinity to pH 4.5	27.53	188	198.17	188	200.17	91	92	84-110	1	5

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD	DUP RPD Max
	mg/l	mg/l		
Batch number: 163120635002	Sample number(s):	8682715-8682716,8	682719-8682725	BKG: 8682722
Calcium	15.81	15.84	0	20
Magnesium	2.77	2.78	0	2.0

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729841

Reported: 01/04/2017 14:13

Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP	RPD	DUP R	D Max	
	mg/l	mg/l					
Potassium	2.74	2.78	1	(1)	2	0	
Sodium	62.63	62.75		0	2	0	
	mg/l	mg/l					
Batch number: 16319118101B	Sample number(s):	8682715-8682716,8682	2720-	8682723	,86827	25 BKG:	8682722
Total Nitrite/Nitrate Nitrogen	5.07	5.03		1		2	
Batch number: 16321118102A	Sample number(s):	8682719 BKG: P68784	5				
Total Nitrite/Nitrate Nitrogen	3.59	3.56		1		2	
Batch number: 16321120131A	Sample number(s):	8682715-8682716,8682			,86827	25 BKG:	8682722
Chloride	103.54	102.52		1	1	5	
Sulfate	14.23	14.04	1	(1)	1	5	
	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16319006204A	Sample number(s):	8682715-8682716,8682	2719	8682721	-86827	25 BKG:	8682722
Total Alkalinity to pH 4.5	27.53	27.49		0		5	0002722
	~ 7 1 ()	0.500,500 0.500,500	•				
Batch number: 16319006204B	Sample number(s): 23.11	8682720 BKG: 8682720 21.6		(1)		5	
Total Alkalinity to pH 4.5	43.11	21.0	/ ^	(1))	

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: L163161AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8682715	104	102	98	97
8682716	103	101	98	98
8682717	103	102	98	98
8682719	104	102	98	98
8682720	103	103	98	98
8682721	104	102	97	97
8682722	103	103	96	97
8682723	104	101	98	99
8682724	103	101	99	100
Blank	102	102	97	98
LCS	101	101	99	99
MS	104	101	98	99
MSD	103	101	99	100

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729841

Reported: 01/04/2017 14:13

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: L163161AA

Limits: 80-116 77-113 80-113 78-113

Analysis Name: 16 PFCs Batch number: 16321007

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8682715	85	110	111	82	88	84
8682716	84	122	121	88	96	86
8682717	95	91	85	95	98	91
8682718	87	85	78	89	77	86
8682719	88	127	140*	95	95	100
8682720	94	138*	135*	92	100	93
8682721	102	152*	155*	105	107	98
8682722	72	115	108	98	93	104
8682723	38*	46*	21*	48*	31*	52*
8682724	66*	80	34*	91	58*	89
8682726	67*	84	59*	75	71	73
Blank	89	93	87	93	91	89
LCS	79	76	78	79	85	82
MS	38*	46*	21*	48*	31*	52*
MSD	66*	80	34*	91	58*	89
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8682715	79	78	80	74	72	67*
8682716	94	85	79	77	70	76
8682717	97	100	101	96	87	99
8682718	81	86	96	98	90	90
8682719	91	90	87	80	79	71
8682720	99	95	89	87	76	84
8682721	101	93	97	100	83	99
8682722	89	89	90	88	79	83
8682723	56*	50*	62*	71	57*	65*
8682724	92	72	79	85	76	83
8682726	76	69*	64*	72	66*	44*
Blank	89	91	88	96	101	97
LCS	82	90	68*	81	92	75
MS	56*	50*	62*	71	57*	65*
MSD	92	72	79	85	76	83
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA			

*- Outside of specification	*_	Outside	of s	pecifica	ition
-----------------------------	----	---------	------	----------	-------

71

8682715

8682716

65*

73

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

61*

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1729841

Reported: 01/04/2017 14:13

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 16321007

	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
8682717	94	86	77	
8682718	91	87	77	
8682719	72	69*	70	
8682720	79	84	82	
8682721	100	92	83	
8682722	84	77	72	
8682723	52*	70	67*	
8682724	76	87	82	
8682726	55*	33*	46*	
Blank	105	96	85	
LCS	88	79	77	
MS	52*	70	67*	
MSD	76	87	82	
Limits:	70-130	70-130	70-130	

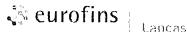
^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

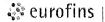
⁽²⁾ The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.



Environmental Services Analysis Request/Chain of Custody

Acct.	#: 37191		Grou	p#:	17	298c	11		Sam	ple#:	86	98	27	15-	2(э				COC#:	15589
Client: C.T. Male Associates	,					Matrix	-					Ar	nalys	es l	Requ	uest	==			For Lab Us	se Only
Project Name/#: SGPP - Merrimack	Site ID:											Pı	ese	rvat	on (Cocie	es:			SF#: <u>285327</u>	
Project Manager: Kirk Moline	P.O. #:	16.612	.6		Ę	Ground			Н	N		s								SCR#: <u>19606</u> 3	<u>.</u>
Sampler: Tonather Disput					Sediment	Ground	3					N							į	Preservat	ion Codes
Phone #: 578 -786 - 7400	Quote #:	214135			Sec		13	ners		(၁၀		17		B)	Ġ.					H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						Potable NPDES	A	Containers	(8260C)	(6010C)	A	NO.	6	2320	7 mod.)					N = HNO ₃	B = NaOH
	Colle	ection		Composite			;; ½	# of	VOAs (826	Mg, Na, K	(353.2) ((353.2) 🕂	04- (300.0)	nity (SM 2320B)	(EPA 537					$S = H_2SO_4$ $O = Other$	P = H₃PO₄
Sample Identification	Date	Time	Grab	Com	Soil	Water	Other:	Total	TCL \	Ca, M	Z CN	NO3	CI-, S	Alkalinity	PFCs					Rem	arks
SG2 -AP/0 -50-161103 1860	11/3/16	0753	×			X		11	X	X		X	×	X	X.						
SG 2 -AP/0 -60-16/103 186	1	0955	X			X		11	X	X		X	X	X	X						
SG 2 -47 LTB01-16103 1850	and the second	r ead ed?	X				X	3	Х						X						
SG 2 - FT84 - 1611=3 1869	- i	1015	Х.				X								X						
SGZ -API0 -70-16/103 18/50	Anguage, see a construction of the constructio	1205	X			X		11	Х	X		Х	X	X	X						
SG2 -AP10 -80 - 161103 1860	√	1420	X			X_		11	X	X		×	X	×	X						
SG2 -AP10 -84.5 - 16/103 1860	11/3/16	1635	X			X		11	X	X		X	X	X	X	.,					
SG2 -AP69 - 28 - 16/104 1600	11/4/10	0950	X			X		33	X	X		X	X	X	X					MS/Ms	D
SG2 -APRBOI - 16/104 1860	11/4/16	0740	X				X	2							X						
SG -AP - 16																					
Turnaround Time Requested (TAT) (pleas	e check): Stan	idard 💢	RUSH	1	Reli	nquished	by:			į	Date	/		Time		Rebe	ivec	d by:		Date	Time
(RUSH TAT is subject to Eurofins Lancaster Laborate	ries approval	and surchar	rges.)		Dati	nquished	<u> 2 </u>	Contractive Contra			<u>////</u> Date	p		<i>∕∕∕∕</i> Time		Rese	-iv-c-	d b		Date	Time
Date results are needed: E-mail address to send RUSH results:	at.L.	Diale.	/		17611	nqu _{le} neu	υy.				Date			111116		176.26	ниес	ц Бу.		Date	111116
Data Package Options (please check if req	Irlinkisya uired)	e crimal	e.com	1	Reli	nquished	by:				Date			Time		Rece	eivec	d by:	and the same and	Date	Time
Type I (Validation/non-CLP)		TX TRRP	· - 13													and the second second	and the same of th	America at a graph of the	-		
	CP				Reli	nquished	by:				Date			Fime	- Comment	Rece	ivec	d by:		Date	Time
· · · · · · · · · · · · · · · · · · ·	Туре А 📋									and the same of							/	,_	_	/	_
Type VI (Raw Data Only) 🗌 💮 ASP	Туре В 🗌	·			Reli	nquished	by:				Date	·		Time		Reice	ivec	d by:) Date	Time/
EDD Format: EQuIS																4	61	11	1	14710	(17,0)
If site-specific QC (MS/MSD/Dup) required submit triplicate volume.	indicate Q	C sample	s and			ll No.: nquished b	y Con Fed5		ial Ca	rrier: Othe	r					Te n	~ pera	ıture ι	upon rec	eipt <u>19</u> - 2	24°c



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

167406

Group Number(s): 1729841

Client: C.T Male

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

11/05/2016 9:50

Number of Packages:

<u>2</u>

Number of Projects:

1

State/Province of Origin:

<u>NH</u>

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

Yes

Custody Seal Present:

Yes

Sample Date/Times match COC:

Yes

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

Air Quality Samples Present:

N/A

No

Samples Chilled:

Yes

Total Trip Blank Qty:

3

Paperwork Enclosed:

Yes

Trip Blank Type:

HCI

Samples Intact:

Yes No

Missing Samples:

No

Extra Samples:

Nο

Unpacked by Karen Diem (3060) at 12:42 on 11/05/2016

Discrepancy in Container Qty on COC:

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler#	Thermometer ID	Corrected Temp	Therm. Type	<u>lce Type</u>	Ice Present?	Ice Container	Elevated Temp?
1	DT121	1.9	DT	Wet	Υ	Bagged	N
2	DT121	2.4	DT	Wet	Υ	Bagged	N



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RL Reporting Limit kg **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: January 25, 2017

Project: SGPP - Merrimack

Submittal Date: 11/09/2016 Group Number: 1731052 SDG: MMK09 PO Number: 16.6126 State of Sample Origin: NH

	Lancaster Labs
Client Sample Description	<u>(LL) #</u>
SG2-SWDnMerr-161107 Grab Surface Water	8687827
SG2-SWDnBab-161107 Grab Surface Water	8687828
SG2-SWMidBab-161107 Grab Surface Water	8687829
SG2-SWFD01-161107 Grab Surface Water	8687830
SG2-SWUpBab-161108 Grab Surface Water	8687831
SG2-SWUpBab-161108 MS Grab Surface Water	8687832
SG2-SWUpBab-161108 MSD Grab Surface Water	8687833
SG2-SWUpBab-161108 Dupl Grab Surface Water	8687834
SG2-SWUpMerr-161108 Grab Surface Water	8687835
SG2-FTB01-161108 Blank Water	8687836
SG2-LTB01-161108 Blank Water	8687837
SG2-MER45-8-161108 Grab Groundwater	8687838
SG2-SWEB01-161108 Grab Blank Water	8687839
SG2-RB01-161108 Grab Blank Water	8687840
SG2-RB02-161108 Grab Blank Water	8687841
SG2-MER45-4A-161108 Grab Groundwater	8687842
SG2-PolandDistilled-161108 Grab Groundwater	8687843
SG2-MER45-6-161108 Grab Groundwater	8687844
SG2-MER45-9-161108 Grab Groundwater	8687845
SG2-MER45-7-161108 Grab Groundwater	8687846

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To C. T. Male Associates Attn: Jeff Marx



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Electronic Copy To C. T. Male Associates Attn: Dan Reilly Electronic Copy To C. T. Male Associates Attn: Kirk Moline

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250



Project Name: SGPP - Merrimack LL Group #: 1731052

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

EPA 537 Rev. 1.1 modified, Misc. Organics

Sample #s: 8687827, 8687828, 8687829, 8687830, 8687831, 8687832, 8687833, 8687835, 8687836, 8687838, 8687839, 8687841, 8687843, 8687844, 8687845, 8687846
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample #s: 8687840

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample internal standard is outside the QC acceptance limits.

Target analytes were detected in this rinse blank. The following corrective action was taken: the sample was re-extracted outside of the required hoding time and no reportable hits were detected. the data is reported from the initial in-hold extraction of the sample. Both sets of data are available in the data package.

<u>Sample #s: 8687837, 8687842</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits. The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: the sample was reinjected outside of the required holding time and all internal standards were within QC acceptance limits. The data is reported from the initial injection of the sample. Both sets of data are available in the data package.

Batch #: 16322013 (Sample number(s): 8687827-8687833, 8687835-8687846 UNSPK: 8687831)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Perfluorododecanoic acid, Perfluorotetradecanoic acid, Perfluorohexanoic acid

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8687827, 8687828, 8687829, 8687830, 8687831, 8687832, 8687833, 8687835, 8687836, 8687837, 8687838, 8687839, 8687840, 8687841, 8687842, 8687843, 8687844, 8687845, 8687846, Blank, LCS, MS, MSD

EPA 300.0, Wet Chemistry

<u>Batch #: 16323120121B</u> (Sample number(s): 8687827-8687828, 8687845-8687846 UNSPK: 8687827 BKG: 8687827)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Chloride, Sulfate

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Chloride, Sulfate

EPA 353.2, Wet Chemistry

<u>Batch #: 16321118101B (Sample number(s): 8687827-8687832, 8687834-8687835, 8687838-8687839, 8687842, 8687844 UNSPK: 8687831 BKG: 8687831)</u>

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Total Nitrite/Nitrate Nitrogen

<u>Batch #: 16321118102A (Sample number(s): 8687845-8687846 UNSPK: 8687845 BKG: 8687845)</u>

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Nitrite/Nitrate Nitrogen

SM 2320 B-1997, Wet Chemistry

<u>Batch #: 16321002202A (Sample number(s): 8687830, 8687839 UNSPK: P688635 BKG: P688635, P688637)</u>

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Alkalinity to pH 4.5

Batch #: 16321005106A (Sample number(s): 8687827, 8687829, 8687831-8687835, 8687834, 8687844-8687845 UNSPK: 8687831 BKG: P687605, P8687831)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Total Alkalinity to pH 4.5



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWDnMerr-161107 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687827 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/07/2016 15:15 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30 Reported: 01/25/2017 13:54

MM901 SDG#: MMK09-01

CAT No.	Analysis Name	CAS Number	As Rec Result	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 82	260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	IJ	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	IJ	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	IJ	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	Ū	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	IJ	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	Ū	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	τι	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	IJ	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	τι	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	Ū	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	IJ	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-01-5	0.5	IJ	0.5	1	1
11997	Ethylbenzene	10061-02-6	0.5	IJ	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
11997	2-Hexanone	591-78-6	3	IJ	3	10	1
11997			3 1	U	1	5	1
11997	Isopropylbenzene	98-82-8 79-20-9	1	IJ	1	5	1
	Methyl Acetate		0.5	IJ			
11997	Methyl Tertiary Butyl Ether	1634-04-4	3	U	0.5 3	1 10	1 1
11997 11997	4-Methyl-2-pentanone	108-10-1 108-87-2	3 1	IJ	1	5	1
	Methylcyclohexane		_	-			=
11997	Methylene Chloride	75-09-2	2 1	U U	2 1	4 5	1
11997	Styrene	100-42-5		U TT			1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	· ·	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1 1	1
11997	Toluene	108-88-3	0.5	U	0.5	_	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U 	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



5.0

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWDnMerr-161107 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687827 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/07/2016 15:15 by JD C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30

Reported: 01/25/2017 13:54

MM901 SDG#: MMK09-01

12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene	2 0.20 0.2	95-47-6	0.5	U	0.5	1	1
00882	VOA Library Se	earch						
	The results from the FORM 1 - VOA-TIC. on the back of the	The qualifier						
Misc.	Organics	EPA 537 Romodified	ev. 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic		335-67-1	3		0.5	2	1
10954	Perfluorononanoic		375-95-1	0.6	U	0.6	2	1
	Perfluorodecanoic		335-76-2	0.5	IJ	0.5	2	1
	Perfluoroundecano:		2058-94-8	1	IJ	1	3	1
10954	Perfluorododecano:		307-55-1	0.5	IJ	0.5	2	1
10954	Perfluorotridecano		72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradeca		376-06-7	0.5	IJ	0.5	2	1
10954	Perfluorohexanoic		307-24-4	2	J	0.5	2	1
10954			375-85-9	1	J	0.5	2	1
	Perfluorobutanesul		375-73-5	0.7	U	0.7	2	1
	Perfluorohexanesul		355-46-4	1	IJ	1	3	1
	Perfluoro-octanesu		1763-23-1	2	IJ	2	6	1
	Perfluorobutanoic		375-22-4	3	IJ	3	10	1
10954	Perfluoropentanoio		2706-90-3	2	ıΤ	0.5	2	1
	stated QC limits ar			_	o .	0.5	۷	Τ
	be obtained to calc			ileni da	ca points			
Metal	S	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	4.39		0.0382	0.400	1
01757	Magnesium		7439-95-4	0.957	,	0.0190	0.200	1
01762	Potassium		7440-09-7	1.19		0.160	1.00	1
01767	Sodium		7440-23-5	12.5		0.173	2.00	1
Wet Cl	hemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	14.3		1.0	2.0	5
00228	Sulfate		14808-79-8	5.2		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitr	rate Nitrogen	n.a.	0.20		0.040	0.10	1
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity t	to pH 4.5	n.a.	8.7		1.7	5.0	1
12149	Bicarbonate Alkal:	-	n.a.	8.7		1.7	5.0	1
	Carbonate Alkalin	-	n a	1 7	TT	1 7	5 0	1

n.a.

1.7 U

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWDnMerr-161107 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687827 LL Group # 1731052 Account # 37191

Brandon P Costik

Brandon P Costik

1

1

Project Name: SGPP - Merrimack

Collected: 11/07/2016 15:15 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

MM901 SDG#: MMK09-01

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

Sample Comments

Laboratory Sample Analysis Record

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

SM 2320 B-1997

SM 2320 B-1997

Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles SW-846 8260C 1 Y163234AA 11/19/2016 02:05 Kevin D Kelly 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 Y163234AA 11/19/2016 02:05 Kevin D Kelly 10954 14 PFCs EPA 537 Rev. 1.1 16322013 11/23/2016 12:11 Jason W Knight 1 modified EPA 537 Rev. 1.1 14091 PFAA Water Prep 16322013 11/20/2016 12:00 Devon M Whooley 1 1 modified 01750 Calcium SW-846 6010C 163160635005 1 11/19/2016 03:10 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163160635005 11/19/2016 03:10 Matthew R 1 Machtinger 01762 Potassium SW-846 6010C 1 163160635005 11/19/2016 03:10 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163160635005 1 11/19/2016 03:10 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163160635005 11/17/2016 23:00 Annamaria Kuhns 1 U4 00224 Chloride EPA 300.0 16323120121B 11/18/2016 18:14 Hallie Burnett 00228 Sulfate EPA 300.0 16323120121B Hallie Burnett 1 11/18/2016 18:14 5 EPA 353.2 07882 Total Nitrite/Nitrate 1 16321118101B 11/16/2016 03:17 Joseph E McKenzie 1 Nitrogen SM 2320 B-1997 16321005106A 12150 Total Alkalinity to pH 11/17/2016 16:54 Brandon P Costik

16321005106A

16321005106A

11/17/2016 16:54

11/17/2016 16:54

1

1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.
VOLATILE ORGANICS	ANALYSIS DATA SHEET	
TENTATIVELY IDEN	TIFIED COMPOUNDS	!!!
TENTATIVELY IDENTIFIED COMPOUNDS Name: Lancaster Laboratories	! MM901 !	
Lab Name: Lancaster Laboratories	Contract:	!
Lab Code: LANCAS Case No.:_	SAS No.:	_ SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID: 8687	827
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0935	5.i/16nov18b.b/yn18s78.d
Level: (low/med) LOW	Date Received: 11/0	9/16
Moisture: not dec.	Date Analyzed: 11/1	9/16
Column: (pack/cap) CAP	Dilution Factor: 1.	0
	CONCENTRATION UNI	TS:
Number TICs found: 0	(ug/L or ug/Kg) u	g/L

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
	==!===================================	===!====! ! !		!===== ! U
	!	i i	•	!
				!
4	_!	!!		!
5	!	!!		!
6	!	!!		!
7	!	!!		!
8	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
		!!		!
	!	!!		!
	!	!!		!
	_!	!!		!
	!	!!		!
	!	!!		!
	_!	!!		!
	!	!!		!
	<u>!</u>	!!		!
	!	!!		!
	!	<u></u> :!		!
	!	<u></u> :!		!
	!	<u></u> :!		!
	!	<u></u> :!		<u>:</u>
0	!	<u></u> !!		!
ge 1 of 1	!	!!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWDnBab-161107 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687828 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/07/2016 15:40 by JD C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30 Reported: 01/25/2017 13:54

MM902 SDG#: MMK09-02

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	Ū	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	ττ	0.5	1	1
11997	1,2-Dibromoethane 1,2-Dichlorobenzene	95-50-1	0.5 1	U	1	5	1
11997	•		1	ττ	1	5 5	1
	1,3-Dichlorobenzene	541-73-1		-			
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U 	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ū	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	Ū	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ū	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	IJ	0.5	1	1
		1,,001 20 1	٠.٥		<u> </u>		

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWDnBab-161107 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687828 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/07/2016 15:40 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

MM902 SDG#: MMK09-02

CAT No.	Analysis Name		CAS Number	As Re Resul	eceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
•	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library	Search						
	The results from	n the volatile li C. The qualifier						
Misc.	Organics	EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoi	c acid	335-67-1	13		0.5	2	1
10954	Perfluorononanoi	c acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoi	c acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecar	noic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecar	noic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotrideca	noic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetrade	canoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoi	c acid	307-24-4	5		0.5	2	1
10954	Perfluoroheptano	oic acid	375-85-9	4		0.5	2	1
10954	-		375-73-5	3		0.7	2	1
10954			355-46-4	2	J	1	3	1
10954	Perfluoro-octane	sulfonate	1763-23-1	4	J	2	6	1
10954	Perfluorobutanoi	c Acid	375-22-4	7	J	3	10	1
	Perfluoropentano		2706-90-3	3		0.5	2	1
The	stated QC limits be obtained to ca	are advisory onl		ient da	ta points			
Metal	3	SW-846 60	10C	mg/1		mg/l	mg/l	
01750	Calcium		7440-70-2	15.3		0.0382	0.400	1
01757	Magnesium		7439-95-4	3.52		0.0190	0.200	1
01762	Potassium		7440-09-7	2.99		0.160	1.00	1
01767	Sodium		7440-23-5	46.7		0.173	2.00	1
Wet Cl	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	80.8		10.0	20.0	50
00228	Sulfate		14808-79-8	29.5		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Ni		n.a.	0.17		0.040	0.10	1
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity		n.a.	12.7		1.7	5.0	1

12.7

1.7 U

n.a.

n.a.

1.7

5.0

5.0

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWDnBab-161107 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687828 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/07/2016 15:40 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

MM902 SDG#: MMK09-02

12148 Carbonate Alkalinity

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

SM 2320 B-1997

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles SW-846 8260C 1 Y163234AA 11/19/2016 02:27 Kevin D Kelly 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 Y163234AA 11/19/2016 02:27 Kevin D Kelly 10954 14 PFCs EPA 537 Rev. 1.1 16322013 11/23/2016 12:32 Jason W Knight 1 modified EPA 537 Rev. 1.1 14091 PFAA Water Prep 16322013 11/20/2016 12:00 Devon M Whooley 1 1 modified 01750 Calcium SW-846 6010C 163160635005 1 11/19/2016 03:13 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163160635005 11/19/2016 03:13 Matthew R 1 Machtinger 01762 Potassium SW-846 6010C 1 163160635005 11/19/2016 03:13 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163160635005 1 11/19/2016 03:13 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163160635005 11/17/2016 23:00 Annamaria Kuhns 1 U4 00224 Chloride EPA 300.0 16323120121B 11/18/2016 21:44 Hallie Burnett 00228 Sulfate EPA 300.0 16323120121B Hallie Burnett 1 11/18/2016 21:27 5 07882 Total Nitrite/Nitrate EPA 353.2 1 16321118101B 11/16/2016 03:19 Joseph E McKenzie 1 Nitrogen SM 2320 B-1997 16321002201A 12150 Total Alkalinity to pH 11/16/2016 21:00 Brandon P Costik 16321002201A 12149 Bicarbonate Alkalinity SM 2320 B-1997 1 Brandon P Costik 11/16/2016 21:00 1

16321002201A

11/16/2016 21:00

Brandon P Costik

1

1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE NO.	
VOLATILE ORGANICS ANAI	LYSIS DATA SHEET	_		
TENTATIVELY IDENTIF	IED COMPOUNDS	!	!	
		!	MM902 !	
Lab Name: Lancaster Laboratories	Contract:	!_	!	
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8687828	3		
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355.i		ov18b.b/yn18s79	. Ċ
Level: (low/med) LOW	Date Received: 11/09/1			
Moisture: not dec.	Date Analyzed: 11/19/1	.6		
Column: (pack/cap) CAP	Dilution Factor: 1.0			
	CONCENTRATION UNITS:			
Number TICs found: 0	(ug/L or ug/Kg) ug/I	1		

! ! CAS NUMBER	! ! COMPOUND NAME	! ! RT	! ! EST. CONC.	
! 1. VOCTIC	!Total VOC TICs	==!====== !	•	! ===== : ! U :
! 2	!!	!	!	!!
! 3	!	!	!	!!
! 4	_!	!	!	!!
! 5	_!	!	!	!
	!	!	!	!
	!!	<u>-</u>	!	¦
	: !	<u>-</u>	! !	;——
			!!	i
! 11		<u>i</u>	· !	ii
			!	
		!	!	!
!14	!	!	!	!!
	!	!	!	!!
	!		!	!!
	!	!	!	!!
!18	!	!	!	!!
	!	!	!	!
	_!	!	!	<u>!</u>
	!	<u>-</u>	!	!
		-	! !	;
! 24		<u>-</u> i	·	:
	i	;	·	ii
	i	<u>i</u>	· !	ii
! 27.			!	i
! 28			!	!
! 29.			!	! !
!30		!	!	!!
!	!	!	!	!!

page 1 of 1

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWMidBab-161107 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687829 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/07/2016 16:30 by JD C. T. Male Associates

50 Century Hill Drive Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

MM903 SDG#: MMK09-03

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWMidBab-161107 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687829 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/07/2016 16:30 by JD C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30 Reported: 01/25/2017 13:54

MM903 SDG#: MMK09-03

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	50C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Se The results from FORM 1 - VOA-TIC. on the back of th	the volatile li The qualifier						
364	0	ED3 537 D	1 1	ng/l		ng/l	ng/l	
Misc.	Organics	EPA 537 Romodified	€V. I.I	119/1		119/1	119/1	
10054	- 63		205 65 4	1.0			•	
10954	Perfluorooctanoic		335-67-1	12		0.5	2	1
10954			375-95-1	0.8	J	0.6	2	1
10954	Perfluorodecanoic		335-76-2	0.5	U	0.5	2	1
10954			2058-94-8	1	U	1	3	1
10954	Perfluorododecano		307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecan	oic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradec	anoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic	acid	307-24-4	5		0.5	2	1
10954	Perfluoroheptanoi	c acid	375-85-9	3		0.5	2	1
10954	Perfluorobutanesu	lfonate	375-73-5	3		0.7	2	1
10954	Perfluorohexanesu	lfonate	355-46-4	2	J	1	3	1
10954	Perfluoro-octanes	ulfonate	1763-23-1	4	J	2	6	1
10954	Perfluorobutanoic	Acid	375-22-4	7	J	3	10	1
	Perfluoropentanoi		2706-90-3	4	•	0.5	2	1
The	stated QC limits and the obtained to calc	re advisory onl	y until suffic		ta points			_
Metals	3	SW-846 603	L0C	mg/1		mg/l	mg/l	
01750	Calcium		7440-70-2	14.8		0.0382	0.400	1
01757	Magnesium		7439-95-4	3.42		0.0190	0.200	1
01762	Potassium		7440-09-7	2.92		0.160	1.00	1
01767	Sodium		7440-23-5	44.7		0.173	2.00	1
Wet Cl	nemistry	EPA 300.0		mg/1		mg/l	mg/l	
00224	Chloride		16887-00-6	79.2		10.0	20.0	50
00228	Sulfate		14808-79-8	30.4		1.5	5.0	5
							•	
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nit		n.a.	0.19		0.040	0.10	1
		SM 2320 B	-1997	-	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity	to pH 4.5	n.a.	12.7		1.7	5.0	1

12.7

1.7 U

n.a.

n.a.

1.7

5.0

5.0

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWMidBab-161107 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687829 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/07/2016 16:30 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

MM903 SDG#: MMK09-03

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles SW-846 8260C 1 Y163234AA 11/19/2016 02:49 Kevin D Kelly 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 Y163234AA 11/19/2016 02:49 Kevin D Kelly 10954 14 PFCs EPA 537 Rev. 1.1 16322013 11/23/2016 12:52 Jason W Knight 1 modified EPA 537 Rev. 1.1 14091 PFAA Water Prep 16322013 11/20/2016 12:00 Devon M Whooley 1 1 modified 01750 Calcium SW-846 6010C 163160635005 1 11/19/2016 03:22 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163160635005 11/19/2016 03:22 Matthew R 1 Machtinger 01762 Potassium SW-846 6010C 1 163160635005 11/19/2016 03:22 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163160635005 1 11/19/2016 03:22 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163160635005 11/17/2016 23:00 Annamaria Kuhns 1 U4 00224 Chloride EPA 300.0 16326120151A 11/21/2016 14:44 Hallie Burnett 00228 Sulfate EPA 300.0 16326120151A Hallie Burnett 1 11/21/2016 14:29 5 07882 Total Nitrite/Nitrate EPA 353.2 1 16321118101B 11/16/2016 03:20 Joseph E McKenzie 1 Nitrogen SM 2320 B-1997 16321005106A 12150 Total Alkalinity to pH 11/17/2016 16:37 Brandon P Costik 12149 Bicarbonate Alkalinity SM 2320 B-1997 1 16321005106A Brandon P Costik 11/17/2016 16:37 1 12148 Carbonate Alkalinity SM 2320 B-1997 1 16321005106A 11/17/2016 16:37 Brandon P Costik 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	NALVOTO DAMA CUMM	EPA SAMPLE NO	
	VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS ame: Lancaster Laboratories ode: LANCAS Case No.: x: (soil/water) WATER e wt/vol: 5.0 (g/mL)mL : (low/med) LOW sture: not dec. n: (pack/cap) CAP VOLATILE ORGANICS ANALYSIS DATA SHEET Lab SHEET Lab Sample ID: 868782 Lab File ID:HP09355. Date Received: 11/09/ Date Analyzed: 11/19/ Dilution Factor: 1.0 CONCENTRATION UNITS	!	<u>!</u>
		! MM903	!
ab Name: Lancaster Laboratories	Contract:	!	!
ab Code: LANCAS Case No.:	SAS No.:	SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8687	7829	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0935	55.i/16nov18b.b/yn	18s80.d
evel: (low/med) LOW	Date Received: 11/0	09/16	
Moisture: not dec.	Date Analyzed: 11/1	19/16	
column: (pack/cap) CAP	Dilution Factor: 1.	. 0	
	CONCENTRATION UNI	ITS:	
Number TICs found: 0	(ua/L or ua/Ka) i	ıa/I.	

! ! CAS NUMBER	! ! COMPOUND NAME ==!===========	! ! RT	! ! EST. CONC.	
! 1. VOCTIC	==!===================================	!	•	! ===== : ! U
! 2	!!	!	!	!!
! 3	!	!	!	!!
	!	!	!	!!
! 5	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!			!
!10	!	!	!	!
!11			!	!
	!	<u>-</u>	!	<u>:</u> ———
	<u>-</u>	:	·	:
		<u>i</u>	·	i
		i	:	i
		i	·	i
		i	·	i
!19.	!	i	 !	
! 20.		i	 !	!
	!		!	!
	1		!	!
!23	!	!	!	!
!24	!	!	!	!
	<u></u>	!	!	!
	!	!	!	!!
!27	!	!	!	!!
!28	!	!	!	!!
!29		!	!	!!
!30	!	!	!	!!
!	!	!	!	!

page 1 of 1

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWFD01-161107 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687830 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/07/2016 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

MM904 SDG#: MMK09-04FD

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	Li	Received mit of mantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug	r/l	
11997	Acetone	67-64-1	6	U	6	20)	1
11997	Benzene	71-43-2	0.5	IJ	0.5	1		1
11997	Bromochloromethane	74-97-5	1	IJ	1	5		1
11997	Bromodichloromethane	75-27-4	0.5	IJ	0.5	1		1
11997	Bromoform	75-25-2	0.5	U	0.5	4		1
11997	Bromomethane	74-83-9	0.5	U	0.5	1		1
11997	2-Butanone	78-93-3	3	IJ	3	10)	1
11997	Carbon Disulfide	75-15-0	1	U	1	5		1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1		1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1		1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1		1
11997	Chloroform	67-66-3	0.5	U	0.5	1		1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1		1
11997	Cyclohexane	110-82-7	2	IJ	2	5		1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5		1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5	1		1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5	1		1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5		1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1	5		1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1	5		1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5	1		1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5	1		1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1		1
11997	,	75-35-4	0.5	Ū	0.5	1		1
11997	1,1-Dichloroethene		0.5	Ū	0.5	1		1
	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1		1
11997	trans-1,2-Dichloroethene	156-60-5		IJ		1		
11997	1,2-Dichloropropane	78-87-5	0.5	-	0.5	_		1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1		1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1		1
11997	Ethylbenzene	100-41-4	0.5	U 	0.5	1		1
11997	Freon 113	76-13-1	2	U 	2	10		1
11997	2-Hexanone	591-78-6	3	U 	3	10)	1
11997	Isopropylbenzene	98-82-8	1	Ū	1	5		1
11997	Methyl Acetate	79-20-9	1	U	1	5		1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1		1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10)	1
11997	Methylcyclohexane	108-87-2	1	U	1	5		1
11997	Methylene Chloride	75-09-2	2	U	2	4		1
11997	Styrene	100-42-5	1	U	1	5		1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1		1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1		1
11997	Toluene	108-88-3	0.5	U	0.5	1		1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5		1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5		1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1		1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1		1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1		1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1		1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1		1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1		1

^{*=}This limit was used in the evaluation of the final result



As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWFD01-161107 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687830 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/07/2016 by JD C. T. Male Associates 50 Century Hill Drive

As Received

Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

SDG#: MMK09-04FD MM904

12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	eceived .t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8	260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library S	Search						
	The results from FORM 1 - VOA-TIC on the back of t	. The qualifie						
Misc.	Organics	EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoi	c acid	335-67-1	11		0.5	2	1
10954	Perfluorononanoi	c acid	375-95-1	0.6	U	0.6	2	1
10954			335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecan	oic acid	2058-94-8	1	U	1	3	1
10954		oic acid	307-55-1	0.5	U	0.5	2	1
10954			72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetrade	canoic acid	376-06-7	0.5	U	0.5	2	1
10954			307-24-4	5		0.5	2	1
10954	-		375-85-9	4		0.5	2	1
10954	Perfluorobutanes	ulfonate	375-73-5	2		0.7	2	1
10954	Perfluorohexanes	ulfonate	355-46-4	2	J	1	3	1
10954	Perfluoro-octane	sulfonate	1763-23-1	5	J	2	6	1
10954	Perfluorobutanoi	c Acid	375-22-4	6	J	3	10	1
10954	Perfluoropentano	ic Acid	2706-90-3	5		0.5	2	1
	stated QC limits abe obtained to call			ient da	ta points			
Metal	s	SW-846 6	010C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	15.0		0.0382	0.400	1
01757			7439-95-4	3.45		0.0190	0.200	1
01762	_		7440-09-7	2.96		0.160	1.00	1
01767			7440-23-5	45.3		0.173	2.00	1
Wet C	hemistry	EPA 300.	0	mg/l		mg/l	mg/l	
00224	-		16887-00-6	83.8		10.0	20.0	50
00228			14808-79-8	29.8		1.5	5.0	5
		EPA 353.	2	mg/l		mg/l	mg/l	
07882	Total Nitrite/Ni	trate Nitrogen	n.a.	0.19		0.040	0.10	1
		SM 2320	B-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity		n.a.	11.6		1.7	5.0	1
12149	Bicarbonate Alka	-	n.a.	11.6		1.7	5.0	1
10110	a l	-		1 7		1 8	5.0	-

1.7 U

n.a.

1.7

5.0

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWFD01-161107 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687830 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/07/2016 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

MM904 SDG#: MMK09-04FD

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Trial# Batch# Analysis Date and S

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Tir	ne		Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163234AA	11/19/2016	03:11	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163234AA	11/19/2016	03:11	Kevin D Kelly	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016	13:13	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16322013	11/20/2016	12:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163160635005	11/19/2016	03:25	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016	03:25	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016	03:25	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016	03:25	Matthew R Machtinger	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163160635005	11/17/2016	23:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	16326120151A	11/21/2016	15:14	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16326120151A	11/21/2016	14:59	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16321118101B	11/16/2016	03:26	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321002202A	11/16/2016	22:30	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321002202A	11/16/2016	22:30	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16321002202A	11/16/2016	22:30	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.	
VOLATILE ORGANICS ANAI	LYSIS DATA SHEET		_
TENTATIVELY IDENTIFI	IED COMPOUNDS	!	!
		! MM904	!
Lab Name: Lancaster Laboratories	Contract:	!	_!
Lab Code: LANCAS Case No.:	SAS No.:	_ SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 86878	330	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0935!	5.i/16nov18b.b/yn18	3s81.d
Level: (low/med) LOW	Date Received: 11/09	9/16	
Moisture: not dec.	Date Analyzed: 11/19	9/16	
Column: (pack/cap) CAP	Dilution Factor: 1.0)	
	CONCENTRATION UNIT	rs:	
Number TICs found: 0	(ug/L or ug/Kg) ug	g/L	

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
	!Total VOC TICs	:: !		: ! U
	_!	i	•	!
	· ·			!
	į			!
	<u> </u>			!
6	!	!!		!
7.	!	!!		!
	!	!		!
9	!	!!		!
.0.	!	!		!
1	!	!!		!
	!	!!		!
.3	!	!!		!
4	!	!!		!
	!	!!		!
	!	!!		!
7	!	!!		!
.8	!	!!		!
.9	!	!!		!
	!	!!		!
1	!	!!		!
2	!	!!		!
3	!	!!		!
4	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
0	!	!!		!
	!	!!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWUpBab-161108 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687831 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 09:10 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30 Reported: 01/25/2017 13:54

MM905 SDG#: MMK09-05BKG

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



5.0

5.0

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWUpBab-161108 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687831 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 09:10 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

n.a.

n.a.

Reported: 01/25/2017 13:54

MM905 SDG#: MMK09-05BKG

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea	arch						
	The results from the FORM 1 - VOA-TIC. on the back of this	The qualifier	-					
Misc.	Organics	EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic a	acid	335-67-1	11		0.5	2	1
10954	Perfluorononanoic a	acid	375-95-1	0.6	J	0.6	2	1
10954	Perfluorodecanoic a	acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoi	c acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoio	c acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecano:	ic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradeca	noic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic a	acid	307-24-4	4		0.5	2	1
10954	Perfluoroheptanoic	acid	375-85-9	3		0.5	2	1
10954	Perfluorobutanesul:	fonate	375-73-5	3		0.7	2	1
10954	Perfluorohexanesul:	fonate	355-46-4	2	J	1	3	1
10954	Perfluoro-octanesu	lfonate	1763-23-1	4	J	2	6	1
10954	Perfluorobutanoic	Acid	375-22-4	9	J	3	10	1
10954	Perfluoropentanoic	Acid	2706-90-3	3		0.5	2	1
	stated QC limits are be obtained to calcu			eient da	ta points			
Metal	s	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	14.9		0.0382	0.400	1
01757	Magnesium		7439-95-4	3.45		0.0190	0.200	1
01762	Potassium		7440-09-7	2.83		0.160	1.00	1
01767	Sodium		7440-23-5	44.4		0.173	2.00	1
Wet C	hemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	84.2		10.0	20.0	50
00221	Sulfate		14808-79-8	30.7		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitra		n.a.	0.18		0.040	0.10	1
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to		n.a.	11.8		1.7	5.0	1
				0		- • •		-

1.7

11.8

1.7 U

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWUpBab-161108 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687831 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 09:10 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

MM905 SDG#: MMK09-05BKG

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163234AA	11/19/2016	00:58	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163234AA	11/19/2016	00:58	Kevin D Kelly	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016	10:08	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16322013	11/20/2016	12:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163160635005	11/19/2016	02:52	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016	02:52	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016	02:52	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016	02:52	Matthew R Machtinger	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163160635005	11/17/2016	23:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	16326120151A	11/21/2016	15:43	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16326120151A	11/21/2016	15:29	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16321118101B	11/16/2016	03:12	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321005106A	11/17/2016	13:44	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321005106A	11/17/2016	13:44	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16321005106A	11/17/2016	13:44	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA SAMPLE NO.				
VOLATILE ORGANICS A		_			
TENTATIVELY IDENT	IFIED COMPOUNDS	!	!		
		! MM905	!		
ab Name: Lancaster Laboratories	Contract:	!	_!		
ab Code: LANCAS Case No.:	SAS No.:	SDG No.:			
<pre>Matrix: (soil/water) WATER</pre>	Lab Sample ID: 8687	7831			
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0935	55.i/16nov18b.b/yn18	3s75.d		
evel: (low/med) LOW	Date Received: 11/0)9/16			
Moisture: not dec.	Date Analyzed: 11/1	19/16			
clumn: (pack/cap) CAP	Dilution Factor: 1.	. 0			
	CONCENTRATION UNI	ITS:			
Number TICs found: 0	(lig/L or lig/Kg) i	ıa/Tı			

CAS NUMBER	! COMPOUND NAME		! EST. CONC.	
	==!===================================	!	•	!===== ! U
	_!		!	 !
		!	 !	!
			!	
5.		!	!	!
6.	_!	!	!	!
	!	!	!	!
8	!	!	!	!
9	!!	!	!	!
0	!	!	!	!
1	!	!	!	!
2	!	!	!	!
.3		!	!	!
4	!	!	!	!
5	!	!	!	!
		!	!	!
7	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	_!	!	•	!
	<u>!</u>	!		!
	<u>!</u>		!	
	_!	!	!	!
0	!	!	!	!
	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWUpBab-161108 MS Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687832 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 09:10 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

MM905 SDG#: MMK09-05MS

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 82	260C	ug/l	ug/l	ug/l	
11997	Acetone	67-64-1	170	6	20	1
11997	Benzene	71-43-2	22	0.5	1	1
11997	Bromochloromethane	74-97-5	22	1	5	1
11997	Bromodichloromethane	75-27-4	23	0.5	1	1
11997	Bromoform	75-25-2	19	0.5	4	1
11997	Bromomethane	74-83-9	20	0.5	1	1
11997	2-Butanone	78-93-3	140	3	10	1
11997	Carbon Disulfide	75-15-0	23	1	5	1
11997	Carbon Tetrachloride	56-23-5	24	0.5	1	1
11997	Chlorobenzene	108-90-7	21	0.5	1	1
11997	Chloroethane	75-00-3	21	0.5	1	1
11997	Chloroform	67-66-3	23	0.5	1	1
11997	Chloromethane	74-87-3	20	0.5	1	1
11997	Cyclohexane	110-82-7	22	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	18	2	5	1
11997	Dibromochloromethane	124-48-1	21	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	21	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	21	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	21	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	21	1	5	1
11997	Dichlorodifluoromethane	75-71-8	20	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	24	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	25	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	25	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	22	0.5	1	1
11997	•		23		1	
11997	trans-1,2-Dichloroethene	156-60-5 78-87-5	23	0.5 0.5	1	1 1
	1,2-Dichloropropane		20		1	1
11997	cis-1,3-Dichloropropene	10061-01-5	21	0.5 0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6 100-41-4	22	0.5	1	1
11997	Ethylbenzene		23		10	
11997	Freon 113	76-13-1	98	2		1
11997	2-Hexanone	591-78-6		3	10	1
11997	Isopropylbenzene	98-82-8	22	1	5	1
11997	Methyl Acetate	79-20-9	21	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	20	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	99	3	10	1
11997	Methylcyclohexane	108-87-2	22	1	5	1
11997	Methylene Chloride	75-09-2	21	2	4	1
11997	Styrene	100-42-5	20	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	20	0.5	1	1
11997	Tetrachloroethene	127-18-4	23	0.5	1	1
11997	Toluene	108-88-3	22	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	20	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	19	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	20	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	21	0.5	1	1
11997	Trichloroethene	79-01-6	23	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	23	0.5	1	1
11997	Vinyl Chloride	75-01-4	21	0.5	1	1
11997	m+p-Xylene	179601-23-1	43	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWUpBab-161108 MS Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687832 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 09:10 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30 Reported: 01/25/2017 13:54

MM905 SDG#: MMK09-05MS

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	50C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	21	0.5	1	1
Misc.	Organics	EPA 537 Re	ev. 1.1	ng/l	ng/l	ng/l	
		modified					
10954	Perfluorooctanoic a		335-67-1	230	0.5	2	1
10954	Perfluorononanoic a		375-95-1	210	0.6	2	1
10954	Perfluorodecanoic a		335-76-2	230	0.5	2	1
10954	Perfluoroundecanoio		2058-94-8	250	1	3	1
10954	Perfluorododecanoio		307-55-1	230	0.5	2	1
10954	Perfluorotridecanoi		72629-94-8	230	0.5	2	1
10954	Perfluorotetradecar		376-06-7	240	0.5	2	1
10954	Perfluorohexanoic a		307-24-4	220	0.5	2	1
10954	Perfluoroheptanoic		375-85-9	250	0.5	2	1
10954	Perfluorobutanesulf		375-73-5	210	0.7	2	1
	Perfluorohexanesulf		355-46-4	220	1	3	1
10954	Perfluoro-octanesul	fonate.	1763-23-1	240	2	6	1
	Perfluorobutanoic A	cid	375-22-4	240	3	10	1
	Perfluoropentanoic		2706-90-3	230	0.5	2	1
	stated QC limits are be obtained to calcu			ent data points			
can	be obtained to cared	iacc scatisti	car rimics.				
Metals	5	SW-846 603	L0C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	19.4	0.0382	0.400	1
01757	Magnesium		7439-95-4	5.52	0.0190	0.200	1
01762	Potassium		7440-09-7	13.0	0.160	1.00	1
01767	Sodium		7440-23-5	55.8	0.173	2.00	1
Wot Cl	nemistry	EPA 300.0		mg/l	mg/l	mg/l	
	-	EPA 300.0	16005 00 6	<u>-</u> .	<u>-</u> .	<u>-</u> .	4.0
00224	Chloride		16887-00-6	163	8.0	16.0	40
00228	Sulfate		14808-79-8	85.6	3.0	10.0	10
		EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitra	te Nitrogen	n.a.	1.2	0.040	0.10	1
		SM 2320 B	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to		n.a.	179	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
------------	--------	----------	--------

CAT	Analysis Name	Method	Trial# Batch#	Analysis	Analyst	Dilution
No.				Date and Time		Factor

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWUpBab-161108 MS Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687832 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 09:10 by JD C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30 Reported: 01/25/2017 13:54

MM905 SDG#: MMK09-05MS

Laboratory Sample Analysis Record

			•					
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163234AA	11/19/2016	01:20	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163234AA	11/19/2016	01:20	Kevin D Kelly	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016	10:29	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16322013	11/20/2016	12:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163160635005	11/19/2016	03:01	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016	03:01	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016	03:01	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016	03:01	Matthew R Machtinger	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163160635005	11/17/2016	23:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	2	16326120151A	12/01/2016	02:19	Clinton M Wilson	40
00228	Sulfate	EPA 300.0	2	16326120151A	12/01/2016	01:15	Clinton M Wilson	10
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16321118101B	11/16/2016	03:13	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321005106A	11/17/2016	14:01	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWUpBab-161108 MSD Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687833 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 09:10 by JD

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 11/09/2016 09:30

Reported: 01/25/2017 13:54

MM905 SDG#: MMK09-05MSD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 8	3260C	ug/l	ug/l	ug/l	
11997	Acetone	67-64-1	160	6	20	1
11997	Benzene	71-43-2	22	0.5	1	1
11997	Bromochloromethane	74-97-5	22	1	5	1
11997	Bromodichloromethane	75-27-4	23	0.5	1	1
11997	Bromoform	75-25-2	18	0.5	4	1
11997	Bromomethane	74-83-9	20	0.5	1	1
11997	2-Butanone	78-93-3	140	3	10	1
11997	Carbon Disulfide	75-15-0	23	1	5	1
11997	Carbon Tetrachloride	56-23-5	24	0.5	1	1
11997	Chlorobenzene	108-90-7	22	0.5	1	1
11997	Chloroethane	75-00-3	21	0.5	1	1
11997	Chloroform	67-66-3	23	0.5	1	1
11997	Chloromethane	74-87-3	20	0.5	1	1
11997	Cyclohexane	110-82-7	22	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	18	2	5	1
11997	Dibromochloromethane	124-48-1	21	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	21	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	21	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	21	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	21	1	5	1
11997	Dichlorodifluoromethane	75-71-8	20	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	24	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	24	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	23	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	21	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	23	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	23	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	20	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	21	0.5	1	1
11997	Ethylbenzene	100-41-4	22	0.5	1	1
11997	Freon 113	76-13-1	23	2	10	1
11997	2-Hexanone	591-78-6	98	3	10	1
11997	Isopropylbenzene	98-82-8	22	1	5	1
11997	Methyl Acetate	79-20-9	21	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	21	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	99	3	10	1
11997	Methylcyclohexane	108-87-2	22	1	5	1
11997	Methylene Chloride	75-09-2	21	2	4	1
11997	Styrene	100-42-5	21	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	20	0.5	1	1
11997	Tetrachloroethene	127-18-4	23	0.5	1	1
11997	Toluene	108-88-3	22	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	20	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	20	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	20	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	21	0.5	1	1
11997	Trichloroethene	79-01-6	23	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	22	0.5	1	1
11997	Vinyl Chloride	75-01-4	21	0.5	1	1
11997	m+p-Xylene	179601-23-1	43	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWUpBab-161108 MSD Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687833 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 09:10 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30

Reported: 01/25/2017 13:54

MM905 SDG#: MMK09-05MSD

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846	8260C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	20	0.5	1	1
Misc.	Organics	EPA 537 modifie	Rev. 1.1	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic a	cid	335-67-1	270	0.5	2	1
10954	Perfluorononanoic a	cid	375-95-1	250	0.6	2	1
10954	Perfluorodecanoic a	cid	335-76-2	240	0.5	2	1
10954	Perfluoroundecanoic	acid	2058-94-8	260	1	3	1
10954	Perfluorododecanoic	acid	307-55-1	260	0.5	2	1
10954	Perfluorotridecanoi	c acid	72629-94-8	260	0.5	2	1
10954	Perfluorotetradecan	oic acid	376-06-7	260	0.5	2	1
10954	Perfluorohexanoic a	cid	307-24-4	270	0.5	2	1
10954	Perfluoroheptanoic	acid	375-85-9	250	0.5	2	1
10954	Perfluorobutanesulf	onate	375-73-5	220	0.7	2	1
10954	Perfluorohexanesulf		355-46-4	220	1	3	1
10954	Perfluoro-octanesul	fonate	1763-23-1	240	2	6	1
10954	Perfluorobutanoic A	cid	375-22-4	250	3	10	1
	Perfluoropentanoic		2706-90-3	250	0.5	2	1
	stated QC limits are			ient data points			
can l	oe obtained to calcu	late statis	stical limits.				
Metals	5	SW-846	6010C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	19.5	0.0382	0.400	1
01757	Magnesium		7439-95-4	5.56	0.0190	0.200	1
01762	Potassium		7440-09-7	13.0	0.160	1.00	1
01767	Sodium		7440-23-5	56.1	0.173	2.00	1
Wet Ch	nemistry	SM 2320	B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	рн 4.5	n.a.	189	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

	Laboratory Sample Analysis Record											
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	me	Analyst	Dilution Factor				
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163234AA	11/19/2016	01:42	Kevin D Kelly	1				
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163234AA	11/19/2016	01:42	Kevin D Kelly	1				
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016	10:49	Jason W Knight	1				
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16322013	11/20/2016	12:00	Devon M Whooley	1				
01750	Calcium	SW-846 6010C	1	163160635005	11/19/2016	03:04	Matthew R Machtinger	1				

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWUpBab-161108 MSD Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687833 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 09:10 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

MM905 SDG#: MMK09-05MSD

		Laborat	ory Sa	ample Analysi	s Record			
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016	03:04	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016	03:04	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016	03:04	Matthew R Machtinger	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163160635005	11/17/2016	23:00	Annamaria Kuhns	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321005106A	11/17/2016	14:10	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWUpBab-161108 Dupl Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687834 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 09:10 by JD

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 11/09/2016 09:30

Reported: 01/25/2017 13:54

MM905 SDG#: MMK09-05DUP

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	5	SW-846	6010C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	15.2	0.0382	0.400	1
01757	Magnesium		7439-95-4	3.52	0.0190	0.200	1
01762	Potassium		7440-09-7	2.94	0.160	1.00	1
01767	Sodium		7440-23-5	45.3	0.173	2.00	1
Wet Ch	nemistry	EPA 300	.0	mg/l	mg/l	mg/l	
00224	Chloride		16887-00-6	82.3	4.0	8.0	20
00228	Sulfate		14808-79-8	30.0	1.5	5.0	5
		EPA 353	.2	mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitra	te Nitroge	n n.a.	0.16	0.040	0.10	1
		SM 2320	B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	pH 4.5	n.a.	12.6	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
01750	Calcium	SW-846 6010C	1	163160635005	11/19/2016	02:58	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016	02:58	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016	02:58	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016	02:58	Matthew R Machtinger	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163160635005	11/17/2016	23:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	2	16326120151A	12/01/2016	01:31	Clinton M Wilson	20
00228	Sulfate	EPA 300.0	2	16326120151A	12/01/2016	00:58	Clinton M Wilson	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16321118101B	11/16/2016	03:15	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321005106A	11/17/2016	13:53	Brandon P Costik	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWUpMerr-161108 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687835 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 10:30 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30

Reported: 01/25/2017 13:54

MM906 SDG#: MMK09-06

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	IJ	0.5	1	1
11997	Bromochloromethane	74-97-5	1	IJ	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	IJ	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	II	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	IJ	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	II	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	IJ	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1	1
11997	,	75-35-4	0.5	Ū	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1	1
11997	trans-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1	1
11997	•	78-87-5	0.5	IJ	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5	1	1
11997		10061-01-5	0.5	IJ	0.5	1	1
11997	trans-1,3-Dichloropropene Ethylbenzene	10061-02-6	0.5	IJ	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
				IJ		10	
11997	2-Hexanone	591-78-6	3 1	Ū	3 1	5	1
11997	Isopropylbenzene	98-82-8	1	IJ	1	5 5	1 1
11997	-	79-20-9	0.5	IJ	0.5		
11997	Methyl Tertiary Butyl Ether	1634-04-4		U	0.5 3	1	1
11997	4-Methyl-2-pentanone	108-10-1	3 1	IJ	1	10 5	1
11997	Methylcyclohexane	108-87-2		IJ	2		1
11997	Methylene Chloride	75-09-2	2	-		4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U 	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U 	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U 	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U 	1	5	1
11997		71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWUpMerr-161108 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687835 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 10:30 by JD

C. T. Male Associates
50 Century Hill Drive

As Received

Latham NY 12110

Submitted: 11/09/2016 09:30

Reported: 01/25/2017 13:54

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

MM906 SDG#: MMK09-06

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived	Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea	arch						
	The results from the FORM 1 - VOA-TIC. on the back of this	The qualifier	-					
Misc.	Organics	EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic		335-67-1	3		0.5	2	1
10954	Perfluorononanoic		375-95-1	0.6	U	0.6	2	1
	Perfluorodecanoic		335-76-2	0.5	U	0.5	2	1
10954			2058-94-8	1	U	1	3	1
10954			307-55-1	0.5	U	0.5	2	1
10954			72629-94-8	0.5	U	0.5	2	1
10954			376-06-7	0.5	U	0.5	2	1
10954			307-24-4	2	J	0.5	2	1
10954	-		375-85-9	2	_	0.5	2	1
	Perfluorobutanesul		375-73-5	1	J	0.7	2	1
10954			355-46-4	1	U	1	3 6	1
	Perfluoro-octanesu		1763-23-1	2	U	2 3	10	1 1
	Perfluorobutanoic		375-22-4 2706-90-3	3 2	U J	0.5	2	1
	Perfluoropentanoic					0.5	2	<u>T</u>
	stated QC limits are be obtained to calcu	-	-	eient da	ta points			
Metals	5	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	3.90		0.0382	0.400	1
01757	Magnesium		7439-95-4	0.842		0.0190	0.200	1
01762	Potassium		7440-09-7	1.08		0.160	1.00	1
01767	Sodium		7440-23-5	11.7		0.173	2.00	1
Wet Cl	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	18.6		1.0	2.0	5
00228	Sulfate		14808-79-8	6.4		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitr		n.a.	0.20		0.040	0.10	1
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to		n.a.	5.4		1.7	5.0	1
10140				- 4				_

1.7

5.0

5.0

5.4

n.a.

n.a.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWUpMerr-161108 Grab Surface Water

SGPP - Merrimack

LL Sample # GW 8687835 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 10:30 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

MM906 SDG#: MMK09-06

12148 Carbonate Alkalinity

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

SM 2320 B-1997

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles SW-846 8260C 1 Y163234AA 11/19/2016 03:33 Kevin D Kelly 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 Y163234AA 11/19/2016 03:33 Kevin D Kelly 10954 14 PFCs EPA 537 Rev. 1.1 16322013 11/23/2016 13:33 Jason W Knight 1 modified EPA 537 Rev. 1.1 14091 PFAA Water Prep 16322013 Devon M Whooley 1 11/20/2016 12:00 1 modified 01750 Calcium SW-846 6010C 163160635005 1 11/19/2016 03:28 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163160635005 11/19/2016 03:28 Matthew R 1 Machtinger 01762 Potassium SW-846 6010C 1 163160635005 11/19/2016 03:28 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163160635005 1 11/19/2016 03:28 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163160635005 11/17/2016 23:00 Annamaria Kuhns 1 U4 00224 Chloride EPA 300.0 16326120151A 11/21/2016 13:45 Hallie Burnett 00228 Sulfate EPA 300.0 16326120151A Hallie Burnett 1 11/21/2016 13:45 5 07882 Total Nitrite/Nitrate EPA 353.2 1 16321118101B 11/16/2016 03:27 Joseph E McKenzie 1 Nitrogen SM 2320 B-1997 16321005106A 12150 Total Alkalinity to pH 11/17/2016 17:02 Brandon P Costik 12149 Bicarbonate Alkalinity SM 2320 B-1997 1 16321005106A Brandon P Costik 11/17/2016 17:02 1

16321005106A

11/17/2016 17:02

Brandon P Costik

1

1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA S	SAMPLE N	Ю.
VOLATILE ORGANICS A TENTATIVELY IDENT		!		!
		! 1	MM906	!
ab Name: Lancaster Laboratories	Contract:	!		!
ab Code: LANCAS Case No.:	SAS No.:	SDG 1	No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8687	7835		
sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0935	55.i/16nov	v18b.b/y	m18s82.d
evel: (low/med) LOW	Date Received: 11/0	09/16	_	
Moisture: not dec.	Date Analyzed: 11/1	19/16		
clumn: (pack/cap) CAP	Dilution Factor: 1.	. 0		
	CONCENTRATION UNI	ITS:		
Number TICs found: 0	(11a/T, or 11a/Ka) 1	1a / T.		

CAS NUMBER	! COMPOUND NAME ==!==================================	! RT	EST. CONC.	
	!Total VOC TICs	!		!===== ! U
	!!	! !		!
	!	!		!
4.	!	!		!
5	!	!!		!
6	!	!		!
7	!	!!		!
8	!	!		!
9	!	!!	!	!
.0.	!	!		!
1	!	!!		!
2	!!	!!		!
.3	!	!!		!
4	!	!!		!
.5	!	!!		!
.6	!	!!		!
.7	!	!!		!
.8	!	!!		!
.9	!	!!		!
0	!	!!		!
1	!	!!		!
	!	!!		!
3	!	!!		!
4	!	!!		!
5	!	!!		!
6	!	!!		!
.7	!	!!		!
8		!!		!
9		!!		!
0	!	!!		!
	!	! !		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-FTB01-161108 Blank Water

SGPP - Merrimack

LL Sample # WW 8687836 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 08:23

C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30

Reported: 01/25/2017 13:54

MM907 SDG#: MMK09-07TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
	stated QC limits are advisory on	-	ient da	ta points			

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	ne	Analyst	Dilution Factor
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016	13:54	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16322013	11/20/2016	12:00	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LTB01-161108 Blank Water

SGPP - Merrimack

LL Sample # WW 8687837 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30 Reported: 01/25/2017 13:54

MM908 SDG#: MMK09-08TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U 	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U U	2 1	4 5	1 1
11997	Styrene	100-42-5	1 0.5	U	0.5	1	1
11997	1,1,2,2-Tetrachloroethane Tetrachloroethene	79-34-5	0.5	U		1	
11997 11997	Toluene	127-18-4 108-88-3	0.5	U	0.5 0.5	1	1 1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
	1,2,4-Trichlorobenzene		1	U	1	5	1
11997 11997	1,1,1-Trichloroethane	120-82-1 71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-00-5 79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-09-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1
11221	W. P WATCHE	1,7001-23-1	0.5	U	0.5	-	±

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LTB01-161108 Blank Water

SGPP - Merrimack

LL Sample # WW 8687837 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30 Reported: 01/25/2017 13:54

MM908 SDG#: MMK09-08TB

CAT No.	Analysis Name		CAS Number	Result	=	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles o-Xylene	SW-846	8260C 95-47-6	ug/l 0.5	U	ug/l 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 53	7 Rev. 1.1	ng/l		ng/l	ng/l	
	modifie	ed					
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: the sample was reinjected outside of the required holding time and all internal standards were within QC acceptance limits. The data is reported from the initial injection of the sample. Both sets of data are available in the data package.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	e	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163234AA	11/19/2016 0	00:14	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163234AA	11/19/2016 0	00:14	Kevin D Kelly	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016 1	14:14	Jason W Knight	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LTB01-161108 Blank Water

SGPP - Merrimack

LL Sample # WW 8687837 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30

Reported: 01/25/2017 13:54

MM908 SDG#: MMK09-08TB

Laboratory Sample Analysis Record

CAT Analysis Name Method Trial# Batch# Analysis Analyst Dilution No.

14091 PFAA Water Prep EPA 537 Rev. 1.1 1 16322013 11/20/2016 12:00 Devon M Whooley 1 modified



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA SAMPLE NO.			
VOLATILE ORGANICS A				
TENTATIVELY IDENT	!	!		
		! MM908	!	
ab Name: Lancaster Laboratories	Contract:	!	!	
ab Code: LANCAS Case No.:	SAS No.:	SDG No.:	_	
Matrix: (soil/water) WATER	Lab Sample ID: 8687	7837		
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0935	55.i/16nov18b.b/yn18	s73.d	
evel: (low/med) LOW	Date Received: 11/0	09/16		
Moisture: not dec.	Date Analyzed: 11/1	19/16		
clumn: (pack/cap) CAP	Dilution Factor: 1.	. 0		
	CONCENTRATION UNI	ITS:		
Number TICs found: 0	(ua/L or ua/Ka) i	ıa/I.		

CAS NUMBER	! COMPOUND NAME ==!============	. 101	! EST. CONC.	
1. VOCTIC	==!===================================	•	•	!==== ! U
2	!	!	!	!
	!!	!	!	!
4	!!	!	!	!
5	!	!	!	!
6	!	!	!	!
7		!	!	!
8	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
.4	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	_!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!		!
	!	!	!	!
8	_ !	!	!	!
9		!	!	!
0	!	!	!	!
	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-8-161108 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8687838 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 10:30 by JD C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30 Reported: 01/25/2017 13:54

MM909 SDG#: MMK09-09

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Lim	it*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l		ug/l	
11997	Acetone	67-64-1	6	U	6		20	1
11997	Benzene	71-43-2	0.5	IJ	0.5		1	1
11997	Bromochloromethane	74-97-5	1	IJ	1		5	1
11997	Bromodichloromethane	75-27-4	0.5	IJ	0.5		1	1
11997	Bromoform	75-25-2	0.5	U	0.5		4	1
11997	Bromomethane	74-83-9	0.5	U	0.5		1	1
11997	2-Butanone	78-93-3	3	IJ	3		10	1
11997	Carbon Disulfide	75-15-0	1	U	1		5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5		1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5		1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5		1	1
11997	Chloroform	67-66-3	0.5	U	0.5		1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5		1	1
11997	Cyclohexane	110-82-7	2	IJ	2		5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2		5	1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5		1	1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5		1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1		5	1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1		5	1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1		5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5		1	1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5		1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5		1	1
11997	1,1-Dichloroethene	75-35-4	0.5	Ū	0.5		1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	Ū	0.5		1	1
11997	trans-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5		1	1
11997	1,2-Dichloropropane	78-87-5	0.5	IJ	0.5		1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5		1	1
11997	trans-1,3-Dichloropropene	10061-01-5	0.5	IJ	0.5		1	1
11997	Ethylbenzene	10061-02-6	0.5	IJ	0.5		1	1
11997	Freon 113	76-13-1	2	IJ	2		10	1
			3	IJ			10	=
11997	2-Hexanone	591-78-6	3 1	Ū	3 1		5	1 1
11997	Isopropylbenzene	98-82-8	1	U	1		5	1
11997	Methyl Acetate	79-20-9	0.5	IJ	0.5			
11997	Methyl Tertiary Butyl Ether	1634-04-4		-			1	1
11997	4-Methyl-2-pentanone	108-10-1	3 1	U U	3 1		10 5	1 1
11997	Methylcyclohexane	108-87-2	2	IJ	2			
11997	Methylene Chloride	75-09-2		-			4	1
11997	Styrene	100-42-5	1	U	1		5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U 	0.5		1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5		1	1
11997	Toluene	108-88-3	0.5	U 	0.5		1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U 	1		5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U 	1		5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5		1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ū	0.5		1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5		1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5		1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5		1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5		1	1

^{*=}This limit was used in the evaluation of the final result



5.0

5.0

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-8-161108 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8687838 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 10:30 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

n.a.

n.a.

Reported: 01/25/2017 13:54

MM909 SDG#: MMK09-09

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Se	arch						
	The results from t FORM 1 - VOA-TIC. on the back of thi	The qualifier	-					
Misc.	Organics	EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic	acid	335-67-1	52		0.5	2	1
10954	Perfluorononanoic	acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic	acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoi	c acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoi	c acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecano	ic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradeca	noic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic	acid	307-24-4	11		0.5	2	1
10954	Perfluoroheptanoio	acid	375-85-9	11		0.5	2	1
10954	Perfluorobutanesul	fonate	375-73-5	4		0.7	2	1
10954	Perfluorohexanesul	fonate	355-46-4	3		1	3	1
10954	Perfluoro-octanesu	lfonate	1763-23-1	3	J	2	6	1
10954	Perfluorobutanoic	Acid	375-22-4	5	J	3	10	1
10954			2706-90-3	8		0.5	2	1
	stated QC limits ar			ient da	ta points			
	be obtained to calc			i ciro da	ou points			
Metal	s	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	16.2		0.0382	0.400	1
01757	Magnesium		7439-95-4	2.87		0.0190	0.200	1
01762	Potassium		7440-09-7	1.98		0.160	1.00	1
01767	Sodium		7440-23-5	55.6		0.173	2.00	1
Wet C	hemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	113		20.0	40.0	100
00228	Sulfate		14808-79-8	13.9		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitr		n.a.	2.3		0.040	0.10	1
		SM 2320 B	_1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity t		n.a.	21.8		1.7	5.0	1
12130	TOCAL AINALLIIILLY L	O bu 4.9	ıı.a.	21.0		1./	5.0	_

1.7

21.8

1.7 U

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-8-161108 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8687838 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 10:30 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

MM909 SDG#: MMK09-09

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles SW-846 8260C 1 Y163234AA 11/19/2016 03:55 Kevin D Kelly 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 Y163234AA 11/19/2016 03:55 Kevin D Kelly 10954 14 PFCs EPA 537 Rev. 1.1 16322013 11/23/2016 14:35 Jason W Knight 1 modified EPA 537 Rev. 1.1 11/20/2016 12:00 14091 PFAA Water Prep 16322013 Devon M Whooley 1 1 modified 01750 Calcium SW-846 6010C 163160635005 1 11/19/2016 03:31 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163160635005 11/19/2016 03:31 Matthew R 1 Machtinger 01762 Potassium SW-846 6010C 1 163160635005 11/19/2016 03:31 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163160635005 1 11/19/2016 03:31 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163160635005 11/17/2016 23:00 Annamaria Kuhns 1 U4 00224 Chloride EPA 300.0 16326120151A 11/21/2016 17:42 Hallie Burnett 100 00228 Sulfate EPA 300.0 16326120151A Hallie Burnett 1 11/21/2016 17:27 5 07882 Total Nitrite/Nitrate EPA 353.2 1 16321118101B 11/16/2016 03:29 Joseph E McKenzie 1 Nitrogen SM 2320 B-1997 16321005106A 12150 Total Alkalinity to pH 11/17/2016 16:21 Brandon P Costik 12149 Bicarbonate Alkalinity SM 2320 B-1997 1 16321005106A Brandon P Costik 11/17/2016 16:21 1 12148 Carbonate Alkalinity SM 2320 B-1997 1 16321005106A 11/17/2016 16:21 Brandon P Costik 1

^{*=}This limit was used in the evaluation of the final result



Number TICs found: 0

Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E					
S DATA SHEET					
COMPOUNDS	!!!				
	! MM909 !				
Contract:	!!				
SAS No.:	SDG No.:				
b Sample ID: 8687838					
ab File ID:HP09355.i/1	16nov18b.b/yn18s83	٠. (
te Received: 11/09/16					
te Analyzed: 11/19/16					
lution Factor: 1.0					
CONCENTRATION UNITS:					
	S DATA SHEET COMPOUNDS Contract: SAS No.: b Sample ID: 8687838	COMPOUNDS ! ! ! MM909 ! ! ! MM909 ! ! ! MM909 ! ! ! ! MM909 ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! !			

(ug/L or ug/Kg) ug/L

	! COMPOUND NAME		! EST. CONC.	
	==!===================================	•	•	!===== ! U
		!	!	!
		!	!	!
	!		!	!
5	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	_!	!	!	!
	_!	!		!
	<u>!</u>	!	!	!
			!	
	<u>-</u> -		!	¦
	! !	i	·	<u>;</u> ———
	<u>-</u>	i	!	:
		i	:	i
	!	i	· !	;——
	i	i	!	!
		i	!	! !
	_!	!	!	!
	!		!	!
	!!	!	!	!
	!!	!	!	!
25		!	!	!
	!	!	!	!
	!	!	!	!
	_!	!		!
	_!	!	!	!
30	_!	!	!	!
	!	1	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWEB01-161108 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8687839 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 12:00 by JD C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30 Reported: 01/25/2017 13:54

MM910 SDG#: MMK09-10EB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWEB01-161108 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8687839 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 12:00 by JD C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 11/09/2016 09:30 Reported: 01/25/2017 13:54

SDG#: MMK09-10EB MM910

CAT No.	Analysis Name		CAS Number	Result	=	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	50C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea	rch						
	The results from the FORM 1 - VOA-TIC. on the back of this	The qualifier	-					
Misc.	Organics	EPA 537 Re	ev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic a	.cid	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic a	.cid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic a	.cid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic	acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoio	acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoi	c acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecan	oic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic a	.cid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic	acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulf	onate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulf	onate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesul	fonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic A	cid	375-22-4	3	Ū	3	10	1
	Perfluoropentanoic		2706-90-3	0.5	Ū	0.5	2	1
	stated QC limits are				a points			
	be obtained to calcu				F			
Metals	3	SW-846 601	LOC	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	0.089	5 J	0.0382	0.400	1
01757	Magnesium		7439-95-4	0.019) U	0.0190	0.200	1
01762	Potassium		7440-09-7	0.160	IJ	0.160	1.00	1
01767	Sodium		7440-23-5	0.229		0.173	2.00	1
Wet Ch	nemistry	EPA 300.0		mg/1		mg/l	mg/l	
00224	Chloride		16887-00-6	0.20	U	0.20	0.40	1
00228	Sulfate		14808-79-8	0.30	U	0.30	1.0	1
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitra		n.a.	0.040	U	0.040	0.10	1
		SM 2320 B-	-1997	mg/la	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to		n.a.	1.7	U	1.7	5.0	1
12150	_	-		1.7	IJ	1.7	5.0	1
	Bicarbonate Alkalin	-	n.a.		IJ			1
12148	Carbonate Alkalinit	У	n.a.	1.7	U	1.7	5.0	Τ

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-SWEB01-161108 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8687839 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 12:00 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

MM910 SDG#: MMK09-10EB

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Trial# Batch# Analysis

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Ti	me		Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163234AA	11/19/2016	00:36	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163234AA	11/19/2016	00:36	Kevin D Kelly	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016	15:57	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16322013	11/20/2016	12:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163160635005	11/19/2016	03:34	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016	03:34	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016	03:34	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016	03:34	Matthew R Machtinger	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163160635005	11/17/2016	23:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	2	16326120151A	11/23/2016	00:48	Clinton M Wilson	1
00228	Sulfate	EPA 300.0	2	16326120151A	11/23/2016	00:48	Clinton M Wilson	1
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16321118101B	11/16/2016	03:31	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321002202A	11/16/2016	23:00	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321002202A	11/16/2016	23:00	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16321002202A	11/16/2016	23:00	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.
VOLATILE ORGANICS	ANALYSIS DATA SHEET	
TENTATIVELY IDEN	TIFIED COMPOUNDS	!!!
		! MM910 !
Lab Name: Lancaster Laboratories	Contract:	!!
Lab Code: LANCAS Case No.:_	SAS No.:	_ SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID: 8687	839
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0935	5.i/16nov18b.b/yn18s74.d
Level: (low/med) LOW	Date Received: 11/0	9/16
Moisture: not dec.	Date Analyzed: 11/1	9/16
Column: (pack/cap) CAP	Dilution Factor: 1.	0
	CONCENTRATION UNI	TS:
Number TICs found: 0	(ug/L or ug/Kg) u	g/L

CAS NUMBER	! COMPOUND NAME		EST. CONC.	~
	!Total VOC TICs	!: !		!===== ! U
2	_!	!!	!	!
	_!	!		!
	!		!	!
	!		!	!
6	!	!	!	!
7	!		!	!
8	!!	!!	<u> </u>	!
9	!	!!	!	!
.0	!	!!		!
1	!!	!!	<u> </u>	!
2	!	!!	!	!
.3	!!	!!	<u> </u>	!
4	!	!!	!	!
.5	!	!!		!
	!	!!	!	!
7	!	!!	!	!
.8	!	!!	!	!
9	!	!!	!	!
0	!	!!	!	!
1	!	!!		!
2	!!	!!	<u> </u>	!
3	!	!!	!	!
4	!!	!!	<u> </u>	!
	!	!!	!	!
6	!!	!!	!	!
.7	!	!!		!
	!	!!		!
9	!	!!		!
0	!	!!		!
	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-RB01-161108 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8687840 LL Group # 1731052

Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 08:15 by JD

C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30

Reported: 01/25/2017 13:54

MM911 SDG#: MMK09-11RB

Analysis Name	CAS Number	Resul	.t	Method Detection Limit	Limit of t* Quantitation	Dilution Factor
Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
modified						
Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
Perfluorohexanoic acid	307-24-4	0.6	J	0.5	2	1
Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
	Organics EPA 537 modified Perfluorooctanoic acid Perfluorononanoic acid Perfluoroundecanoic acid Perfluoroundecanoic acid Perfluorotridecanoic acid Perfluorotridecanoic acid Perfluorotradecanoic acid Perfluorobetradecanoic acid Perfluorobetradecanoic acid Perfluorohexanoic acid Perfluorobetradecanoic acid Perfluorobetranoic acid Perfluorobetranoic acid Perfluorobetranoic acid Perfluorobetranoic acid Perfluorobetranoic acid Perfluorohexanesulfonate Perfluorobetranoic Acid Perfluoropentanoic Acid	Organics EPA 537 Rev. 1.1 modified Perfluorooctanoic acid 335-67-1 Perfluorononanoic acid 375-95-1 Perfluoroundecanoic acid 335-76-2 Perfluoroundecanoic acid 2058-94-8 Perfluorododecanoic acid 307-55-1 Perfluorotridecanoic acid 72629-94-8 Perfluorotetradecanoic acid 376-06-7 Perfluorobetanoic acid 376-06-7 Perfluorohexanoic acid 375-85-9 Perfluorobetanoic acid 375-85-9 Perfluorobetanoic acid 375-73-5 Perfluorobetanoic acid 375-23-1 Perfluoro-octanesulfonate 1763-23-1 Perfluorobutanoic Acid 375-22-4 Perfluoropentanoic Acid 2706-90-3	Organics EPA 537 Rev. 1.1 ng/1 modified Perfluorooctanoic acid 335-67-1 0.5 Perfluorononanoic acid 335-76-2 0.5 Perfluoroundecanoic acid 335-76-2 0.5 Perfluoroundecanoic acid 307-55-1 0.5 Perfluorotridecanoic acid 307-55-1 0.5 Perfluorotridecanoic acid 72629-94-8 0.5 Perfluorotridecanoic acid 72629-94-8 0.5 Perfluorotridecanoic acid 376-06-7 0.5 Perfluorobetradecanoic acid 376-85-9 0.5 Perfluorobetanoic acid 375-85-9 0.5 Perfluorobetanoic acid 375-85-9 0.5 Perfluorobetanoic acid 375-73-5 0.7 Perfluorobetanoic acid 355-46-4 1 Perfluoro-octanesulfonate 355-46-4 1 Perfluorobutanoic Acid 375-22-4 3 Perfluoropentanoic Acid 2706-90-3 0.5	Organics EPA 537 Rev. 1.1 ng/1 modified Perfluorooctanoic acid 335-67-1 0.5 U Perfluorononanoic acid 375-95-1 0.6 U Perfluorodecanoic acid 335-76-2 0.5 U Perfluoroundecanoic acid 2058-94-8 1 U Perfluorododecanoic acid 307-55-1 0.5 U Perfluorotridecanoic acid 72629-94-8 0.5 U Perfluorotridecanoic acid 72629-94-8 0.5 U Perfluorotetradecanoic acid 376-06-7 0.5 U Perfluorohexanoic acid 376-06-7 0.5 U Perfluorohexanoic acid 375-85-9 0.5 U Perfluorobutanesulfonate 375-73-5 0.7 U Perfluorobutanesulfonate 355-46-4 1 U Perfluoro-octanesulfonate 1763-23-1 2 U Perfluorobutanoic Acid 375-22-4 3 U Perfluoropentanoic Acid 2706-90-3 0.5 U	Analysis Name CAS Number Result Detection Limit Organics EPA 537 Rev. 1.1 ng/l ng/l Perfluorooctanoic acid 335-67-1 0.5 U 0.5 Perfluoroononanoic acid 375-95-1 0.6 U 0.6 Perfluorodecanoic acid 335-76-2 0.5 U 0.5 Perfluoroundecanoic acid 2058-94-8 1 U 1 Perfluorododecanoic acid 307-55-1 0.5 U 0.5 Perfluorotridecanoic acid 72629-94-8 0.5 U 0.5 Perfluorotetradecanoic acid 376-06-7 0.5 U 0.5 Perfluorohexanoic acid 376-06-7 0.5 U 0.5 Perfluorohexanoic acid 375-85-9 0.5 U 0.5 Perfluorobutanesulfonate 375-73-5 0.7 U 0.7 Perfluoro-octanesulfonate 375-73-5 0.7 U 0.7 Perfluorobutanoic Acid 375-22-4 3 U 3	Analysis Name CAS Number Result Detection Limit* Quantitation Organics EPA 537 Rev. 1.1 ng/l ng/l ng/l ng/l Perfluorooctanoic acid acid 335-67-1 0.5 U 0.5 2 Perfluoroononanoic acid acid 375-95-1 0.6 U 0.6 2 Perfluorodecanoic acid 2058-94-8 1 U 1 3 Perfluorodecanoic acid 307-55-1 0.5 U 0.5 2 Perfluorotridecanoic acid 72629-94-8 0.5 U 0.5 2 Perfluorotetradecanoic acid 72629-94-8 0.5 U 0.5 2 Perfluorotetradecanoic acid 376-06-7 0.5 U 0.5 2 Perfluorohexanoic acid 376-06-7 0.5 U 0.5 2 Perfluorobetanoic acid 375-85-9 0.5 U 0.5 2 Perfluorobexanesulfonate 375-73-5 0.7 U 0.7 2 Perfluoro-octanesulfonate 355-46-4 1 U 1 3

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample internal standard is outside the QC acceptance limits.

Target analytes were detected in this rinse blank. The following corrective action was taken: the sample was re-extracted outside of the required hoding time and no reportable hits were detected. the data is reported from the initial in-hold extraction of the sample. Both sets of data are available in the data package.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016	16:18	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16322013	11/20/2016	12:00	Devon M Whooley	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-RB02-161108 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8687841 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 08:30 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30

Latham NY 12110

Reported: 01/25/2017 13:54

MM912 SDG#: MMK09-12RB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified	l					
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
The	stated QC limits are advisory o	nly until suffic	ient da	ta points			
can	he obtained to calculate statis	tical limits					

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	ne	Analyst	Dilution Factor
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016	16:38	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16322013	11/20/2016	12:00	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-4A-161108 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8687842 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 12:35 by JD C. T. Male Associates

50 Century Hill Drive Submitted: 11/09/2016 09:30 Latham NY 12110

Submitted: 11/09/2016 09:30 Latham NY 121 Reported: 01/25/2017 13:54

MM913 SDG#: MMK09-13

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	3260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	IJ	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	tī	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	τι	0.5	1	1
			0.5	Ū	0.5	1	1
11997 11997	1,2-Dibromoethane	106-93-4 95-50-1	0.5 1	ττ	0.5	5	1
	1,2-Dichlorobenzene			-			
11997	1,3-Dichlorobenzene	541-73-1	1	U 	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U 	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	Ū	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	Ū	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	Ū	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	IJ	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	tī	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	Ū	0.5	1	1
1122/	m+b-virene	1/9001-23-1	0.5	U	0.5	1	±

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-4A-161108 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8687842 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 12:35 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30 Reported: 01/25/2017 13:54

MM913 SDG#: MMK09-13

CAT No. Analysis Name	Analysis Name CAS Number		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles 11997 o-Xylene	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/1 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form

•		1.1 ng/l		ng/l	ng/l	
Perfluorooctanoic acid	335-67-1	82		0.5	2	1
Perfluorononanoic acid	375-95-1	0.6	J	0.6	2	1
Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
Perfluorohexanoic acid	307-24-4	14		0.5	2	1
Perfluoroheptanoic acid	375-85-9	15		0.5	2	1
Perfluorobutanesulfonate	375-73-5	6		0.7	2	1
Perfluorohexanesulfonate	355-46-4	4		1	3	1
Perfluoro-octanesulfonate	1763-23-1	4	J	2	6	1
Perfluorobutanoic Acid	375-22-4	5	J	3	10	1
Perfluoropentanoic Acid	2706-90-3	9		0.5	2	1
	modified Perfluorooctanoic acid Perfluorononanoic acid Perfluoroundecanoic acid Perfluoroundecanoic acid Perfluorotecanoic acid Perfluorotetradecanoic acid Perfluorotetradecanoic acid Perfluorohexanoic acid Perfluorohexanoic acid Perfluorobetanoic acid Perfluorobutanesulfonate Perfluoro-octanesulfonate Perfluorobutanoic Acid	modified Perfluorooctanoic acid 335-67-1 Perfluorononanoic acid 375-95-1 Perfluorodecanoic acid 335-76-2 Perfluoroundecanoic acid 2058-94-8 Perfluorododecanoic acid 307-55-1 Perfluorotridecanoic acid 72629-94-8 Perfluorotetradecanoic acid 376-06-7 Perfluorohexanoic acid 375-85-9 Perfluorobutanesulfonate 375-73-5 Perfluorobexanesulfonate 355-46-4 Perfluoro-octanesulfonate 1763-23-1 Perfluorobutanoic Acid 375-22-4	modified Perfluorooctanoic acid 335-67-1 82 Perfluorononanoic acid 375-95-1 0.6 Perfluorodecanoic acid 335-76-2 0.5 Perfluoroundecanoic acid 2058-94-8 1 Perfluorododecanoic acid 307-55-1 0.5 Perfluorotridecanoic acid 72629-94-8 0.5 Perfluorotetradecanoic acid 376-06-7 0.5 Perfluorohexanoic acid 307-24-4 14 Perfluoroheptanoic acid 375-85-9 15 Perfluorobutanesulfonate 375-73-5 6 Perfluoro-octanesulfonate 355-46-4 4 Perfluorobutanoic Acid 375-22-4 5	modified Perfluorooctanoic acid 335-67-1 82 Perfluorononanoic acid 375-95-1 0.6 J Perfluorodecanoic acid 335-76-2 0.5 U Perfluoroundecanoic acid 2058-94-8 1 U Perfluorododecanoic acid 307-55-1 0.5 U Perfluorotridecanoic acid 72629-94-8 0.5 U Perfluorotetradecanoic acid 376-06-7 0.5 U Perfluorohexanoic acid 307-24-4 14 Perfluorohexanoic acid 375-85-9 15 Perfluorobutanesulfonate 375-73-5 6 Perfluoro-octanesulfonate 355-46-4 4 Perfluorobutanoic Acid 375-22-4 5 J	modified Perfluorooctanoic acid 335-67-1 82 0.5 Perfluoroonanoic acid 375-95-1 0.6 J 0.6 Perfluorodecanoic acid 2058-94-8 1 U 1 Perfluorododecanoic acid 307-55-1 0.5 U 0.5 Perfluorotridecanoic acid 72629-94-8 0.5 U 0.5 Perfluorotetradecanoic acid 376-06-7 0.5 U 0.5 Perfluorohexanoic acid 307-24-4 14 0.5 Perfluorohexanoic acid 375-85-9 15 0.5 Perfluorobutanesulfonate 375-73-5 6 0.7 Perfluoro-octanesulfonate 355-46-4 4 1 Perfluorobutanoic Acid 375-22-4 5 J 3	modified Perfluorooctanoic acid 335-67-1 82 0.5 2 Perfluorononanoic acid 375-95-1 0.6 J 0.6 2 Perfluorodecanoic acid 335-76-2 0.5 U 0.5 2 Perfluoroundecanoic acid 2058-94-8 1 U 1 3 Perfluorodecanoic acid 307-55-1 0.5 U 0.5 2 Perfluorotridecanoic acid 72629-94-8 0.5 U 0.5 2 Perfluorotetradecanoic acid 376-06-7 0.5 U 0.5 2 Perfluorohexanoic acid 376-06-7 0.5 U 0.5 2 Perfluoroheptanoic acid 375-85-9 15 0.5 2 Perfluorobetanesulfonate 375-73-5 6 0.7 2 Perfluorohexanesulfonate 355-46-4 4 1 3 Perfluorobutanoic Acid 375-22-4 5

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: the sample was reinjected outside of the required holding time and all internal standards were within QC acceptance limits. The data is reported from the initial injection of the sample. Both sets of data are available in the data package.

Metals	3	SW-846 60	10C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	12.4	0.0382	0.400	1
01757	Magnesium		7439-95-4	2.30	0.0190	0.200	1
01762	Potassium		7440-09-7	1.86	0.160	1.00	1
01767	Sodium		7440-23-5	55.3	0.173	2.00	1
Wet Ch	nemistry	EPA 300.0)	mg/l	mg/l	mg/l	
00224	Chloride		16887-00-6	91.1	10.0	20.0	50
00228	Sulfate		14808-79-8	13.2	1.5	5.0	5
		EPA 353.2	2	mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitra	te Nitrogen	n.a.	3.5	0.040	0.10	1
		SM 2320 E	3-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	pH 4.5	n.a.	24.6	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-4A-161108 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8687842 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 12:35 by JD C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30 Reported: 01/25/2017 13:54

MM913 SDG#: MMK09-13

CAT No.	3 1		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor	
Wet C	hemistry	SM 2320	B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3		
12149	Bicarbonate Alkalini	ty	n.a.	24.6	1.7	5.0	1	
12148	Carbonate Alkalinity		n.a.	1.7 U	1.7	5.0	1	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
------------	--------	----------	--------

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Ti	me		Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163234AA	11/19/2016	04:18	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163234AA	11/19/2016	04:18	Kevin D Kelly	1
10954	14 PFCs	EPA 537 Rev. 1.1	1	16322013	11/23/2016	16:59	Jason W Knight	1
		modified	_					_
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16322013	11/20/2016	12:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163160635005	11/19/2016	03:37	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016	03:37	Matthew R	1
							Machtinger	
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016	03:37	Matthew R	1
							Machtinger	
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016	03:37	Matthew R	1
							Machtinger	
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	163160635005	11/17/2016	23:00	Annamaria Kuhns	1
	U4							
00224	Chloride	EPA 300.0	1	16326120151A	11/21/2016	18:26	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16326120151A	11/21/2016	18:11	Hallie Burnett	5
07882	Total Nitrite/Nitrate	EPA 353.2	1	16321118101B	11/16/2016	03:33	Joseph E McKenzie	1
	Nitrogen							
12150	Total Alkalinity to pH	SM 2320 B-1997	1	16321002201A	11/16/2016	20:06	Brandon P Costik	1
	4.5							
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321002201A	11/16/2016	20:06	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16321002201A	11/16/2016	20:06	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E							
ANALYSIS DATA SHEET							
TIFIED COMPOUNDS	!		!				
	!	MM913	!				
Contract:	_ !		!				
SAS No.:	SDG	No.:					
Lab Sample ID: 868784	12						
Lab File ID:HP09355	.i/16n	ov18b.b/	yn18s	84.d			
Date Received: 11/09	/16						
Date Analyzed: 11/19	/16						
Dilution Factor: 1.0							
CONCENTRATION UNITS	3:						
(ug/L or ug/Kg) ug/	/L						
	CONTRACT: SAS No.: Lab Sample ID: 868784 Lab File ID:HP09355 Date Received: 11/09, Date Analyzed: 11/19, Dilution Factor: 1.0 CONCENTRATION UNITS	ANALYSIS DATA SHEET TIFIED COMPOUNDS ! Contract: SAS No.: SDG Lab Sample ID: 8687842 Lab File ID:HP09355.i/16n Date Received: 11/09/16 Date Analyzed: 11/19/16	ANALYSIS DATA SHEET TIFIED COMPOUNDS Contract: SAS No.: SDG No.: Lab Sample ID: 8687842 Lab File ID:HP09355.i/16nov18b.b/ Date Received: 11/09/16 Date Analyzed: 11/19/16 Dilution Factor: 1.0 CONCENTRATION UNITS:	TIFIED COMPOUNDS Contract: SAS No.: SDG No.: Lab Sample ID: 8687842 Lab File ID:HP09355.i/16nov18b.b/yn18s Date Received: 11/09/16 Date Analyzed: 11/19/16 Dilution Factor: 1.0 CONCENTRATION UNITS:			

CAS NUMBER	! COMPOUND NAME		EST. CONC.	~
	!Total VOC TICs	!		:===== ! U
2	_!	!!	!	!
3	!	!		!
4	1	!		!
5	!			!
6	!	!		!
7	!	!		!
8	!	!		!
9	!	!		!
	!	!		!
1	!	!		!
2	!	!		!
3	!	!		!
	!	!		!
	!	!		!
	!	!		!
7	!	!		!
8	!	!		!
.9	!	!		!
0	!	!		!
1	!	!		!
	!	!		!
3	_!	!		!
	!	!		!
	!	!		!
6	!	!		!
7	!	!		!
	!	!		!
	!	!	l	!
0	!	!		!
	!	!	l	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-PolandDistilled-161108 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8687843 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 08:10 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30

Reported: 01/25/2017 13:54

MM914 SDG#: MMK09-14

CAT No.	Analysis Name	CA	.S Number	As Rec Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Misc.	Organics E	PA 537 Rev.	1.1	ng/l		ng/l	ng/l	
	m	odified						
10954	Perfluorooctanoic aci	d 33	5-67-1	2		0.5	2	1
10954	Perfluorononanoic aci	d 37	5-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic aci	d 33	5-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic a	cid 20	58-94-8	1	U	1	3	1
10954	Perfluorododecanoic a	cid 30	7-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic	acid 72	629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoi	c acid 37	6-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic aci	d 30	7-24-4	4		0.5	2	1
10954	Perfluoroheptanoic ac	id 37	5-85-9	2	J	0.5	2	1
10954	Perfluorobutanesulfon	ate 37	5-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfon	ate 35	5-46-4	2	J	1	3	1
10954	Perfluoro-octanesulfo	nate 17	63-23-1	2	U	2	6	1
10954	Perfluorobutanoic Aci	d 37	5-22-4	3	U	3	10	1
10954	Perfluoropentanoic Ac	id 27	06-90-3	1	J	0.5	2	1
The	stated QC limits are ac	dvisory only un	ntil sufficie	ent data	a points			
can :	be obtained to calculat	e statistical	limits.					

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	me	Analyst	Dilution Factor
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016	17:19	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16322013	11/20/2016	12:00	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-6-161108 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8687844 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 14:15 by JD

C. T. Male Associates
50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

MM915 SDG#: MMK09-15

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Lim	As Receiv Limit of it* Quantitat	Dilution
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	Ū	0.5	1	1
11997	Bromochloromethane	74-97-5	1	Ū	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	Ū	0.5	1	1
11997	Bromoform	75-25-2	0.5	IJ	0.5	4	1
11997	Bromomethane	74-83-9	0.5	Ū	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	Ū	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	Ū	0.5	1	1
11997	Chloroethane	75-00-3	0.5	Ū	0.5	1	1
11997	Chloroform	67-66-3	0.5	Ū	0.5	1	1
11997	Chloromethane	74-87-3	0.5	Ū	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	Ū	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	IJ	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	Ū	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	IJ	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	Ū	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	IJ	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	Ū	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	IJ	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	Ū	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	IJ	1	5	1
11997	Methyl Acetate	79-20-9	1	IJ	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	Ū	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	IJ	3	10	1
11997	Methylcyclohexane	108-87-2	1	IJ	1	5	1
11997	Methylene Chloride	75-09-2	2	IJ	2	4	1
11997	Styrene	100-42-5	1	Ū	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	IJ	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	II	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	IJ	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	IJ	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1
	L 11 TOILC	1,7001 23 -I	0.5	v	0.5		±

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-6-161108 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8687844 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 14:15 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30

Reported: 01/25/2017 13:54

MM915 SDG#: MMK09-15

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Se The results from FORM 1 - VOA-TIC. on the back of th	the volatile li The qualifier						
Miga	Organics	EPA 537 R	av. 1 1	ng/l		ng/l	ng/l	
MISC.	Organics	modified	=v. 1.1	5, -		3, -	3, -	
10954	Perfluorooctanoic		335-67-1	49		0.5	2	1
10954			375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic		335-76-2	0.5	τī	0.5	2	1
10954			2058-94-8	1	Ū	1	3	1
10954	Perfluorododecano		307-55-1	0.5	Ū	0.5	2	1
10954			72629-94-8	0.5	τι	0.5	2	1
10954	Perfluorotetradec		72629-94-8 376-06-7	0.5	τι	0.5	2	1
				9	U		2	1
10954			307-24-4	9		0.5	2	
10954	Perfluoroheptanoi		375-85-9			0.5		1
10954			375-73-5	3	-	0.7	2	1
	Perfluorohexanesu		355-46-4	2	J -	1	3	1
	Perfluoro-octanes		1763-23-1	3	J	2	6	1
	Perfluorobutanoic		375-22-4	4	J	3	10	1
	Perfluoropentanoi		2706-90-3	7		0.5	2	1
	stated QC limits as be obtained to cal			ient da	ta points			
Metals	3	SW-846 60	10C	mg/1		mg/l	mg/l	
01750	Calcium		7440-70-2	15.9		0.0382	0.400	1
01757	Magnesium		7439-95-4	2.87		0.0190	0.200	1
01762	Potassium		7440-09-7	2.19		0.160	1.00	1
01767	Sodium		7440-23-5	61.4		0.173	2.00	1
Wet Cl	nemistry	EPA 300.0		mg/1		mg/l	mg/l	
00224	Chloride		16887-00-6	114		10.0	20.0	50
00228	Sulfate		14808-79-8	13.6		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nit		n.a.	2.2		0.040	0.10	1
		SM 2320 B	_1007	ma/1	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity		n.a.	21.0		1.7	5.0	1
TZTOU	TOCAL ALKALLIIILLY	CO Pu 4.5	11.a.	∠⊥.∪		1./	J. U	±

21.0

1.7 U

n.a.

n.a.

1.7

5.0

5.0

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-6-161108 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8687844 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 14:15 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

MM915 SDG#: MMK09-15

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles SW-846 8260C 1 Y163234AA 11/19/2016 04:40 Kevin D Kelly 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 Y163234AA 11/19/2016 04:40 Kevin D Kelly 10954 14 PFCs EPA 537 Rev. 1.1 16322013 11/23/2016 17:40 Jason W Knight 1 modified EPA 537 Rev. 1.1 14091 PFAA Water Prep 16322013 Devon M Whooley 1 11/20/2016 12:00 1 modified 01750 Calcium SW-846 6010C 163160635005 1 11/19/2016 03:40 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163160635005 11/19/2016 03:40 Matthew R 1 Machtinger 01762 Potassium SW-846 6010C 1 163160635005 11/19/2016 03:40 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163160635005 11/19/2016 03:40 1 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163160635005 11/17/2016 23:00 Annamaria Kuhns 1 U4 00224 Chloride EPA 300.0 16326120151A 11/21/2016 18:56 Hallie Burnett 00228 Sulfate EPA 300.0 16326120151A Hallie Burnett 1 11/21/2016 18:41 5 EPA 353.2 07882 Total Nitrite/Nitrate 1 16321118101B 11/16/2016 03:34 Joseph E McKenzie 1 Nitrogen SM 2320 B-1997 16321005106A 12150 Total Alkalinity to pH 11/17/2016 16:29 Brandon P Costik 12149 Bicarbonate Alkalinity SM 2320 B-1997 1 16321005106A Brandon P Costik 11/17/2016 16:29 1 12148 Carbonate Alkalinity SM 2320 B-1997 1 16321005106A 11/17/2016 16:29 Brandon P Costik 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA SAMPLE NO.		
VOLATILE ORGANICS		_	
TENTATIVELY IDEN	!	!	
		! MM915	!
Lab Name: Lancaster Laboratories	Contract:	_ !	!
Lab Code: LANCAS Case No.:_	SAS No.:	SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 86878	44	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355	.i/16nov18b.b/yn1	.8s85.d
Level: (low/med) LOW	Date Received: 11/09	/16	
Moisture: not dec.	Date Analyzed: 11/19	/16	
Column: (pack/cap) CAP	Dilution Factor: 1.0		
	CONCENTRATION UNIT	S:	
Number TICs found: 0	(ug/L or ug/Kg) ug	/L	

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
	==!===================================	!		!===== ! U
	!	İ	!	!
	!			!
		1		!
				!
6.	!	1		1
	<u>.</u>			i
	!	1		!
		1		i
0				i
				i
	<u>.</u>	i	· ·	i
		i	i	i
				i
	<u>.</u>	i	· ·	i
	<u>.</u>			i
	!	1		!
	!	1		i
		1		!
	!	1		!
		1		i
	<u>.</u>			i
		1		!
	1			!
	!	1		!
	i i	!		1
	1	· ·		!
				!
9.	!			!
	!	· ·		!
	· · · · · · · · · · · · · · · · · · ·	:		:

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-9-161108 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8687845 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 15:45 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30

Reported: 01/25/2017 13:54

MM916 SDG#: MMK09-16

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	Ū	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	ττ	0.5	1	1
11997	1,2-Dibromoethane 1,2-Dichlorobenzene	95-50-1	0.5 1	U	0.5	5	1
11997	•		1	ττ	1	5 5	1
	1,3-Dichlorobenzene	541-73-1		-			
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U 	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ū	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	Ū	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ū	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	IJ	0.5	1	1
		1,,001 20 1	٠.٥		<u> </u>		

^{*=}This limit was used in the evaluation of the final result



As Received

5.0

5.0

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-9-161108 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8687845 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 15:45 by JD

C. T. Male Associates
50 Century Hill Drive

As Received

Latham NY 12110

Submitted: 11/09/2016 09:30 Reported: 01/25/2017 13:54

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

MM916 SDG#: MMK09-16

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	50C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea	rch						
	The results from th FORM 1 - VOA-TIC. on the back of this	The qualifier						
Misc.	Organics	EPA 537 Re	ev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic a		335-67-1	93		0.5	2	1
10954	Perfluorononanoic a		375-95-1	0.8	J	0.6	2	1
10954			335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic		2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic	acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoi		72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecan	oic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic a	cid	307-24-4	19		0.5	2	1
10954	Perfluoroheptanoic	acid	375-85-9	15		0.5	2	1
10954	Perfluorobutanesulf	onate	375-73-5	6		0.7	2	1
10954	Perfluorohexanesulf	onate	355-46-4	6		1	3	1
10954	Perfluoro-octanesul	fonate	1763-23-1	8		2	6	1
10954	Perfluorobutanoic A	cid	375-22-4	6	J	3	10	1
10954	Perfluoropentanoic	Acid	2706-90-3	10		0.5	2	1
The	stated QC limits are	advisory only	y until suffici	ient dat	a points			
can	be obtained to calcul	late statisti	cal limits.					
Metal	S	SW-846 603	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	13.8		0.0382	0.400	1
01757	Magnesium		7439-95-4	2.41		0.0190	0.200	1
01762	Potassium		7440-09-7	2.16		0.160	1.00	1
01767	Sodium		7440-23-5	49.9		0.173	2.00	1
Wet Cl	hemistry	EPA 300.0		mg/1		mg/l	mg/l	
00224	Chloride		16887-00-6	79.3		10.0	20.0	50
00228	Sulfate		14808-79-8	12.9		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitra		n.a.	3.6		0.040	0.10	1
		SM 2320 B-	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to		n.a.	17.1		1.7	5.0	1
1210	TOTAL MINATIFIED TO	Dir 4.0	11.a.	1/·1		± • /	5.0	_

1.7

17.1

1.7 U

n.a.

n.a.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-9-161108 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8687845 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 15:45 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

MM916 SDG#: MMK09-16

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles SW-846 8260C 1 Y163234AA 11/19/2016 05:02 Kevin D Kelly 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 Y163234AA 11/19/2016 05:02 Kevin D Kelly 10954 14 PFCs EPA 537 Rev. 1.1 16322013 11/23/2016 18:00 Jason W Knight 1 modified EPA 537 Rev. 1.1 14091 PFAA Water Prep 16322013 11/20/2016 12:00 Devon M Whooley 1 1 modified 01750 Calcium SW-846 6010C 163160635005 1 11/19/2016 03:43 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163160635005 11/19/2016 03:43 Matthew R 1 Machtinger 01762 Potassium SW-846 6010C 1 163160635005 11/19/2016 03:43 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163160635005 1 11/19/2016 03:43 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163160635005 11/17/2016 23:00 Annamaria Kuhns 1 U4 00224 Chloride EPA 300.0 16323120121B 11/18/2016 21:11 Hallie Burnett 00228 Sulfate EPA 300.0 16323120121B Hallie Burnett 1 11/18/2016 20:55 5 07882 Total Nitrite/Nitrate EPA 353.2 1 16321118102A 11/16/2016 03:40 Joseph E McKenzie 1 Nitrogen SM 2320 B-1997 16321005106A 12150 Total Alkalinity to pH 11/17/2016 16:45 Brandon P Costik 12149 Bicarbonate Alkalinity SM 2320 B-1997 1 16321005106A Brandon P Costik 11/17/2016 16:45 1 12148 Carbonate Alkalinity SM 2320 B-1997 1 16321005106A 11/17/2016 16:45 Brandon P Costik 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

	1E		EPA	SAMPLE NO.
VOLATII	LE ORGANICS ANALY	YSIS DATA SHEET		
TENTA	ATIVELY IDENTIFI	ED COMPOUNDS	!	!
			!	MM916 !
ab Name: Lancaster La	aboratories	Contract:	!	!
ab Code: LANCAS	Case No.:	SAS No.:	SDG	No.:
Matrix: (soil/water) V	VATER	Lab Sample ID: 868784	5	
Sample wt/vol: 5.0 ((g/mL)mL	Lab File ID: HP09355.:	i/16n	ov18b.b/yn18s86.
evel: (low/med) LOW		Date Received: 11/09/	16	
Moisture: not dec.		Date Analyzed: 11/19/2	16	
'olumn: (pack/cap) (PAP	Dilution Factor: 1.0		

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) ug/L

	! COMPOUND NAME		! EST. CONC.	
	==!===================================	•	•	!===== ! U
		!	!	!
		!	!	!
	!		!	!
5	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	_!	!	!	!
	_!	!		!
	<u>!</u>	!	!	!
			!	
	<u>-</u> -		!	¦
	! !	i	·	<u>;</u> ———
	<u>-</u>	i	!	:
		i	:	i
	!	i	· !	;——
	i	i	!	!
		i	!	! !
	_!	!	!	!
	!		!	!
	!!	!	!	!
	!!	!	!	!
25		!	!	!
	!	!	!	!
	!	!	!	!
	_!	!		!
	_!	!	!	!
30	_!	!	!	!
	!	1	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-7-161108 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8687846 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 16:20 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30

Reported: 01/25/2017 13:54

MM917 SDG#: MMK09-17

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit	As Received Limit of t* Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	Ū	0.5	1	1
11997	Bromochloromethane	74-97-5	1	Ū	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U 	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U 	0.5	1	1
11997	Toluene	108-88-3	0.5	U 	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



5.0

5.0

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-7-161108 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8687846 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 16:20 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/09/2016 09:30

Reported: 01/25/2017 13:54

MM917 SDG#: MMK09-17

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea	rch						
	The results from the FORM 1 - VOA-TIC. on the back of this	The qualifier	-					
Misc.	Organics	EPA 537 Re	ev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic a	.cid	335-67-1	58		0.5	2	1
10954	Perfluorononanoic a	.cid	375-95-1	0.7	J	0.6	2	1
10954	Perfluorodecanoic a	.cid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic	acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic	acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoi	c acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecan	oic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic a	cid	307-24-4	13		0.5	2	1
10954		acid	375-85-9	11		0.5	2	1
10954	-		375-73-5	4		0.7	2	1
10954			355-46-4	3		1	3	1
10954			1763-23-1	4	J	2	6	1
10954			375-22-4	5	J	3	10	1
10954			2706-90-3	8	J	0.5	2	1
	stated QC limits are			-	ta nointe	0.3	2	-
	be obtained to calcu			iciic ua	ca poincs			
Metal	s	SW-846 603	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	16.6		0.0382	0.400	1
01757	Magnesium		7439-95-4	3.23		0.0190	0.200	1
01762	Potassium		7440-09-7	2.37		0.160	1.00	1
01767	Sodium		7440-23-5	52.7		0.173	2.00	1
Wet C	hemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	96.0		10.0	20.0	50
00221	Sulfate		14808-79-8	11.4		1.5	5.0	5
00220	Dailace		11000 75-0	11.1		1.5	5.0	3
		EPA 353.2		mg/1		mg/l	mg/l	
07882	Total Nitrite/Nitra	te Nitrogen	n.a.	3.0		0.040	0.10	1
		SM 2320 B-	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to		n.a.	20.4		1.7	5.0	1
						• •	- · -	

1.7

20.4

1.7 U

n.a.

n.a.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-7-161108 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8687846 LL Group # 1731052 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/08/2016 16:20 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/09/2016 09:30 Latham NY 12110

Reported: 01/25/2017 13:54

MM917 SDG#: MMK09-17

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles SW-846 8260C 1 Y163234AA 11/19/2016 05:24 Kevin D Kelly 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 Y163234AA 11/19/2016 05:24 Kevin D Kelly 10954 14 PFCs EPA 537 Rev. 1.1 16322013 11/23/2016 18:21 Jason W Knight 1 modified EPA 537 Rev. 1.1 14091 PFAA Water Prep 16322013 11/20/2016 12:00 Devon M Whooley 1 1 modified 01750 Calcium SW-846 6010C 163160635005 1 11/19/2016 03:46 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163160635005 11/19/2016 03:46 Matthew R 1 Machtinger 01762 Potassium SW-846 6010C 1 163160635005 11/19/2016 03:46 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163160635005 11/19/2016 03:46 1 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163160635005 11/17/2016 23:00 Annamaria Kuhns 1 U4 00224 Chloride EPA 300.0 16323120121B 11/18/2016 22:16 Hallie Burnett 00228 Sulfate EPA 300.0 16323120121B 11/18/2016 22:00 Hallie Burnett 1 5 EPA 353.2 07882 Total Nitrite/Nitrate 1 16321118102A 11/16/2016 04:11 Joseph E McKenzie 1 Nitrogen SM 2320 B-1997 16321002201A 12150 Total Alkalinity to pH 11/16/2016 19:42 Brandon P Costik 16321002201A 12149 Bicarbonate Alkalinity SM 2320 B-1997 1 Brandon P Costik 11/16/2016 19:42 1 12148 Carbonate Alkalinity SM 2320 B-1997 1 16321002201A 11/16/2016 19:42 Brandon P Costik 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE NO.	
VOLATILE ORGANICS ANALYS	SIS DATA SHEET			
TENTATIVELY IDENTIFIED	COMPOUNDS	!		!
		!	MM917	!
Lab Name: Lancaster Laboratories	Contract:	!		!
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	_
Matrix: (soil/water) WATER L	ab Sample ID: 8687846			
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID: HP09355.i/	16nc	v18b.b/yn18	s87.d
Level: (low/med) LOW D	ate Received: 11/09/16			
% Moisture: not dec. D	ate Analyzed: 11/19/16			
Column: (pack/cap) CAP D	ilution Factor: 1.0			

Number TICs found: 0

Diluction Factor: 1.0

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/L

	! COMPOUND NAME		! EST. CONC.	
	==!===================================	•	•	!===== ! U
		!	!	!
		!	!	!
	!		!	!
5	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	_!	!	!	!
	_!	!		!
	<u>!</u>	!	!	!
			!	
	<u>-</u> -		!	¦
	! !	i	·	<u>;</u> ———
	<u>-</u>	i	!	:
		i	:	i
	!	i	· !	;——
	i	i	!	!
		i	!	! !
	_!	!	!	!
	!		!	!
	!!	!	!	!
	!!	!	!	!
25		!	!	!
	!	!	!	!
	!	!	!	!
	_!	!		!
	_!	!	!	!
30	_!	!	!	!
	!	1	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1731052

Reported: 01/25/2017 13:54

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Batch number: Y163234AA	Sample	numbei	(s): 8687	827-8687833,8687835,8687837-8687839,8687842,8687844-8687846
Acetone	6	U	6	20
Benzene	0.5	U	0.5	1
Bromochloromethane	1	U	1	5
Bromodichloromethane	0.5	U	0.5	1
Bromoform	0.5	U	0.5	4
Bromomethane	0.5	U	0.5	1
2-Butanone	3	U	3	10
Carbon Disulfide	1	U	1	5
Carbon Tetrachloride	0.5	Ū	0.5	1
Chlorobenzene	0.5	U	0.5	1
Chloroethane	0.5	U	0.5	1
Chloroform	0.5	Ū	0.5	1
Chloromethane	0.5	U	0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	U	2	5
Dibromochloromethane	0.5	U	0.5	1
1,2-Dibromoethane	0.5	U	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5
Dichlorodifluoromethane	0.5	U	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	U	0.5	1
trans-1,2-Dichloroethene	0.5	U	0.5	1
1,2-Dichloropropane	0.5	U	0.5	1
cis-1,3-Dichloropropene	0.5	U	0.5	1
trans-1,3-Dichloropropene	0.5	U	0.5	1
Ethylbenzene	0.5	U	0.5	1
Freon 113	2	U	2	10
2-Hexanone	3	U	3	10
Isopropylbenzene	1	U	1	5
Methyl Acetate	1	U	1	5
Methyl Tertiary Butyl Ether	0.5	U	0.5	1
4-Methyl-2-pentanone	3	U	3	10
Methylcyclohexane	1	U	1	5
Methylene Chloride	2	U	2	4
Styrene	1	U	1	5
1,1,2,2-Tetrachloroethane	0.5	U	0.5	1

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1731052

Reported: 01/25/2017 13:54

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Tetrachloroethene	0.5	U	0.5	1
Toluene	0.5	U	0.5	1
1,2,3-Trichlorobenzene	1	U	1	5
1,2,4-Trichlorobenzene	1	U	1	5
1,1,1-Trichloroethane	0.5	U	0.5	1
1,1,2-Trichloroethane	0.5	U	0.5	1
Trichloroethene	0.5	U	0.5	1
Trichlorofluoromethane	0.5	U	0.5	1
Vinyl Chloride	0.5	U	0.5	1
m+p-Xylene	0.5	U	0.5	1
o-Xylene	0.5	U	0.5	1
	ng/l		ng/l	ng/l
Batch number: 16322013	_			827-8687833,8687835-8687846
Perfluorooctanoic acid	0.5	U	0.5	2
Perfluorononanoic acid	0.6	U	0.6	2
Perfluorodecanoic acid	0.5	U	0.5	2
Perfluoroundecanoic acid	1	U	1	3
Perfluorododecanoic acid Perfluorotridecanoic acid	0.5 0.5	U	0.5 0.5	2 2
Perfluorotridecanoic acid Perfluorotetradecanoic acid	0.5	U U	0.5	2 2
Perfluorotetradecanoic acid	0.5	IJ	0.5	2
Perfluoroheptanoic acid	0.5	IJ	0.5	2
Perfluorobutanesulfonate	0.7	IJ	0.7	2
Perfluorohexanesulfonate	1	II	1	3
Perfluoro-octanesulfonate	2	IJ	2	6
Perfluorobutanoic Acid	3	U	3	10
Perfluoropentanoic Acid	0.5	Ū	0.5	2
-	mg/l		mg/l	mg/1
Batch number: 163160635005	-	numbe	-	827-8687835,8687838-8687839,8687842,8687844-8687846
Calcium	0.0382		0.0382	0.400
Magnesium	0.0190		0.0190	0.200
Potassium	0.160		0.160	1.00
Sodium	0.173		0.173	2.00
Batch number: 16321118101B	Cample	numbe	r(a). 8687	827-8687832,8687834-8687835,8687838-8687839,8687842,8687844
Total Nitrite/Nitrate Nitrogen	0.040		0.040	0.10
Total Nicifee/Niciaec Niciogen	0.010	Ü	0.010	0.10
Batch number: 16321118102A	Sample	numbe	r(s): 8687	845-8687846
Total Nitrite/Nitrate Nitrogen	0.040		0.040	0.10
,				
Batch number: 16323120121B	Sample	numbe	r(s): 8687	827-8687828,8687845-8687846
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
Batch number: 16326120151A	Samnla	numbe	r(a): 8697	829-8687832,8687834-8687835,8687838-8687839,8687842,8687844
Chloride	0.20	II	0.20	0.40
Sulfate	0.30	IJ	0.30	1.0
	0.00	_	2.50	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1731052

Reported: 01/25/2017 13:54

Method Blank (continued)

Analysis Name	Result MDL** mg/l mg/l	LOQ mg/l
	mg/l as CaCO3 mg/l a CaCO3	as mg/l as CaCO3
Batch number: 16321002201A Total Alkalinity to pH 4.5	Sample number(s): 86 1.7 U 1.7	687828,8687842,8687846 5.0
Batch number: 16321002202A Total Alkalinity to pH 4.5	Sample number(s): 86	687830,8687839 5.0
Batch number: 16321005106A Total Alkalinity to pH 4.5	Sample number(s): 86	687827,8687829,8687831-8687835,8687838,8687844-868 5.0

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: Y163234AA		-	327-8687833,86	-	837-8687	839 8687	842 8687844-	868784	5
Acetone	150	166.04	150	162.94	111	109	50-168	2	30
Benzene	20	20.51	20	20.35	103	102	78-120	1	30
Bromochloromethane	20	21.72	20	21.46	109	107	80-125	1	30
Bromodichloromethane	20	21.76	20	21.46	109	107	80-120	1	30
Bromoform	20	19.03	20	18.51	95	93	59-120	3	30
Bromomethane	20	18.2	20	18.42	91	92	55-123	1	30
2-Butanone	150	144.41	150	142.19	96	95	57-145	2	30
Carbon Disulfide	20	20.96	20	20.87	105	104	58-120	0	30
Carbon Tetrachloride	20	20.77	20	20.51	104	103	74-130	1	30
Chlorobenzene	20	20.4	20	20.3	102	102	80-120	1	30
Chloroethane	20	18.94	20	19.18	95	96	56-120	1	30
Chloroform	20	21.51	20	21.37	108	107	80-120	1	30
Chloromethane	20	18.19	20	18.35	91	92	59-127	1	30
Cyclohexane	20	16.73	20	16.85	84	84	65-131	1	30
1,2-Dibromo-3-chloropropane	20	19.12	20	19.23	96	96	59-120	1	30
Dibromochloromethane	20	20.67	20	20.49	103	102	78-120	1	30
1,2-Dibromoethane	20	20.81	20	20.61	104	103	80-120	1	30
1,2-Dichlorobenzene	20	20.53	20	20.57	103	103	80-120	0	30
1,3-Dichlorobenzene	20	20.11	20	20.13	101	101	80-120	0	30
1,4-Dichlorobenzene	20	20.4	20	20.61	102	103	80-120	1	30
Dichlorodifluoromethane	20	14.46	20	14.17	72	71	49-134	2	30
1,1-Dichloroethane	20	21.87	20	22.15	109	111	80-120	1	30
1,2-Dichloroethane	20	23	20	23.16	115	116	66-128	1	30
1,1-Dichloroethene	20	19.73	20	19.83	99	99	76-124	1	30
cis-1,2-Dichloroethene	20	20.14	20	20.37	101	102	80-120	1	30
trans-1,2-Dichloroethene	20	20.93	20	20.71	105	104	80-120	1	30
1,2-Dichloropropane	20	21.4	20	21.66	107	108	80-120	1	30
cis-1,3-Dichloropropene	20	19.1	20	19	96	95	80-120	1	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1731052

Reported: 01/25/2017 13:54

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
trans-1,3-Dichloropropene	20	20.49	20	20.16	102	101	76-120	2	30
Ethylbenzene	20	20.59	20	20.48	103	102	78-120	1	30
Freon 113	20	16.59	20	17	83	85	64-136	2	30
2-Hexanone	100	101.25	100	100.3	101	100	49-146	1	30
Isopropylbenzene	20	19.94	20	19.97	100	100	80-120	0	30
Methyl Acetate	20	21.66	20	21.74	108	109	61-137	0	30
Methyl Tertiary Butyl Ether	20	20.27	20	20.44	101	102	75-120	1	30
4-Methyl-2-pentanone	100	102.1	100	100.89	102	101	55-141	1	30
Methylcyclohexane	20	16.27	20	16.12	81	81	66-126	1	30
Methylene Chloride	20	20.02	20	20.17	100	101	80-120	1	30
Styrene	20	19.37	20	19.35	97	97	80-120	0	30
1,1,2,2-Tetrachloroethane	20	20.06	20	20.24	100	101	72-120	1	30
Tetrachloroethene	20	20.94	20	21.15	105	106	80-129	1	30
Toluene	20	20.24	20	20.34	101	102	80-120	0	30
1,2,3-Trichlorobenzene	20	19.8	20	19.8	99	99	69-120	0	30
1,2,4-Trichlorobenzene	20	19.34	20	19.47	97	97	72-120	1	30
1,1,1-Trichloroethane	20	17.95	20	17.85	90	89	66-126	1	30
1,1,2-Trichloroethane	20	20.43	20	20.86	102	104	80-120	2	30
Trichloroethene	20	20.75	20	21	104	105	80-120	1	30
Trichlorofluoromethane	20	17.78	20	17.74	89	89	67-129	0	30
Vinyl Chloride	20	18.05	20	18.22	90	91	63-121	1	30
m+p-Xylene	40	40.45	40	40.24	101	101	80-120	1	30
o-Xylene	20	19.3	20	19.26	96	96	80-120	0	30
	ng/l	ng/l	ng/l	ng/l					
Batch number: 16322013	Sample numbe	er(s): 86878	27-8687833,86	87835-8687	846				
Perfluorooctanoic acid	200	221.14	,		111		70-130		
Perfluorononanoic acid	200	231.63			116		70-130		
Perfluorodecanoic acid	200	238.93			119		70-130		
Perfluoroundecanoic acid	200	245.5			123		70-130		
Perfluorododecanoic acid	200	246.02			123		70-130		
Perfluorotridecanoic acid	200	237.33			119		70-130		
Perfluorotetradecanoic acid	200	229.25			115		70-130		
Perfluorohexanoic acid	200	228.05			114		70-130		
Perfluoroheptanoic acid	200	247.79			124		70-130		
Perfluorobutanesulfonate	176.8	211.83			120		70-130		
Perfluorohexanesulfonate	189.2	192.25			102		70-130		
Perfluoro-octanesulfonate	191.2	245.89			129		70-130		
Perfluorobutanoic Acid	200	216.3			108		70-130		
Perfluoropentanoic Acid	200	229.27			115		70-130		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 163160635005	Sample numbe	er(s): 86878	27-8687835,86	87838-8687	839,8687	842,8687	844-8687846		
Calcium	4.00	3.91	,		98		80-120		
Magnesium	2.00	1.96			98		80-120		
Potassium	10	9.79			98		80-120		
Sodium	10	9.77			98		80-120		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1731052

Reported: 01/25/2017 13:54

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/l	LCS Conc mg/l	LCSD Spike Added mg/l	LCSD Conc mg/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 16321118101B Total Nitrite/Nitrate Nitrogen	Sample number 2.50	er(s): 86878 2.51	827-8687832,86	587834-8687	7835,8687 101	838-8687	839,8687842, 90-110	8687844	
Batch number: 16321118102A Total Nitrite/Nitrate Nitrogen	Sample number 2.50	er(s): 86878 2.26	845-8687846		90		90-110		
Batch number: 16323120121B Chloride Sulfate	Sample number 3.00 7.50	er(s): 86878 2.91 7.41	827-8687828,86	587845-8685	7846 97 99		90-110 90-110		
Batch number: 16326120151A	Sample numbe	er(s): 8687	829-8687832,86	587834-8687	7835,8687	838-8687	839,8687842,	8687844	
Chloride Sulfate	3.00 7.50	2.96 7.47			99 100		90-110 90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16321002201A Total Alkalinity to pH 4.5	Sample number 188	er(s): 86878 188.05	828,8687842,86	587846	100		84-110		
Batch number: 16321002202A Total Alkalinity to pH 4.5	Sample number 188	er(s): 86878 188.96	830,8687839		101		84-110		
Batch number: 16321005106A Total Alkalinity to pH 4.5	Sample number 188	er(s): 86878 179.47	827,8687829,86	87831-8687	7835,8687 95	838,8687	844-8687845 84-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspi Con ug/	C	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: Y163234AA	Sample UNSPK:			7827-8687	833,8687835	,8687837-8	8687839,	8687842,	8687844-86	37846	
Acetone	6	U	150	166.65	150	164.47	111	110	50-168	1	30
Benzene	0.5	U	20	22.12	20	22.01	111	110	78-120	0	30
Bromochloromethane	1	U	20	22.35	20	22.43	112	112	80-125	0	30
Bromodichloromethane	0.5	U	20	22.87	20	22.68	114	113	80-120	1	30
Bromoform	0.5	U	20	19.04	20	18.39	95	92	59-120	3	30
Bromomethane	0.5	U	20	19.91	20	20.43	100	102	55-123	3	30
2-Butanone	3	U	150	139.23	150	138.38	93	92	57-145	1	30
Carbon Disulfide	1	U	20	23.39	20	23.11	117	116	58-120	1	30
Carbon Tetrachloride	0.5	U	20	24.04	20	23.98	120	120	74-130	0	30
Chlorobenzene	0.5	U	20	21.36	20	21.67	107	108	80-120	1	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1731052

Reported: 01/25/2017 13:54

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspi Cor ug/	ıc	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Chloroethane	0.5	U	20	20.96	20	21.04	105	105	56-120	0	30
Chloroform	0.5	IJ	20	22.94	20	23.04	115	115	80-120	0	30
Chloromethane	0.5	IJ	20	19.77	20	20.37	99	102	59-127	3	30
Cyclohexane	2	IJ	20	21.84	20	22.17	109	111	65-131	1	30
1,2-Dibromo-3-chloropropane	2	U	20	18.28	20	18.13	91	91	59-120	1	30
Dibromochloromethane	0.5	U	20	20.83	20	20.82	104	104	78-120	0	30
1,2-Dibromoethane	0.5	Ū	20	20.94	20	20.92	105	105	80-120	0	30
1,2-Dichlorobenzene	1	Ū	20	20.69	20	20.96	103	105	80-120	1	30
1,3-Dichlorobenzene	1	Ū	20	20.57	20	20.79	103	104	80-120	1	30
1,4-Dichlorobenzene	1	Ū	20	20.89	20	21.01	104	105	80-120	1	30
Dichlorodifluoromethane	0.5	U	20	19.99	20	20.11	100	101	49-134	1	30
1,1-Dichloroethane	0.5	Ū	20	23.53	20	23.53	118	118	80-120	0	30
1,2-Dichloroethane	0.5	Ū	20	24.52	20	24.01	123	120	66-128	2	30
1,1-Dichloroethene	0.5	IJ	20	22.44	20	22.77	112	114	76-124	1	30
cis-1,2-Dichloroethene	0.5	IJ	20	21.57	20	21.4	108	107	80-120	1	30
trans-1,2-Dichloroethene	0.5	Ū	20	22.71	20	22.68	114	113	80-120	0	30
1,2-Dichloropropane	0.5	U	20	22.71	20	22.94	114	115	80-120	1	30
cis-1,3-Dichloropropene	0.5	Ū	20	19.61	20	20.06	98	100	80-120	2	30
trans-1,3-Dichloropropene	0.5	Ū	20	20.74	20	21.03	104	105	76-120	1	30
Ethylbenzene	0.5	Ū	20	22.1	20	22.25	111	111	78-120	1	30
Freon 113	2	Ū	20	23	20	22.63	115	113	64-136	2	30
2-Hexanone	3	U	100	98.16	100	98.28	98	98	49-146	0	30
Isopropylbenzene	1	U	20	21.54	20	21.72	108	109	80-120	1	30
Methyl Acetate	1	U	20	21.36	20	20.87	107	104	61-137	2	30
Methyl Tertiary Butyl Ether	0.5	U	20	20.47	20	20.76	102	104	75-120	1	30
4-Methyl-2-pentanone	3	Ū	100	99.28	100	99.27	99	99	55-141	0	30
Methylcyclohexane	1	U	20	22.37	20	22.14	112	111	66-126	1	30
Methylene Chloride	2	U	20	21.16	20	21.35	106	107	80-120	1	30
Styrene	1	U	20	20.5	20	20.58	102	103	80-120	0	30
1,1,2,2-Tetrachloroethane	0.5	U	20	20.04	20	20.06	100	100	72-120	0	30
Tetrachloroethene	0.5	U	20	23.35	20	23.3	117	116	80-129	0	30
Toluene	0.5	U	20	21.78	20	22.11	109	111	80-120	1	30
1,2,3-Trichlorobenzene	1	U	20	19.72	20	20.13	99	101	69-120	2	30
1,2,4-Trichlorobenzene	1	U	20	19.43	20	19.64	97	98	72-120	1	30
1,1,1-Trichloroethane	0.5	U	20	19.81	20	19.85	99	99	66-126	0	30
1,1,2-Trichloroethane	0.5	U	20	20.9	20	20.79	104	104	80-120	1	30
Trichloroethene	0.5	U	20	22.98	20	22.6	115	113	80-120	2	30
Trichlorofluoromethane	0.5	U	20	22.6	20	22.45	113	112	67-129	1	30
Vinyl Chloride	0.5	U	20	20.51	20	20.77	103	104	63-121	1	30
m+p-Xylene	0.5	U	40	43.16	40	43.42	108	109	80-120	1	30
o-Xylene	0.5	U	20	20.56	20	20.38	103	102	80-120	1	30
	ng/	1	ng/l	ng/l	ng/l	ng/l					
Batch number: 16322013	Sample	numb	er(s): 8687	7827-8687	833,8687835	-8687846 t	JNSPK: 86	87831			
Perfluorooctanoic acid	11.	48	199.42	232.26	200.52	265.58	111	127	70-130	13	30
Perfluorononanoic acid	0.6	16	199.42	212.98	200.52	254.84	106	127	70-130	18	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1731052

Reported: 01/25/2017 13:54

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ng/l	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Perfluorodecanoic acid	0.5 U	199.42	228.25	200.52	241.72	114	121	70-130	6	30
Perfluoroundecanoic acid	1 U	199.42	249.15	200.52	261.13	125	130	70-130	5	30
Perfluorododecanoic acid	0.5 U	199.42	228.63	200.52	264.65	115	132*	70-130	15	30
Perfluorotridecanoic acid	0.5 U	199.42	230.4	200.52	255.78	116	128	70-130	10	30
Perfluorotetradecanoic acid	0.5 U	199.42	238.34	200.52	261.72	120	131*	70-130	9	30
Perfluorohexanoic acid	4.40	199.42	221.6	200.52	272.81	109	134*	70-130	21	30
Perfluoroheptanoic acid	2.67	199.42	247.46	200.52	251.68	123	124	70-130	2	30
Perfluorobutanesulfonate	2.65	176.49	205.92	177.46	224.66	115	125	70-130	9	30
Perfluorohexanesulfonate	1.96	188.45	220	189.49	223.73	116	117	70-130	2	30
Perfluoro-octanesulfonate	3.80	190.45	239	191.5	239.39	123	123	70-130	0	30
Perfluorobutanoic Acid	9.08	199.42	235.4	200.52	249.54	113	120	70-130	6	30
Perfluoropentanoic Acid	3.48	199.42	234.82	200.52	254.24	116	125	70-130	8	30
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 163160635005	Sample numb 8687831	er(s): 8687	7827-8687	835,8687838-	-8687839,	8687842,	8687844-8	687846 UN	SPK:	
Calcium	14.93	4.00	19.4	4.00	19.47	112	114	75-125	0	20
Magnesium	3.45	2.00	5.52	2.00	5.56	104	106	75-125	1	20
Potassium	2.83	10	13.03	10	13.04	102	102	75-125	0	20
Sodium	44.39	10	55.78	10	56.07	114 (2)	117 (2)	75-125	1	20
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 16321118101B	Sample numb		7827-8687	832,8687834-	-8687835,	8687838-	8687839,8	687842,86	87844	
Total Nitrite/Nitrate Nitrogen	0.175	1.00	1.24			106		90-110		
Batch number: 16321118102A	Sample numb	er(s): 8685	7845-8687	846 UNSPK: 8	8687845					
Total Nitrite/Nitrate Nitrogen	3.59	5.00	6.43			57*		90-110		
Batch number: 16323120121B	Cample numb	er(a): 868	7927_9697	828,8687845-	_9697916	IIMCDV: 9	697927			
Chloride	14.29	20	41.29	020,0007045	-0007040	135*	007027	90-110		
Sulfate	5.20	50	61.51			113*		90-110		
Batch number: 16326120151A	Sample numb		7829-8687	832,8687834-	-8687835,	8687838-	8687839,8	687842,86	87844	
Chloride	84.23	80	163.33			99		90-110		
Sulfate	30.69	50	85.6			110		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16321002201A	Sample numb	er(s): 8687	7828,8687	842,8687846	UNSPK: P	688768				
Total Alkalinity to pH 4.5	32.42	188	215.84			98		84-110		
Batch number: 16321002202A	Sample numb	er(s): 8687	7830,8687	839 UNSPK: I	P688635					
Total Alkalinity to pH 4.5	150.64	188	304.38			82*		84-110		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1731052

Reported: 01/25/2017 13:54

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/l as CaCO3	MS Spike Added mg/l as CaCO3	MS Conc mg/l as CaCO3	MSD Spike Added mg/l as CaCO3	MSD Conc mg/l as CaCO3	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 16321005106A	Sample numb	er(s): 868	7827,8687	829,8687831	-8687835,8	687838,8	8687844-8	8687845 UN	SPK:	
Total Alkalinity to pH 4.5	11.77	188	179.33			89		84-110		

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD	DUP RPD Max				
	mg/l	mg/l						
Batch number: 163160635005	Sample number(s):	8687827-8687835,	8687838-8687839	,8687842,8687844	4-8687846 BKG: 8687831			
Calcium	14.93	15.23	2	20				
Magnesium	3.45	3.52	2	20				
Potassium	2.83	2.94	4 (1)	20				
Sodium	44.39	45.28	2	20				
	mg/l	mg/l						
Batch number: 16321118101B	Sample number(s): 8687831	8687827-8687832,	8687834-8687835	5,8687838-8687839	9,8687842,8687844 BKG:			
Total Nitrite/Nitrate Nitrogen	0.175	0.165	6* (1)	2				
Batch number: 16321118102A Total Nitrite/Nitrate Nitrogen	Sample number(s): 3.59	8687845-8687846 3.56	BKG: 8687845	2				
Batch number: 16323120121B	Sample number(s):	8687827-8687828	. 8687845-8687846	5 BKG: 8687827				
Chloride	14.29	17.18	18*	15				
Sulfate	5.20	6.41	21* (1)	15				
Batch number: 16326120151A	Sample number(s): 8687831	8687829-8687832,	8687834-8687835	5,8687838-8687839	9,8687842,8687844 BKG:			
Chloride	84.23	82.34	2 (1)	15				
Sulfate	30.69	30.05	2	15				
mg/l as CaCO3 mg/l as CaCO3								
Batch number: 16321002201A Total Alkalinity to pH 4.5	Sample number(s): 32.42	8687828,8687842, 32.47	.8687846 BKG: P6 0	588768 5				
Batch number: 16321002202A Total Alkalinity to pH 4.5	Sample number(s): 150.64	8687830,8687839 146.27	BKG: P688635	5				

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Group Number: 1731052 Client Name: C. T. Male Associates

Reported: 01/25/2017 13:54

Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

BKG Conc DUP RPD DUP RPD Max Analysis Name DUP Conc

> mg/l as CaCO3 mg/l as CaCO3

Batch number: 16321005106A Sample number(s): 8687827,8687829,8687831-8687835,8687838,8687844-8687845 BKG: 8687831

Total Alkalinity to pH 4.5 11.77 12.58 7* (1)

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed $% \left(1\right) =\left(1\right) \left(1\right) +\left(1\right) \left(1\right) \left(1\right) +\left(1\right) \left(unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: Y163234AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	l oluene-d8	4-Bromofluorobenzene
8687827	102	103	98	97
8687828	104	103	97	96
8687829	104	103	97	96
8687830	105	104	97	96
8687831	105	103	97	95
8687832	103	102	99	100
8687833	102	100	99	101
8687835	105	104	96	95
8687837	105	104	97	95
8687838	105	103	97	95
8687839	106	102	97	96
8687842	105	102	97	97
8687844	105	104	96	95
8687845	105	105	97	95
8687846	106	104	97	96
Blank	102	101	97	96
LCS	102	102	99	100
LCSD	102	103	99	100
MS	103	102	99	100
MSD	102	100	99	101
Limits:	80-116	77-113	80-113	78-113

Analysis Name: 14 PFCs

Batch number: 16322013

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA	
8687827	69*	83	83	65*	67*	67*	
8687828	65*	88	94	60*	71	63*	
8687829	51*	70	74	57*	52*	50*	
8687830	56*	75	86	55*	63*	57*	
8687831	62*	85	86	61*	66*	64*	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1731052

Reported: 01/25/2017 13:54

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 14 PFCs Batch number: 16322013

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA	
8687832	63*	84	91	61*	65*	59*	
8687833	51*	65*	68*	41*	50*	48*	
8687835	59*	66*	69*	55*	53*	50*	
8687836	48*	50*	44*	44*	44*	42*	
8687837	48*	49*	43*	45*	50*	45*	
8687838	54*	57*	55*	56*	54*	51*	
8687839	58*	59*	57*	65*	61*	61*	
8687840	51*	52*	46*	53*	49*	51*	
8687841	70	66*	67*	70	66*	66*	
8687842	61*	68*	65*	58*	66*	52*	
8687843	51*	43*	43*	51*	48*	50*	
8687844	60*	60*	58*	64*	69*	62*	
8687845	61*	65*	65*	59*	62*	64*	
8687846	63*	71	71	60*	64*	61*	
Blank	62*	64*	60*	68*	68*	61*	
LCS	67*	63*	58*	66*	77	67*	
MS	63*	84	91	61*	65*	59*	
MSD	51*	65*	68*	41*	50*	48*	
Limits:	70-130	70-130	70-130	70-130	70-130	70-130	
	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA	
8687827	65*	66*	72	68*	70	66*	
8687828	62*	67*	69*	62*	79	54*	
8687829	56*	55*	52*	49*	67*	44*	
8687830	59*	53*	59*	55*	72	58*	
8687831	63*	61*	63*	62*	80	63*	
8687832	61*	63*	66*	63*	79	61*	
8687833	45*	54*	50*	45*	59*	42*	
8687835	52*	53*	57*	55*	72	49*	
8687836	45*	50*	55*	49*	60*	47*	
8687837	47*	45*	49*	48*	59*	47*	
8687838	54*	46*	47*	53*	79	53*	
8687839	60*	55*	59*	59*	80	55*	
8687840	53*	50*	52*	55*	68*	51*	
8687841	68*	69*	74	70	85	65*	
8687842	60*	58*	55*	59*	75	61*	
8687843	49*	50*	54*	47*	55*	48*	
8687844	63*	64*	61*	62*	78	58*	
8687845	57*	53*	54*	55*	73	56*	
8687846	68*	74	66*	68*	89	66*	
Blank	64*	64*	66*	63*	76	62*	
LCS	68*	56*	58*	63*	95	63*	
MS	61*	63*	66*	63*	79	61*	
MSD	45*	54*	50*	45*	59*	42*	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



70-130

70-130

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1731052

70-130

Reported: 01/25/2017 13:54

Surrogate Quality Control (continued)

70-130

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

70-130

Analysis Name: 14 PFCs Batch number: 16322013

70-130

DIMITOD.	70 130	70 130	70 130	,
	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
8687827	88	62*	58*	
8687828	61*	54*	47*	
8687829	57*	44*	41*	
8687830	73	53*	47*	
8687831	77	59*	51*	
8687832	80	59*	53*	
8687833	64*	42*	38*	
8687835	72	50*	44*	
8687836	57*	48*	31*	
8687837	62*	42*	38*	
8687838	64*	52*	45*	
8687839	72	56*	50*	
8687840	74	39*	39*	
8687841	86	64*	57*	
8687842	67*	57*	49*	
8687843	56*	44*	43*	
8687844	82	61*	52*	
8687845	74	56*	53*	
8687846	95	62*	63*	
Blank	86	62*	56*	
LCS	93	62*	61*	
MS	80	59*	53*	
MSD	64*	42*	38*	
Limits:	70-130	70-130	70-130	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



Lancaster Laboratories

Environmental Services Analysis Request/Chain of Custody

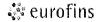
Acct. #:	37191		Grou	1p #:	173/052				Sample # 8687827-46						_	COC#: 15594																		
Client: C.T. Male Associates						Matrix						Ar	ıalys	es Re	que	sted		-	For Lab Use Only															
Project Name/#: SGPP - Merrimack	Site ID:					XX						Pı	resei	rvallo	ı Co	des			SF#: <u>286049</u>															
Project Manager: Kirk Moline	P.O. #:	16.612	6		ent	ace	<u>;</u> :		Н	N	S								SCR#: <u>19606</u>	9														
Sampler: JD, JC, LC, RH					Sedime	Ground	5		S				20 B)						Preservat	tion Codes														
Phone #: 578 7786 7400	Quote #:	214135			Sec		12	ners	+ TICs	8	53.2)		M 23	mod.)					H = HCI	T = Thiosulfate														
State where sample(s) were collected: NH						Potable NPDES	N.	Containers	(8260C)	(6010C)	3 (3	6	rb (S						N = HNO ₃	B = NaOH														
	Colle	ection		Composite			r. Bles	# of	/OAs (826	\(\times \)	1g, Na, K NO2 / NC O4- (300	보 위 위		ŭ × 3 8	ŭ x y 8	g, Na, K NO2 / NC	fig, Na, K	저 일	Mg, Na, K al NO2 / NC SO4- (300	Jg, Na, K NO2 / NC	저 일	포트워트	Ag, Na, K NO2 / NC SO4- (300	lg, Na, K NO2 / NC O4- (300	보 위 위	lg, Na, K NO2 / NC O4- (300	Carb/Bicarb (SM 2320 B)	(EPA 537					$S = H_2SO_4$ O = Other	P = H ₃ PO ₄
Sample Identification	Date	Time	Grab	Com	Soil Water Other: Toثal #		TCL \	TCL \ Ca, M Total Cl-, S Cl-, S		PFCs					Rem	narks																		
SG2-SWD-Merr - 161107	117/16	1575	×			SW		11	X	X	X	×	X	X																				
SG2-SWDn Bab - 161107		1540	X			SW		11	X	X	X	X	X	\times	L																			
562 - SWMid Bab - 161107	1	1630	X			SW		11	×	X	X	X	Х	X																				
SG2 - SWF081 - 16/107	11/7/16	caspane	×			SW		11	$\overline{\chi}$	χ	X	X	X	X																				
SGZ - SHUp Bub - 161108	11/8/16		X			SW		33	X	X	X	X	X	X					MS/MS	4.0														
S62 - SWUPMEN - 16/108	11/8/16	1030	X			SW	<u> </u>	11	X	X	X	X	χ	X					,															
0 562- FTB 01 - 16/108		0323					X	1						X																				
SG2-LTB01 -161108		e commence of the commence of					X	3	X					X																				
SG2-MER45-8-161108		1030	\times			GW		11	X	\times	\times	X	\times	X																				
SG2 -SWEBO1-161108	11/8/16	1200	X				Х	//	\times	X	.بخر.	\times	X	×																				
Turnaround Time Requested (TAT) (please of	check): Stand	X brack	RUSH	-I	Relig	nquished	bv:	~ 44		l	Date			Time	Re	eceive	d by:		Date	Time														
(RUSH TAT is subject to Eurofins Lancaster Laborator	ies approval a	and surchar	ges.)			MM		EUN	france		8/) Date		1	7:45 Time	+	aceive	-d by:		Date	Time														
Date results are needed: E-mail address to send RUSH results:	1.1.	D = white.	/ /		Kein	nquished	ъу. \			'	Date			line	Live	*CGIAC	ю by.		Date	I IIIIe														
Dat: Package Options (please check if requi	Moline	<u> C 7 /44/</u>	(e. co.	per	Reli	nquished	by:	<u> </u>		 	Date		-	Time	− R€	eceive	ad by:		Date	Time														
Type I (Validation/non-CLP) MA MC		TX TRRP) ₋ 13				•						İ				/		1															
Type III (Reduced non-CLP) CTRC			10		Reli	nquished	by:			-	Date		-	Time	Ré	eceive	ed by:		Date	Time														
	Гуре А 🗌			ļ							\																							
· · · · · · · · · · · · · · · · · · ·	Гуре В 🗌				Relir	nquished	by:				Date	_4		Time	Re	eceive	d by:		Date	Time														
EDD Format: EQuIS										<u> </u>			\triangle		motoson			27/20	11/9/16	0930														
If site-specific QC (MS/MSD/Dup) required, indicate QC samples and				Airbill No.: Relinquished by Commercial Ca								Te	Temperature upon receipt Y 5 2 °C																					



Laboratories

Lancaster Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #:					1731052 s					Sample #: 8687827-46								COC#:	15594		
Client: C.T. Male Associates						Matrix				Analyses Requested							T For Lab Us	se Only			
Project Name/#: SGPP - Merrimack	Site ID:					区 :			Preservation C						Codes SF#: <u>286049</u>						
Project Manager: Kirk Moline	P.O. #: \	6.612	6		뉟	nd	١,		Н	N	S									SCR#: <u>19606</u>	9
Sampler: JO, JC, LC, RH					Sediment	Ground	かれ		ν				(0 B)							Preservat	ion Codes
Phone #: 518-786-7400	Quote #:	214135			Sed		73	ers	+ TICs	ြ	(353.2)		M 2320	(3)						H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						ble ES	7	Containers	()	(6010C)		(6	rb (SM	7 mod.)				:		N = HNO ₃	B = NaOH
	Colle	ction		Composite		Potable r	: Blan	₩ of	VOAs (8260C)	Mg, Na, K	Total NO2 / NO3	SO4- (300.0)	Carb/Bicarb	(EPA 537						$S = H_2SO_4$ $O = Other$	P = H ₃ PO ₄
Sample Identification	Date	Time	Grab	Com	Soil	Water	Other:	Total	TCL V	Ca, M	Total	CI-, S	ALK +	PFCs						Rem	arks
SG2-RB01-161108	1118/16	0815	X				X	T						X							
SG2-RB02-161108			X				X	P						X						7	
SG2-MER45-4A-161108		1235	X			X		-	X	X	X	X	X	X							
SG2-Poland Distilled-161108		0810	Χ			X		i						X						Bottlea Wa	rectic Decon
SG2-MER45-6-161108		1415	Х			X			X	X	X	X	X	X							
SG2-MER45-9-161108		1545	X			X		- Company	Х	Χ	X	Χ	X	X							
SG2-MER45-7-161108		1620	X			X		AMERICA .	Χ	X	X	X	X	X							
																					_
Turnaround Time Requested (TAT) (please of	check): Stan	dard 🔀	RUS	Н		quished				1 /	Date	1 : :		Time	political _e	Rec	eived	by:		Date	Time
(RUSH TAT is subject to Eurofins Lancaster Laborator	ies approvai	and surchar	ges.)		1./	onune nquished				U	/8/ Date	16	l/	Time		Rece	nivod	hu		Date	Time
Date results are needed: E-mail address to send RUSH results: K	Mine P	+00/116	2 70	$\overline{\sim}$	176111	iquisneu	Bish				Date			IIIIE		Nec	siveu	by.		Date	riiile
Data Package Options (please check if requi		- I I WILL	- <u>'((</u>		Relir	 nquished	by:			ļ	Date			Time	-	Rec	eived	by:		Date	Time
Type I (Validation/non-CLP)		TX TRRP	- 13	\Box			·														
Type III (Reduced non-CLP)				_	Relir	nquished	by:			-	Date			Time		Rec	eived	by:		Date	Time
	ype A 🔲																				
	ype B 🗌				Relir	nquished	by:				Date			Time		,	eived	-	K	Date	Time
EDD Format: EQuIS									<u> </u>				\		mostar Sol		11/9/16	0930			
f site-specific QC (MS/MSD/Dup) required, indicate QC samples and				Airbill No.: Relinquished by Commercial Carrier: UPS Fed£x Other Temperature upon re-						pon rec	eipt)									



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

167677

Group Number(s): 1731052

Client: C.T. Male

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

11/09/2016 9:30

Number of Packages:

3

Number of Projects:

1

State/Province of Origin:

<u>NH</u>

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

Yes

Custody Seal Present:

Yes

Sample Date/Times match COC:

Yes

Custody Seal Intact:

Paperwork Enclosed:

Yes

VOA Vial Headspace ≥ 6mm:

No

3

Samples Chilled:

Yes Yes Total Trip Blank Qty:

Air Quality Samples Present:

See Below

Samples Intact:

Yes

Trip Blank Type:

No No

Missing Samples:

No

...

Extra Samples:

No No

Unpacked by Krista Abel (3058) at 14:00 on 11/09/2016

Discrepancy in Container Qty on COC:

Trip Blank Type(s): 1 Unpres, 2 Hcl

Samples Chilled Details

Thermometer Types:

Page 1 of 1

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler#	Thermometer ID	Corrected Temp	Therm. Type	<u>Ice Type</u>	Ice Present?	Ice Container	Elevated Temp?
1	DT146	0.7	DT	Wet	Υ	Bagged	N
2	DT146	1.6	DT	Wet	Υ	Bagged	N
3	DT146	4.7	DT	Wet	Υ	Bagged	N



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RLkg Reporting Limit **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: January 30, 2017

Project: SGPP - Merrimack

Submittal Date: 11/12/2016 Group Number: 1732744 SDG: MMK10 PO Number: 16.6126 State of Sample Origin: NH

	Lancaster Labs
Client Sample Description	<u>(LL) #</u>
SG2-LTB01-161111 Blank Water	8695116
SG2-FTB01-161111 Blank Water	8695117
SG2-LNGMW-2-161111 Grab Groundwater	8695118
SG2-MER45-11-161111 Grab Groundwater	8695119

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To C. T. Male Associates Attn: Jeff Marx
Electronic Copy To C. T. Male Associates Attn: Jeff Marx
Electronic Copy To C. T. Male Associates Attn: Dan Reilly
Electronic Copy To C. T. Male Associates Attn: Kirk Moline

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250



Project Name: SGPP - Merrimack LL Group #: 1732744

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

EPA 537 Rev. 1.1 modified, Misc. Organics

Sample #s: 8695116, 8695117, 8695118, 8695119

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Batch #: 16327003 (Sample number(s): 8695116-8695119 UNSPK: P697075)

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8695116, 8695118, 8695118, 8695119, Blank, LCS, MS, MSD

EPA 300.0, Wet Chemistry

<u>Batch #: 16330987171B (Sample number(s): 8695118-8695119 UNSPK: P693356 BKG: P693356)</u>

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Chloride, Sulfate

EPA 353.2, Wet Chemistry

<u>Batch #: 16323118103A (Sample number(s): 8695118-8695119 UNSPK: P693363 BKG: P693363)</u>

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Nitrite/Nitrate Nitrogen

SM 2320 B-1997, Wet Chemistry

<u>Batch #: 16326010102A (Sample number(s): 8695119 UNSPK: P697075 BKG: P697075, P697666)</u>

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Total Alkalinity to pH 4.5



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-LTB01-161111 Blank Water

SGPP - Merrimack

LL Sample # WW 8695116 LL Group # 1732744 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/11/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/12/2016 11:00 Reported: 01/30/2017 13:32

MM101 SDG#: MMK10-01TB

Column C	CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
11997 Renzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997 Bromochloromethane	11997	Acetone	67-64-1	6	U	6	20	1
11997 Bromoform 75-27-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997 Rromoferm	11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997 Strommethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997 Z-Butanone	11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1
11997 Chlorobersene	11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997 Chlorochame	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997 Chloroform	11997	Chlorobenzene	108-90-7	0.5	U	0.5		
11997 Chloromethane	11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997 Cyclohexane	11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997 1,2-Dithromo-3-chloropropane	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	Cyclohexane	110-82-7	2	U	2	5	1
11997 1,2-Dibromoethane	11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997 1,2-Dichlorobenzene	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997 1,3-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997 1,4-Dichlorobenzene	11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997 Dichlorodifluoromethane	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997 1,1-Dichloroethane	11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997 1,2-Dichloroethane	11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997 trans-1,2-Dichloroethene	11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,1-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-01-6 0.5 U 0.5 1 1 11997 Trichloroethane 79-01-6 0.5 U 0.5 1 1 11997 Trichloroethane 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997 2-Hexanone 591-78-6 3	11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997 Isopropylbenzene	11997	Freon 113	76-13-1	2	U	2	10	1
11997 Methyl Acetate 79-20-9 1 U 1 5 1 1 1 1 1 1 1 1	11997	2-Hexanone	591-78-6	3	U	3	10	1
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997 4-Methyl-2-pentanone	11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethane 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichloroebenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichloroebenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethane 79-01-6 0.5 U 0.5 1 1	11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethane 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 <tr< td=""><td>11997</td><td>4-Methyl-2-pentanone</td><td>108-10-1</td><td>3</td><td>U</td><td>3</td><td>10</td><td>1</td></tr<>	11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethane 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethane 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Styrene	100-42-5	1	U	1	5	1
11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1			120-82-1	1	U	1		
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1			71-55-6	0.5	U	0.5		
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1			79-01-6	0.5	U		1	
					U			
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1	11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
	11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-LTB01-161111 Blank Water

SGPP - Merrimack

LL Sample # WW 8695116 LL Group # 1732744 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/11/2016

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

Submitted: 11/12/2016 11:00

Reported: 01/30/2017 13:32

MM101 SDG#: MMK10-01TB

CAT No.	Analysis Name		CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles o-Xylene	SW-846 826	50C 95-47-6	ug/l 0.5	U	ug/l 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

1
1
1
1
1
1
1
1
1
1
1
1
1
1

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163271AA	11/22/2016	10:15	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163271AA	11/22/2016	10:15	Kevin A Sposito	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16327003	11/30/2016	04:21	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1	1	16327003	11/25/2016	08:45	Robert Brown	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Lab Name: Lancas Lab Code: LANCAS Matrix: (soil/wa Sample wt/vol: Level: (low/med) & Moisture: not Column: (pack/c Number TICs fou	ter) WATER Lab 5.0 (g/mL)mL Lab LOW Date dec. Date ap) CAP Dilu CO	SAS No.: Sample ID: 80 File ID:HP01 Received: 1: Analyzed: 1: tion Factor: NCENTRATION 0 g/L or ug/Kg	SDG No. 595116 9355.i/16nov22 1/12/16 1/22/16 1.0 UNITS:) ug/L	a.b/yn22s02
	! COMPOUND NAME !==========	! RT	! EST. CONC.	! Q !
1. VOCTIC 2. 3. 3. 3. 4. 4. 5. 5. 6. 7. 8. 9. 9. 110 111 112 113 114 115 115 116 117 118 119	•			

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-FTB01-161111 Blank Water

SGPP - Merrimack

LL Sample # WW 8695117 LL Group # 1732744 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/11/2016 08:15

C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 11/12/2016 11:00

Reported: 01/30/2017 13:32

MM102 SDG#: MMK10-02TB

CAT No.	Analysis Name	CAS Number	Resu	lt	Method Detection Lim	Limit of hit* Quantitation	Dilution on Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified	1					
10954	Perfluorooctanoic acid	335-67-1	1	U	1	2	1
10954	Perfluorononanoic acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid	307-24-4	1	U	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	1	U	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	5	U	5	10	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	1	U	1	3	1
	stated QC limits are advisory o	-	ient d	ata points			

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16327003	11/30/2016	04:42	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16327003	11/25/2016	08:45	Robert Brown	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-LNGMW-2-161111 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695118 LL Group # 1732744 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/11/2016 10:50 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/12/2016 11:00 Reported: 01/30/2017 13:32

MM103 SDG#: MMK10-03

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-LNGMW-2-161111 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695118 LL Group # 1732744 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/11/2016 10:50 by JC

C. T. Male Associates
50 Century Hill Drive

As Received

Latham NY 12110

Submitted: 11/12/2016 11:00

Reported: 01/30/2017 13:32

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

MM103 SDG#: MMK10-03

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea	e volatile li						
	FORM 1 - VOA-TIC. on the back of this		s appearing in	the "Q	" column are	defined		
Misc.	Organics	EPA 537 Remodified	ev. 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic a	cid	335-67-1	75		1	2	1
10954	Perfluorononanoic a	cid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic a	cid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic	acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic	acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoi	c acid	72629-94-8	2	U	2	4	1
10954			376-06-7	3	U	3	5	1
10954			307-24-4	15		1	2	1
10954	-		375-85-9	10		1	2	1
10954			375-73-5	4	U	4	10	1
10954			355-46-4	4	U	4	10	1
10954			1763-23-1	5	U	5	10	1
10954			375-22-4	8	J	3	10	1
10954	-		2706-90-3	9		1	3	1
	stated QC limits are be obtained to calcul			ient dat	a points			
Metal	5	SW-846 603	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	17.7		0.0382	0.400	1
01757	Magnesium		7439-95-4	3.17		0.0190	0.200	1
01762	Potassium		7440-09-7	1.18		0.160	1.00	1
01767	Sodium		7440-23-5	10.9		0.173	2.00	1
Wet Cl	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	13.2		1.0	2.0	5
00228	Sulfate		14808-79-8	22.5		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitra	te Nitrogen	n.a.	1.4		0.040	0.10	1
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	рН 4.5	n.a.	41.3		1.7	5.0	1
10110	-1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	. .		44 0				

1.7

5.0 5.0

41.3

n.a.

n.a.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-LNGMW-2-161111 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695118 LL Group # 1732744 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/11/2016 10:50 by JC C. T. Male Associates

50 Century Hill Drive Submitted: 11/12/2016 11:00 Latham NY 12110

Reported: 01/30/2017 13:32

MM103 SDG#: MMK10-03

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Ti	me		Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163271AA	11/22/2016	12:05	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163271AA	11/22/2016	12:05	Kevin A Sposito	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16327003	11/30/2016	05:02	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16327003	11/25/2016	08:45	Robert Brown	1
01750	Calcium	SW-846 6010C	1	163260635001	11/22/2016	03:55	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163260635001	11/22/2016	03:55	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163260635001	11/22/2016	03:55	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163260635001	11/22/2016	03:55	Matthew R Machtinger	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163260635001	11/21/2016	16:40	Barbara A Kane	1
00224	Chloride	EPA 300.0	1	16330987171B	11/25/2016	22:46	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	16330987171B	11/25/2016	22:46	Clinton M Wilson	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16323118103A	11/18/2016	09:01	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16324004201A	11/19/2016	18:32	Kenneth A Bell	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16324004201A	11/19/2016	18:32	Kenneth A Bell	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16324004201A	11/19/2016	18:32	Kenneth A Bell	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E		EPA SAMI	PLE NO.
V	OLATILE ORGANICS ANAI TENTATIVELY IDENTIFI	ED COMPOUNDS	! ! ! MM10	
ab Name: Lancas: ab Code: LANCAS atrix: (soil/wat ample wt/vol: ! evel: (low/med) Moisture: not o blumn: (pack/ca Number TICs four	Case No.: ter) WATER 5.0 (g/mL)mL LOW dec. ap) CAP	Contract: SAS No.: Lab Sample ID: 80 Lab File ID:HPO Date Received: 1 Date Analyzed: 1 Dilution Factor: CONCENTRATION (ug/L or ug/Kg	SDG No. 695118 9355.i/16nov228 1/12/16 1/22/16 1.0 UNITS:	·
	! ! COMPOUND NAME !==========		! EST. CONC.	
2	!Total VOC TICS ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! !			
22 23 24 25.	! ! !		! ! !	!! !! !!
8 9	! ! !	! ! !	! !	!! !!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MER45-11-161111 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695119 LL Group # 1732744 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/11/2016 12:05 by JC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/12/2016 11:00 Reported: 01/30/2017 13:32

MM104 SDG#: MMK10-04

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MER45-11-161111 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695119 LL Group # 1732744 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/11/2016 12:05 by JC C. T. Male Associates 50 Century Hill Drive

As Received

Latham NY 12110

Submitted: 11/12/2016 11:00

Reported: 01/30/2017 13:32

MM104 SDG#: MMK10-04

12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	eceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Se	arch						
	The results from t FORM 1 - VOA-TIC. on the back of thi	The qualifier						
Misc.	Organics	EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic	acid	335-67-1	32		1	2	1
10954	Perfluorononanoic	acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic	acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoi	c acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoi	c acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecand	oic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradeca	anoic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic	acid	307-24-4	11		1	2	1
10954	Perfluoroheptanoio	acid	375-85-9	8		1	2	1
10954	Perfluorobutanesul	fonate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesul	fonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesu	ılfonate	1763-23-1	5	U	5	10	1
10954	Perfluorobutanoic	Acid	375-22-4	5	J	3	10	1
10954	Perfluoropentanoio	c Acid	2706-90-3	10		1	3	1
The	stated QC limits ar	e advisory onl	y until suffic	ient da	ta points			
	be obtained to calc				-			
Metal	S	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	40.9		0.0382	0.400	1
01757	Magnesium		7439-95-4	9.79		0.0190	0.200	1
01762	_		7440-09-7	3.63		0.160	1.00	1
01767	Sodium		7440-23-5	134		0.173	2.00	1
Wet C	hemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	-		16887-00-6	303		20.0	40.0	100
00224	Sulfate		14808-79-8	9.9		1.5	5.0	5
00220	Sullace		14000-79-0	9.9		1.5	3.0	3
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitr	rate Nitrogen	n.a.	1.2		0.040	0.10	1
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity t		n.a.	20.4		1.7	5.0	1
12149	Bicarbonate Alkali	-	n.a.	20.4		1.7	5.0	1
10140	a l	-		1 7		1 8	5.0	-

1.7 U

1.7

5.0

n.a.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MER45-11-161111 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695119 LL Group # 1732744 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/11/2016 12:05 by JC C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/12/2016 11:00 Reported: 01/30/2017 13:32

MM104 SDG#: MMK10-04

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles Y163271AA SW-846 8260C 1 11/22/2016 12:28 Kevin A Sposito 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 Y163271AA 11/22/2016 12:28 Kevin A Sposito 1 10954 14 PFCs EPA 537 Rev. 1.1 16327003 11/30/2016 05:23 Marissa C 1 modified Drexinger EPA 537 Rev. 1.1 16327003 11/25/2016 08:45 14091 PFAA Water Prep Robert Brown 1 1 modified 01750 Calcium SW-846 6010C 163260635001 1 11/22/2016 03:58 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163260635001 11/22/2016 03:58 Matthew R 1 Machtinger 01762 Potassium SW-846 6010C 1 163260635001 11/22/2016 03:58 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163260635001 11/22/2016 03:58 1 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163260635001 11/21/2016 16:40 Barbara A Kane 1 U4 00224 Chloride EPA 300.0 16330987171B 11/27/2016 18:25 Clinton M Wilson 100 00228 Sulfate EPA 300.0 16330987171B Clinton M Wilson 1 11/25/2016 23:00 5 16323118103A 07882 Total Nitrite/Nitrate EPA 353.2 1 11/18/2016 09:03 Joseph E McKenzie 1 Nitrogen 16326010102A 12150 Total Alkalinity to pH SM 2320 B-1997 11/21/2016 19:10 Kenneth A Bell 16326010102A 12149 Bicarbonate Alkalinity SM 2320 B-1997 1 11/21/2016 19:10 Kenneth A Bell 1 12148 Carbonate Alkalinity SM 2320 B-1997 1 16326010102A 11/21/2016 19:10 Kenneth A Bell 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E VOLATILE ORGANICS ANA:	IVOIO DATA OHEET	EPA SAM	PLE NO.
	TENTATIVELY IDENTIF	IED COMPOUNDS	! ! MM1	! 04 !
ab Code: LANCA atrix: (soil/w	S Case No.: vater) WATER 5.0 (g/mL)mL 1) LOW dec. cap) CAP	Contract: SAS No.: Lab Sample ID: 86 Lab File ID:HP09 Date Received: 12 Date Analyzed: 12 Dilution Factor: CONCENTRATION (ug/L or ug/Kg	SDG No. 595119 9355.i/16nov228 1/12/16 1/22/16 1.0 JNITS:	
CAS NUMBER	! ! COMPOUND NAME		EST. CONC.	
2	!Total VOC TICS ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! !			
28 29	! ! !	!! !	!	!! !!
age 1 of 1		i	!	ii

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732744

Reported: 01/30/2017 13:32

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Batch number: Y163271AA	Sample	number	(s): 86951	16,8695118-8695119
Acetone	6	U	6	20
Benzene	0.5	U	0.5	1
Bromochloromethane	1	U	1	5
Bromodichloromethane	0.5	U	0.5	1
Bromoform	0.5	U	0.5	4
Bromomethane	0.5	U	0.5	1
2-Butanone	3	U	3	10
Carbon Disulfide	1	U	1	5
Carbon Tetrachloride	0.5	U	0.5	1
Chlorobenzene	0.5	U	0.5	1
Chloroethane	0.5	U	0.5	1
Chloroform	0.5	U	0.5	1
Chloromethane	0.5	U	0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	U	2	5
Dibromochloromethane	0.5	U	0.5	1
1,2-Dibromoethane	0.5	U	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5
Dichlorodifluoromethane	0.5	U	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	U	0.5	1
trans-1,2-Dichloroethene	0.5	U	0.5	1
1,2-Dichloropropane	0.5	U	0.5	1
cis-1,3-Dichloropropene	0.5	U	0.5	1
trans-1,3-Dichloropropene	0.5	U	0.5	1
Ethylbenzene	0.5	U	0.5	1
Freon 113	2	U	2	10
2-Hexanone	3	U	3	10
Isopropylbenzene	1	U	1	5
Methyl Acetate	1	U	1	5
Methyl Tertiary Butyl Ether	0.5	U	0.5	1
4-Methyl-2-pentanone	3	U	3	10
Methylcyclohexane	1	U	1	5
Methylene Chloride	2	U	2	4
Styrene	1	U	1	5
1,1,2,2-Tetrachloroethane	0.5	U	0.5	1

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732744

Reported: 01/30/2017 13:32

Method Blank (continued)

Analysis Name	Result ug/l	MDL**	LOQ ug/l
Tetrachloroethene Toluene 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Trichlorofluoromethane Vinyl Chloride m+p-Xylene o-Xylene	0.5 U 0.5 U 1 U 1 U 0.5 U 0.5 U 0.5 U 0.5 U 0.5 U 0.5 U 0.5 U 0.5 U 0.5 U	0.5 0.5 1 1 0.5 0.5 0.5 0.5 0.5	1 1 5 5 1 1 1 1 1 1
	ng/l	ng/l	ng/l
Batch number: 16327003 Perfluorooctanoic acid Perfluorononanoic acid Perfluorodecanoic acid Perfluoroundecanoic acid Perfluorotodecanoic acid Perfluorotridecanoic acid Perfluorotetradecanoic acid Perfluorotetradecanoic acid Perfluorohexanoic acid Perfluorohexanoic acid Perfluorobutanesulfonate Perfluoro-octanesulfonate Perfluorobutanoic Acid Perfluoropentanoic Acid	Sample numb 1	er(s): 8695 1 1 1 2 3 2 3 1 4 4 5 3 1	116-8695119 2 2 2 2 4 5 4 5 2 2 10 10 10 10 3
	mg/l	mg/l	mg/l
Batch number: 163260635001 Calcium Magnesium Potassium Sodium	Sample numb 0.0508 J 0.0190 U 0.160 U 0.173 U	er(s): 8695 0.0382 0.0190 0.160 0.173	118-8695119 0.400 0.200 1.00 2.00
Batch number: 16323118103A Total Nitrite/Nitrate Nitrogen	Sample numb 0.040 U	er(s): 8695 0.040	118-8695119 0.10
Batch number: 16330987171B Chloride Sulfate	Sample numb 0.20 U 0.30 U	er(s): 8695 0.20 0.30	118-8695119 0.40 1.0
	mg/l as CaC	O3 mg/l as CaCO3	mg/l as CaCO3
Batch number: 16324004201A Total Alkalinity to pH 4.5	Sample numb		
Batch number: 16326010102A Total Alkalinity to pH 4.5	Sample numb	er(s): 8695 1.7	119 5.0

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732744

Reported: 01/30/2017 13:32

Method Blank (continued)

Analysis Name Result MDL** LOQ mg/l as CaCO3 mg/l as mg/l as CaCO3 CaCO3

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: Y163271AA	Sample number	r(s): 86951	16,8695118-86	95119					
Acetone	150	162.15			108		50-168		
Benzene	20	20.64			103		78-120		
Bromochloromethane	20	20.95			105		80-125		
Bromodichloromethane	20	21.38			107		80-120		
Bromoform	20	18.65			93		59-120		
Bromomethane	20	18.05			90		55-123		
2-Butanone	150	125.59			84		57-145		
Carbon Disulfide	20	21.71			109		58-120		
Carbon Tetrachloride	20	20.98			105		74-130		
Chlorobenzene	20	19.98			100		80-120		
Chloroethane	20	19.07			95		56-120		
Chloroform	20	21.1			105		80-120		
Chloromethane	20	18.62			93		59-127		
Cyclohexane	20	20.13			101		65-131		
1,2-Dibromo-3-chloropropane	20	16.35			82		59-120		
Dibromochloromethane	20	20.27			101		78-120		
1,2-Dibromoethane	20	19.96			100		80-120		
1,2-Dichlorobenzene	20	19.85			99		80-120		
1,3-Dichlorobenzene	20	19.59			98		80-120		
1,4-Dichlorobenzene	20	19.81			99		80-120		
Dichlorodifluoromethane	20	17.52			88		49-134		
1,1-Dichloroethane	20	22.09			110		80-120		
1,2-Dichloroethane	20	22.66			113		66-128		
1,1-Dichloroethene	20	21.14			106		76-124		
cis-1,2-Dichloroethene	20	20.49			102		80-120		
trans-1,2-Dichloroethene	20	21.15			106		80-120		
1,2-Dichloropropane	20	21.64			108		80-120		
cis-1,3-Dichloropropene	20	20.11			101		80-120		
trans-1,3-Dichloropropene	20	20.97			105		76-120		
Ethylbenzene	20	20.36			102		78-120		
Freon 113	20	20.62			103		64-136		
2-Hexanone	100	88.38			88		49-146		
Isopropylbenzene	20	19.7			99		80-120		
Methyl Acetate	20	19.85			99		61-137		
Methyl Tertiary Butyl Ether	20	20.21			101		75-120		
4-Methyl-2-pentanone	100	91.69			92		55-141		
Methylcyclohexane	20	19.98			100		66-126		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732744

Reported: 01/30/2017 13:32

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Methylene Chloride	20	20.4			102		80-120		
Styrene	20	19.19			96		80-120		
1,1,2,2-Tetrachloroethane	20	18.87			94		72-120		
Tetrachloroethene	20	23.36			117		80-129		
Toluene	20	20.51			103		80-120		
1,2,3-Trichlorobenzene	20	18.8			94		69-120		
1,2,4-Trichlorobenzene	20	18.75			94		72-120		
1,1,1-Trichloroethane	20	17.76			89		66-126		
1,1,2-Trichloroethane	20	20.01			100		80-120		
Trichloroethene	20	20.73			104		80-120		
Trichlorofluoromethane	20	19.36			97		67-129		
Vinyl Chloride	20	18.67			93		63-121		
m+p-Xylene	40	39.71			99		80-120		
o-Xylene	20	19.22			96		80-120		
	ng/l	ng/l	ng/l	ng/l					
Batch number: 16327003	Sample numbe	er(s): 86951	.16-8695119						
Perfluorooctanoic acid	200	198.09			99		70-130		
Perfluorononanoic acid	200	212.6			106		70-130		
Perfluorodecanoic acid	200	228.72			114		70-130		
Perfluoroundecanoic acid	200	229.67			115		70-130		
Perfluorododecanoic acid	200	227.34			114		70-130		
Perfluorotridecanoic acid	200	231.53			116		70-130		
Perfluorotetradecanoic acid	200	222.69			111		70-130		
Perfluorohexanoic acid	200	222.61			111		70-130		
Perfluoroheptanoic acid	200	213.69			107		70-130		
Perfluorobutanesulfonate	176.8	192.54			109		70-130		
Perfluorohexanesulfonate	189.2	217.64			115		70-130		
Perfluoro-octanesulfonate	191.2	221.98			116		70-130		
Perfluorobutanoic Acid	200	219.2			110		70-130		
Perfluoropentanoic Acid	200	216.76			108		70-130		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 163260635001	Sample numbe	er(s): 86951	.18-8695119						
Calcium	4.00	3.96			99		80-120		
Magnesium	2.00	1.96			98		80-120		
Potassium	10	9.91			99		80-120		
Sodium	10	9.65			96		80-120		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 16323118103A	Sample numbe	er(s): 86951	.18-8695119						
Total Nitrite/Nitrate Nitrogen	2.50	2.63			105		90-110		
Batch number: 16330987171B	Sample numbe	x/a): 060F1	10 0605110						
Chloride	3.00	2.95	.10-0033113		98		90-110		
					98 98				
Sulfate	7.50	7.33			98		90-110		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732744

Reported: 01/30/2017 13:32

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/l as CaCO3	LCS Conc mg/l as CaCO3	LCSD Spike Added mg/l as CaCO3	LCSD Conc mg/l as CaCO3	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 16324004201A	Sample numbe	er(s): 86951	18						
Total Alkalinity to pH 4.5	188	185.14			98		84-110		
Batch number: 16326010102A	Sample numbe	er(s): 86951	19						
Total Alkalinity to pH 4.5	188	181.54			97		84-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspike Conc ug/l	ed M	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: Y163271AA	Sample n	number	(s): 8695	116,8695	118-8695119	UNSPK: P6	595182				
Acetone	6	U	150	161.08	150	155.86	107	104	50-168	3	30
Benzene	0.5	U	20	21.96	20	21.82	110	109	78-120	1	30
Bromochloromethane	1	U	20	21.86	20	21.88	109	109	80-125	0	30
Bromodichloromethane	0.5	U	20	22.37	20	22.13	112	111	80-120	1	30
Bromoform	0.5	U	20	19.03	20	18.54	95	93	59-120	3	30
Bromomethane	0.5	U	20	19.24	20	18.93	96	95	55-123	2	30
2-Butanone	3	U	150	129.52	150	125.61	86	84	57-145	3	30
Carbon Disulfide	1	U	20	23.87	20	23.67	119	118	58-120	1	30
Carbon Tetrachloride	0.5	U	20	23.15	20	22.95	116	115	74-130	1	30
Chlorobenzene	0.5	U	20	21.29	20	20.91	106	105	80-120	2	30
Chloroethane	0.5	U	20	20.92	20	20.44	105	102	56-120	2	30
Chloroform	0.5	U	20	22.24	20	22.09	111	110	80-120	1	30
Chloromethane	0.5	U	20	19.89	20	19.82	99	99	59-127	0	30
Cyclohexane	2	U	20	22.24	20	22.25	111	111	65-131	0	30
1,2-Dibromo-3-chloropropane	2	U	20	16.5	20	16.43	83	82	59-120	0	30
Dibromochloromethane	0.5	U	20	20.88	20	20.57	104	103	78-120	2	30
1,2-Dibromoethane	0.5	U	20	20.65	20	20.24	103	101	80-120	2	30
1,2-Dichlorobenzene	1	U	20	20.5	20	20.58	103	103	80-120	0	30
1,3-Dichlorobenzene	1	U	20	20.63	20	20.48	103	102	80-120	1	30
1,4-Dichlorobenzene	1	U	20	20.99	20	20.57	105	103	80-120	2	30
Dichlorodifluoromethane	0.5	U	20	19.33	20	19.01	97	95	49-134	2	30
1,1-Dichloroethane	0.5	U	20	23.4	20	23.48	117	117	80-120	0	30
1,2-Dichloroethane	0.5	U	20	23.13	20	22.72	116	114	66-128	2	30
1,1-Dichloroethene	0.5	U	20	23.5	20	23.13	118	116	76-124	2	30
cis-1,2-Dichloroethene	0.5	U	20	21.47	20	21.28	107	106	80-120	1	30
trans-1,2-Dichloroethene	0.5	U	20	23.06	20	22.81	115	114	80-120	1	30
1,2-Dichloropropane	0.5	U	20	22.51	20	22.52	113	113	80-120	0	30
cis-1,3-Dichloropropene	0.5	U	20	20.58	20	20.45	103	102	80-120	1	30
trans-1,3-Dichloropropene	0.5	U	20	21.48	20	21.38	107	107	76-120	0	30
Ethylbenzene	0.5	U	20	21.56	20	21.61	108	108	78-120	0	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732744

Reported: 01/30/2017 13:32

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Freon 113	2 U	20	23.14	20	22.33	116	112	64-136	4	30
2-Hexanone	3 U		90.53	100	88.83	91	89	49-146	2	30
Isopropylbenzene	1 U	20	21.07	20	20.95	105	105	80-120	1	30
Methyl Acetate	1 U	20	19.77	20	19.4	99	97	61-137	2	30
Methyl Tertiary Butyl Ether	0.5 U	20	21	20	20.89	105	104	75-120	1	30
4-Methyl-2-pentanone	3 U	100	93.2	100	90.65	93	91	55-141	3	30
Methylcyclohexane	1 U	20	22.3	20	22.12	112	111	66-126	1	30
Methylene Chloride	2 U	20	21.38	20	20.98	107	105	80-120	2	30
Styrene	1 U	20	20.17	20	20.01	101	100	80-120	1	30
1,1,2,2-Tetrachloroethane	0.5 U	20	19.62	20	19.04	98	95	72-120	3	30
Tetrachloroethene	0.5 U	20	23.05	20	22.98	115	115	80-129	0	30
Toluene	0.5 U		21.57	20	21.63	108	108	80-120	0	30
1,2,3-Trichlorobenzene	1 U		18.87	20	19.03	94	95	69-120	1	30
1,2,4-Trichlorobenzene	1 U		18.84	20	18.93	94	95	72-120	0	30
1,1,1-Trichloroethane	0.5 U		19.4	20	19.27	97	96	66-126	1	30
1,1,2-Trichloroethane	0.5 U		20.46	20	20.39	102	102	80-120	0	30
Trichloroethene	0.5 U		22.3	20	22.22	112	111	80-120	0	30
Trichlorofluoromethane	0.5 U		21.23	20	20.99	106	105	67-129	1	30
Vinyl Chloride	0.5 U		20.3	20	20.29	101	101	63-121	0	30
m+p-Xylene	0.5 U		42.63	40	42.42	107	106	80-120	0	30
o-Xylene	0.5 U	20	20.17	20	20.09	101	100	80-120	0	30
	ng/l	ng/l	ng/l	ng/l	ng/l					
Batch number: 16327003	Sample nu	mber(s): 869	5116-8695	119 UNSPK:	P697075					
Perfluorooctanoic acid	45.34	200.54	256.33	200.7	274.78	105	114	70-130	7	30
Perfluorononanoic acid	1 U	200.54	234.57	200.7	206.79	117	103	70-130	13	30
Perfluorodecanoic acid	1 U	200.54	198.65	200.7	236.9	99	118	70-130	18	30
Perfluoroundecanoic acid	2 U	200.54	241.04	200.7	259.8	120	129	70-130	7	30
Perfluorododecanoic acid	3 U		240.53	200.7	230.68	120	115	70-130	4	30
Perfluorotridecanoic acid	2 U		240.34	200.7	226.68	120	113	70-130	6	30
Perfluorotetradecanoic acid	3 U		220.77	200.7	217.87	110	109	70-130	1	30
Perfluorohexanoic acid	10.19	200.54	249.55	200.7	236.09	119	113	70-130	6	30
Perfluoroheptanoic acid	7.45	200.54	238.66	200.7	228.5	115	110	70-130	4	30
Perfluorobutanesulfonate	4 U		215.88	177.42	212.64	122	120	70-130	2	30
Perfluorohexanesulfonate	4 U		223.88	189.87	203.47	118	107	70-130	10	30
Perfluoro-octanesulfonate	5 U		199.12	191.87	216.68	104	113	70-130	8	30
Perfluorobutanoic Acid	5.16	200.54	240.99	200.7	230.56	118	112	70-130	4	30
Perfluoropentanoic Acid	6.98	200.54	240.53	200.7	230.55	116	111	70-130	4	30
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 163260635001	Sample nu	mber(s): 869	5118-8695	119 UNSPK:	P695182					
Calcium	21	4.00	24.82	4.00	24.6	95 (2)	90 (2)	75-125	1	20
Magnesium	3.69	2.00	5.60	2.00	5.56	96	94	75-125	1	20
Potassium	1.93	10	11.87	10	11.65	99	97	75-125	2	20
Sodium	74.73	10	84.63	10	84.03	99 (2)	93 (2)	75-125	1	20

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732744

Reported: 01/30/2017 13:32

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/l	MS Spike Added mg/l	MS Conc mg/l	MSD Spike Added mg/l	MSD Conc mg/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 16323118103A	Sample numbe	er(s): 8695	5118-86951	119 UNSPK:	P693363					
Total Nitrite/Nitrate Nitrogen	0.040 U	1.00	1.19			119*		90-110		
Batch number: 16330987171B Chloride Sulfate	Sample number 14.5 45.85	er(s): 8699 40 100	5118-86951 59.38 159.95	119 UNSPK:	P693356	112* 114*		90-110 90-110		
	mg/l as	mg/l as	mg/l as	mg/l as	mg/l as					
	CaCO3	CaCO3	CaCO3	CaCO3	CaCO3					
Batch number: 16324004201A	Sample numb	er(s): 8695	5118 UNSPE	K: P695182						
Total Alkalinity to pH 4.5	16.67	188	185.69	188	195.59	90	95	84-110	5	5
Batch number: 16326010102A	Sample numb	er(s): 8695	5119 UNSPE	K: P697075						
Total Alkalinity to pH 4.5	17.59	188	183.25	188	191.31	88	92	84-110	4	5

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD	DUP RPD Max
	mg/l	mg/l		
Batch number: 163260635001		8695118-8695119 BKG:	P695182	
Calcium	21	21.11	1	20
Magnesium	3.69	3.72	1	20
Potassium	1.93	1.97	2 (1)	20
Sodium	74.73	75.24	1	20
	mg/l	mg/l		
Batch number: 16323118103A	Sample number(s):	8695118-8695119 BKG:	P693363	
Total Nitrite/Nitrate Nitrogen	0.040 U	0.040 U	0 (1)	2
Batch number: 16330987171B	Sample number(s):	8695118-8695119 BKG:	D693356	
Chloride	14.5	14.37	1 (1)	15
Sulfate	45.85	45.72	0 (1)	15
Ballace	13.03	13.72	0 (1)	15
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 16324004201A Total Alkalinity to pH 4.5	Sample number(s): 16.67	8695118 BKG: P695182 16.81	1 (1)	5
Batch number: 16326010102A Total Alkalinity to pH 4.5	Sample number(s): 17.59	8695119 BKG: P697075 20.4	15* (1)	5

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732744

Reported: 01/30/2017 13:32

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: Y163271AA

	Dibromofluoromethane 1,2-Dichloroe		Toluene-d8	4-Bromofluorobenzene
8695116	102	101	98	97
8695118	102	102	97	97
8695119	101	104	97	96
Blank	102	102	98	98
LCS	100	102	99	99
MS	100	100	98	100
MSD	100	98	98	100
Limits:	80-116	77-113	80-113	78-113

Analysis Name: 14 PFCs Batch number: 16327003

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8695116	64*	64*	63*	66*	61*	68*
8695117	65*	64*	62*	60*	58*	67*
8695118	64*	61*	64*	61*	58*	65*
8695119	66*	64*	68*	63*	61*	69*
Blank	68*	70	69*	67*	67*	71
LCS	63*	61*	65*	53*	59*	60*
MS	65*	71	78	63*	74	71
MSD	68*	76	77	59*	69*	69*
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8695116	64*	71	71	65*	63*	61*
8695117	66*	71	70	71	69*	59*
8695118	63*	62*	72	67*	65*	59*
8695119	65*	77	69*	73	71	64*
Blank	74	69*	69*	69*	69*	58*
LCS	66*	64*	69*	62*	76	65*
MS	71	79	63*	73	72	67*
MSD	65*	74	66*	69*	78	68*

70-130

70-130

70-130

	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
8695116	66*	58*	52*	
8695117	71	60*	60*	
8695118	71	54*	55*	
8695119	74	70	65*	
Blank	73	61*	61*	

70-130

70-130

Limits:

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

70-130

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732744

Reported: 01/30/2017 13:32

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 14 PFCs Batch number: 16327003

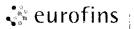
	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
LCS	85	65*	67*	
MS	79	63*	65*	
MSD	89	67*	68*	
Limits:	70-130	70-130	70-130	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

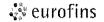
⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



Page 104 | Lancaster Environmental Services Analysis Request/Chain of Custody Laboratories

Acct. #:	37191		Grou	#: qu	17	3274	4		Samı	ple #:	38	<u> 29c</u>	<u> </u>	-19						COC#: 1	15594	
Client: C.T. Male Associates						Matrix	΄.					Aı	naly	ses R	lequ	quested F				For Lab Use Only		
Project Name/#: SGPP - Merrimack	Site ID:]					P	rese	rvatio	on C	Code	s			SF#: <u>286049</u>		
Project Manager: Kirk Moline	P.O. #: /	10.61:	26		뒽	1 '		'	Н	N	S				•					SCR#: <u>196069</u>	<u> </u>	
Sampler: JC					Sediment	Ground	1		S				(0 B)							Preservat	ion Codes	
Phone #: 518-786-7502	Quote #:	214135			Sed] 🗟		+ TICs	ျွ	(353.2)		A 232	_{(ii}						H = HCI	T = Thiosulfate	
State where sample(s) were collected: NH						ble ES	区	Containers	(S)	(6010C)	3 (35	1 ~1	NS) q	7 mod.)						N = HNO ₃	B = NaOH	
	Colle	ection		osite		Potable	Biank)As (8260C)	Na, K	2 / NC	4- (300.0)	Carb/Bicarb (SM 2320 B)	(EPA 537						$S = H_2SO_4$ $O = Other$	P = H ₃ PO ₄	
Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other:	Total #	TCL VC	Ca, Mg,	Total N		+	g						Rem	ıarks	
SG2-LTB01-161111	11/11/1/6			Ť	٣	+-	X	3	$\sqrt{}$					X	\exists	寸	寸	\top				
SG2-FTB01-161111		0815	X	\Box		†	X			\Box		\vdash		X	\exists		\top	\top				
SG2-LNGMW-2-161111	11/11/16	1.5	+ +	\Box	\vdash	tx	+		X	×	X	×	X	X	寸		\exists	1				
SG2-MER45-11-161111	, ,	1205	T			İχ		1	X	X	X		X	 	\exists		\neg					
		10.00																				
				\Box																		
Turnaround Time Requested (TAT) (please of		~~		4 🔲		nquished		7°			Date	111	1	Time	- 1	Rece	ived	by:		Date	Time	
(RUSH TAT is subject to Eurofins Lancaster Laboratori	es approval a	and surchar	ges.)			nquished		EVNX	w		/ [] / Date	116		<u> </u>		\ Rece	hod	b.v.		Date	Time	
Date results are needed: E-mail address to send RUSH results: $\cancel{ extit{K}} \cdot \cancel{ extit{N}}$	Ninel	TONEW	~~IP		4	nquisned	by.			'	Date	2		Linie	ľ	Kece	Iveu	by.		Date	Time	
Data Package Options (please check if require	·	<u> </u>	KINA			nquished	by:	$\overline{}$	$\overline{}$	 	Date	 }	\vdash	Time	\dashv	Rece	ived	by:		Date	Time	
Type I (Validation/non-CLP)		TX TRRP	' - 13			•	•										`	/				
Type III (Reduced non-CLP) CT RC		••••	•=		Reli	nquished	l by:				Date	<u> </u>		Time		Rece	ived	by:		Date	Time	
	уре А 🔲			,		_					\	!				L						
	уре В 🗌				Relir	nquished	by:				Date	$\overline{}$		Time		Rece		/	1/2	Date	Time	
EDD Format: EQuIS					a Airbi	ill No.:							<u> </u>		\dashv	<u> </u>	10/	to h	194	11/12/16	1100	
If site-specific QC (MS/MSD/Dup) required, i	indicate Q	C sample	s and		Relin	nquished b)	0.9-		
submit triplicate volume.				,	UPS	·	FedE	Ex>	<u> </u>	Othe	۱ <u>د</u>			_		Temp	berat	ure up	on rece	əipt <u>~ ~~</u> `	<u>≲</u> _°c	



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

168069

Group Number(s): 1732744

Client: C.T. Male

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

11/12/2016 11:00

Number of Packages:

2

Number of Projects:

1

State/Province of Origin:

<u>NH</u>

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

Yes

Custody Seal Present:

Y.es

Sample Date/Times match COC:

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

Yes

Samples Chilled:

Yes

Total Trip Blank Qty:

Nο

3

Paperwork Enclosed:

Yes

Trip Blank Type:

See Below

Samples Intact:

Yes

Air Quality Samples Present:

No

Missing Samples:

No

Extra Samples:

No

Discrepancy in Container Qty on COC:

No

Trip Blank Type(s): 1 Unpres, 2 HCL

Unpacked by Krista Abel (3058) at 12:02 on 11/12/2016

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle) -

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler#	Thermometer ID	Corrected Temp	Therm. Type	<u>lce Type</u>	Ice Present?	Ice Container	Elevated Temp?
1	DT146	0.9	DT	Wet	Υ	Bagged	N
2	DT146	0.5	ÐΤ	Wet	Υ	Bagged	N



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RLReporting Limit kg **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: January 04, 2017

Project: SGPP - Merrimack

Submittal Date: 11/10/2016 Group Number: 1732745 SDG: MMK11 PO Number: 16.6126 State of Sample Origin: NH

	Lancaster Labs
Client Sample Description	<u>(LL) #</u>
SG2-GWEB01-161109 Blank Water	8695120
SG2-FTB01-161109 Blank Water	8695121
SG2-MER45-3A-161109 Grab Groundwater	8695122
SG2-MER45-5A-161109 Grab Groundwater	8695123
SG2-MER45-28-161109 Grab Groundwater	8695124
SG2-MER1MW-161109 Grab Groundwater	8695125
SG2-LNGMW-4-161109 Grab Groundwater	8695126
SG2-GWFD01-161109 Grab Groundwater	8695127
SG2-LTB01-161109 Blank Water	8695128

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	C. T. Male Associates	Attn: Jeff Marx
Electronic Copy To	C. T. Male Associates	Attn: Dan Reilly
Electronic Copy To	C. T. Male Associates	Attn: Kirk Moline



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250



Project Name: SGPP - Merrimack LL Group #: 1732745

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260C, GC/MS Volatiles

Batch #: Y163263AA (Sample number(s): 8695122-8695128 UNSPK: P699736)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Carbon Disulfide

EPA 537 Rev. 1.1 modified, Misc. Organics

Sample #s: 8695120, 8695121, 8695122, 8695123, 8695125, 8695126, 8695127, 8695128 The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample #s: 8695124

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken:

The sample was reinjected and comparable results were observed.

Batch #: 16323001 (Sample number(s): 8695120-8695128 UNSPK: P695182)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Perfluoroheptanoic acid, Perfluoro-octanesulfonate

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8695120, 8695121, 8695122, 8695123, 8695124, 8695125, 8695126, 8695127, 8695128, Blank, LCS, MS, MSD

EPA 353.2, Wet Chemistry

Batch #: 16323118103A (Sample number(s): 8695120 UNSPK: P693363 BKG: P693363)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Nitrite/Nitrate Nitrogen
Batch #: 16325118101B (Sample number(s): 8695127 UNSPK: P697075 BKG: P697075)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Nitrite/Nitrate Nitrogen

SM 2320 B-1997, Wet Chemistry

Batch #: 16321005103A (Sample number(s): 8695120, 8695122-8695124, 8695126 UNSPK: P690739 BKG: P690739, P691182)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Total Alkalinity to pH 4.5

v 1.9.4



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-GWEB01-161109 Blank Water

SGPP - Merrimack

LL Sample # WW 8695120 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 08:15 by LC

C. T. Male Associates
50 Century Hill Drive

Submitted: 11/10/2016 09:30 Latham NY 12110

Reported: 01/04/2017 16:35

11MM1 SDG#: MMK11-01EB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U U	2 1	4 5	1 1
11997	Styrene	100-42-5	1 0.5	U	0.5	1	1
11997	1,1,2,2-Tetrachloroethane Tetrachloroethene	79-34-5	0.5	U		1	
11997 11997	Toluene	127-18-4 108-88-3	0.5	U	0.5 0.5	1	1 1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-00-5 79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-09-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1
11221	W. P WATCHE	1,7001-23-1	0.5	U	0.5	-	±

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-GWEB01-161109 Blank Water

SGPP - Merrimack

LL Sample # WW 8695120 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 08:15 by LC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/10/2016 09:30 Reported: 01/04/2017 16:35

xcporcea. 01/04/201/ 10:55

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

11MM1 SDG#: MMK11-01EB

CAT No.	Analysis Name		CAS Number	Result	:	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	50C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882 VOA Library Search								
	The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.							
Misc.	Organics	EPA 537 Remodified	ev. 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic a		335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic a		375-95-1	0.6	IJ	0.6	2	1
10954	Perfluorodecanoic a		335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic		2058-94-8	1	IJ	1	3	1
10954	Perfluorododecanoic	acid	307-55-1	0.5	Ū	0.5	2	1
10954	Perfluorotridecanoi	c acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecan	oic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic a	cid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic	acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate		375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate		355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate		1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic A	cid	375-22-4	3	U	3	10	1
	Perfluoropentanoic		2706-90-3	0.5	U	0.5	2	1
The stated QC limits are advisory only until sufficient data points								
can be obtained to calculate statistical limits.								
Metal	s	SW-846 603	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	0.0382	? U	0.0382	0.400	1
01757	Magnesium		7439-95-4	0.0190) U	0.0190	0.200	1
01762	Potassium		7440-09-7	0.160	U	0.160	1.00	1
01767	Sodium		7440-23-5	0.173	Ū	0.173	2.00	1
Wet C	nemistry EPA 300.0			mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	0.20	U	0.20	0.40	1
00228	Sulfate		14808-79-8	0.30	U	0.30	1.0	1
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitra	te Nitrogen	n.a.	0.056	J	0.040	0.10	1
	SM 2320 B-1997			mg/l a	s CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	рн 4.5	n.a.	1.7	U	1.7	5.0	1

1.7

5.0

5.0

1.7

n.a.

n.a.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-GWEB01-161109 Blank Water

SGPP - Merrimack

LL Sample # WW 8695120 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 08:15 by LC

C. T. Male Associates 50 Century Hill Drive

Submitted: 11/10/2016 09:30

Reported: 01/04/2017 16:35

Latham NY 12110

11MM1 SDG#: MMK11-01EB

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles SW-846 8260C 1 L163281AA 11/23/2016 10:21 Kevin A Sposito 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 L163281AA 11/23/2016 10:21 Kevin A Sposito 10954 14 PFCs EPA 537 Rev. 1.1 16323001 11/23/2016 23:09 Jason W Knight 1 modified EPA 537 Rev. 1.1 14091 PFAA Water Prep 16323001 11/20/2016 12:00 Devon M Whooley 1 1 modified 01750 Calcium SW-846 6010C 163160635005 1 11/19/2016 03:49 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163160635005 11/19/2016 03:49 1 Matthew R Machtinger 01762 Potassium SW-846 6010C 1 163160635005 11/19/2016 03:49 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163160635005 11/19/2016 03:49 1 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163160635005 11/17/2016 23:00 Annamaria Kuhns 1 U4 00224 Chloride EPA 300.0 16326120171B 11/23/2016 06:23 Clinton M Wilson 00228 Sulfate EPA 300.0 2 16326120171B 11/23/2016 06:23 Clinton M Wilson 1 EPA 353.2 07882 Total Nitrite/Nitrate 1 16323118103A 11/18/2016 09:05 Joseph E McKenzie 1 Nitrogen SM 2320 B-1997 16321005103A 12150 Total Alkalinity to pH 11/17/2016 03:15 Brandon P Costik 16321005103A 12149 Bicarbonate Alkalinity SM 2320 B-1997 1 Brandon P Costik 11/17/2016 03:15 1 12148 Carbonate Alkalinity SM 2320 B-1997 1 16321005103A 11/17/2016 03:15 Brandon P Costik 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

			EPA	NO.			
		VOLAT	TILE ORGANICS AN	ALYSIS DATA SHEET			
		TEN	!		!		
					!	11MM1	!
Lab	Name:	Lancaster	Laboratories	Contract:	!		!
Lab	Code:	LANCAS	Case No.:	SAS No.:	_ SDG	No.:	

Lab Code: LANC Matrix: (soil/water) WATER Lab Sample ID: 8695120

Sample wt/vol: 5.0 (g/mL)mL Level: (low/med) LOW Lab File ID: HP09915.i/16nov23a.b/ln23s02.d

Date Received: 11/10/16 Date Analyzed: 11/23/16 % Moisture: not dec. Column: (pack/cap) CAP Dilution Factor: 1.0 CONCENTRATION UNITS: Number TICs found: 0 (ug/L or ug/Kg) ug/L

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
	==!===================================	===!=====! !		!====: ! U
2		i		!
	<u> </u>	!		1
4.		!		!
6.		!		!
		!		!
	!	!		!
9.	!	! !		!
	_!	!		!
1	!	!		!
.2.	!	!		!
.3	!	!		!
.4	!	!		!
.5	!!	!!		!
.6	!	!		!
.7	!	!!		!
.8	!	!!		!
.9	!!	!!		!
20	!!	!!		!
21	!	!!		!
.2	!	!!		!
	!	!!		!
24	!!	!!		!
25	!	!!		!
26	!	!!		!
.7	!!	!!		!
	!	!!		!
9	!	!!		!
0	!!	!!		!
-	1	1		!



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-FTB01-161109 Blank Water

SGPP - Merrimack

LL Sample # WW 8695121 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 08:30

C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 11/10/2016 09:30

Reported: 01/04/2017 16:35

11MM2 SDG#: MMK11-02TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit	Limit of t* Quantitation	Dilution Factor
Misc.	Organics EPA 53	7 Rev. 1.1	ng/l		ng/l	ng/l	
	modifi	ed					
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
	stated QC limits are advisory		ient da	ta points			

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	ne	Analyst	Dilution Factor
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/23/2016	23:29	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16323001	11/20/2016	12:00	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-3A-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695122 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 10:15 by LC C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/10/2016 09:30 Reported: 01/04/2017 16:35

11MM3 SDG#: MMK11-03

CAT No.	Analysis Name	CAS Number	As Rec Result	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 82	260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	Ū	0.5	1	1
11997	Bromochloromethane	74-97-5	1	IJ	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	Ū	0.5	1	1
11997	Bromoform	75-25-2	0.5	IJ	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	Ū	0.5	1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1	1
11997	Chloroform	67-66-3	0.5	Ū	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	IJ	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	IJ	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	Ū	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	IJ	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-01-5	0.5	IJ	0.5	1	1
11997	Ethylbenzene	10061-02-6	0.5	IJ	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
11997	2-Hexanone	591-78-6	3	IJ	3	10	1
11997			3 1	U	1	5	1
11997	Isopropylbenzene	98-82-8 79-20-9	1	IJ	1	5	1
	Methyl Acetate		0.5	IJ			
11997	Methyl Tertiary Butyl Ether	1634-04-4	3	U	0.5 3	1 10	1 1
11997 11997	4-Methyl-2-pentanone	108-10-1 108-87-2	3 1	IJ	1	5	1
	Methylcyclohexane		_	•			=
11997	Methylene Chloride	75-09-2	2 1	U U	2 1	4 5	1
11997	Styrene	100-42-5		U II			1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	0	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1 1	1
11997	Toluene	108-88-3	0.5	U	0.5	_	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U 	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ŭ	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-3A-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695122 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 10:15 by LC C. T. Male Associates

50 Century Hill Drive

As Received

Latham NY 12110

Submitted: 11/10/2016 09:30 Reported: 01/04/2017 16:35

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

11MM3 SDG#: MMK11-03

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea	arch						
	The results from the FORM 1 - VOA-TIC. on the back of this	The qualifier	-					
Misc.	Organics	EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic		335-67-1	140		0.5	2	1
10954	Perfluorononanoic		375-95-1	1	J	0.6	2	1
10954			335-76-2	0.5	U	0.5	2	1
10954			2058-94-8	1	U	1	3	1
10954			307-55-1	0.5	U	0.5	2	1
10954			72629-94-8	0.5	U	0.5	2	1
10954			376-06-7	0.5	U	0.5	2	1
10954			307-24-4	19		0.5	2	1
10954	-		375-85-9	22		0.5	2	1
	Perfluorobutanesul		375-73-5	7		0.7	2	1
10954			355-46-4	4		1	3	1
	Perfluoro-octanesu		1763-23-1	9		2	6	1
	Perfluorobutanoic		375-22-4	7	J	3	10	1
	Perfluoropentanoic		2706-90-3	12		0.5	2	1
	stated QC limits are be obtained to calcu			eient da	ta points			
Metals	3	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	14.8		0.0382	0.400	1
01757	Magnesium		7439-95-4	3.10		0.0190	0.200	1
01762	Potassium		7440-09-7	2.49		0.160	1.00	1
01767	Sodium		7440-23-5	61.2		0.173	2.00	1
Wet C	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	99.4		10.0	20.0	50
00221	Sulfate		14808-79-8	12.0		1.5	5.0	5
				/ J		ma /1	/1	
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitr	ate Nitrogen	n.a.	0.39		0.040	0.10	1
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to		n.a.	34.4		1.7	5.0	1
10140	-1 1 1 -11			24.4				

1.7

5.0

5.0

34.4

n.a.

n.a.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-3A-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695122 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 10:15 by LC C. T. Male Associates 50 Century Hill Drive

Submitted: 11/10/2016 09:30 Latham NY 12110

Reported: 01/04/2017 16:35

11MM3 SDG#: MMK11-03

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles SW-846 8260C 1 Y163263AA 11/21/2016 23:37 Kevin D Kelly 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 Y163263AA 11/21/2016 23:37 Kevin D Kelly 10954 14 PFCs EPA 537 Rev. 1.1 16323001 11/23/2016 23:50 Jason W Knight 1 modified EPA 537 Rev. 1.1 14091 PFAA Water Prep 16323001 Devon M Whooley 1 11/20/2016 12:00 1 modified 01750 Calcium SW-846 6010C 163160635005 1 11/19/2016 03:58 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163160635005 11/19/2016 03:58 Matthew R 1 Machtinger 01762 Potassium SW-846 6010C 1 163160635005 11/19/2016 03:58 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163160635005 1 11/19/2016 03:58 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163160635005 11/17/2016 23:00 Annamaria Kuhns 1 U4 00224 Chloride EPA 300.0 16326120171B 11/21/2016 19:35 Clinton M Wilson 00228 Sulfate EPA 300.0 16326120171B 11/21/2016 19:20 Clinton M Wilson 1 5 EPA 353.2 07882 Total Nitrite/Nitrate 1 16325118101A 11/20/2016 19:08 Joseph E McKenzie 1 Nitrogen SM 2320 B-1997 16321005103A 12150 Total Alkalinity to pH 11/17/2016 03:22 Brandon P Costik 12149 Bicarbonate Alkalinity SM 2320 B-1997 1 16321005103A Brandon P Costik 11/17/2016 03:22 1 12148 Carbonate Alkalinity SM 2320 B-1997 1 16321005103A 11/17/2016 03:22 Brandon P Costik 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.	
VOLATILE ORGANICS A		_	
TENTATIVELY IDENT	!	!	
		! 11MM3	!
ab Name: Lancaster Laboratories	Contract:	!	_!
ab Code: LANCAS Case No.:	SAS No.:	SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 869!	5122	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP093!	55.i/16nov21b.b/yn21	ls71.d
evel: (low/med) LOW	Date Received: 11/2	LO/16	
Moisture: not dec.	Date Analyzed: 11/2	21/16	
column: (pack/cap) CAP	Dilution Factor: 1	. 0	
	CONCENTRATION UNI	ITS:	
Number TICs found: 0	(11a/L or 11a/Ka) 1	ıa/T.	

CAS NUMBER	! COMPOUND NAME ==!==================================	! RT	EST. CONC.	
	!Total VOC TICs	!		!===== ! U
	!!	! !		!
	!	!		!
4.	!	!		!
5	!	!!		!
6	!	!		!
7	!	!!		!
8	!	!		!
9	!	!!	!	!
.0.	!	!		!
1	!	!!		!
2	!!	!!		!
.3	!	!!		!
4	!	!!		!
.5	!	!!		!
.6	!	!!		!
.7	!	!!		!
.8	!	!!		!
.9	!	!!		!
0	!	!!		!
1	!	!!		!
	!	!!		!
3	!	!!		!
4	!	!!		!
5	!	!!		!
6	!	!!		!
.7	!	!!		!
8		!!		!
9		!!		!
0	!	!!		!
	!	! !		!



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-5A-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695123 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 14:30 by LC C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 11/10/2016 09:30 Reported: 01/04/2017 16:35

11MM4 SDG#: MMK11-04

No. ABILYSIS Name CAS Number Result Description of the property of	CAT	Analysis Name	CAS Number		ceived	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution
1997 Acetome	No.	-	2		τ		-	Factor
11999 Renzene	•			_		-	_	
1997 Bromochloromethane			* * * *					
1997 Bromofich 75-27-4 0.5 0 0.5 1 1 1 1 1 1 1 1 1								
1997 Bromoform								
11997 Bromomethane					-			
1997 Z-Butanone								
1997 Carbon Disulfide								
11997 Carbon Tetrachloride					-			
1997 Chloroethane					-			
11997 Chloroethane								
11997 Chloroform					-			
11997 Chloromethane					-			
11997 Cyclohexane					-			
11997 1,2-Dibromo-3-chloropropane								
11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1 1 1 1 1 1 1 1 1								
11997 1,2-Dichlorobehane		·	96-12-8	_	-		-	
11997 1,2-Dichlorobenzene					-			
11997 1,3-Dichlorobenzene								
11997 1.4-Dichlorobenzene		•	95-50-1		-			
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U			1
11997 1,1-Dichloroethane	11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997 1,2-Dichloroethane								
11997 1,1-Dichloroethene	11997	1,1-Dichloroethane	75-34-3	0.5	U		1	1
11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 Ethylbenzene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Z-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-87-2 1 U 1 5 1 11997 Methyl-2-pentanone 108-87-2 1 U 1 5 1 <td< td=""><td>11997</td><td>cis-1,2-Dichloroethene</td><td>156-59-2</td><td>0.5</td><td>U</td><td>0.5</td><td>1</td><td>1</td></td<>	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone	11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997 2-Hexanone 591-78-6 3	11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997 Isopropylbenzene 98-82-8 1	11997	Freon 113	76-13-1	2	U	2	10	1
11997 Methyl Acetate 79-20-9 1 U 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997	2-Hexanone	591-78-6	3	U	3	10	1
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylchene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichloroethane 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichloroethane 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 Trichloroethene 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4	11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 Trichloroethene 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 <tr< td=""><td>11997</td><td>4-Methyl-2-pentanone</td><td>108-10-1</td><td>3</td><td>U</td><td>3</td><td>10</td><td>1</td></tr<>	11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997 Styrene 100-42-5 1 U 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Styrene	100-42-5	1	U	1	5	1
11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichlorobethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichlorobethane 79-00-5 0.5 U 0.5 1 1 11997 Trichlorobethane 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	1,1,2-Trichloroethane	79-00-5	0.5	U		1	1
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997		79-01-6	0.5	U		1	1
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1					U			
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1	11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
	11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-5A-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695123 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 14:30 by LC C. T. Male Associates

50 Century Hill Drive Submitted: 11/10/2016 09:30 Latham NY 12110

Reported: 01/04/2017 16:35

11MM4 SDG#: MMK11-04

CAT No. Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles 11997 o-Xylene	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/1 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics	EPA 53	Rev.	1.1	ng/l			ng/l	ng/l	
		modifie	ed							
10954	Perfluorooctanoic a	cid	335	5-67-1	62			0.5	2	1
10954	Perfluorononanoic a	cid	375	5-95-1	0.6	U		0.6	2	1
10954	Perfluorodecanoic a	cid	335	5-76-2	0.5	U		0.5	2	1
10954	Perfluoroundecanoic	acid	205	58-94-8	1	U		1	3	1
10954	Perfluorododecanoic	acid	307	7-55-1	0.5	U		0.5	2	1
10954	Perfluorotridecanoi	c acid	726	529-94-8	0.5	U		0.5	2	1
10954	Perfluorotetradecan	oic acid	376	5-06-7	0.5	U		0.5	2	1
10954	Perfluorohexanoic a	cid	307	7-24-4	12			0.5	2	1
10954	Perfluoroheptanoic	acid	375	5-85-9	10			0.5	2	1
10954	Perfluorobutanesulf	onate	375	5-73-5	4			0.7	2	1
10954	Perfluorohexanesulf	onate	355	5-46-4	4			1	3	1
10954	Perfluoro-octanesul:	fonate	176	53-23-1	3	J		2	6	1
10954	Perfluorobutanoic A	cid	375	5-22-4	5	J		3	10	1
10954	Perfluoropentanoic	Acid	270	06-90-3	9			0.5	2	1
m1	00 1::	- 32	1		ناف المنادي		_			

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Metal	s	SW-846 60	10C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	25.9	0.0382	0.400	1
01757	Magnesium		7439-95-4	5.56	0.0190	0.200	1
01762	Potassium		7440-09-7	2.73	0.160	1.00	1
01767	Sodium		7440-23-5	56.9	0.173	2.00	1
Wet C	hemistry	EPA 300.0)	mg/l	mg/l	mg/l	
00224	Chloride		16887-00-6	118	10.0	20.0	50
00228	Sulfate		14808-79-8	11.3	1.5	5.0	5
		EPA 353.2	!	mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrat	e Nitrogen	n.a.	1.9	0.040	0.10	1
		SM 2320 B	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	pH 4.5	n.a.	28.8	1.7	5.0	1
12149	Bicarbonate Alkalini	.ty	n.a.	28.8	1.7	5.0	1
12148	Carbonate Alkalinity	r	n.a.	1.7 U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-5A-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695123 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 14:30 by LC C. T. Male Associates 50 Century Hill Drive

Submitted: 11/10/2016 09:30 Latham NY 12110

Reported: 01/04/2017 16:35

11MM4 SDG#: MMK11-04

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles SW-846 8260C 1 Y163263AA 11/21/2016 23:59 Kevin D Kelly 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 Y163263AA 11/21/2016 23:59 Kevin D Kelly 10954 14 PFCs EPA 537 Rev. 1.1 16323001 11/24/2016 00:10 Jason W Knight 1 modified EPA 537 Rev. 1.1 14091 PFAA Water Prep 16323001 11/20/2016 12:00 Devon M Whooley 1 1 modified 01750 Calcium SW-846 6010C 163160635005 1 11/19/2016 04:01 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163160635005 11/19/2016 04:01 Matthew R 1 Machtinger 01762 Potassium SW-846 6010C 1 163160635005 11/19/2016 04:01 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163160635005 11/19/2016 04:01 1 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163160635005 11/17/2016 23:00 Annamaria Kuhns 1 U4 00224 Chloride EPA 300.0 16326120171B 11/21/2016 20:04 Clinton M Wilson 00228 Sulfate EPA 300.0 16326120171B 11/21/2016 19:50 Clinton M Wilson 1 5 EPA 353.2 07882 Total Nitrite/Nitrate 1 16325118101A 11/20/2016 19:13 Joseph E McKenzie 1 Nitrogen SM 2320 B-1997 16321005103A 12150 Total Alkalinity to pH 11/17/2016 03:29 Brandon P Costik 12149 Bicarbonate Alkalinity SM 2320 B-1997 1 16321005103A Brandon P Costik 11/17/2016 03:29 1 12148 Carbonate Alkalinity SM 2320 B-1997 1 16321005103A 11/17/2016 03:29 Brandon P Costik 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.					
VOLATILE ORGANICS ANALY	VOLATILE ORGANICS ANALYSIS DATA SHEET						
TENTATIVELY IDENTIFIE	ED COMPOUNDS	!!!					
		! 11MM4 !					
Lab Name: Lancaster Laboratories	Contract:	!!					
Lab Code: LANCAS Case No.:	SAS No.:	SDG No.:					
Matrix: (soil/water) WATER	Lab Sample ID: 8695123						
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID: HP09355.i/	/16nov21b.b/yn21s72.d					
Level: (low/med) LOW	Date Received: 11/10/16	5					
% Moisture: not dec.	Date Analyzed: 11/21/16	5					
Column: (pack/cap) CAP	Dilution Factor: 1.0						

Column: (pack/cap) CAP Dilution Factor: 1.0 CONCENTRATION UNITS: Number TICs found: 0 (ug/L or ug/Kg) ug/L

1	1	1 1		
			EST. CONC.	
•	=!====================================	==!=====!	.========	!===== ! U
! 2				: U
	!	:i		i ———
		:i		i
	!	;i		!
! 6				·
	!	;i		!
	i i			!
! 9.		· ·		!
!10				!
!11.	i i			!
!12				!
!13.	i i			!
!14		!		!
!15				!
!16	!	!		!
!17	!	!!		!
	!	!		!
!19.		!		!
	!	!!		!
!21.	!			!
! 22	!			!
!23		!!		!
!24		!!		!
! 25	.!	!!		!
! 26	_!	!!		!
! 27	.!	!!		!
! 28	.!	!!		!
! 29	.!	!!		!
!30		!!		!
!	!	!!		!

page 1 of 1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-28-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695124 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 15:50 by LC C. T. Male Associates

50 Century Hill Drive

Submitted: 11/10/2016 09:30 Latham NY 12110

Reported: 01/04/2017 16:35

11MM5 SDG#: MMK11-05

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	3260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	IJ	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	tī	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	τι	0.5	1	1
			0.5	Ū	0.5	1	1
11997 11997	1,2-Dibromoethane	106-93-4 95-50-1	0.5 1	ττ	0.5	5	1
	1,2-Dichlorobenzene			-			
11997	1,3-Dichlorobenzene	541-73-1	1	U 	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U 	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	Ū	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	Ū	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	Ū	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	IJ	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	tī	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	Ū	0.5	1	1
1122/	m+b-virene	1/9001-23-1	0.5	U	0.5	1	±

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-28-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695124 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 15:50 by LC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/10/2016 09:30

Reported: 01/04/2017 16:35

11MM5 SDG#: MMK11-05

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8	260C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5 U	0.5	1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form

Misc.	Organics EPA 537		ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	59		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.9	J	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	12		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	10		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	4		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	3		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	3	J	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	5	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	9		0.5	2	1
m1.							

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: The sample was reinjected and comparable results were observed.

Metals	SW-846 60)10C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	18.0	0.0382	0.400	1
01757	Magnesium	7439-95-4	3.17	0.0190	0.200	1
01762	Potassium	7440-09-7	2.23	0.160	1.00	1
01767	Sodium	7440-23-5	50.3	0.173	2.00	1
Wet Ch	nemistry EPA 300.0)	mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	138	10.0	20.0	50
00228	Sulfate	14808-79-8	6.1	1.5	5.0	5
	EPA 353.2	2	mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	0.53	0.040	0.10	1
	SM 2320 I	3-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	2.7 J	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	2.7 J	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-28-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695124 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 15:50 by LC

C. T. Male Associates
50 Century Hill Drive

Submitted: 11/10/2016 09:30 Latham NY 12110

Reported: 01/04/2017 16:35

11MM5 SDG#: MMK11-05

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

	Laboratory Sample Analysis Record								
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor	
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163263AA	11/22/2016	00:21	Kevin D Kelly	1	
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163263AA	11/22/2016	00:21	Kevin D Kelly	1	
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/24/2016	00:31	Jason W Knight	1	
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16323001	11/20/2016	12:00	Devon M Whooley	1	
01750	Calcium	SW-846 6010C	1	163160635005	11/19/2016	04:04	Matthew R Machtinger	1	
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016	04:04	Matthew R Machtinger	1	
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016	04:04	Matthew R Machtinger	1	
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016	04:04	Matthew R Machtinger	1	
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163160635005	11/17/2016	23:00	Annamaria Kuhns	1	
00224	Chloride	EPA 300.0	1	16326120171B	11/21/2016	20:33	Clinton M Wilson	50	
00228	Sulfate	EPA 300.0	1	16326120171B	11/21/2016	20:19	Clinton M Wilson	5	
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101A	11/20/2016	19:15	Joseph E McKenzie	1	
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321005103A	11/17/2016	03:36	Brandon P Costik	1	
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321005103A	11/17/2016	03:36	Brandon P Costik	1	
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16321005103A	11/17/2016	03:36	Brandon P Costik	1	

^{*=}This limit was used in the evaluation of the final result



Number TICs found: 0

Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

	EPA	SAMPLE I	NO.					
VOLATI	VOLATILE ORGANICS ANALYSIS DATA SHEET							
TENT	!		!					
			!	11MM5	!			
ab Name: Lancaster I	Laboratories	Contract:	!		!			
ab Code: LANCAS	Case No.:	SAS No.:	SDG	No.:				
Matrix: (soil/water)	WATER	Lab Sample ID: 8695124						
Sample wt/vol: 5.0	(g/mL)mL	Lab File ID:HP09355.i	/16nd	ov21b.b/y	yn21s73.			
Level: (low/med) LOW		Date Received: 11/10/1	6					
Moisture: not dec.		Date Analyzed: 11/22/1	6					
column: (pack/cap)	CAP	Dilution Factor: 1.0						
		CONCENTRATION UNITS:						

(ug/L or ug/Kg) ug/L

CAS NUMBER	! COMPOUND NAME		EST. CONC.	~
	!Total VOC TICs	!		: ! U
2	_!	!!	!	!
3	!	!		!
4	1	!		!
5	!	!		!
6	!	!		!
7	!	!		!
8	!	!		!
9	!	!		!
	!	!		!
1	!	!		!
2	!	!		!
3	!	!		!
	!	!		!
	!	!		!
	!	!		!
7	!	!		!
8	!	!		!
.9	!	!		!
0	!	!		!
1	!	!		!
	!	!		!
3	_!	!		!
	!	!		!
	!	!		!
6	!	!		!
7	!	!		!
	!	!		!
	!	!	l	!
0	!	!		!
	!	!	l	!



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER1MW-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695125 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 15:50 by LC

C. T. Male Associates
50 Century Hill Drive

Submitted: 11/10/2016 09:30 Latham NY 12110

Reported: 01/04/2017 16:35

11MM6 SDG#: MMK11-06

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	Met	Received hod ection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/	1	ug/l	
11997	Acetone	67-64-1	20		6		20	1
11997	Benzene	71-43-2	0.5	U	0.5		1	1
11997	Bromochloromethane	74-97-5	1	IJ	1		5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5		1	1
11997	Bromoform	75-25-2	0.5	Ū	0.5		4	1
11997	Bromomethane	74-83-9	0.5	Ū	0.5		1	1
11997	2-Butanone	78-93-3	3	IJ	3		10	1
11997	Carbon Disulfide	75-15-0	1	U	1		5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5		1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5		1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5		1	1
11997	Chloroform	67-66-3	0.5	Ū	0.5		1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5		1	1
11997	Cyclohexane	110-82-7	2	IJ	2		5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2		5	1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5		1	1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5		1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1		5	1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1		5	1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1		5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5		1	1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5		1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5		1	1
11997	,	75-35-4	0.5	U	0.5		1	1
11997	1,1-Dichloroethene cis-1,2-Dichloroethene	156-59-2	0.5	Ū	0.5		1	1
11997	•	156-59-2	0.5	IJ	0.5		1	1
11997	trans-1,2-Dichloroethene 1,2-Dichloropropane	78-87-5	0.5	IJ	0.5		1	1
			0.5	Ū	0.5		1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	IJ	0.5		1	
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	IJ	0.5		1	1 1
11997	Ethylbenzene	100-41-4		-	2			
11997	Freon 113	76-13-1	2	U			10	1
11997	2-Hexanone	591-78-6	3	U	3		10	1
11997	Isopropylbenzene	98-82-8	1	U	1 1		5 5	1
11997	Methyl Acetate	79-20-9	1	U	0.5			1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U			1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3		10	1
11997	Methylcyclohexane	108-87-2	1	U 	1		5	1
11997	Methylene Chloride	75-09-2	2	U 	2		4	1
11997	Styrene	100-42-5	1	U 	1		5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U 	0.5		1	1
11997	Tetrachloroethene	127-18-4	0.5	U 	0.5		1	1
11997	Toluene	108-88-3	0.5	U	0.5		1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U 	1		5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1		5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5		1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ū	0.5		1	1
11997	Trichloroethene	79-01-6	0.5	U 	0.5		1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5		1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5		1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5		1	1

^{*=}This limit was used in the evaluation of the final result



As Received

5.0

5.0

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER1MW-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695125 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 15:50 by LC C. T. Male Associates

50 Century Hill Drive

As Received

Latham NY 12110

Submitted: 11/10/2016 09:30

Reported: 01/04/2017 16:35

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

11MM6 SDG#: MMK11-06

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea	rch						
	The results from th FORM 1 - VOA-TIC. on the back of this	The qualifier						
Misc.	Organics	EPA 537 Re	ev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic a		335-67-1	23		0.5	2	1
10954	Perfluorononanoic a		375-95-1	0.6	U	0.6	2	1
10954			335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic		2058-94-8	1	U	1	3	1
10954			307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoi		72629-94-8	0.5	U	0.5	2	1
10954			376-06-7	0.5	U	0.5	2	1
10954			307-24-4	8		0.5	2	1
10954	-		375-85-9	7		0.5	2	1
10954			375-73-5	5		0.7	2	1
	Perfluorohexanesulf	onate	355-46-4	1	J	1	3	1
10954	Perfluoro-octanesul	fonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic A	cid	375-22-4	4	J	3	10	1
10954	Perfluoropentanoic	Acid	2706-90-3	8		0.5	2	1
The	stated QC limits are	advisory only	y until suffici	ient dat	ta points			
can	be obtained to calcul	late statisti	cal limits.					
Metal	5	SW-846 603	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	39.0		0.0382	0.400	1
01757	Magnesium		7439-95-4	7.40		0.0190	0.200	1
01762	Potassium		7440-09-7	5.10		0.160	1.00	1
01767	Sodium		7440-23-5	140		0.173	2.00	1
								_
Wet Cl	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	293		10.0	20.0	50
00228	Sulfate		14808-79-8	22.8		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitra		n.a.	0.33		0.040	0.10	1
		SM 2320 B	_1007	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
10150	Total Alkalimita ta			-		<u>-</u> -	=	1
12150	Total Alkalinity to	рп 4.5	n.a.	13.6		1.7	5.0	1

1.7

13.6

1.7 U

n.a.

n.a.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER1MW-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695125 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 15:50 by LC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/10/2016 09:30

Reported: 01/04/2017 16:35

11MM6 SDG#: MMK11-06

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles SW-846 8260C 1 Y163263AA 11/22/2016 00:43 Kevin D Kelly 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 Y163263AA 11/22/2016 00:43 Kevin D Kelly 10954 14 PFCs EPA 537 Rev. 1.1 16323001 11/24/2016 00:51 Jason W Knight 1 modified EPA 537 Rev. 1.1 14091 PFAA Water Prep 16323001 Devon M Whooley 1 11/20/2016 12:00 1 modified 01750 Calcium SW-846 6010C 163160635005 1 11/19/2016 04:07 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163160635005 11/19/2016 04:07 Matthew R 1 Machtinger 01762 Potassium SW-846 6010C 1 163160635005 11/19/2016 04:07 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163160635005 11/19/2016 04:07 1 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163160635005 11/17/2016 23:00 Annamaria Kuhns 1 U4 00224 Chloride EPA 300.0 16326120171B 11/21/2016 21:32 Clinton M Wilson 00228 Sulfate EPA 300.0 16326120171B Clinton M Wilson 1 11/21/2016 20:48 5 EPA 353.2 07882 Total Nitrite/Nitrate 1 16325118101A 11/20/2016 19:16 Joseph E McKenzie 1 Nitrogen SM 2320 B-1997 16321005104A 12150 Total Alkalinity to pH 11/17/2016 07:44 Brandon P Costik 16321005104A 12149 Bicarbonate Alkalinity SM 2320 B-1997 1 Brandon P Costik 11/17/2016 07:44 1 12148 Carbonate Alkalinity SM 2320 B-1997 1 16321005104A 11/17/2016 07:44 Brandon P Costik 1

^{*=}This limit was used in the evaluation of the final result



Number TICs found: 0

Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	1E						
VOLATILE ORGANICS	VOLATILE ORGANICS ANALYSIS DATA SHEET						
TENTATIVELY IDEN	TIFIED COMPOUNDS	!!!					
		! 11MM6 !					
Lab Name: Lancaster Laboratories	Contract:	!!					
Lab Code: LANCAS Case No.:_	SAS No.:	SDG No.:	_				
Matrix: (soil/water) WATER	Lab Sample ID: 8695125	5					
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355.i	/16nov21b.b/yn21s	374.d				
Level: (low/med) LOW	Date Received: 11/10/1	_6					
% Moisture: not dec.	Date Analyzed: 11/22/1	_6					
Column: (pack/cap) CAP	Dilution Factor: 1.0						
	CONCENTRATION UNITS:						

(ug/L or ug/Kg) ug/L

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
	==!===================================	===!====! ! !		!===== ! U
	!	i i	•	!
				!
4	_!	!!		!
5	!	!!		!
6	!	!!		!
7	!	!!		!
8	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
		!!		!
	!	!!		!
	!	!!		!
	_!	!!		!
	!	!!		!
	!	!!		!
	_!	!!		!
	_!	!!		!
	_!	!!		!
	!	!!		!
	!	<u></u> :!		!
	!	<u></u> :!		!
	!	<u></u> :!		!
	!	<u></u> :!		<u>:</u>
0	!	<u></u> !!		!
ge 1 of 1	!	!!		!



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LNGMW-4-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695126 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 16:30 by LC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/10/2016 09:30 Reported: 01/04/2017 16:35

11MM7 SDG#: MMK11-07

GC/MS Volatiles SW-846 8260C ug/l ug/l ug/l 11997 Acetone 67-64-1 6 U 6 20 1 11997 Benzene 71-43-2 0.5 U 0.5 1 1 11997 Bromochloromethane 75-27-4 0.5 U 0.5 1 1 11997 Bromodichloromethane 75-25-2 0.5 U 0.5 4 1 11997 Bromodethane 74-83-9 0.5 U 0.5 4 1 11997 Bromomethane 74-83-9 0.5 U 0.5 4 1 11997 Acebon Disulfide 75-15-0 1 U 1 5 1 11997 Carbon Disulfide 75-15-0 1 U 1 5 1 11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 11997 Chlorobenzene 75-00-3	
11997 Benzene	
11997 Bromochloromethane	
11997 Bromodichloromethane	
11997 Bromoform 75-25-2 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	
11997 Bromomethane	
11997 2-Butanone 78-93-3 3 U 3 10 1 1 1997 Carbon Disulfide 75-15-0 1 U 1 5 1 1 1 1 1 1 1 1	
11997 Carbon Disulfide	
11997 Carbon Tetrachloride	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 1 1 1 1 1 1	
11997 Chloroethane 75-00-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
11997 Chloroethane 75-00-3 0.5 U 0.5 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 11997 Chloromethane 74-87-3 0.5 U 0.5 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1 11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1 1 11997 1,2-Dibromoethane 106-93-4 0.5 U 0.5 1 1 11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 11997 1,3-Dichlorobenzene 541-73-1 1 U 1 5 1 1 11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5 1 1 11997 1,1-Dichloroethane 75-71-8 0.5 U 0.5 <td< td=""><td></td></td<>	
11997 Chloroform 67-66-3 0.5 U 0.5 1 1 11997 Chloromethane 74-87-3 0.5 U 0.5 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1 11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1 1 11997 1,2-Dibromoethane 106-93-4 0.5 U 0.5 1 1 11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 11997 1,3-Dichlorobenzene 541-73-1 1 U 1 5 1 11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5 1 11997 1,1-Dichloroethane 75-71-8 0.5 U 0.5 1 1 11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1 1	
11997 Cyclohexane 110-82-7 2 U 2 5 1 11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1 11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1 1 11997 1,2-Dibromoethane 106-93-4 0.5 U 0.5 1 1 11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 11997 1,3-Dichlorobenzene 541-73-1 1 U 1 5 1 11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5 1 11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 11997 1,1-Dichloroethane 75-34-3 0.7 J 0.5 1 1 11997 1,2-Dichloroethene 107-06-2 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 </td <td></td>	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1 11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1 1 11997 1,2-Dibromoethane 106-93-4 0.5 U 0.5 1 1 11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 11997 1,3-Dichlorobenzene 541-73-1 1 U 1 5 1 11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5 1 11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 11997 1,1-Dichloroethane 75-34-3 0.7 J 0.5 1 1 11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1 1 11997 1,1-Dichloroethene 75-35-4 0.8 J 0.5 1 1 11997 trans-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1 11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1 1 11997 1,2-Dibromoethane 106-93-4 0.5 U 0.5 1 1 11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 11997 1,3-Dichlorobenzene 541-73-1 1 U 1 5 1 11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5 1 11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 11997 1,1-Dichloroethane 75-34-3 0.7 J 0.5 1 1 11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1 1 11997 1,1-Dichloroethene 75-35-4 0.8 J 0.5 1 1 11997 trans-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1	
11997 1,2-Dibromoethane 106-93-4 0.5 U 0.5 1 1 11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 11997 1,3-Dichlorobenzene 541-73-1 1 U 1 5 1 11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5 1 11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 11997 1,1-Dichloroethane 75-34-3 0.7 J 0.5 1 1 11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1 1 11997 1,1-Dichloroethene 75-35-4 0.8 J 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1	
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 11997 1,3-Dichlorobenzene 541-73-1 1 U 1 5 1 11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5 1 11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 11997 1,1-Dichloroethane 75-34-3 0.7 J 0.5 1 1 11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1 1 11997 1,1-Dichloroethene 75-35-4 0.8 J 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1	
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 11997 1,3-Dichlorobenzene 541-73-1 1 U 1 5 1 11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5 1 11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 11997 1,1-Dichloroethane 75-34-3 0.7 J 0.5 1 1 11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1 1 11997 1,1-Dichloroethene 75-35-4 0.8 J 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1	
11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5 1 11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 11997 1,1-Dichloroethane 75-34-3 0.7 J 0.5 1 1 11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1 1 11997 1,1-Dichloroethene 75-35-4 0.8 J 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 11997 1,1-Dichloroethane 75-34-3 0.7 J 0.5 1 1 11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1 1 11997 1,1-Dichloroethene 75-35-4 0.8 J 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 11997 1,1-Dichloroethane 75-34-3 0.7 J 0.5 1 1 11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1 1 11997 1,1-Dichloroethene 75-35-4 0.8 J 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1	
11997 1,1-Dichloroethane 75-34-3 0.7 J 0.5 1 1 11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1 1 11997 1,1-Dichloroethene 75-35-4 0.8 J 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1	
11997 1,1-Dichloroethene 75-35-4 0.8 J 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1	
11997 1,1-Dichloroethene 75-35-4 0.8 J 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1	
11997 Freon 113 76-13-1 2 U 2 10 1	
11997 2-Hexanone 591-78-6 3 U 3 10 1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1	
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1	
11997 Methylene Chloride 75-09-2 2 U 2 4 1	
11997 Styrene 100-42-5 1 U 1 5 1	
11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	
11997 Tetrachloroethene 127-18-4 3 0.5 1 1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1	
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1	
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1	
11997 Trichloroethene 79-01-6 4 0.5 1 1	
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1	
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1	

^{*=}This limit was used in the evaluation of the final result



5.0

5.0

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LNGMW-4-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695126 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 16:30 by LC C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/10/2016 09:30 Reported: 01/04/2017 16:35

11MM7 SDG#: MMK11-07

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	0C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea	rch						
	The results from the FORM 1 - VOA-TIC. on the back of this	The qualifier	-					
Misc.	Organics	EPA 537 Re	v. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic a	cid	335-67-1	12		0.5	2	1
10954	Perfluorononanoic a	cid	375-95-1	0.7	J	0.6	2	1
10954	Perfluorodecanoic a	cid	335-76-2	0.7	J	0.5	2	1
10954	Perfluoroundecanoic	acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic	acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoi	c acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecan	oic acid	376-06-7	0.6	J	0.5	2	1
10954	Perfluorohexanoic a	cid	307-24-4	17		0.5	2	1
10954	Perfluoroheptanoic	acid	375-85-9	14		0.5	2	1
10954	Perfluorobutanesulf		375-73-5	4		0.7	2	1
10954			355-46-4	7		1	3	1
10954			1763-23-1	3	J	2	6	1
	Perfluorobutanoic A		375-22-4	11	· ·	3	10	1
10954			2706-90-3	24		0.5	2	1
	stated QC limits are				a points	0.3	2	-
	be obtained to calcu			Tenc dat	a points			
Metal	s	SW-846 601	.0C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	29.1		0.0382	0.400	1
01757	Magnesium		7439-95-4	11.5		0.0190	0.200	1
01762	Potassium		7440-09-7	2.97		0.160	1.00	1
01767	Sodium		7440-23-5	12.3		0.173	2.00	1
Wet C	hemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	42.2		10.0	20.0	50
00221	Sulfate		14808-79-8	48.2		1.5	5.0	5
								-
		EPA 353.2		mg/1		mg/l	mg/l	
07882	Total Nitrite/Nitra	te Nitrogen	n.a.	0.040	U	0.040	0.10	1
		SM 2320 B-	1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	рн 4.5	n.a.	55.7		1.7	5.0	1

1.7

55.7

1.7 U

n.a.

n.a.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LNGMW-4-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695126 LL Group # 1732745 Account # 37191

Brandon P Costik

Brandon P Costik

Brandon P Costik

1

1

Project Name: SGPP - Merrimack

Collected: 11/09/2016 16:30 by LC C. T. Male Associates 50 Century Hill Drive

Submitted: 11/10/2016 09:30 Latham NY 12110

Reported: 01/04/2017 16:35

11MM7 SDG#: MMK11-07

12150 Total Alkalinity to pH

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

Sample Comments

Laboratory Sample Analysis Record

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

SM 2320 B-1997

SM 2320 B-1997

SM 2320 B-1997

Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles SW-846 8260C 1 Y163263AA 11/22/2016 01:05 Kevin D Kelly 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 Y163263AA 11/22/2016 01:05 Kevin D Kelly 10954 14 PFCs EPA 537 Rev. 1.1 16323001 11/24/2016 01:12 Jason W Knight 1 modified EPA 537 Rev. 1.1 11/20/2016 12:00 14091 PFAA Water Prep 16323001 Devon M Whooley 1 1 modified 01750 Calcium SW-846 6010C 163160635005 1 11/19/2016 04:10 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163160635005 11/19/2016 04:10 Matthew R 1 Machtinger 01762 Potassium SW-846 6010C 1 163160635005 11/19/2016 04:10 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163160635005 11/19/2016 04:10 1 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163160635005 11/17/2016 23:00 Annamaria Kuhns 1 U4 00224 Chloride EPA 300.0 16326120171B 11/21/2016 22:01 Clinton M Wilson 00228 Sulfate EPA 300.0 16326120171B Clinton M Wilson 1 11/21/2016 21:46 5 07882 Total Nitrite/Nitrate EPA 353.2 1 16325118101A 11/20/2016 19:18 Joseph E McKenzie 1 Nitrogen

16321005103A

16321005103A

16321005103A

1

1

11/17/2016 02:57

11/17/2016 02:57

11/17/2016 02:57

^{*=}This limit was used in the evaluation of the final result



Number TICs found: 0

Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.	
VOLATILE ORGANICS A			
TENTATIVELY IDENT	!!!		
		! 11MM7 !	
Lab Name: Lancaster Laboratories	Contract:	!!	
Lab Code: LANCAS Case No.:	SAS No.:	SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8695126	6	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355.	i/16nov21b.b/yn21s75.	Ċ
Level: (low/med) LOW	Date Received: 11/10/2	16	
% Moisture: not dec.	Date Analyzed: 11/22/2	16	
Column: (pack/cap) CAP	Dilution Factor: 1.0		
	CONCENTRATION UNITS	:	

(ug/L or ug/Kg) ug/L

CAS NUMBER	! COMPOUND NAME		! EST. CONC.	
	!Total VOC TICs	===!====== !	•	!===== ! U
	_!	į	!	
		i	!	!
		i	·	!
	<u> </u>	i	!	!
	<u> </u>	i	!	!
	<u> </u>	i	!	!
	<u> </u>	i	!	!
		i	!	!
0.		i	!	!
		i	!	!
	<u> </u>	i	!	!
	<u> </u>	i	·	!
	<u> </u>	i	!	!
		i		
		i	· !	<u>. </u>
		i	!	!
	<u> </u>	i		
	!	i	!	!
			!	!
1.		i		
2.		i	!	!
	<u> </u>	i	!	!
		!	!	!
	<u> </u>	i	!	!
	_!	!		!
		!	!	!
			!	!
	<u> </u>		!	!
0.		· ·	!	!
			!	!



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-GWFD01-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695127 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 by LC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/10/2016 09:30

Reported: 01/04/2017 16:35

11MM8 SDG#: MMK11-08FD

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	Ū	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	ττ	0.5	1	1
11997	1,2-Dibromoethane 1,2-Dichlorobenzene	95-50-1	0.5 1	U	1	5	1
11997	•		1	ττ	1	5 5	1
	1,3-Dichlorobenzene	541-73-1		-			
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U 	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ū	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	Ū	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ū	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	IJ	0.5	1	1
		1,,001 20 1	٠.٥		<u> </u>		

^{*=}This limit was used in the evaluation of the final result



As Received

5.0

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-GWFD01-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695127 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 by LC

C. T. Male Associates
50 Century Hill Drive

As Received

Latham NY 12110

Submitted: 11/10/2016 09:30

Reported: 01/04/2017 16:35

11MM8 SDG#: MMK11-08FD

12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	eceived t	Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8	260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library S	Search						
	The results from FORM 1 - VOA-TIC on the back of t	. The qualifi						
Misc.	Organics	EPA 537 modified		ng/l		ng/l	ng/l	
10954	Perfluorooctanoi		335-67-1	59		0.5	2	1
10954			375-95-1	0.6	U	0.6	2	1
10954			335-76-2	0.5	Ū	0.5	2	1
10954	Perfluoroundecan	oic acid	2058-94-8	1	Ū	1	3	1
10954			307-55-1	0.5	Ū	0.5	2	1
10954	Perfluorotrideca	noic acid	72629-94-8	0.5	Ū	0.5	2	1
10954		canoic acid	376-06-7	0.5	Ū	0.5	2	1
10954	Perfluorohexanoi	c acid	307-24-4	11		0.5	2	1
10954	Perfluoroheptano	ic acid	375-85-9	9		0.5	2	1
10954	_		375-73-5	3		0.7	2	1
10954	Perfluorohexanes	ulfonate	355-46-4	3	J	1	3	1
10954	Perfluoro-octane	sulfonate	1763-23-1	2	J	2	6	1
10954	Perfluorobutanoi	c Acid	375-22-4	5	J	3	10	1
10954	Perfluoropentano	ic Acid	2706-90-3	8		0.5	2	1
The	stated QC limits a	are advisory o	nly until suffic	cient da	ta points			
	be obtained to cal				-			
Metal	s	SW-846 6	010C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	25.2		0.0382	0.400	1
01757	Magnesium		7439-95-4	5.40		0.0190	0.200	1
01762	Potassium		7440-09-7	2.62		0.160	1.00	1
01767	Sodium		7440-23-5	55.0		0.173	2.00	1
Wet C	hemistry	EPA 300.	0	mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	119		10.0	20.0	50
00228	Sulfate		14808-79-8	11.2		1.5	5.0	5
		EPA 353.	2	mg/l		mg/l	mg/l	
07882	Total Nitrite/Ni	trate Nitrogen	n.a.	1.9		0.080	0.20	2
		SM 2320	B-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity	to pH 4.5	n.a.	26.9		1.7	5.0	1
12149	Bicarbonate Alka		n.a.	26.9		1.7	5.0	1
		4						_

1.7

1.7 U

n.a.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-GWFD01-161109 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695127 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016 by LC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/10/2016 09:30 Reported: 01/04/2017 16:35

11MM8 SDG#: MMK11-08FD

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles SW-846 8260C 1 Y163263AA 11/22/2016 01:27 Kevin D Kelly 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 Y163263AA 11/22/2016 01:27 Kevin D Kelly 10954 14 PFCs EPA 537 Rev. 1.1 16323001 11/24/2016 01:32 Jason W Knight 1 modified EPA 537 Rev. 1.1 14091 PFAA Water Prep 16323001 11/20/2016 12:00 Devon M Whooley 1 1 modified 01750 Calcium SW-846 6010C 163160635005 1 11/19/2016 04:13 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163160635005 11/19/2016 04:13 Matthew R 1 Machtinger 01762 Potassium SW-846 6010C 1 163160635005 11/19/2016 04:13 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163160635005 11/19/2016 04:13 1 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163160635005 11/17/2016 23:00 Annamaria Kuhns 1 U4 00224 Chloride EPA 300.0 16326120171B 11/21/2016 22:30 Clinton M Wilson 00228 Sulfate EPA 300.0 16326120171B 11/21/2016 22:15 Clinton M Wilson 1 5 EPA 353.2 07882 Total Nitrite/Nitrate 1 16325118101B 11/20/2016 19:43 Joseph E McKenzie 2 Nitrogen SM 2320 B-1997 16321005104A 12150 Total Alkalinity to pH 11/17/2016 07:36 Brandon P Costik 16321005104A 12149 Bicarbonate Alkalinity SM 2320 B-1997 1 Brandon P Costik 11/17/2016 07:36 1 12148 Carbonate Alkalinity SM 2320 B-1997 1 16321005104A 11/17/2016 07:36 Brandon P Costik 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Lab Code: LANCAS Case No.: SAS No.: SDG No.:	1E		EPA	SAMPLE NO.	
Lab Name: Lancaster Laboratories	VOLATILE ORGANICS ANAL	YSIS DATA SHEET			
Lab Name: Lancaster Laboratories Contract: !	TENTATIVELY IDENTIFI	ED COMPOUNDS	!		!
Lab Code: LANCAS Case No.: SAS No.: SDG No.:			!	11MM8	!
Matrix: (soil/water) WATER Lab Sample ID: 8695127 Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov21b.b/yn21s76. Level: (low/med) LOW Date Received: 11/10/16	Lab Name: Lancaster Laboratories	Contract:	!		.!
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov21b.b/yn21s76. Level: (low/med) LOW Date Received: $11/10/16$	Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	_
Level: (low/med) LOW Date Received: 11/10/16	Matrix: (soil/water) WATER	Lab Sample ID: 8695127			
	Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355.i	/16nd	ov21b.b/yn21	s76.d
% Moisture: not dec. Date Analyzed: 11/22/16	Level: (low/med) LOW	Date Received: 11/10/1	5		
	% Moisture: not dec.	Date Analyzed: 11/22/1	5		

% Moisture: not dec. Column: (pack/cap) CAP Dilution Factor: 1.0 CONCENTRATION UNITS: Number TICs found: 0 (ug/L or ug/Kg) ug/L

CAS NUMBER	! COMPOUND NAME ==!============		EST. CONC.	
	==!===================================	! ====!====! !		!====== ! U
	_!	!!		!
3	!	!		!
4		!!		!
	!	!!		!
	!	!!		!
	_!	!!		!
	_!	!!		!
	_!	!!		!
	<u></u> !	<u></u> !		<u> </u>
	 	<u>-</u>		!
				
	!	:		:
14 15.		:		<u>;</u>
	<u> </u>	:i		:
	i	ii		·
	!	:i		;
	<u>;</u>	ii		i
		i		!
21.		i		!
22.				!
23.	!	!!		!
	!	!		!
25		!!		!
26	!!	!!		!
27		!!		!
	!	!!		!
	_!	!!		!
30	!	!!		!
	!	!!!		!



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LTB01-161109 Blank Water

SGPP - Merrimack

LL Sample # WW 8695128 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/10/2016 09:30 Reported: 01/04/2017 16:35

11MM9 SDG#: MMK11-09TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	Ū	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1 2	U	1	5	1
11997	Methylene Chloride	75-09-2	_	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997 11997	Tetrachloroethene Toluene	127-18-4	0.5 0.5	U	0.5 0.5	1 1	1 1
		108-88-3					
11997	1,2,3-Trichlorobenzene	87-61-6	1 1	U	1 1	5	1 1
11997 11997	1,2,4-Trichlorobenzene 1,1,1-Trichloroethane	120-82-1 71-55-6	0.5	U	0.5	5 1	1
				U		1	1
11997 11997	1,1,2-Trichloroethane Trichloroethene	79-00-5 79-01-6	0.5 0.5	U	0.5	1	1
11997	Trichloroethene Trichlorofluoromethane	79-01-6 75-69-4	0.5	IJ	0.5 0.5	1	1
11997		75-69-4 75-01-4	0.5	U	0.5	1	1
11997	Vinyl Chloride m+p-Xylene	75-01-4 179601-23-1	0.5	IJ	0.5	1	1
11331	m±b-v\rene	1/9001-23-1	0.5	U	0.5	т	Τ

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LTB01-161109 Blank Water

SGPP - Merrimack

LL Sample # WW 8695128 LL Group # 1732745 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/09/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/10/2016 09:30

Reported: 01/04/2017 16:35

11MM9 SDG#: MMK11-09TB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles o-Xylene	SW-846 8260C 95-47-6	ug/l 0.5 U	ug/l 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form

5		_	EPA 537 Rev. 1.1 ng/l			ng/l	ng/l	
		mod	ified					
	10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
	10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
	10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
	10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
	10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
	10954	Perfluorotridecanoic aci	d 72629-94-8	0.5	U	0.5	2	1
	10954	Perfluorotetradecanoic a	cid 376-06-7	0.5	U	0.5	2	1
	10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
	10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
	10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
	10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
	10954	Perfluoro-octanesulfonat	e 1763-23-1	2	U	2	6	1
	10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
	10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time		Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163263AA	11/21/2016 2	1:02	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163263AA	11/21/2016 2	1:02	Kevin D Kelly	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/24/2016 0	2:34	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16323001	11/20/2016 1	2:00	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA	SAMPLE NO.	
VOLATILE ORGANICS ANALYSIS DATA SHEET	_		_
TENTATIVELY IDENTIFIED COMPOUNDS	!		!
	!	11MM9	!
Lab Name: Lancaster Laboratories Contract:	!_		_!
Lab Code: LANCAS Case No.: SAS No.:	SDG	No.:	
Matrix: (soil/water) WATER Lab Sample ID: 8695128	;		

Matrix: (soil/water) WATER Lab Sample ID: 8695128
Sample wt/vol: 5.0 (g/mL)mL Lab File ID: HP09355.i/16nov21b.b/yn21s64.d
Level: (low/med) LOW Date Received: 11/10/16

Level: (low/med) LOW

Received: 11/10/16

Moisture: not dec.

Column: (pack/cap) CAP

Date Received: 11/10/16

Date Analyzed: 11/21/16

Dilution Factor: 1.0

CONCENTRATION UNITS:

Number TICs found: 0

CURPLOY ug/Kg) ug/L

! CAS NUMBER !=======	! COMPOUND NAME :=!===================================		! EST. CONC.	
•	!Total VOC TICs	:!====== !	•	!====== ! U
! 2.			!	
	!	!	!	!
! 4.	Ţ.	1	!	i ———
	!	!	!	!
! 6.	!	· !	!	!
! 7	!	!	!	!
	!	!	!	!
! 9	!	!	!	!
!10	<u> </u>	!	!	!
!11	!	.!	!	!
		.1	!	!
!13	!	.!	!	!
!14	!	.!	!	!
!15	!	.!	!	!
	_!	.!	!	!
		.!	!	!
	!	.!	!	!
!19	!	.!	!	!
!20		_!	!	!
! 21	_!	.!	!	!
! 22	_!	.!	!	!
!23		_!	!	!
!24	_!	_!	!	!
! 25	_!	_!	!	!
!26	!	_!	!	!
! 27		_!	!	!
		_!	!	!
!29		_!	!	!
!30	!	_!	!	!
ı	!	!	!	!



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732745

Reported: 01/04/2017 16:35

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL*	* LOQ
	ug/l		ug/l	ug/l
Batch number: L163281AA	Sample	number	(s):	8695120
Acetone	6	U	6	20
Benzene	0.5	U	0.5	1
Bromochloromethane	1	U	1	5
Bromodichloromethane	0.5	U	0.5	1
Bromoform	0.5	U	0.5	4
Bromomethane	0.5	U	0.5	1
2-Butanone	3	U	3	10
Carbon Disulfide	1	U	1	5
Carbon Tetrachloride	0.5	U	0.5	1
Chlorobenzene	0.5	U	0.5	1
Chloroethane	0.5	U	0.5	1
Chloroform	0.5	U	0.5	1
Chloromethane	0.5	U	0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	U	2	5
Dibromochloromethane	0.5	U	0.5	1
1,2-Dibromoethane	0.5	U	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5
Dichlorodifluoromethane	0.5	U	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	U	0.5	1
trans-1,2-Dichloroethene	0.5	U	0.5	1
1,2-Dichloropropane	0.5	U	0.5	1
cis-1,3-Dichloropropene	0.5	U	0.5	1
trans-1,3-Dichloropropene	0.5	U	0.5	1
Ethylbenzene	0.5	U	0.5	1
Freon 113	2	U	2	10
2-Hexanone	3	U	3	10
Isopropylbenzene	1	U	1	5
Methyl Acetate	1	U	1	5
Methyl Tertiary Butyl Ether	0.5	U	0.5	1
4-Methyl-2-pentanone	3	U	3	10
Methylcyclohexane	1	U	1	5
Methylene Chloride	2	U	2	4
Styrene	1	U	1	5
1,1,2,2-Tetrachloroethane	0.5	U	0.5	1

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732745

Reported: 01/04/2017 16:35

Method Blank (continued)

Analysis Name	Result		MDL*	* LOQ
	ug/l		ug/l	ug/l
Tetrachloroethene	0.5	U	0.5	1
Toluene	0.5	U	0.5	1
1,2,3-Trichlorobenzene	1	Ū	1	5
1,2,4-Trichlorobenzene	1	U	1	5
1,1,1-Trichloroethane	0.5	U	0.5	1
1,1,2-Trichloroethane	0.5	Ū	0.5	1
Trichloroethene	0.5	U	0.5	1
Trichlorofluoromethane	0.5	U	0.5	1
Vinyl Chloride	0.5	U	0.5	1
m+p-Xylene	0.5	U	0.5	1
o-Xylene	0.5	U	0.5	1
Batch number: Y163263AA	Sample	numbei	(s): 8	8695122-8695128
Acetone	6	U	6	20
Benzene	0.5	U	0.5	1
Bromochloromethane	1	U	1	5
Bromodichloromethane	0.5	U	0.5	1
Bromoform	0.5	U	0.5	4
Bromomethane	0.5	U	0.5	1
2-Butanone	3	U	3	10
Carbon Disulfide	1	U	1	5
Carbon Tetrachloride	0.5	U	0.5	1
Chlorobenzene	0.5	U	0.5	1
Chloroethane	0.5	U	0.5	1
Chloroform	0.5	U	0.5	1
Chloromethane	0.5	U	0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	U	2	5
Dibromochloromethane	0.5	U	0.5	1
1,2-Dibromoethane	0.5	U	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5
Dichlorodifluoromethane	0.5	U	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	U	0.5	1
trans-1,2-Dichloroethene	0.5	U	0.5	1
1,2-Dichloropropane	0.5	U	0.5	1
cis-1,3-Dichloropropene	0.5	U	0.5	1
trans-1,3-Dichloropropene	0.5	U	0.5	1
Ethylbenzene	0.5	U	0.5	1
Freon 113	2	U	2	10
2-Hexanone	3	U	3	10
Isopropylbenzene	1	U	1	5
Methyl Acetate	1	U	1	5
Methyl Tertiary Butyl Ether	0.5 3	U	0.5	1 10
4-Methyl-2-pentanone	5	U	3	10

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732745

Reported: 01/04/2017 16:35

Method Blank (continued)

Analysis Name	Result	MDL**	LOQ
	ug/l	ug/l	ug/l
Methylcyclohexane Methylene Chloride Styrene 1,1,2,2-Tetrachloroethane Tetrachloroethene Toluene 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Trichlorofluoromethane Vinyl Chloride m+p-Xylene o-Xylene	1 U 2 U 1 U 0.5 U	1 2 1 0.5 0.5 0.5 1 0.5 0.5 0.5 0.5 0.5	5 4 5 1 1 5 5 1 1 1 1 1 1 1
	ng/l	ng/l	ng/l
Batch number: 16323001 Perfluorooctanoic acid Perfluorononanoic acid Perfluorodecanoic acid Perfluorodecanoic acid Perfluorododecanoic acid Perfluorotridecanoic acid Perfluorotridecanoic acid Perfluorotetradecanoic acid Perfluorohexanoic acid Perfluoroheptanoic acid Perfluorobeptanoic acid Perfluorobetanesulfonate Perfluorocanoicanesulfonate Perfluorobutanesulfonate Perfluorobutanoic Acid Perfluoropentanoic Acid	Sample num 0.5 U 0.6 U 0.5 U 1 U 0.5 U 0.5 U 0.5 U 0.5 U 0.5 U 0.7 U 1 U 2 U 3 U 0.5 U	ber(s): 8695 0.5 0.6 0.5 1 0.5 0.5 0.5 0.5 0.5 0.7 1 2 3 0.5	120-8695128 2 2 2 3 2 2 2 2 2 2 2 2 2 3 6 10 2
	mg/l	mg/l	mg/l
Batch number: 163160635005 Calcium Magnesium Potassium Sodium	Sample num 0.0382 U 0.0190 U 0.160 U 0.173 U	ber(s): 8695 0.0382 0.0190 0.160 0.173	120,8695122-8695127 0.400 0.200 1.00 2.00
Batch number: 16323118103A Total Nitrite/Nitrate Nitrogen	Sample num 0.040 U	ber(s): 8695 0.040	0.10
Batch number: 16325118101A Total Nitrite/Nitrate Nitrogen	Sample num 0.040 U	ber(s): 8695 0.040	122-8695126
Batch number: 16325118101B	Sample num	ber(s): 8695	127

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732745

Reported: 01/04/2017 16:35

Method Blank (continued)

Analysis Name	Result mg/l	MDL**	LOQ mg/l
Total Nitrite/Nitrate Nitrogen	0.040 U	0.040	0.10
Batch number: 16326120171B	Sample numbe 0.20 U 0.30 U	r(s): 86951	120,8695122-8695127
Chloride		0.20	0.40
Sulfate		0.30	1.0
	mg/l as CaCO	3 mg/l as CaCO3	mg/l as CaCO3
Batch number: 16321005103A	Sample numbe	r(s): 86951	120,8695122-8695124,8695126
Total Alkalinity to pH 4.5		1.7	5.0
Batch number: 16321005104A	Sample numbe 2.8 J	r(s): 86951	125,8695127
Total Alkalinity to pH 4.5		1.7	5.0

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: L163281AA	Sample number	r(s): 86951	.20						
Acetone	150	132.7			88		50-168		
Benzene	20	19.12			96		78-120		
Bromochloromethane	20	20.69			103		80-125		
Bromodichloromethane	20	19.19			96		80-120		
Bromoform	20	16.47			82		59-120		
Bromomethane	20	18.77			94		55-123		
2-Butanone	150	139.59			93		57-145		
Carbon Disulfide	20	20.53			103		58-120		
Carbon Tetrachloride	20	20.41			102		74-130		
Chlorobenzene	20	18.17			91		80-120		
Chloroethane	20	18.69			93		56-120		
Chloroform	20	19.54			98		80-120		
Chloromethane	20	17.31			87		59-127		
Cyclohexane	20	20.89			104		65-131		
1,2-Dibromo-3-chloropropane	20	16.62			83		59-120		
Dibromochloromethane	20	18.05			90		78-120		
1,2-Dibromoethane	20	18.32			92		80-120		
1,2-Dichlorobenzene	20	18.54			93		80-120		
1,3-Dichlorobenzene	20	18.18			91		80-120		
1,4-Dichlorobenzene	20	18.49			92		80-120		
Dichlorodifluoromethane	20	18.82			94		49-134		
1,1-Dichloroethane	20	19.55			98		80-120		
1,2-Dichloroethane	20	19.93			100		66-128		
1,1-Dichloroethene	20	20.86			104		76-124		
cis-1,2-Dichloroethene	20	19.79			99		80-120		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732745

Reported: 01/04/2017 16:35

LCS/LCSD (continued)

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
trans-1,2-Dichloroethene	20	20.08			100		80-120		
1,2-Dichloropropane	20	19.17			96		80-120		
cis-1,3-Dichloropropene	20	18.1			90		80-120		
trans-1,3-Dichloropropene	20	17.62			88		76-120		
Ethylbenzene	20	18.13			91		78-120		
Freon 113	20	22.12			111		64-136		
2-Hexanone	100	79.34			79		49-146		
Isopropylbenzene	20	18.54			93		80-120		
Methyl Acetate	20	20.47			102		61-137		
Methyl Tertiary Butyl Ether	20	19.96			100		75-120		
4-Methyl-2-pentanone	100	85.19			85		55-141		
Methylcyclohexane	20	21.6			108		66-126		
Methylene Chloride	20	19.87			99		80-120		
Styrene	20	18.42			92		80-120		
1,1,2,2-Tetrachloroethane	20	17.66			88		72-120		
Tetrachloroethene	20	19.26			96		80-129		
Toluene	20	18.52			93		80-120		
1,2,3-Trichlorobenzene	20	17.29			86		69-120		
1,2,4-Trichlorobenzene	20	17.28			86		72-120		
1,1,1-Trichloroethane	20	17.16			86		66-126		
1,1,2-Trichloroethane	20	18.04			90		80-120		
Trichloroethene	20	19.16			96		80-120		
Trichlorofluoromethane	20	22.99			115		67-129		
Vinyl Chloride	20	19.22			96		63-121		
m+p-Xylene	40	36.74			92		80-120		
o-Xylene	20	18.01			92		80-120		
0-xylene	20	10.01			90		80-120		
Batch number: Y163263AA	Sample numbe		L22-8695128						
Acetone	150	162.11			108		50-168		
Benzene	20	20.73			104		78-120		
Bromochloromethane	20	21.31			107		80-125		
Bromodichloromethane	20	21.37			107		80-120		
Bromoform	20	18.69			93		59-120		
Bromomethane	20	17.98			90		55-123		
2-Butanone	150	139.04			93		57-145		
Carbon Disulfide	20	21.7			109		58-120		
Carbon Tetrachloride	20	20.21			101		74-130		
Chlorobenzene	20	20.13			101		80-120		
Chloroethane	20	19.08			95		56-120		
Chloroform	20	21.13			106		80-120		
Chloromethane	20	18.07			90		59-127		
Cyclohexane	20	18.27			91		65-131		
1,2-Dibromo-3-chloropropane	20	18.01			90		59-120		
Dibromochloromethane	20	20.13			101		78-120		
1,2-Dibromoethane	20	20.66			103		80-120		
1,2-Dichlorobenzene	20	20.14			101		80-120		
1,3-Dichlorobenzene	20	19.97			100		80-120		
1,4-Dichlorobenzene	20	19.99			100		80-120		
,									

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732745

Reported: 01/04/2017 16:35

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
		-	ug/1	ug/1					
Dichlorodifluoromethane	20	14.25			71		49-134		
1,1-Dichloroethane	20	22.05			110		80-120		
1,2-Dichloroethane	20	22.24			111		66-128		
1,1-Dichloroethene	20	21.12			106		76-124		
cis-1,2-Dichloroethene	20	20.54			103		80-120		
trans-1,2-Dichloroethene	20	21.25			106		80-120		
1,2-Dichloropropane	20	21.82			109		80-120		
cis-1,3-Dichloropropene	20	19.93			100		80-120		
trans-1,3-Dichloropropene	20	20.89			104		76-120		
Ethylbenzene	20	20.46			102		78-120		
Freon 113	20	18.59			93		64-136		
2-Hexanone	100	98.57			99		49-146		
Isopropylbenzene	20	19.9			99		80-120		
Methyl Acetate	20	21.49			107		61-137		
Methyl Tertiary Butyl Ether	20	20.35			102		75-120		
4-Methyl-2-pentanone	100	98.69			99		55-141		
Methylcyclohexane	20	18.06			90		66-126		
Methylene Chloride	20	20.51			103		80-120		
Styrene	20	19.54			98		80-120		
1,1,2,2-Tetrachloroethane	20	19.9			100		72-120		
Tetrachloroethene	20	21.08			105		80-129		
Toluene	20	20.6			103		80-120		
1,2,3-Trichlorobenzene	20	19.1			96		69-120		
1,2,4-Trichlorobenzene	20	18.8			94		72-120		
1,1,1-Trichloroethane	20	17.65			88		66-126		
1,1,2-Trichloroethane	20	20.57			103		80-120		
Trichloroethene	20	20.68			103		80-120		
Trichlorofluoromethane	20	17.18			86		67-129		
Vinyl Chloride	20	18.25			91		63-121		
m+p-Xylene	40	40.28			101		80-120		
o-Xylene	20	19.42			97		80-120		
0 11/10110	20	17.12					00 120		
	ng/l	ng/l	ng/l	ng/l					
Batch number: 16323001	Sample numbe	r(s): 86951	20-8695128						
Perfluorooctanoic acid	200	220.63	.20 0035220		110		70-130		
Perfluorononanoic acid	200	223.78			112		70-130		
Perfluorodecanoic acid	200	235.81			118		70-130		
Perfluoroundecanoic acid	200	255.05			128		70-130		
Perfluorododecanoic acid	200	224.06			112		70-130		
Perfluorotridecanoic acid	200	231.67			116		70-130		
Perfluorotetradecanoic acid	200	237.28			119		70-130		
Perfluorotetradecanoic acid	200	229.07			115		70-130		
Perfluoronexanoic acid	200	249.12			125		70-130		
Perfluorobutanesulfonate	176.8	207.45			117		70-130		
Perfluorobutanesulionate Perfluorohexanesulfonate					109				
Perfluoronexanesulfonate Perfluoro-octanesulfonate	189.2	207.01			109 125		70-130		
	191.2	238.21					70-130		
Perfluorobutanoic Acid	200	230.06			115		70-130		
Perfluoropentanoic Acid	200	237.02			119		70-130		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732745

Reported: 01/04/2017 16:35

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ng/l	LCS Conc ng/l	LCSD Spike Added ng/l	LCSD Conc ng/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	mg/l	mg/l	mg/l	mg/l					
Batch number: 163160635005	Sample numbe	r(s): 8695	120,8695122-86	95127					
Calcium	4.00	3.91			98		80-120		
Magnesium	2.00	1.96			98		80-120		
Potassium	10	9.79			98		80-120		
Sodium	10	9.77			98		80-120		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 16323118103A	Sample numbe	r(s): 8695	120						
Total Nitrite/Nitrate Nitrogen	2.50	2.63			105		90-110		
Batch number: 16325118101A	Sample numbe		122-8695126						
Total Nitrite/Nitrate Nitrogen	2.50	2.43			97		90-110		
Batch number: 16325118101B	Sample numbe		127						
Total Nitrite/Nitrate Nitrogen	2.50	2.43			97		90-110		
Batch number: 16326120171B	Sample numbe	r(s): 8695	120,8695122-86	95127					
Chloride	3.00	2.84			95		90-110		
Sulfate	7.50	7.04			94		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16321005103A Total Alkalinity to pH 4.5	Sample numbe 188	r(s): 8695 174.26	120,8695122-86	95124,8695	93		84-110		
Batch number: 16321005104A Total Alkalinity to pH 4.5	Sample numbe	r(s): 8695 177.97	125,8695127		95		84-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspik Cond ug/l	!	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: L163281AA	Sample	numbe	er(s): 8695	5120 UNSP	K: P697075						
Acetone	6	U	150	135.14	150	142.98	90	95	50-168	6	30
Benzene	0.5	U	20	20.55	20	20.29	103	101	78-120	1	30
Bromochloromethane	1	U	20	21.49	20	21.29	107	106	80-125	1	30
Bromodichloromethane	0.5	U	20	19.58	20	19.6	98	98	80-120	0	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732745

Reported: 01/04/2017 16:35

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspi Cor ug/	ıc	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Bromoform	0.5	U	20	16.57	20	16.29	83	81	59-120	2	30
Bromomethane	0.5	U	20	20.78	20	20.93	104	105	55-123	1	30
2-Butanone	3	U	150	140.7	150	139.59	94	93	57-145	1	30
Carbon Disulfide	1	U	20	22.12	20	21.58	111	108	58-120	2	30
Carbon Tetrachloride	0.5	U	20	22.55	20	22.06	113	110	74-130	2	30
Chlorobenzene	0.5	U	20	19.01	20	18.67	95	93	80-120	2	30
Chloroethane	0.5	U	20	20.17	20	20.3	101	101	56-120	1	30
Chloroform	0.5	U	20	20.82	20	20.59	104	103	80-120	1	30
Chloromethane	0.5	U	20	18.8	20	19.15	94	96	59-127	2	30
Cyclohexane	2	U	20	22.94	20	22.49	115	112	65-131	2	30
1,2-Dibromo-3-chloropropane	2	U	20	15.46	20	15.63	77	78	59-120	1	30
Dibromochloromethane	0.5	U	20	18.09	20	18.06	90	90	78-120	0	30
1,2-Dibromoethane	0.5	U	20	18.59	20	18.63	93	93	80-120	0	30
1,2-Dichlorobenzene	1	U	20	18.48	20	18.53	92	93	80-120	0	30
1,3-Dichlorobenzene	1	U	20	18.44	20	18.48	92	92	80-120	0	30
1,4-Dichlorobenzene	1	U	20	18.63	20	18.6	93	93	80-120	0	30
Dichlorodifluoromethane	0.5	U	20	21.31	20	21.59	107	108	49-134	1	30
1,1-Dichloroethane	0.5	U	20	20.85	20	20.72	104	104	80-120	1	30
1,2-Dichloroethane	0.5	U	20	20.51	20	20.48	103	102	66-128	0	30
1,1-Dichloroethene	0.5	U	20	22.75	20	22.33	114	112	76-124	2	30
cis-1,2-Dichloroethene	0.5	U	20	20.78	20	20.46	104	102	80-120	2	30
trans-1,2-Dichloroethene	0.5	U	20	21.95	20	21.44	110	107	80-120	2	30
1,2-Dichloropropane	0.5	U	20	19.74	20	19.85	99	99	80-120	1	30
cis-1,3-Dichloropropene	0.5	U	20	18.91	20	18.79	95	94	80-120	1	30
trans-1,3-Dichloropropene	0.5	U	20	17.72	20	17.72	89	89	76-120	0	30
Ethylbenzene	0.5	U	20	19.19	20	18.99	96	95	78-120	1	30
Freon 113	2	U	20	24.02	20	24.51	120	123	64-136	2	30
2-Hexanone	3	U	100	79.48	100	78.21	79	78	49-146	2	30
Isopropylbenzene	1	U	20	19.68	20	19.47	98	97	80-120	1	30
Methyl Acetate	1	U	20	20.06	20	19.88	100	99	61-137	1	30
Methyl Tertiary Butyl Ether	0.5	U	20	20.13	20	20.09	101	100	75-120	0	30
4-Methyl-2-pentanone	3	U	100	86.32	100	85.75	86	86	55-141	1	30
Methylcyclohexane	1	U	20	24.25	20	23.85	121	119	66-126	2	30
Methylene Chloride	2	U	20	20.47	20	20.12	102	101	80-120	2	30
Styrene	1	U	20	19.18	20	19.08	96	95	80-120	0	30
1,1,2,2-Tetrachloroethane	0.5	U	20	17.23	20	16.84	86	84	72-120	2	30
Tetrachloroethene	0.5	U	20	20.09	20	20.08	100	100	80-129	0	30
Toluene	0.5	U	20	19.58	20	19.16	98	96	80-120	2	30
1,2,3-Trichlorobenzene	1	U	20	16.86	20	17.16	84	86	69-120	2	30
1,2,4-Trichlorobenzene	1	U	20	17.25	20	17.5	86	88	72-120	1	30
1,1,1-Trichloroethane	0.5	U	20	18.63	20	18.45	93	92	66-126	1	30
1,1,2-Trichloroethane	0.5	U	20	18.21	20	17.97	91	90	80-120	1	30
Trichloroethene	0.5	U	20	20.7	20	20.56	104	103	80-120	1	30
Trichlorofluoromethane	0.5	U	20	25.58	20	25.28	128	126	67-129	1	30
Vinyl Chloride	0.5	U	20	21.15	20	21.33	106	107	63-121	1	30
m+p-Xylene	0.5	U	40	38.62	40	38.33	97	96	80-120	1	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732745

Reported: 01/04/2017 16:35

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspik Condug/l	2	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
o-Xylene	0.5	U	20	18.94	20	18.67	95	93	80-120	1	30
Batch number: Y163263AA	Sample	numb	er(s): 8695	122-8695	128 UNSPK:	P699736					
Acetone	6	U	150	181.29	150	173.89	121	116	50-168	4	30
Benzene	0.5	U	20	22.34	20	22.06	112	110	78-120	1	30
Bromochloromethane	1	U	20	22.27	20	22.03	111	110	80-125	1	30
Bromodichloromethane	0.5	U	20	22.18	20	22	111	110	80-120	1	30
Bromoform	0.5	U	20	18.63	20	18.39	93	92	59-120	1	30
Bromomethane	0.5	U	20	19.44	20	19.29	97	96	55-123	1	30
2-Butanone	3	U	150	144.16	150	143.77	96	96	57-145	0	30
Carbon Disulfide	1	U	20	24.3	20	24.43	121*	122*	58-120	1	30
Carbon Tetrachloride	0.5	U	20	22.9	20	23.03	114	115	74-130	1	30
Chlorobenzene	0.5	U	20	21.5	20	21.26	107	106	80-120	1	30
Chloroethane	0.5	U	20	21.13	20	21.42	106	107	56-120	1	30
Chloroform	0.5	U	20	22.47	20	22.12	112	111	80-120	2	30
Chloromethane	0.5	U	20	20.16	20	20.49	101	102	59-127	2	30
Cyclohexane	3.56	;	20	26.99	20	27.14	117	118	65-131	1	30
1,2-Dibromo-3-chloropropane	2	U	20	18.17	20	18.21	91	91	59-120	0	30
Dibromochloromethane	0.5	U	20	20.73	20	20.77	104	104	78-120	0	30
1,2-Dibromoethane	0.5	U	20	20.99	20	20.92	105	105	80-120	0	30
1,2-Dichlorobenzene	1	U	20	20.88	20	20.67	104	103	80-120	1	30
1,3-Dichlorobenzene	1	U	20	20.88	20	20.49	104	102	80-120	2	30
1,4-Dichlorobenzene	1	U	20	21.03	20	20.75	105	104	80-120	1	30
Dichlorodifluoromethane	0.5	U	20	18.69	20	18.86	93	94	49-134	1	30
1,1-Dichloroethane	0.5	U	20	23.98	20	23.74	120	119	80-120	1	30
1,2-Dichloroethane	0.5	U	20	23.4	20	23.08	117	115	66-128	1	30
1,1-Dichloroethene	0.5	U	20	24.05	20	23.25	120	116	76-124	3	30
cis-1,2-Dichloroethene	0.5	U	20	21.75	20	21.86	109	109	80-120	0	30
trans-1,2-Dichloroethene	0.5	U	20	23.42	20	23.17	117	116	80-120	1	30
1,2-Dichloropropane	0.5	U	20	22.99	20	22.96	115	115	80-120	0	30
cis-1,3-Dichloropropene	0.5	U	20	21.17	20	21.02	106	105	80-120	1	30
trans-1,3-Dichloropropene	0.5	U	20	21.71	20	21.55	109	108	76-120	1	30
Ethylbenzene	0.5	U	20	22.22	20	21.89	111	109	78-120	1	30
Freon 113	2	U	20	23.32	20	23.24	117	116	64-136	0	30
2-Hexanone	3	U	100	98.43	100	98.1	98	98	49-146	0	30
Isopropylbenzene	1	U	20	22.13	20	21.95	111	110	80-120	1	30
Methyl Acetate	1	U	20	21.02	20	21.47	105	107	61-137	2	30
Methyl Tertiary Butyl Ether	0.5	U	20	20.78	20	20.92	104	105	75-120	1	30
4-Methyl-2-pentanone	3	U	100	98.39	100	97.83	98	98	55-141	1	30
Methylcyclohexane	1	U	20	23.34	20	23.09	117	115	66-126	1	30
Methylene Chloride	2	U	20	21.67	20	21.5	108	108	80-120	1	30
Styrene	1	U	20	20.64	20	20.45	103	102	80-120	1	30
1,1,2,2-Tetrachloroethane	0.5	U	20	20.27	20	20.09	101	100	72-120	1	30
Tetrachloroethene	0.5	U	20	23.88	20	23.42	119	117	80-129	2	30
Toluene	0.5	U	20	22.05	20	21.86	110	109	80-120	1	30
1,2,3-Trichlorobenzene	1	U	20	19.42	20	19.52	97	98	69-120	1	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732745

Reported: 01/04/2017 16:35

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
1,2,4-Trichlorobenzene	1 U	20	19.8	20	19.75	99	99	72-120	0	30
1,1,1-Trichloroethane	0.5 U	20	19.5	20	19.43	98	97	66-126	0	30
1,1,2-Trichloroethane	0.5 U	20	20.87	20	20.96	104	105	80-120	0	30
Trichloroethene	0.5 U	20	22.87	20	22.62	114	113	80-120	1	30
Trichlorofluoromethane	0.5 U	20	20.97	20	21.22	105	106	67-129	1	30
Vinyl Chloride	0.5 U	20	20.47	20	20.85	102	104	63-121	2	30
m+p-Xylene	0.5 U	40	43.39	40	42.74	108	107	80-120	2	30
o-Xylene	0.5 U	20	20.63	20	20.45	103	102	80-120	1	30
	ng/l	ng/l	ng/l	ng/l	ng/l					
Batch number: 16323001	Sample num	per(s): 8695	5120-8695	128 UNSPK:	P695182					
Perfluorooctanoic acid	17.21	200.1	272.84	200.54	254.41	128	118	70-130	7	30
Perfluorononanoic acid	0.6 U	200.1	240.34	200.54	253.58	120	126	70-130	5	30
Perfluorodecanoic acid	0.5 U	200.1	216.95	200.54	238.49	108	119	70-130	9	30
Perfluoroundecanoic acid	1 U	200.1	235.95	200.54	246.51	118	123	70-130	4	30
Perfluorododecanoic acid	0.5 U	200.1	244.94	200.54	238.75	122	119	70-130	3	30
Perfluorotridecanoic acid	0.5 U	200.1	253.99	200.54	249.48	127	124	70-130	2	30
Perfluorotetradecanoic acid	0.5 U	200.1	238.31	200.54	251.35	119	125	70-130	5	30
Perfluorohexanoic acid	4.43	200.1	244.08	200.54	254.68	120	125	70-130	4	30
Perfluoroheptanoic acid	3.36	200.1	254.92	200.54	265.92	126	131*	70-130	4	30
Perfluorobutanesulfonate	1.19	177.09	215.36	177.48	214.43	121	120	70-130	0	30
Perfluorohexanesulfonate	1.11	189.1	217.69	189.51	221.71	115	116	70-130	2	30
Perfluoro-octanesulfonate	2 U	191.1	269.13	191.52	226.3	141*	118	70-130	17	30
Perfluorobutanoic Acid	3 U	200.1	233.86	200.54	239.31	117	119	70-130	2	30
Perfluoropentanoic Acid	3.77	200.1	245.47	200.54	246.78	121	121	70-130	1	30
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 163160635005	Sample num	oer(s): 8695	5120,8695	122-8695127	UNSPK: I	687831				
Calcium	14.93	4.00	19.4	4.00	19.47	112	114	75-125	0	20
Magnesium	3.45	2.00	5.52	2.00	5.56	104	106	75-125	1	20
Potassium	2.83	10	13.03	10	13.04	102	102	75-125	0	20
Sodium	44.39	10	55.78	10	56.07	114 (2)	117 (2)	75-125	1	20
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 16323118103A	Sample num	per(s): 8695	120 UNSF	к: р693363						
Total Nitrite/Nitrate Nitrogen	0.040 U	1.00	1.19			119*		90-110		
Batch number: 16325118101A	Sample numi	oer(s): 8695	5122-8695	126 UNSPK:	P695182					
Total Nitrite/Nitrate Nitrogen	1.02	2.00	3.07			102		90-110		
Batch number: 16325118101B	Cample num	oer(s): 8695	5127 IINGE	ov: D697075						
Total Nitrite/Nitrate Nitrogen	2.23	2.00	4.78	K. P03/0/5		128*		90-110		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732745

Reported: 01/04/2017 16:35

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/l	MS Spike Added mg/l	MS Conc mg/l	MSD Spike Added mg/l	MSD Conc mg/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 16326120171B	Sample numb	er(s): 869	5120,8695	122-8695127	UNSPK:	8695122				
Chloride	99.44	200	317.67			109		90-110		
Sulfate	11.98	50	64.87			106		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as	3				
Batch number: 16321005103A	Sample numb	er(s): 869	5120,8695	122-8695124	,8695126	UNSPK: P	690739			
Total Alkalinity to pH 4.5	465.09	188	615.97	188	615.73	80*	80*	84-110	0	5
Batch number: 16321005104A	Sample numb	er(s): 869	5125,8695	127 UNSPK: 1	P687642					
Total Alkalinity to pH 4.5	96.37	188	254.48	188	257.42	84	86	84-110	1	5

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD	DUP RPD Max
	mg/l	mg/l		
Batch number: 163160635005	Sample number(s):	8695120,8695122-869	5127 BKG: P6	87831
Calcium	14.93	15.23	2	20
Magnesium	3.45	3.52	2	20
Potassium	2.83	2.94	4 (1)	20
Sodium	44.39	45.28	2	20
	mg/l	mg/l		
Batch number: 16323118103A	Sample number(s):	8695120 BKG: P69336	3	
Total Nitrite/Nitrate Nitrogen	0.040 U	0.040 U	0 (1)	2
Batch number: 16325118101A	Sample number(s):	8695122-8695126 BKG	: P695182	
Total Nitrite/Nitrate Nitrogen	1.02	1.04	2	2
Batch number: 16325118101B	Cample number(a):	8695127 BKG: P69707	E	
Total Nitrite/Nitrate Nitrogen	2.23	2.25	1	2
Total Nitilite/Nitilate Nitiogen	2.23	2.25	1	2
Batch number: 16326120171B		8695120,8695122-869		
Chloride	99.44	98.96	0 (1)	15
Sulfate	11.98	13.44	11 (1)	15
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 16321005103A	Sample number(s):	8695120,8695122-869	5124,8695126	BKG: P690739

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732745

Reported: 01/04/2017 16:35

Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l as CaCO3	DUP Conc mg/l as CaCO3	DUP RPD	DUP RPD Max
Total Alkalinity to pH 4.5	465.09	462.62	1	5
Batch number: 16321005104A	Sample number(s):	8695125,8695127 BKG:	P687642	5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: L163281AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8695120	104	101	98	98
Blank	103	101	98	98
LCS	102	102	99	99
MS	104	102	98	100
MSD	104	101	98	99
Limits:	80-116	77-113	80-113	78-113

Analysis Name: SOM02.2 Volatiles

Batch number: Y163263AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8695122	101	102	98	97
8695123	101	102	97	97
8695124	103	103	97	98
8695125	103	105	97	96
8695126	103	102	97	96
8695127	103	103	97	97
8695128	101	103	98	97
Blank	100	104	98	98
LCS	100	100	99	100
MS	101	101	99	101
MSD	101	100	99	100
Timits:	80-116	77-113	80-113	78-113

Analysis Name: 14 PFCs Batch number: 16323001

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8695120	62*	63*	57*	72	69*	65*
8695121	56*	55*	51*	57*	51*	53*
8695122	60*	63*	58*	60*	65*	61*

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732745

Reported: 01/04/2017 16:35

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 14 PFCs Batch number: 16323001

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8695123	65*	69*	62*	61*	59*	63*
8695124	60*	67*	54*	52*	47*	53*
8695125	61*	57*	49*	62*	68*	58*
8695126	63*	75	72	66*	63*	62*
8695127	54*	56*	50*	57*	57*	55*
8695128	63*	65*	58*	67*	73	71
Blank	69*	73	62*	75	81	74
LCS	66*	62*	59*	66*	71	64*
MS	61*	61*	56*	62*	68*	64*
MSD	64*	62*	62*	66*	65*	61*
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8695120	71	62*	57*	59*	71	62*
8695121	52*	60*	61*	51*	62*	47*
8695122	60*	54*	57*	57*	78	58*
8695123	65*	63*	62*	62*	78	61*
8695124	53*	55*	78	52*	116	46*
8695125	61*	57*	60*	55*	75	53*
8695126	59*	62*	58*	66*	79	59*
8695127	52*	54*	60*	57*	74	52*
8695128	65*	71	65*	63*	77	62*
Blank	73	73	65*	66*	99	66*
LCS	68*	55*	63*	64*	86	68*
MS	58*	55*	58*	69*	82	70
MSD	66*	67*	59*	60*	96	62*
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	de Neteosaa	13C2 DEDoDA	13C2 DETADA			

	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
8695120	77	57*	49*	
8695121	69*	48*	41*	
8695122	71	49*	47*	
8695123	85	66*	56*	
8695124	109	44*	39*	
8695125	81	56*	48*	
8695126	86	63*	56*	
8695127	73	57*	47*	
8695128	74	60*	52*	
Blank	86	65*	60*	
LCS	90	68*	63*	
MS	89	63*	63*	
MSD	88	66*	60*	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732745

Reported: 01/04/2017 16:35

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 14 PFCs Batch number: 16323001

Limits: 70-130 70-130 70-130

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

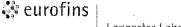
⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



Lancaster Laboratories Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191				up #:	1732745				Sample #: 8695/20 - 28								COC#: 15594					
Client: C.T. Male Associates					Matrix				Analyses Red							quested				For Lab Use Only		
Project Name/#: SGPP - Merrimack	Site ID:											Pı	ese	rvatio	n C	odes	5			SF#: <u>286049</u>		
Project Manager: Kirk Moline	P.O.#:	16.6	126	γ	ᇉ	1	5		Н	N	S									SCR#: <u>19606</u>	9	
Sampler: LC TC RH					Sediment	Ground Surface	2to		رې د				:0 B)							Preserva	tion Codes	
Phone #: 518 - 786 7502	Quote #:	214135			Sed		3		- TICs	ပ္ထ	(353.2)		12320	⊕ Fi			Ì			H = HCI	T = Thiosulfate	
State where sample(s) were collected: NH		·		Ĭ,		ble	ank	Containers	0C)	(6010C)		6	rb (SM	7 mod.)			ŀ			N = HNO ₃	B = NaOH	
	Colle	ection		te		Potable NPDES	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		(8260C)	\times	/ NO3	(300.0)	Carb/Bicarb	A 537						S = H ₂ SO ₄	P = H ₃ PO ₄	
	Cone	ction		posi				# of	VOAs	Mg, Na,	NO2	-40	Carb	(EPA						O = Other		
Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other:	Total	TCL. V	Ca, M	Total NO2	CI-, S(ALK +	PFCs						Ren	narks	
SG2-GWEBOI-161109	11/9/16	0815	X				X	-	X	X	X	X	X	X								
SG2-PTB01-161109		0830	X				X							X								
SG2-MER45-3A-161109		1015	X			X			×	X	X	+	X	X								
SG2-MERYS-5A-161109		143C	X			X		11	X	\times	X	X	X	X								
SG2-MER45-28-161109		1550	X			ヤ		11	X	X	X	4	+	+								
SG2-MER1MW-161109		1650	X			X		10	X	X	X	X	X	X								
SG2-LNGMW-4-161109		1630	X			X		1	X	\times	X	X	X	X								_
SG2-GWP001-161109		Carrie and a second second	X			X			X	X	X	ャ	ナ	X								
SG2-LTB01-161109		(Communications)					X	3	X					X								
Turnaround Time Requested (TAT) (please of		7.4	RUS	Н	1 1	guished		7		ì	Date		10	Time 711 C	, F	Recei	ved b	y:		Date	Time	
RUSH TAT is subject to Eurofins Lancaster Laborator Date results are needed:	ies approval	ar.d surchar	ges.)			ANUN nquished	<u> </u>	<u>A</u> N	u^		<i>4 </i> Date		17	7 Time	<u> </u>	Recei	ved h	ıV.		Date	Time	_
E-mail address to send RUSH results: 12. M	Minela	Ctm	116 x	TVC	4	iquisileu	Dy.				Date			/	<u> </u>	(000)	vou n	· y ·	_	Julio	1,,,,,	
Data Package Options (please check if requi		~ (111	NI () 51	112		nquished	by:				Date			Time	F	Recei	ved b	y:	_	Date	Time	_
Type I (Validation/non-CLP)		TX TRRP	- 13														,					
Type III (Reduced non-CLP) CT RC	Р 🗌				Relir	nquished	by:				Dáte			Time	F	Recei	ved b	y:		Date	Time	
	ype A 🔲								_/						\perp							_
	уре В 🗌		·		Relir	nquished	by:				Date			Time	l l	Recei	ved b	y:		Date	Time	
EDD Format: EQuIS					Airbil	II No ·				<u></u>					-		· Seminary			11-10-16	436	_
If site-specific QC (MS/MSD/Dup) required, submit triplicate volume	indicate Q	C sample	s and			quished b			ial Ca '∡		r					Гетр	eratu	re upo	n reco	eint O 4 - 1	⊌ °C	



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

167836

Group Number(s):1732745

Client: C.T. Male

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

11/10/2016 9:30

Number of Packages:

<u>3</u>

Number of Projects:

1

State/Province of Origin:

<u>NH</u>

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

Yes

Custody Seal Present:

Yes

Sample Date/Times match COC:

Yes

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

Air Quality Samples Present:

No

Samples Chilled:

Yes

Total Trip Blank Qty:

See Below

3

Paperwork Enclosed:

Yes Yes Trip Blank Type:

No No

Samples Intact:

No

Missing Samples: Extra Samples:

No

Discrepancy in Container Qty on COC:

No

Trip Blank Type(s): 2 HCL, 1 Unpreserved 250mL plastic bottle

Unpacked by Timothy Cubberley (6520) at 14:01 on 11/10/2016

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler#	Thermometer ID	Corrected Temp	Therm. Type	<u>Ice Type</u>	Ice Present?	Ice Container	Elevated Temp?
1	DT131	2.6	DT	Wet	Υ	Bagged	N
2	DT131	0.9	ÐΤ	Wet	Υ	Bagged	N
3	DT131	1.7	DT	Wet	Υ	Bagged	N

T ± 717-656-2300 F ± 717-656-2681 www.LancasterLabs.com

Page 1 of 1



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RLReporting Limit kg **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: January 05, 2017

Project: SGPP - Merrimack

Submittal Date: 11/11/2016 Group Number: 1732751 SDG: MMK12 PO Number: 16.6126 State of Sample Origin: NH

	Lancaster Labs
Client Sample Description	<u>(LL) #</u>
SG2-LTB01-161110 Blank Water	8695178
SG2-RB01-161110 Blank Water	8695179
SG2-FTB01-161110 Blank Water	8695180
SG2-LNGMW-1-161110 Grab Groundwater	8695181
SG2-MER45-10-161110 Grab Groundwater	8695182
SG2-MER45-10-161110 MS Grab Groundwater	8695183
SG2-MER45-10-161110 MSD Grab Groundwater	8695184
SG2-MER45-10-161110 Dupl Grab Groundwater	8695185
SG2-LNGMW-3-161110 Grab Groundwater	8695186
SG2-MER45-1A-161110 Grab Groundwater	8695187
SG2-RB02-161110 Blank Water	8695188
SG2-MER45-2A-161110 Grab Groundwater	8695189

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	C. T. Male Associates	Attn: Jeff Marx
Electronic Copy To	C. T. Male Associates	Attn: Dan Reilly
Electronic Copy To	C. T. Male Associates	Attn: Kirk Moline



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250



Project Name: SGPP - Merrimack LL Group #: 1732751

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260C, GC/MS Volatiles

Sample #s: 8695186

The referenced method allows a maximum of 20% of the analytes in the calibration to exceed the 20% Drift continuing calibration verification criteria. The reported concentration in the associated sample(s) is considered to be estimated. Therefore the result for the following analyte(s) is estimated: Tetrachloroethene.

EPA 537 Rev. 1.1 modified, Misc. Organics

<u>Sample #s: 8695178, 8695179, 8695180, 8695181, 8695182, 8695183, 8695184, 8695186, 8695187, 8695188, 8695189</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

<u>Batch #: 16323001 (Sample number(s): 8695178-8695184, 8695186-8695189 UNSPK: 8695182)</u>

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Perfluoroheptanoic acid, Perfluoro-octanesulfonate

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8695178, 8695179, 8695180, 8695181, 8695182, 8695183, 8695184, 8695186, 8695187, 8695188, 8695189, Blank, LCS, MS, MSD

SM 2320 B-1997, Wet Chemistry

<u>Batch #: 16326010102A (Sample number(s): 8695181, 8695189 UNSPK: P697075 BKG: P697075, P697666)</u>

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Total Alkalinity to pH 4.5



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LTB01-161110 Blank Water

SGPP - Merrimack

LL Sample # WW 8695178 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/11/2016 09:25 Reported: 01/05/2017 10:50

12MM1 SDG#: MMK12-01TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LTB01-161110 Blank Water

SGPP - Merrimack

LL Sample # WW 8695178 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/11/2016 09:25 Reported: 01/05/2017 10:50

12MM1 SDG#: MMK12-01TB

CAT No.	Analysis Name		CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles o-Xylene	SW-846 826	50C 95-47-6	ug/l 0.5	U	ug/l 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163271AA	11/22/2016	10:37	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163271AA	11/22/2016	10:37	Kevin A Sposito	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/24/2016	02:54	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16323001	11/20/2016	12:00	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE NO.	
VOLATILE ORGANICS ANAI	YSIS DATA SHEET			
TENTATIVELY IDENTIFI	ED COMPOUNDS	!		!
		!	12MM1	!
Lab Name: Lancaster Laboratories	Contract:	!		!
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8695178			
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355.i	/16nd	ov22a.b/yn2	22s03.d
Level: (low/med) LOW	Date Received: 11/11/1	б		
Moisture: not dec.	Date Analyzed: 11/22/1	6		
Column: (pack/cap) CAP	Dilution Factor: 1.0			
	CONCENTRATION UNITS:			
Number TICs found: 0	(ug/L or ug/Kg) ug/L			

! ! CAS NUMBER	! ! COMPOUND NAME ==!==================================	! ! RT	! ! EST. CONC.	~
!=======! ! 1. VOCTIC	==:===================================	: !	•	!====== ! U
. 2	!	!	!	!
! 3	!!	!	!	!
		!	!	!
	!	!	!	!
	_!	!	!	!
	_!	!	!	!
	!	!	!	!
	<u></u> !	!	!	!
			!	!
		:	!	!
			!	<u>;</u>
14.		<u>-</u> i	!	:
	i	;	·	<u>;</u>
		:	·	i
		;	!	i
			 !	!
	<u> </u>	i	 !	i ———
20			!	!
21		!	!	!
22	!		!	!
23	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!		!	!
	!	!	!	!
30	_!	!	!	!
page 1 of 1	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-RB01-161110 Blank Water

SGPP - Merrimack

LL Sample # WW 8695179 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 08:00 by LC

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 11/11/2016 09:25

Reported: 01/05/2017 10:50

12MM2 SDG#: MMK12-02RB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
	stated QC limits are advisory only	-	ient da	ta points			

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/24/2016	03:15	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16323001	11/20/2016	12:00	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-FTB01-161110 Blank Water

SGPP - Merrimack

LL Sample # WW 8695180 LL Group # 1732751

Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 08:05

C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 11/11/2016 09:25

Reported: 01/05/2017 10:50

12MM3 SDG#: MMK12-03TB

CAT No.	Analysis Name		CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics E	EPA 537 Re	ev. 1.1	ng/l		ng/l	ng/l	
	ı	nodified						
10954	Perfluorooctanoic aci	d	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic aci	d	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic aci	ld	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic a	acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic a	acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic	acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoi	c acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic aci	d	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic ad	cid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfor	nate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfor	nate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfo	nate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Aci	d	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Ac	cid	2706-90-3	0.5	U	0.5	2	1
	stated QC limits are a		•	ient dat	a points			

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	12/06/2016	12:21	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16323001	11/20/2016	12:00	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LNGMW-1-161110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695181 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 11:05 by LC C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/11/2016 09:25 Reported: 01/05/2017 10:50

12MM4 SDG#: MMK12-04

CAT No.	Analysis Name	CAS Number	As Rec Result	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 82	260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	Ū	0.5	1	1
11997	Bromochloromethane	74-97-5	1	IJ	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	Ū	0.5	1	1
11997	Bromoform	75-25-2	0.5	IJ	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	Ū	0.5	1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1	1
11997	Chloroform	67-66-3	0.5	Ū	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	IJ	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	IJ	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	Ū	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	IJ	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-01-5	0.5	IJ	0.5	1	1
11997	Ethylbenzene	10061-02-6	0.5	IJ	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
11997	2-Hexanone	591-78-6	3	IJ	3	10	1
11997			3 1	U	1	5	1
11997	Isopropylbenzene	98-82-8 79-20-9	1	IJ	1	5	1
	Methyl Acetate		0.5	IJ			
11997	Methyl Tertiary Butyl Ether	1634-04-4	3	U	0.5 3	1 10	1 1
11997 11997	4-Methyl-2-pentanone	108-10-1 108-87-2	3 1	IJ	1	5	1
	Methylcyclohexane		_	•			=
11997	Methylene Chloride	75-09-2	2 1	U U	2 1	4 5	1
11997	Styrene	100-42-5		U II			1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	0	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1 1	1
11997	Toluene	108-88-3	0.5	U	0.5	_	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U 	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ŭ	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LNGMW-1-161110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695181 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 11:05 by LC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/11/2016 09:25 Reported: 01/05/2017 10:50

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

12MM4	SDG#:	MMK12-	J 4

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library S The results from FORM 1 - VOA-TIO	the volatile li						
	on the back of t		ob appearing in	.1 0110 Q	corumir ar	e derined		
Misc.	Organics	EPA 537 R modified	ev. 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoi	c acid	335-67-1	110		0.5	2	1
10954			375-95-1	0.7	J	0.6	2	1
10954	Perfluorodecanoi		335-76-2	0.5	Ū	0.5	2	1
10954			2058-94-8	1	IJ	1	3	1
10954	Perfluorododecan		307-55-1	0.5	Ū	0.5	2	1
10954			72629-94-8	0.5	IJ	0.5	2	1
10954	Perfluorotetrade		376-06-7	0.5	τι	0.5	2	1
10954				23	U	0.5	2	1
			307-24-4				2	_
10954	Perfluoroheptano		375-85-9	16	_	0.5		1
	Perfluorobutanes		375-73-5	1	J	0.7	2	1
	Perfluorohexanes		355-46-4	3	J	1	3	1
	Perfluoro-octane		1763-23-1	4	J	2	6	1
10954			375-22-4	11		3	10	1
	Perfluoropentano		2706-90-3	14		0.5	2	1
	stated QC limits be obtained to ca			ient da	ta points			
Metal	5	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	42.6		0.0382	0.400	1
01757	Magnesium		7439-95-4	2.64		0.0190	0.200	1
01762	Potassium		7440-09-7	1.78		0.160	1.00	1
01767	Sodium		7440-23-5	6.65		0.173	2.00	1
Wet C	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	4.5		1.0	2.0	5
00228	Sulfate		14808-79-8	31.0		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Ni		n.a.	3.1		0.040	0.10	1
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity		n.a.	96.0		1.7	5.0	1

96.0

1.7 U

n.a.

n.a.

1.7

5.0

5.0

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LNGMW-1-161110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695181 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 11:05 by LC C. T. Male Associates 50 Century Hill Drive

Submitted: 11/11/2016 09:25 Latham NY 12110

Reported: 01/05/2017 10:50

12MM4 SDG#: MMK12-04

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles Y163271AA SW-846 8260C 1 11/22/2016 12:50 Kevin A Sposito 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 Y163271AA 11/22/2016 12:50 Kevin A Sposito 10954 14 PFCs EPA 537 Rev. 1.1 16323001 11/24/2016 03:56 Jason W Knight 1 modified 14091 PFAA Water Prep 16323001 11/20/2016 12:00 Devon M Whooley EPA 537 Rev. 1.1 1 1 modified 01750 Calcium SW-846 6010C 163260635001 1 11/22/2016 03:18 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163260635001 11/22/2016 03:18 Matthew R 1 Machtinger 01762 Potassium SW-846 6010C 1 163260635001 11/22/2016 03:18 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163260635001 11/22/2016 03:18 1 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163260635001 11/21/2016 16:40 Barbara A Kane 1 U4 00224 Chloride EPA 300.0 16328120602A 11/24/2016 02:16 Hallie Burnett 00228 Sulfate EPA 300.0 16328120602A Hallie Burnett 1 11/24/2016 02:16 5 07882 Total Nitrite/Nitrate EPA 353.2 1 16325118101A 11/20/2016 19:01 Joseph E McKenzie 1 Nitrogen SM 2320 B-1997 16326010102A 12150 Total Alkalinity to pH 11/21/2016 18:35 Kenneth A Bell 16326010102A 12149 Bicarbonate Alkalinity SM 2320 B-1997 1 11/21/2016 18:35 Kenneth A Bell 1 12148 Carbonate Alkalinity SM 2320 B-1997 1 16326010102A 11/21/2016 18:35 Kenneth A Bell 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.	
VOLATILE ORGANICS AN	MALYSIS DATA SHEET		
TENTATIVELY IDENTI	FIED COMPOUNDS	!!!	
		! 12MM4 !	
Lab Name: Lancaster Laboratories	Contract:	!!	
Lab Code: LANCAS Case No.:	SAS No.:	SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 86951	.81	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355	5.i/16nov22a.b/yn22s09.d	d
Level: (low/med) LOW	Date Received: 11/11	./16	
Moisture: not dec.	Date Analyzed: 11/22	2/16	
Column: (pack/cap) CAP	Dilution Factor: 1.0)	
	CONCENTRATION UNIT	?S:	
Number TICs found: 0	(ug/L or ug/Kg) ug	J/L	

! ! CAS NUMBER	! ! COMPOUND NAME	! ! RT	! ! EST. CONC.	
! 1. VOCTIC	!Total VOC TICs	==!====== !	•	! ===== : ! U :
! 2	!!	!	!	!!
! 3	!	!	!	!!
! 4	_!	!	!	!!
! 5	_!	!	!	!
	<u></u> !	!	!	!
	!!	<u>-</u>	!	¦
	;	<u>-</u>	: !	;——
			!!	i
! 11		<u>i</u>	· !	ii
			!	
		!	!	!
!14	!	!	!	!!
	!	!	!	!!
	!		!	!!
	!	!	!	!!
!18	!	!	!	!!
	!	!	!	!
	_!	!	!	<u>!</u>
	<u> </u>	<u>-</u>	!	!
	<u>-</u>	<u>-</u>	! !	;
! 24		<u>-</u> i	·	:
	i	;	·	ii
	i	<u>i</u>	· !	ii
! 27.			!	i
! 28			!	!
! 29.			!	! !
!30		!	!	!!
!	!	!	!	!!

page 1 of 1 FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-10-161110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695182 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 13:10 by LC C. T. Male Associates

50 Century Hill Drive

Submitted: 11/11/2016 09:25 Latham NY 12110

Reported: 01/05/2017 10:50

12MM5 SDG#: MMK12-05BKG

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	Ū	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	ττ	0.5	1	1
11997	1,2-Dibromoethane 1,2-Dichlorobenzene	95-50-1	0.5 1	U	1	5	1
11997	•		1	ττ	1	5 5	1
	1,3-Dichlorobenzene	541-73-1		-			
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U 	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ū	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	Ū	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ū	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	IJ	0.5	1	1
		1,,001 20 1	0.0		<u> </u>		

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-10-161110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695182 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 13:10 by LC

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 11/11/2016 09:25

Reported: 01/05/2017 10:50

12MM5 SDG#: MMK12-05BKG

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997			95-47-6	0.5	U	0.5	1	1
00882	VOA Library S The results from FORM 1 - VOA-TIO	the volatile li						
	on the back of t		o appearing i	. 0110 2	, 0014111141	derined		
Misc.	Organics	EPA 537 R modified	ev. 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoi	c acid	335-67-1	17		0.5	2	1
10954			375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoi		335-76-2	0.5	Ū	0.5	2	1
10954			2058-94-8	1	IJ	1	3	1
10954	Perfluorododecan		307-55-1	0.5	Ū	0.5	2	1
10954			72629-94-8	0.5	IJ	0.5	2	1
10954	Perfluorotetrade		376-06-7	0.5	IJ	0.5	2	1
10954			307-24-4	4	U	0.5	2	1
10954	Perfluoroheptano		375-85-9	3		0.5	2	1
	Perfluorobutanes		375-73-5	1	J	0.3	2	1
	Perfluorobutanes		355-46-4	1	J	1	3	1
	Perfluoronexames		1763-23-1	2	Ū	2	6	1
10954			375-22-4	3	ττ	3	10	1
	Perfluoropentano		2706-90-3	4	U	0.5	2	1
The	stated QC limits be obtained to ca	are advisory onl	y until suffic		ta points	0.5	۷	1
Metal	3	SW-846 60	10C	mg/1		mg/l	mg/l	
01750	Calcium		7440-70-2	21.0		0.0382	0.400	1
01757	Magnesium		7439-95-4	3.69		0.0190	0.200	1
01762	Potassium		7440-09-7	1.93		0.160	1.00	1
01767	Sodium		7440-23-5	74.7		0.173	2.00	1
Wet C	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	155		10.0	20.0	50
00228	Sulfate		14808-79-8	10.3		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Ni		n.a.	1.0		0.040	0.10	1
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity		n.a.	16.7		1.7	5.0	1

16.7

1.7 U

n.a.

n.a.

1.7

5.0

5.0

^{*=}This limit was used in the evaluation of the final result



Machtinger

Barbara A Kane

Hallie Burnett

Hallie Burnett

Kenneth A Bell

Kenneth A Bell

Kenneth A Bell

Joseph E McKenzie

1

5

1

1

1

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-10-161110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695182 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 13:10 by LC C. T. Male Associates 50 Century Hill Drive

Submitted: 11/11/2016 09:25 Latham NY 12110

Reported: 01/05/2017 10:50

12MM5 SDG#: MMK12-05BKG

Analysis Name

01163 GC/MS VOA Water Prep

07882 Total Nitrite/Nitrate

12150 Total Alkalinity to pH

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

Nitrogen

10635 ICP-WW, 3005A (tot rec) - SW-846 3005A

11997 SOM02.2 Volatiles

14091 PFAA Water Prep

10954 14 PFCs

01750 Calcium

01757 Magnesium

01762 Potassium

U4 00224 Chloride

00228 Sulfate

01767 Sodium

CAT

No.

Sample Comments

Laboratory Sample Analysis Record

163260635001

16328120602A

16328120602A

16325118101A

16324004201A

16324004201A

16324004201A

1

1

1

1

1

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Method

EPA 300.0

EPA 300.0

EPA 353.2

SM 2320 B-1997

SM 2320 B-1997

SM 2320 B-1997

Trial# Batch# Analysis Analyst Dilution Date and Time Factor Y163271AA SW-846 8260C 1 11/22/2016 10:59 Kevin A Sposito 1 SW-846 5030C 1 Y163271AA 11/22/2016 10:59 Kevin A Sposito EPA 537 Rev. 1.1 16323001 11/23/2016 21:05 Jason W Knight 1 modified EPA 537 Rev. 1.1 16323001 11/20/2016 12:00 Devon M Whooley 1 1 modified SW-846 6010C 163260635001 1 11/22/2016 02:59 Matthew R Machtinger SW-846 6010C 163260635001 11/22/2016 02:59 Matthew R 1 Machtinger SW-846 6010C 1 163260635001 11/22/2016 02:59 Matthew R 1 Machtinger SW-846 6010C 163260635001 11/22/2016 02:59 1 Matthew R

11/21/2016 16:40

11/23/2016 22:51

11/23/2016 22:35

11/20/2016 18:55

11/19/2016 16:58

11/19/2016 16:58

11/19/2016 16:58

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE NO.
VOLATILE ORGANICS ANAI	LYSIS DATA SHEET	_	
TENTATIVELY IDENTIFI	IED COMPOUNDS	!	!
		!	12MM5 !
Lab Name: Lancaster Laboratories	Contract:	!	!
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:
Matrix: (soil/water) WATER	Lab Sample ID: 8695182	2	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355.	1/16n	ov22a.b/yn22s04.
Level: (low/med) LOW	Date Received: 11/11/2	L6	
% Moisture: not dec.	Date Analyzed: 11/22/2	L6	
Column: (pack/cap) CAP	Dilution Factor: 1.0		

! ! CAS NUMBER	! ! COMPOUND NAME		EST. CONC.	
•	==!===================================	! =====!====: !		!===== ! U
	_!	!!		!
! 3	!	!!		!
! 4	!	!!		!
	!	!!		!
! 6	!	!!		!
! 7	!	!!		!
! 8	!	!!		!
! 9		!!		!
	!	!!		!
	!	!!		!
!12	!	!!		!
!13		!!		!
!14		!!		!
!15		!!		!
	!	!!		!
	!	!!		!
!18	!	!!		!
	!	!!		!
	!	!!		!
!21		!!		!
	_!	!!		!
	!	!!		!
! 24		!!		!
!25		!!		!
!26		!!		!
! 27		!!		!
! 28	!	!!		!
! 29		!!		!
!30	!	!!		!
!	!	!!		!

page 1 of 1

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-10-161110 MS Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695183 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 13:10 by LC C. T. Male Associates 50 Century Hill Drive

Submitted: 11/11/2016 09:25 Latham NY 12110

Reported: 01/05/2017 10:50

12MM5 SDG#: MMK12-05MS

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l	ug/l	ug/l	
11997	Acetone	67-64-1	160	6	20	1
11997	Benzene	71-43-2	22	0.5	1	1
11997	Bromochloromethane	74-97-5	22	1	5	1
11997	Bromodichloromethane	75-27-4	22	0.5	1	1
11997	Bromoform	75-25-2	19	0.5	4	1
11997	Bromomethane	74-83-9	19	0.5	1	1
11997	2-Butanone	78-93-3	130	3	10	1
11997	Carbon Disulfide	75-15-0	24	1	5	1
11997	Carbon Tetrachloride	56-23-5	23	0.5	1	1
11997	Chlorobenzene	108-90-7	21	0.5	1	1
11997	Chloroethane	75-00-3	21	0.5	1	1
11997	Chloroform	67-66-3	22	0.5	1	1
11997	Chloromethane	74-87-3	20	0.5	1	1
11997	Cyclohexane	110-82-7	22	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	17	2	5	1
11997	Dibromochloromethane	124-48-1	21	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	21	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	21	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	21	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	21	1	5	1
11997	Dichlorodifluoromethane	75-71-8	19	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	23	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	23	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	24	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	21	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	23	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	23	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	21	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-01-5	21	0.5	1	1
11997	Ethylbenzene	10061-02-6	22	0.5	1	1
11997	Freon 113	76-13-1	23	2	10	1
11997			91	3	10	1
11997	2-Hexanone	591-78-6 98-82-8	21	3 1	5	1
	Isopropylbenzene		20			
11997	Methyl Acetate	79-20-9	21	1 0.5	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	93	3	1	1
11997	4-Methyl-2-pentanone	108-10-1	22		10	1
11997	Methylcyclohexane	108-87-2		1	5	1
11997	Methylene Chloride	75-09-2	21	2	4	1
11997	Styrene	100-42-5	20	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	20	0.5	1	1
11997	Tetrachloroethene	127-18-4	23	0.5	1	1
11997	Toluene	108-88-3	22	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	19	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	19	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	19	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	20	0.5	1	1
11997	Trichloroethene	79-01-6	22	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	21	0.5	1	1
11997	Vinyl Chloride	75-01-4	20	0.5	1	1
11997	m+p-Xylene	179601-23-1	43	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-10-161110 MS Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695183 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 13:10 by LC

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 11/11/2016 09:25

Reported: 01/05/2017 10:50

12MM5 SDG#: MMK12-05MS

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	260C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	20	0.5	1	1
Misc.	Organics	EPA 537 I	Rev. 1.1	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic a		335-67-1	270	0. 5	2	1
				240	0.5	2 2	1
10954	Perfluorononanoic a		375-95-1		0.6	2	1
10954	Perfluorodecanoic a		335-76-2	220	0.5	_	_
10954	Perfluoroundecanoio		2058-94-8	240	1	3	1
10954	Perfluorododecanoio		307-55-1	240	0.5	2	1
10954	Perfluorotridecano:		72629-94-8	250	0.5	2	1
10954	Perfluorotetradecar		376-06-7	240	0.5	2	1
	Perfluorohexanoic a		307-24-4	240	0.5	2	1
10954	Perfluoroheptanoic		375-85-9	250	0.5	2	1
10954	Perfluorobutanesuli		375-73-5	220	0.7	2	1
	Perfluorohexanesuli		355-46-4	220	1	3	1
	Perfluoro-octanesu		1763-23-1	270	2	6	1
	Perfluorobutanoic A		375-22-4	230	3	10	1
10954	Perfluoropentanoic		2706-90-3	250	0.5	2	1
	stated QC limits are be obtained to calcu			ient data points			
Metals	5	SW-846 60)10C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	24.8	0.0382	0.400	1
01757	Magnesium		7439-95-4	5.60	0.0190	0.200	1
01762	Potassium		7440-09-7	11.9	0.160	1.00	1
01767	Sodium		7440-23-5	84.6	0.173	2.00	1
01,01	50414		, 110 23 3	01.0	0.175	2.00	-
Wet Cl	nemistry	EPA 300.0)	mg/l	mg/l	mg/l	
00224	Chloride		16887-00-6	350	20.0	40.0	100
00228	Sulfate		14808-79-8	59.9	3.0	10.0	10
		EPA 353.2	2	mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitra		n.a.	3.1	0.080	0.20	2
			1005	mm/1 am dado3	/1 or GoGC3	mm/1 nm (nm C2)	
		SM 2320 I		mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	рн 4.5	n.a.	186	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
------------	--------	----------	--------

CAT	Analysis Name	Method	Trial# Batch#	Analysis	Analyst	Dilution
No.				Date and Time		Factor

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-10-161110 MS Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695183 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 13:10 by LC C. T. Male Associates

50 Century Hill Drive

Submitted: 11/11/2016 09:25 Latham NY 12110

Reported: 01/05/2017 10:50

12MM5 SDG#: MMK12-05MS

Laboratory Sample Analysis Record

			_					
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163271AA	11/22/2016	11:21	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163271AA	11/22/2016	11:21	Kevin A Sposito	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/23/2016	21:26	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16323001	11/20/2016	12:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163260635001	11/22/2016	03:09	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163260635001	11/22/2016	03:09	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163260635001	11/22/2016	03:09	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163260635001	11/22/2016	03:09	Matthew R Machtinger	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163260635001	11/21/2016	16:40	Barbara A Kane	1
00224	Chloride	EPA 300.0	1	16328120602A	11/24/2016	00:25	Hallie Burnett	100
00228	Sulfate	EPA 300.0	1	16328120602A	11/24/2016	00:10	Hallie Burnett	10
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101A	11/20/2016	18:57	Joseph E McKenzie	2
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16324004201A	11/19/2016	17:05	Kenneth A Bell	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-10-161110 MSD Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695184 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 13:10 by LC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/11/2016 09:25 Reported: 01/05/2017 10:50

12MM5 SDG#: MMK12-05MSD

GC/MS Volatiles SW-846 8260C ug/l ug/l ug/l 11997 Acetone 67-64-1 160 6 20 11997 Benzene 71-43-2 22 0.5 1 11997 Bromochloromethane 74-97-5 22 1 5 11997 Bromoform 75-27-4 22 0.5 1 11997 Bromomethane 74-83-9 19 0.5 4 11997 Bromomethane 74-83-9 19 0.5 1	1 1 1
11997 Benzene 71-43-2 22 0.5 1 11997 Bromochloromethane 74-97-5 22 1 5 11997 Bromodichloromethane 75-27-4 22 0.5 1 11997 Bromoform 75-25-2 19 0.5 4	1 1
11997 Bromochloromethane 74-97-5 22 1 5 11997 Bromodichloromethane 75-27-4 22 0.5 1 11997 Bromoform 75-25-2 19 0.5 4	1
11997 Bromodichloromethane 75-27-4 22 0.5 1 11997 Bromoform 75-25-2 19 0.5 4	
11997 Bromoform 75-25-2 19 0.5 4	1
11007 Promonothons 74.02.0 10 0.5	1
1133/ BIOHOHOHOLHANE /4-83-9 19 U.5 1	1
11997 2-Butanone 78-93-3 130 3 10	1
11997 Carbon Disulfide 75-15-0 24 1 5	1
11997 Carbon Tetrachloride 56-23-5 23 0.5 1	1
11997 Chlorobenzene 108-90-7 21 0.5 1	1
11997 Chloroethane 75-00-3 20 0.5 1	1
11997 Chloroform 67-66-3 22 0.5 1	1
11997 Chloromethane 74-87-3 20 0.5 1	1
11997 Cyclohexane 110-82-7 22 2 5	1
11997 1,2-Dibromo-3-chloropropane 96-12-8 16 2 5	1
11997 Dibromochloromethane 124-48-1 21 0.5 1	1
11997 1,2-Dibromoethane 106-93-4 20 0.5 1	1
11997 1,2-Dichlorobenzene 95-50-1 21 1 5	1
11997 1,3-Dichlorobenzene 541-73-1 20 1 5	1
11997 1,4-Dichlorobenzene 106-46-7 21 1 5	1
11997 Dichlorodifluoromethane 75-71-8 19 0.5 1	1
11997 1,1-Dichloroethane 75-34-3 23 0.5 1	1
11997 1,2-Dichloroethane 107-06-2 23 0.5 1	1
11997 1,1-Dichloroethene 75-35-4 23 0.5 1	1
11997 cis-1,2-Dichloroethene 156-59-2 21 0.5 1	1
11997 trans-1,2-Dichloroethene 156-60-5 23 0.5 1	1
11997 1,2-Dichloropropane 78-87-5 23 0.5 1	1
11997 cis-1,3-Dichloropropene 10061-01-5 20 0.5 1	1
11997 trans-1,3-Dichloropropene 10061-02-6 21 0.5 1	1
11997 Ethylbenzene 100-41-4 22 0.5 1	1
11997 Freon 113 76-13-1 22 2 10	1
11997 2-Hexanone 591-78-6 89 3 10	1
11997 Isopropylbenzene 98-82-8 21 1 5	1
11997 Methyl Acetate 79-20-9 19 1 5	1
11997 Methyl Tertiary Butyl Ether 1634-04-4 21 0.5 1	1
11997 4-Methyl-2-pentanone 108-10-1 91 3 10	1
11997 Methylcyclohexane 108-87-2 22 1 5	1
11997 Methylene Chloride 75-09-2 21 2 4	1
11997 Styrene 100-42-5 20 1 5	1
11997 1,1,2,2-Tetrachloroethane 79-34-5 19 0.5 1	1
11997 Tetrachloroethene 127-18-4 23 0.5 1	1
11997 Toluene 108-88-3 22 0.5 1	1
11997 1,2,3-Trichlorobenzene 87-61-6 19 1 5	1
11997 1,2,4-Trichlorobenzene 120-82-1 19 1 5	1
11997 1,1,1-Trichloroethane 71-55-6 19 0.5 1	1
11997 1,1,2-Trichloroethane 79-00-5 20 0.5 1	1
11997 Trichloroethene 79-01-6 22 0.5 1	1
11997 Trichlorofluoromethane 75-69-4 21 0.5 1	1
11997 Vinyl Chloride 75-01-4 20 0.5 1	1
11997 m+p-Xylene 179601-23-1 42 0.5 1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-10-161110 MSD Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695184 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 13:10 by LC

C. T. Male Associates
50 Century Hill Drive

Submitted: 11/11/2016 09:25 Latham NY 12110

Reported: 01/05/2017 10:50

12MM5 SDG#: MMK12-05MSD

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846	8260C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	20	0.5	1	1
Misc.	Organics	EPA 537	Rev. 1.1	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic a	cid	335-67-1	250	0.5	2	1
10954	Perfluorononanoic a	cid	375-95-1	250	0.6	2	1
10954	Perfluorodecanoic a	cid	335-76-2	240	0.5	2	1
10954	Perfluoroundecanoic	acid	2058-94-8	250	1	3	1
10954	Perfluorododecanoic	acid	307-55-1	240	0.5	2	1
10954	Perfluorotridecanoi	c acid	72629-94-8	250	0.5	2	1
10954	Perfluorotetradecan	oic acid	376-06-7	250	0.5	2	1
10954	Perfluorohexanoic a	cid	307-24-4	250	0.5	2	1
10954	Perfluoroheptanoic	acid	375-85-9	270	0.5	2	1
10954	Perfluorobutanesulf	onate	375-73-5	210	0.7	2	1
10954	Perfluorohexanesulf	onate	355-46-4	220	1	3	1
10954	Perfluoro-octanesul	fonate	1763-23-1	230	2	6	1
10954	Perfluorobutanoic A	cid	375-22-4	240	3	10	1
10954	Perfluoropentanoic	Acid	2706-90-3	250	0.5	2	1
	stated QC limits are be obtained to calcui			lent data points			
Metals	5	SW-846	6010C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	24.6	0.0382	0.400	1
01757	Magnesium		7439-95-4	5.56	0.0190	0.200	1
01762	Potassium		7440-09-7	11.7	0.160	1.00	1
01767	Sodium		7440-23-5	84.0	0.173	2.00	1
Wet Ch	nemistry	SM 2320	B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	pH 4.5	n.a.	196	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

	Laboratory Sample Analysis Record									
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor			
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163271AA	11/22/2016 11:43	Kevin A Sposito	1			
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163271AA	11/22/2016 11:43	Kevin A Sposito	1			
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/23/2016 21:46	Jason W Knight	1			
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16323001	11/20/2016 12:00	Devon M Whooley	1			
01750	Calcium	SW-846 6010C	1	163260635001	11/22/2016 03:12	Matthew R Machtinger	1			

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-10-161110 MSD Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695184 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 13:10 by LC C. T. Male Associates 50 Century Hill Drive

Submitted: 11/11/2016 09:25 Latham NY 12110

Reported: 01/05/2017 10:50

12MM5 SDG#: MMK12-05MSD

	Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor			
01757	Magnesium	SW-846 6010C	1	163260635001	11/22/2016	03:12	Matthew R Machtinger	1			
01762	Potassium	SW-846 6010C	1	163260635001	11/22/2016	03:12	Matthew R Machtinger	1			
01767	Sodium	SW-846 6010C	1	163260635001	11/22/2016	03:12	Matthew R Machtinger	1			
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163260635001	11/21/2016	16:40	Barbara A Kane	1			
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16324004201A	11/19/2016	17:12	Kenneth A Bell	1			



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-10-161110 Dupl Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695185 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 13:10 by LC

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/11/2016 09:25 Reported: 01/05/2017 10:50

12MM5 SDG#: MMK12-05DUP

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	s S	W-846 601	.0C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	21.1	0.0382	0.400	1
01757	Magnesium		7439-95-4	3.72	0.0190	0.200	1
01762	Potassium		7440-09-7	1.97	0.160	1.00	1
01767	Sodium		7440-23-5	75.2	0.173	2.00	1
Wet Ch	nemistry E	PA 300.0		mg/l	mg/l	mg/l	
00224	Chloride		16887-00-6	160	10.0	20.0	50
00228	Sulfate		14808-79-8	10.3	1.5	5.0	5
	E	PA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate	Nitrogen	n.a.	1.0	0.040	0.10	1
	S	M 2320 B-	1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to p	н 4.5	n.a.	16.8	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

	Laboratory Sample Analysis Record									
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor		
01750	Calcium	SW-846 6010C	1	163260635001	11/22/2016	03:05	Matthew R Machtinger	1		
01757	Magnesium	SW-846 6010C	1	163260635001	11/22/2016	03:05	Matthew R Machtinger	1		
01762	Potassium	SW-846 6010C	1	163260635001	11/22/2016	03:05	Matthew R Machtinger	1		
01767	Sodium	SW-846 6010C	1	163260635001	11/22/2016	03:05	Matthew R Machtinger	1		
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163260635001	11/21/2016	16:40	Barbara A Kane	1		
00224	Chloride	EPA 300.0	1	16328120602A	11/23/2016	23:22	Hallie Burnett	50		
00228	Sulfate	EPA 300.0	1	16328120602A	11/23/2016	23:07	Hallie Burnett	5		
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101A	11/20/2016	18:59	Joseph E McKenzie	1		
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16324004201A	11/19/2016	17:18	Kenneth A Bell	1		

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LNGMW-3-161110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695186 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 13:15 by LC C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/11/2016 09:25 Reported: 01/05/2017 10:50

12MM6 SDG#: MMK12-06

CAT No.	Analysis Name	CAS Number	As Rec Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 82	60C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	IJ	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	Ū	1	5	1
11997	Bromodichloromethane	75-27-4	0.6	J	0.5	1	1
11997	Bromoform	75-25-2	0.5	IJ	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1	1
11997	Chloroform	67-66-3	0.5	Ū	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5	1
11997	Dibromochloromethane	124-48-1	0.6	J	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	IJ	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	IJ	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	Ū	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	II	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	Ethylbenzene	10001-02-0	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
11997	2-Hexanone	591-78-6	3	IJ	3	10	1
11997	Isopropylbenzene	98-82-8	1	Ū	1	5	1
11997	Methyl Acetate	79-20-9	1	IJ	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	IJ	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-10-1	1	IJ	1	5	1
11997	Methylene Chloride	75-09-2	2	Ū	2	4	1
11997	Styrene Chioride	100-42-5	1	IJ	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	II	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	J	0.5	1	1
11997	Toluene	108-88-3	0.5	IJ	0.5	1	1
11997		87-61-6	1	IJ	1	5	1
11997	1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene	120-82-1	1	IJ	1	5	1
11997	• •		0.5	U	0.5	1	1
	1,1,1-Trichloroethane	71-55-6 79-00-5	0.5	IJ	0.5	1	1
11997	1,1,2-Trichloroethane			-			
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	-	0.5		
11997	m+p-Xylene	179601-23-1	0.5	Ŭ	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



As Received

Limit of

Detection Limit* Quantitation

As Received

mg/l as CaCO3

1.7

mg/l as CaCO3

1

1

5.0

5.0

Method

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LNGMW-3-161110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695186 LL Group # 1732751 Account # 37191

Dilution

Factor

Project Name: SGPP - Merrimack

Collected: 11/10/2016 13:15 by LC C. T. Male Associates 50 Century Hill Drive

CAS Number

Submitted: 11/11/2016 09:25 Latham NY 12110

Reported: 01/05/2017 10:50

12MM6 SDG#: MMK12-06

Analysis Name

CAT

No.

12150

12149

GC/MS Volatiles SW-846 8260C ug/l ug/l ug/l 11997 o-Xylene 95-47-6 0.5 U 0.5 1 1 The referenced method allows a maximum of 20% of the analytes in the calibration to exceed the 20% Drift continuing calibration verification criteria. The reported concentration in the associated sample(s) is considered to be estimated. Therefore the result for the following analyte(s) is estimated: Tetrachloroethene.								
00882 VOA Library Search The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.								
Misc.	Organics	EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
	modified							
10954	Perfluorooctanoic	acid	335-67-1	56		0.5	2	1
10954	Perfluorononanoic	acid	375-95-1	0.8	J	0.6	2	1
10954	Perfluorodecanoic acid		335-76-2	1	J	0.5	2	1
10954	Perfluoroundecanoic acid		2058-94-8	2	J	1	3	1
10954			307-55-1	2	J	0.5	2	1
10954	Perfluorotridecanoic acid		72629-94-8	2	J	0.5	2	1
10954			376-06-7	1	J	0.5	2	1
10954			307-24-4	10		0.5	2	1
	Perfluoroheptanoic acid		375-85-9	10		0.5	2	1
10954	-		375-73-5	2	J	0.7	2	_ 1
	4 Perfluorohexanesulfonate		355-46-4	2	J	1	3	1
10954			1763-23-1	3	J	2	6	1
10954	Perfluorobutanoic Acid		375-22-4	6	J	3	1.0	1
10954	Perfluoropentanoic Acid		2706-90-3	11		0.5	2	1
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.								
Metal	s	SW-846 603	10C	mg/l		mg/l	mg/l	
01750			7440-70-2	31.3		0.0382	0.400	1
01757	Magnesium		7439-95-4	6.01		0.0190	0.200	1
01762	Potassium		7440-09-7	2.38		0.160	1.00	1
01767	Sodium		7440-23-5	41.9		0.173	2.00	1
01/0/	Boaram		7110 23 3	41.5		0.175	2.00	±
Wet Chemistry EPA 300.0			mg/l		mg/l	mg/l		
00224	Chloride		16887-00-6	122		10.0	20.0	50
00228	Sulfate		14808-79-8	10.9		1.5	5.0	5
		EPA 353.2		mg/1		mg/l	mg/l	
07882	Total Nitrite/Nitr	ate Nitrogen	n.a.	1.2		0.040	0.10	1

As Received

Result

mg/l as CaCO3

22.6

SM 2320 B-1997

n.a.

Total Alkalinity to pH 4.5

Bicarbonate Alkalinity

^{*=}This limit was used in the evaluation of the final result



As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-LNGMW-3-161110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695186 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 13:15 by LC C. T. Male Associates

50 Century Hill Drive

As Received

Latham NY 12110

Submitted: 11/11/2016 09:25 Reported: 01/05/2017 10:50

12MM6 SDG#: MMK12-06

12MM6 SDG#: MMK12-06

Method Limit of CAT As Received Dilution Analysis Name CAS Number Detection Limit* Quantitation No. Result Factor mg/l as CaCO3 mg/l as CaCO3 mg/l as CaCO3 SM 2320 B-1997 Wet Chemistry 12148 Carbonate Alkalinity 1.7 U 1.7 5.0 1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163271AA	11/22/2016	13:12	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163271AA	11/22/2016	13:12	Kevin A Sposito	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	12/06/2016	12:41	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16323001	11/20/2016	12:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	163260635001	11/22/2016	03:21	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163260635001	11/22/2016	03:21	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163260635001	11/22/2016	03:21	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163260635001	11/22/2016	03:21	Matthew R Machtinger	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163260635001	11/21/2016	16:40	Barbara A Kane	1
00224	Chloride	EPA 300.0	1	16328120602A	11/24/2016	00:57	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16328120602A	11/24/2016	00:41	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101A	11/20/2016	19:02	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16324004201A	11/19/2016	19:21	Kenneth A Bell	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16324004201A	11/19/2016	19:21	Kenneth A Bell	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16324004201A	11/19/2016	19:21	Kenneth A Bell	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA SAMPLE NO	Ο.	
VOLATILE ORGANICS ANAI			
TENTATIVELY IDENTIF	IED COMPOUNDS	!	!
		! 12MM6	!
Lab Name: Lancaster Laboratories	Contract:	_ !	!
Lab Code: LANCAS Case No.:	SAS No.:	SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 86951	86	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355	.i/16nov22a.b/yr	n22s10.
Level: (low/med) LOW	Date Received: 11/11	/16	
% Moisture: not dec.	Date Analyzed: 11/22	/16	
Column: (pack/cap) CAP	Dilution Factor: 1.0		

Date Analyzed: 11/22/16 Dilution Factor: 1.0 CONCENTRATION UNITS: Number TICs found: 0 (ug/L or ug/Kg) ug/L

	! COMPOUND NAME		EST. CONC.	! Q
	==!=========== !Total VOC TICs	====!======!	! =====================================	!===== ! IJ
		: :		: 0
2	<u> </u>	:i		:
		:		:
	<u> </u>	:		:
	!	:		·
		:		:
	<u> </u>	:		:
		:		:
-	i			:
	i			:
	<u> </u>	:		:
.3		:		:
. 4		:		:
	<u></u>	:i	·	·
	i	:		:
	i	ii		i
	!	:i	·	·
٥	!	:		:
		ii		:
		:i	·	·
	<u>i</u>	ii		:
		ii		:
		ii		·
	<u>i</u>			
	<u> </u>	:	·	i
		:	·	:
88		:		:
	!	ii	·	i
	<u> </u>	:		·
	_ <u>;</u>	:		:

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-1A-161110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695187 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 14:20 by LC C. T. Male Associates 50 Century Hill Drive

Submitted: 11/11/2016 09:25 Latham NY 12110

Reported: 01/05/2017 10:50

12MM7 SDG#: MMK12-07

GC/MS Volatiles SW-846 8260C ug/l ug/l ug/l 11997 Acetone 67-64-1 6 U 6 20	1
11007 Agetons	1
11997 Acetone 67-64-1 6 U 6 20	1
11997 Benzene 71-43-2 0.5 U 0.5 1	1
11997 Bromochloromethane 74-97-5 1 U 1 5	1
11997 Bromodichloromethane 75-27-4 0.5 U 0.5 1	1
11997 Bromoform 75-25-2 0.5 U 0.5 4	_ 1
11997 Bromomethane 74-83-9 0.5 U 0.5 1	1
11997 2-Butanone 78-93-3 3 U 3 10	1
11997 Carbon Disulfide 75-15-0 1 U 1 5	1
11997 Carbon Tetrachloride 56-23-5 0.5 U 0.5 1	1
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1	1
11997 Chloroethane 75-00-3 0.5 U 0.5 1	1
11997 Chloroform 67-66-3 0.5 U 0.5 1	1
11997 Chloromethane 74-87-3 0.5 U 0.5 1	1
11997 Cyclohexane 110-82-7 2 U 2 5	1
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5	1
11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1	1
11997 1,2-Dibromoethane 106-93-4 0.5 U 0.5 1	1
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5	1
11997 1,3-Dichlorobenzene 541-73-1 1 U 1 5	1
11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5	1
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1	1
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1	1
11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1	1
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1	1
11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1	1
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1	1
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1	1
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1	1
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1	1
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1	1
11997 Freon 113 76-13-1 2 U 2 10	1
11997 2-Hexanone 591-78-6 3 U 3 10	1
11997 Isopropylbenzene 98-82-8 1 U 1 5	1
11997 Methyl Acetate 79-20-9 1 U 1 5	1
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	1
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10	1
11997 Methylcyclohexane 108-87-2 1 U 1 5	1
11997 Methylene Chloride 75-09-2 2 U 2 4	1
11997 Styrene 100-42-5 1 U 1 5	1
11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1	1
11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1	1
11997 Toluene 108-88-3 0.5 U 0.5 1	1
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5	1
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5	1
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1	1
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1	1
11997 Trichloroethene 79-01-6 0.5 U 0.5 1	1
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1	1
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1	1
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1	1

^{*=}This limit was used in the evaluation of the final result



As Received

5.0

5.0

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-1A-161110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695187 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 14:20 by LC

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

As Received

Submitted: 11/11/2016 09:25 Reported: 01/05/2017 10:50

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

12MM7 SDG#: MMK12-07

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea	rch						
	The results from th FORM 1 - VOA-TIC. on the back of this	The qualifier						
Misc.	Organics	EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic a		335-67-1	26		0.5	2	1
10954	Perfluorononanoic a		375-95-1	0.6	U	0.6	2	1
10954			335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic		2058-94-8	1	U	1	3	1
10954			307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoi		72629-94-8	0.5	U	0.5	2	1
10954			376-06-7	0.5	U	0.5	2	1
10954			307-24-4	10		0.5	2	1
10954	-		375-85-9	7		0.5	2	1
10954			375-73-5	6		0.7	2	1
	Perfluorohexanesulf		355-46-4	1	J	1	3	1
10954	Perfluoro-octanesul	fonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic A	cid	375-22-4	5	J	3	10	1
10954	Perfluoropentanoic	Acid	2706-90-3	8		0.5	2	1
The	stated QC limits are	advisory only	y until suffic:	ient dat	ta points			
can	be obtained to calcul	late statisti	cal limits.					
Metal	5	SW-846 603	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	30.4		0.0382	0.400	1
01757	Magnesium		7439-95-4	6.44		0.0190	0.200	1
01762	Potassium		7440-09-7	5.80		0.160	1.00	1
01767	Sodium		7440-23-5	159		0.173	2.00	1
	2						_,,,	_
Wet Cl	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	319		20.0	40.0	100
00228	Sulfate		14808-79-8	10.7		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitra		n.a.	0.91		0.040	0.10	1
		SM 2320 B	_1007	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinita ta			-		<u>-</u> -	=	1
12150	Total Alkalinity to	рп 4.5	n.a.	10.3		1.7	5.0	1

1.7

10.3

1.7 U

n.a.

n.a.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-1A-161110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695187 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 14:20 by LC C. T. Male Associates 50 Century Hill Drive

Submitted: 11/11/2016 09:25 Latham NY 12110

Reported: 01/05/2017 10:50

12MM7 SDG#: MMK12-07

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

SM 2320 B-1997

SM 2320 B-1997

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles Y163271AA SW-846 8260C 1 11/22/2016 13:35 Kevin A Sposito 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 Y163271AA 11/22/2016 13:35 Kevin A Sposito 10954 14 PFCs EPA 537 Rev. 1.1 16323001 11/24/2016 04:37 Jason W Knight 1 modified EPA 537 Rev. 1.1 14091 PFAA Water Prep 16323001 Devon M Whooley 1 11/20/2016 12:00 1 modified 01750 Calcium SW-846 6010C 163260635001 1 11/22/2016 03:30 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163260635001 11/22/2016 03:30 Matthew R 1 Machtinger 01762 Potassium SW-846 6010C 1 163260635001 11/22/2016 03:30 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163260635001 11/22/2016 03:30 1 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163260635001 11/21/2016 16:40 Barbara A Kane 1 U4 00224 Chloride EPA 300.0 16328120602A 11/28/2016 01:28 Clinton M Wilson 100 00228 Sulfate EPA 300.0 16328120602A Hallie Burnett 1 11/24/2016 01:13 5 07882 Total Nitrite/Nitrate EPA 353.2 1 16325118101A 11/20/2016 19:04 Joseph E McKenzie 1 Nitrogen SM 2320 B-1997 16324004201A 12150 Total Alkalinity to pH 11/19/2016 18:05 Kenneth A Bell 16324004201A

16324004201A

11/19/2016 18:05

11/19/2016 18:05

Kenneth A Bell

Kenneth A Bell

1

1

1

1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA	SAMPLE N	10.
VOLATILE ORGANICS ANALYSIS DATA SHEET			
TENTATIVELY IDENTIFIED COMPOUNDS	!		!
	!	12MM7	!
Lab Name: Lancaster Laboratories Contract:	!		!
Lab Code: LANCAS Case No.: SAS No.:	SDG	No.:	
Matrix: (soil/water) WATER Lab Sample ID: 869	5187		
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP093	55.i/16nd	ov22a.b/y	m22s11.d

Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/:
Level: (low/med) LOW Date Received: 11/11/16
% Moisture: not dec. Date Analyzed: 11/22/16
Column: (pack/cap) CAP Dilution Factor: 1.0

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) ug/L

	! COMPOUND NAME		! EST. CONC.	~
	==!===================================	!	!======================================	!===== ! []
2		į		
	·	1	1	
	<u> </u>	i		<u>i</u>
	<u> </u>	i	!	<u>.</u>
	·	i		
	<u> </u>			
	<u> </u>		!	
	!			!
	<u> </u>	i	!	<u>.</u>
				!
	!			!
		i	!	!
	!	!	!	!
.5.		!	!	!
.6.		!	!	!
		!	!	!
.8.	!	!	!	!
.9.		!	!	!
20		!	!	!
21	!	!	!	!
		!	!	!
23	<u> </u>	!	!	!
24		!	!	!
25		!	!	!
26	!	!	!	!
27	!	!	!	!
	!	!	!	!
	!	!	!	!!
80	!	!	!	!
	1	1	1	

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-RB02-161110 Blank Water

SGPP - Merrimack

LL Sample # WW 8695188 LL Group # 1732751

Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 14:40 by LC

C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/11/2016 09:25

Reported: 01/05/2017 10:50

12MM8 SDG#: MMK12-08RB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
The	stated QC limits are advisory or		ient da	ta points			

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/24/2016	04:58	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16323001	11/20/2016	12:00	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-2A-161110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695189 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 16:15 by LC

C. T. Male Associates
50 Century Hill Drive

Submitted: 11/11/2016 09:25 Latham NY 12110

Reported: 01/05/2017 10:50

12MM9 SDG#: MMK12-09

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	3260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	IJ	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	tī	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	τι	0.5	1	1
			0.5	Ū	0.5	1	1
11997 11997	1,2-Dibromoethane	106-93-4 95-50-1	0.5 1	ττ	0.5	5	1
	1,2-Dichlorobenzene			-			
11997	1,3-Dichlorobenzene	541-73-1	1	U 	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U 	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	Ū	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	Ū	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	Ū	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	IJ	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	tī	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	Ū	0.5	1	1
1122/	m+b-virene	1/9001-23-1	0.5	U	0.5	1	±

^{*=}This limit was used in the evaluation of the final result



As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-2A-161110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695189 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 16:15 by LC C. T. Male Associates

As Received

50 Century Hill Drive Latham NY 12110

Submitted: 11/11/2016 09:25

Reported: 01/05/2017 10:50

12MM9 SDG#: MMK12-09

12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Se	arch						
	The results from to FORM 1 - VOA-TIC. on the back of this	The qualifier	-					
Misc.	Organics	EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic	acid	335-67-1	26		0.5	2	1
10954	Perfluorononanoic	acid	375-95-1	2		0.6	2	1
10954	Perfluorodecanoic	acid	335-76-2	0.6	J	0.5	2	1
10954	Perfluoroundecanoi	c acid	2058-94-8	1	U	1	3	1
10954			307-55-1	0.5	U	0.5	2	1
	Perfluorotridecand		72629-94-8	0.5	U	0.5	2	1
10954			376-06-7	0.5	U	0.5	2	1
	Perfluorohexanoic		307-24-4	12		0.5	2	1
	Perfluoroheptanoio		375-85-9	9		0.5	2	1
	Perfluorobutanesul		375-73-5	4		0.7	2	1
	Perfluorohexanesul		355-46-4	1	J	1	3	1
	Perfluoro-octanesu		1763-23-1	16		2	6	1
10954			375-22-4	6	J	3	10	1
10954	Perfluoropentanoio	: Acid	2706-90-3	13		0.5	2	1
	stated QC limits ar be obtained to calc	-	-	ient da	ta points			
Metal	3	SW-846 60	10C	mg/l		mg/l	mg/l	
	Calcium	2 020 00	7440-70-2	15.0		0.0382	0.400	1
01757	Magnesium		7439-95-4	2.50		0.0190	0.200	1
01762	Potassium		7440-09-7	2.51		0.160	1.00	1
01762	Sodium		7440-23-5	158		0.173	2.00	1
01707	30010111		7440-23-3	130		0.175	2.00	1
Wet C	nemistry	EPA 300.0		mg/1		mg/l	mg/l	
00224	Chloride		16887-00-6	285		20.0	40.0	100
00228	Sulfate		14808-79-8	11.6		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitr		n.a.	0.98		0.040	0.10	1
		SM 2320 B	_1007	ma / 1	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
10150	m-+-1 7111411					<u>-</u> .		1
12150	Total Alkalinity t	-	n.a.	21.9		1.7	5.0	1
12149	Bicarbonate Alkali	nity	n.a.	21.9		1.7	5.0	1

1.7 U

1.7

5.0

n.a.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-MER45-2A-161110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8695189 LL Group # 1732751 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/10/2016 16:15 by LC C. T. Male Associates

50 Century Hill Drive

11/21/2016 19:42

11/21/2016 19:42

11/21/2016 19:42

Kenneth A Bell

Kenneth A Bell

Kenneth A Bell

1

1

Latham NY 12110

Submitted: 11/11/2016 09:25 Reported: 01/05/2017 10:50

12MM9 SDG#: MMK12-09

Nitrogen

12150 Total Alkalinity to pH

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

Sample Comments

Laboratory Sample Analysis Record

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Method

SM 2320 B-1997

SM 2320 B-1997

SM 2320 B-1997

CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles Y163271AA SW-846 8260C 1 11/22/2016 13:57 Kevin A Sposito 1 01163 GC/MS VOA Water Prep SW-846 5030C 1 Y163271AA 11/22/2016 13:57 Kevin A Sposito 10954 14 PFCs EPA 537 Rev. 1.1 16323001 11/24/2016 05:18 Jason W Knight 1 modified EPA 537 Rev. 1.1 14091 PFAA Water Prep 16323001 11/20/2016 12:00 Devon M Whooley 1 1 modified 01750 Calcium SW-846 6010C 163260635001 1 11/22/2016 03:33 Matthew R Machtinger 01757 Magnesium SW-846 6010C 163260635001 11/22/2016 03:33 Matthew R 1 Machtinger 01762 Potassium SW-846 6010C 1 163260635001 11/22/2016 03:33 Matthew R 1 Machtinger 01767 Sodium SW-846 6010C 163260635001 11/22/2016 03:33 1 Matthew R Machtinger 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 163260635001 11/21/2016 16:40 Barbara A Kane 1 U4 00224 Chloride EPA 300.0 16328120602A 11/28/2016 01:43 Clinton M Wilson 100 00228 Sulfate EPA 300.0 16328120602A Hallie Burnett 1 11/24/2016 01:44 5 07882 Total Nitrite/Nitrate EPA 353.2 1 16325118101A 11/20/2016 19:06 Joseph E McKenzie 1

16326010102A

16326010102A

16326010102A

1

1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA	SAMPLE NO.	
VOLATILE ORGANICS ANALYSIS DATA SHEET	_		_
TENTATIVELY IDENTIFIED COMPOUNDS	!		_ !
	!	12MM9	!
Lab Name: Lancaster Laboratories Contract:	!		_!
Lab Code: LANCAS Case No.: SAS No.:	SDG	No.:	
Matrix: (soil/water) WATER Lab Sample ID: 8695189			

Matrix: (soil/water) WATER

Sample wt/vol: 5.0 (g/mL)mL

Level: (low/med) LOW

Moisture: not dec.

Lab Sample ID: 8695189

Lab File ID: HP09355.i/16nov22a.b/yn22s12.d

Date Received: 11/11/16

Date Analyzed: 11/22/16

% Moisture: not dec.

Column: (pack/cap) CAP

Date Analyzed: 11/22/16

Dilution Factor: 1.0

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) ug/L

	! COMPOUND NAME		EST. CONC.	~
	==!============ !Total VOC TICs	====!=====:! !	!	•
	_!	i		. 0
	<u>;</u>	i	·	;———
	<u>;</u>	i	i	;
	i	i		!
	<u> </u>	i		!
	<u> </u>	i		!
	!			!
	!			
1.	<u> </u>	· ·		!
	!			!
	<u> </u>	· ·		!
	<u> </u>	!		!
	!			!
.6.	!	!	!	!
	!	!	!	!
.8.	!	!	!	!
	!	!	!	!
20	!	!	!	!
21	!	!!	!	!
.2	!	!!		!
	!	!!	<u> </u>	!
24	!	!!		!
25		!!	!	!
26		!!		!
	!	!!		!
	!	!!		!
	!!	!!		!
0	!	!!		!
	!			!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732751

Reported: 01/05/2017 10:50

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Batch number: Y163271AA	Sample	number	r(s): 86	595178,8695181-8695184,8695186-8695187,8695189
Acetone	6	U	6	20
Benzene	0.5	U	0.5	1
Bromochloromethane	1	U	1	5
Bromodichloromethane	0.5	U	0.5	1
Bromoform	0.5	U	0.5	4
Bromomethane	0.5	U	0.5	1
2-Butanone	3	U	3	10
Carbon Disulfide	1	U	1	5
Carbon Tetrachloride	0.5	U	0.5	1
Chlorobenzene	0.5	U	0.5	1
Chloroethane	0.5	U	0.5	1
Chloroform	0.5	U	0.5	1
Chloromethane	0.5	U	0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	U	2	5
Dibromochloromethane	0.5	U	0.5	1
1,2-Dibromoethane	0.5	U	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5
Dichlorodifluoromethane	0.5	U	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	U	0.5	1
trans-1,2-Dichloroethene	0.5	U	0.5	1
1,2-Dichloropropane	0.5	U	0.5	1
cis-1,3-Dichloropropene	0.5	U	0.5	1
trans-1,3-Dichloropropene	0.5	U	0.5	1
Ethylbenzene	0.5	U	0.5	1
Freon 113	2	U	2	10
2-Hexanone	3	U	3	10
Isopropylbenzene	1	U	1	5
Methyl Acetate	1	U	1	5
Methyl Tertiary Butyl Ether	0.5	U	0.5	1
4-Methyl-2-pentanone	3	U	3	10
Methylcyclohexane	1	U	1	5
Methylene Chloride	2	U	2	4
Styrene	1	U	1	5
1,1,2,2-Tetrachloroethane	0.5	U	0.5	1

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732751

Reported: 01/05/2017 10:50

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Tetrachloroethene	0.5	U	0.5	1
Toluene	0.5	U	0.5	1
1,2,3-Trichlorobenzene	1	U	1	5
1,2,4-Trichlorobenzene	1	U	1	5
1,1,1-Trichloroethane	0.5	U	0.5	1
1,1,2-Trichloroethane	0.5	U	0.5	1
Trichloroethene	0.5	U	0.5	1
Trichlorofluoromethane	0.5	U	0.5	1
Vinyl Chloride	0.5	U	0.5	1
m+p-Xylene	0.5	U	0.5	1
o-Xylene	0.5	U	0.5	1
	ng/l		ng/l	ng/l
Batch number: 16323001	-			178-8695184,8695186-8695189
Perfluorooctanoic acid	0.5	U	0.5	2
Perfluorononanoic acid	0.6	U	0.6	2
Perfluorodecanoic acid	0.5	U	0.5	2
Perfluoroundecanoic acid	1	U	1	3
Perfluorododecanoic acid	0.5	U	0.5	2
Perfluorotridecanoic acid	0.5	U	0.5	2
Perfluorotetradecanoic acid	0.5	U	0.5	2
Perfluorohexanoic acid	0.5	U	0.5	2
Perfluoroheptanoic acid	0.5	U	0.5	2
Perfluorobutanesulfonate Perfluorohexanesulfonate	0.7	U	0.7	2
Perfluoronexanesulfonate Perfluoro-octanesulfonate	1 2	U U	1 2	3 6
Perfluoro-octanesulionate Perfluorobutanoic Acid	3	U	3	10
Perfluoropentanoic Acid	0.5	IJ	0.5	2
refilitoropentanoic Acid		O		_
	mg/l		mg/l	mg/l
Batch number: 163260635001				181-8695187,8695189
Calcium	0.0508		0.0382	0.400
Magnesium	0.0190		0.0190	0.200
Potassium Sodium	0.160 0.173	U	0.160	1.00
	0.173	U	0.173	2.00
Batch number: 16325118101A				181-8695183,8695185-8695187,8695189
Total Nitrite/Nitrate Nitrogen	0.040	Ū	0.040	0.10
Batch number: 16328120602A				181-8695183,8695185-8695187,8695189
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
	mg/l a	s CaCO3	mg/l as CaCO3	mg/l as CaCO3
Batch number: 16324004201A	Sample	number		182-8695187
Total Alkalinity to pH 4.5	1.7	U	1.7	5.0
Batch number: 16326010102A				181,8695189
Total Alkalinity to pH 4.5	1.7	U	1.7	5.0

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732751

Reported: 01/05/2017 10:50

Method Blank (continued)

Analysis Name Result MDL** LOQ mg/l as CaCO3 mg/l as mg/l as

CaCO3 CaCO3

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: Y163271AA	Sample number	r(s): 86951	78,8695181-869	95184,8695	186-8695	187,8695	189		
Acetone	150	162.15			108		50-168		
Benzene	20	20.64			103		78-120		
Bromochloromethane	20	20.95			105		80-125		
Bromodichloromethane	20	21.38			107		80-120		
Bromoform	20	18.65			93		59-120		
Bromomethane	20	18.05			90		55-123		
2-Butanone	150	125.59			84		57-145		
Carbon Disulfide	20	21.71			109		58-120		
Carbon Tetrachloride	20	20.98			105		74-130		
Chlorobenzene	20	19.98			100		80-120		
Chloroethane	20	19.07			95		56-120		
Chloroform	20	21.1			105		80-120		
Chloromethane	20	18.62			93		59-127		
Cyclohexane	20	20.13			101		65-131		
1,2-Dibromo-3-chloropropane	20	16.35			82		59-120		
Dibromochloromethane	20	20.27			101		78-120		
1,2-Dibromoethane	20	19.96			100		80-120		
1,2-Dichlorobenzene	20	19.85			99		80-120		
1,3-Dichlorobenzene	20	19.59			98		80-120		
1,4-Dichlorobenzene	20	19.81			99		80-120		
Dichlorodifluoromethane	20	17.52			88		49-134		
1,1-Dichloroethane	20	22.09			110		80-120		
1,2-Dichloroethane	20	22.66			113		66-128		
1,1-Dichloroethene	20	21.14			106		76-124		
cis-1,2-Dichloroethene	20	20.49			102		80-120		
trans-1,2-Dichloroethene	20	21.15			106		80-120		
1,2-Dichloropropane	20	21.64			108		80-120		
cis-1,3-Dichloropropene	20	20.11			101		80-120		
trans-1,3-Dichloropropene	20	20.97			105		76-120		
Ethylbenzene	20	20.36			102		78-120		
Freon 113	20	20.62			103		64-136		
2-Hexanone	100	88.38			88		49-146		
Isopropylbenzene	20	19.7			99		80-120		
Methyl Acetate	20	19.85			99		61-137		
Methyl Tertiary Butyl Ether	20	20.21			101		75-120		
4-Methyl-2-pentanone	100	91.69			92		55-141		
Methylcyclohexane	20	19.98			100		66-126		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732751

Reported: 01/05/2017 10:50

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Methylene Chloride	20	20.4			102		80-120		
Styrene	20	19.19			96		80-120		
1,1,2,2-Tetrachloroethane	20	18.87			94		72-120		
Tetrachloroethene	20	23.36			117		80-129		
Toluene	20	20.51			103		80-120		
1,2,3-Trichlorobenzene	20	18.8			94		69-120		
1,2,4-Trichlorobenzene	20	18.75			94		72-120		
1,1,1-Trichloroethane	20	17.76			89		66-126		
1,1,2-Trichloroethane	20	20.01			100		80-120		
Trichloroethene	20	20.73			104		80-120		
Trichlorofluoromethane	20	19.36			97		67-129		
Vinyl Chloride	20	18.67			93		63-121		
m+p-Xylene	40	39.71			99		80-120		
o-Xylene	20	19.22			96		80-120		
	ng/l	ng/l	ng/l	ng/l					
Batch number: 16323001	Sample numbe	er(s): 86951	78-8695184,86	95186-8695	5189				
Perfluorooctanoic acid	200	220.63			110		70-130		
Perfluorononanoic acid	200	223.78			112		70-130		
Perfluorodecanoic acid	200	235.81			118		70-130		
Perfluoroundecanoic acid	200	255.05			128		70-130		
Perfluorododecanoic acid	200	224.06			112		70-130		
Perfluorotridecanoic acid	200	231.67			116		70-130		
Perfluorotetradecanoic acid	200	237.28			119		70-130		
Perfluorohexanoic acid	200	229.07			115		70-130		
Perfluoroheptanoic acid	200	249.12			125		70-130		
Perfluorobutanesulfonate	176.8	207.45			117		70-130		
Perfluorohexanesulfonate	189.2	207.01			109		70-130		
Perfluoro-octanesulfonate	191.2	238.21			125		70-130		
Perfluorobutanoic Acid	200	230.06			115		70-130		
Perfluoropentanoic Acid	200	237.02			119		70-130		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 163260635001		er(s): 86951	81-8695187,86	95189					
Calcium	4.00	3.96			99		80-120		
Magnesium	2.00	1.96			98		80-120		
Potassium	10	9.91			99		80-120		
Sodium	10	9.65			96		80-120		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 16325118101A	Sample number	er(s): 86951	81-8695183,86	95185-8695	187,8695	189			
Total Nitrite/Nitrate Nitrogen	2.50	2.43			97		90-110		
Batch number: 16328120602A	Cample numbe	om/a): 060E1	.81-8695183,86	06106 0606	107 0605	1 0 0			
Chloride	3.00	3.05	.01-0033103,86	20102-0095	102	103	90-110		
Sulfate	7.50	7.69			102		90-110		
SUITALE	7.50	1.09			102		90-110		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732751

Reported: 01/05/2017 10:50

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/1 as CaCO3	LCS Conc mg/l as CaCO3	LCSD Spike Added mg/l as CaCO3	LCSD Conc mg/l as CaCO3	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 16324004201A	Sample number	er(s): 8695	182-8695187						
Total Alkalinity to pH 4.5	188	185.14			98		84-110		
Batch number: 16326010102A	Sample numbe	er(s): 8695	181,8695189						
Total Alkalinity to pH 4.5	188	181.54			97		84-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspi Cor ug/	ıc	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: Y163271AA	Sample	numb	er(s): 8695	178,8695	181-8695184	,8695186-	8695187,8	8695189	UNSPK: 869	5182	
Acetone	6	U	150	161.08	150	155.86	107	104	50-168	3	30
Benzene	0.5	U	20	21.96	20	21.82	110	109	78-120	1	30
Bromochloromethane	1	U	20	21.86	20	21.88	109	109	80-125	0	30
Bromodichloromethane	0.5	U	20	22.37	20	22.13	112	111	80-120	1	30
Bromoform	0.5	U	20	19.03	20	18.54	95	93	59-120	3	30
Bromomethane	0.5	U	20	19.24	20	18.93	96	95	55-123	2	30
2-Butanone	3	U	150	129.52	150	125.61	86	84	57-145	3	30
Carbon Disulfide	1	U	20	23.87	20	23.67	119	118	58-120	1	30
Carbon Tetrachloride	0.5	U	20	23.15	20	22.95	116	115	74-130	1	30
Chlorobenzene	0.5	U	20	21.29	20	20.91	106	105	80-120	2	30
Chloroethane	0.5	U	20	20.92	20	20.44	105	102	56-120	2	30
Chloroform	0.5	U	20	22.24	20	22.09	111	110	80-120	1	30
Chloromethane	0.5	U	20	19.89	20	19.82	99	99	59-127	0	30
Cyclohexane	2	U	20	22.24	20	22.25	111	111	65-131	0	30
1,2-Dibromo-3-chloropropane	2	U	20	16.5	20	16.43	83	82	59-120	0	30
Dibromochloromethane	0.5	U	20	20.88	20	20.57	104	103	78-120	2	30
1,2-Dibromoethane	0.5	U	20	20.65	20	20.24	103	101	80-120	2	30
1,2-Dichlorobenzene	1	U	20	20.5	20	20.58	103	103	80-120	0	30
1,3-Dichlorobenzene	1	U	20	20.63	20	20.48	103	102	80-120	1	30
1,4-Dichlorobenzene	1	U	20	20.99	20	20.57	105	103	80-120	2	30
Dichlorodifluoromethane	0.5	U	20	19.33	20	19.01	97	95	49-134	2	30
1,1-Dichloroethane	0.5	U	20	23.4	20	23.48	117	117	80-120	0	30
1,2-Dichloroethane	0.5	U	20	23.13	20	22.72	116	114	66-128	2	30
1,1-Dichloroethene	0.5	U	20	23.5	20	23.13	118	116	76-124	2	30
cis-1,2-Dichloroethene	0.5	U	20	21.47	20	21.28	107	106	80-120	1	30
trans-1,2-Dichloroethene	0.5	U	20	23.06	20	22.81	115	114	80-120	1	30
1,2-Dichloropropane	0.5	U	20	22.51	20	22.52	113	113	80-120	0	30
cis-1,3-Dichloropropene	0.5	U	20	20.58	20	20.45	103	102	80-120	1	30
trans-1,3-Dichloropropene	0.5	U	20	21.48	20	21.38	107	107	76-120	0	30
Ethylbenzene	0.5	U	20	21.56	20	21.61	108	108	78-120	0	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732751

Reported: 01/05/2017 10:50

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Freon 113	2 U	20	23.14	20	22.33	116	112	64-136	4	30
2-Hexanone	3 U	100	90.53	100	88.83	91	89	49-146	2	30
Isopropylbenzene	1 U	20	21.07	20	20.95	105	105	80-120	1	30
Methyl Acetate	1 U	20	19.77	20	19.4	99	97	61-137	2	30
Methyl Tertiary Butyl Ether	0.5 U	20	21	20	20.89	105	104	75-120	1	30
4-Methyl-2-pentanone	3 U	100	93.2	100	90.65	93	91	55-141	3	30
Methylcyclohexane	1 U	20	22.3	20	22.12	112	111	66-126	1	30
Methylene Chloride	2 U	20	21.38	20	20.98	107	105	80-120	2	30
Styrene	1 U	20	20.17	20	20.01	101	100	80-120	1	30
1,1,2,2-Tetrachloroethane	0.5 U	20	19.62	20	19.04	98	95	72-120	3	30
Tetrachloroethene	0.5 U	20	23.05	20	22.98	115	115	80-129	0	30
Toluene	0.5 U	20	21.57	20	21.63	108	108	80-120	0	30
1,2,3-Trichlorobenzene	1 U	20	18.87	20	19.03	94	95	69-120	1	30
1,2,4-Trichlorobenzene	1 U	20	18.84	20	18.93	94	95	72-120	0	30
1,1,1-Trichloroethane	0.5 U	20	19.4	20	19.27	97	96	66-126	1	30
1,1,2-Trichloroethane	0.5 U	20	20.46	20	20.39	102	102	80-120	0	30
Trichloroethene	0.5 U	20	22.3	20	22.22	112	111	80-120	0	30
Trichlorofluoromethane	0.5 U	20	21.23	20	20.99	106	105	67-129	1	30
Vinyl Chloride	0.5 U	20	20.3	20	20.29	101	101	63-121	0	30
m+p-Xylene	0.5 U	40	42.63	40	42.42	107	106	80-120	0	30
o-Xylene	0.5 U	20	20.17	20	20.09	101	100	80-120	0	30
	ng/l	ng/l	ng/l	ng/l	ng/l					
Batch number: 16323001	Sample num	her(a): 869	5178-8695	184,8695186	-8695189	IINISDK: 8	695182			
Perfluorooctanoic acid	17.21	200.1	272.84	200.54	254.41	128	118	70-130	7	30
Perfluorononanoic acid	0.6 U	200.1	240.34	200.51	253.58	120	126	70-130	5	30
Perfluorodecanoic acid	0.5 U	200.1	216.95	200.51	238.49	108	119	70-130	9	30
Perfluoroundecanoic acid	1 U	200.1	235.95	200.51	246.51	118	123	70-130	4	30
Perfluorododecanoic acid	0.5 U	200.1	244.94	200.51	238.75	122	119	70-130	3	30
Perfluorotridecanoic acid	0.5 U	200.1	253.99	200.54	249.48	127	124	70-130	2	30
Perfluorotetradecanoic acid	0.5 U	200.1	238.31	200.54	251.35	119	125	70-130	5	30
Perfluorohexanoic acid	4.43	200.1	244.08	200.54	254.68	120	125	70-130	4	30
Perfluoroheptanoic acid	3.36	200.1	254.92	200.54	265.92	126	131*	70-130	4	30
Perfluorobutanesulfonate	1.19	177.09	215.36	177.48	214.43	121	120	70-130	0	30
Perfluorohexanesulfonate	1.11	189.1	217.69	189.51	221.71	115	116	70-130	2	30
Perfluoro-octanesulfonate	2 U	191.1	269.13	191.52	226.3	141*	118	70-130	17	3.0
Perfluorobutanoic Acid	3 U	200.1	233.86	200.54	239.31	117	119	70-130	2	30
Perfluoropentanoic Acid	3.77	200.1	245.47	200.54	246.78	121	121	70-130	1	30
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 163260635001			-	187,8695189		695182				
Calcium	21	4.00	24.82	4.00	24.6	95 (2)	90 (2)	75-125	1	20
Magnesium	3.69	2.00	5.60	2.00	5.56	95 (2)	90 (2)	75-125	1	20
Potassium	1.93	10	11.87	10	11.65	99	94 97	75-125	2	20
Sodium	1.93 74.73	10	84.63	10	84.03	99 (2)	93 (2)	75-125	1	20
BOULUM	14.13	10	04.03	10	04.03	99 (Z)	93 (4)	13-125	Τ.	20

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732751

Reported: 01/05/2017 10:50

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/l	MS Spike Added mg/l	MS Conc mg/l	MSD Spike Added mg/l	MSD Conc mg/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 16325118101A	Sample numb			183,8695185	-8695187,		UNSPK:			
Total Nitrite/Nitrate Nitrogen	1.02	2.00	3.07			102		90-110		
Batch number: 16328120602A Chloride Sulfate	Sample numb 154.88 10.32	er(s): 8695 200 50	5181-8695 350.26 59.91	183,8695185	5-8695187,	8695189 98 99	UNSPK:	8695182 90-110 90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16324004201A	Sample numb	er(s): 8695	182-8695	187 UNSPK:	8695182					
Total Alkalinity to pH 4.5	16.67	188	185.69	188	195.59	90	95	84-110	5	5
Batch number: 16326010102A	Sample numb	er(s): 8695	181,8695	189 UNSPK:	P697075					
Total Alkalinity to pH 4.5	17.59	188	183.25	188	191.31	88	92	84-110	4	5

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max	
Batch number: 163260635001 Calcium Magnesium Potassium Sodium	Sample number(s): 21 3.69 1.93 74.73	8695181-8695187,8695 21.11 3.72 1.97 75.24	5189 BKG: 8 1 1 2 (1) 1	695182 20 20 20 20 20	
	mg/l	mg/l			
Batch number: 16325118101A Total Nitrite/Nitrate Nitrogen	Sample number(s): 1.02	8695181-8695183,8695 1.04	5185-869518 2	7,8695189 BKG: 8695182 2	
Batch number: 16328120602A Chloride Sulfate	Sample number(s): 154.88 10.32	8695181-8695183,8695 160.41 10.34	5185-869518 4 0 (1)	7,8695189 BKG: 8695182 15 15	
	mg/l as CaCO3	mg/l as CaCO3			
Batch number: 16324004201A Total Alkalinity to pH 4.5	Sample number(s): 16.67	8695182-8695187 BKG: 16.81	8695182 1 (1)	5	
Batch number: 16326010102A Total Alkalinity to pH 4.5	Sample number(s): 17.59	8695181,8695189 BKG: 20.4	P697075 15* (1)	5	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732751

Reported: 01/05/2017 10:50

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: Y163271AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8695178	102	102	98	96
8695181	102	104	98	95
8695182	103	101	98	96
8695183	100	100	98	100
8695184	100	98	98	100
8695186	103	102	97	96
8695187	103	103	98	96
8695189	103	100	97	96
Blank	102	102	98	98
LCS	100	102	99	99
MS	100	100	98	100
MSD	100	98	98	100
Limits:	80-116	77-113	80-113	78-113

Analysis Name: 14 PFCs Batch number: 16323001

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8695178	68*	67*	62*	67*	67*	69*
8695179	66*	69*	60*	71	65*	65*
8695180	59*	58*	53*	56*	55*	56*
8695181	62*	72	65*	65*	63*	63*
8695182	56*	66*	61*	61*	58*	57*
8695183	61*	61*	56*	62*	68*	64*
8695184	64*	62*	62*	66*	65*	61*
8695186	60*	67*	70	55*	51*	53*
8695187	54*	55*	50*	56*	61*	57*
8695188	56*	53*	47*	57*	62*	57*
8695189	60*	61*	56*	59*	60*	59*
Blank	69*	73	62*	75	81	74
LCS	66*	62*	59*	66*	71	64*
MS	61*	61*	56*	62*	68*	64*
MSD	64*	62*	62*	66*	65*	61*
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8695178	68*	67*	66*	75	82	69*
8695179	65*	68*	70	64*	79	57*
8695180	57*	62*	70	66*	72	58*
8695181	60*	61*	58*	59*	76	56*
8695182	56*	53*	58*	58*	68*	56*

69*

82

70

58*

8695183

55*

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

58*

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732751

Reported: 01/05/2017 10:50

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 14 PFCs Batch number: 16323001

	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA	
8695184	66*	67*	59*	60*	96	62*	-
8695186	59*	67*	79	58*	87	56*	
8695187	55*	47*	46*	48*	66*	45*	
8695188	53*	61*	60*	55*	69*	53*	
8695189	60*	54*	61*	64*	76	62*	
Blank	73	73	65*	66*	99	66*	
LCS	68*	55*	63*	64*	86	68*	
MS	58*	55*	58*	69*	82	70	
MSD	66*	67*	59*	60*	96	62*	
Limits:	70-130	70-130	70-130	70-130	70-130	70-130	

	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
8695178	87	67*	57*	
8695179	83	60*	53*	
8695180	68*	62*	64*	
8695181	83	49*	44*	
8695182	78	57*	52*	
8695183	89	63*	63*	
8695184	88	66*	60*	
8695186	108	59*	70	
8695187	65*	51*	45*	
8695188	74	45*	43*	
8695189	83	61*	50*	
Blank	86	65*	60*	
LCS	90	68*	63*	
MS	89	63*	63*	
MSD	88	66*	60*	
Limits:	70-130	70-130	70-130	

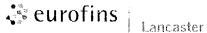
^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

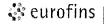
P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.



Laboratories

Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #:						1327	51		Sam	ple #:	8(<u> 95</u>	17	B-6	39						COC#:	15594
Client: C.T. Male Associates						Matri	x		Analyses Requested								For Lab Use Only					
Project Name/#: SGPP - Merrimack	Site ID:				Preserv			rvati	ori (Code	es				SF#: <u>286049</u>							
Project Manager: Kirk Moline	P.O. #:	16.613	16] ម្	l pu			Н	N	s										SCR#: <u>19606</u>	9
Sampler: LC JC RH					Sediment	Ground	4		s				0 B)								Preserva	tion Codes
Phonc #: 5\8-786-7500 Quote #: 214135			Sed		7/2	ers	- TICs	ပ	(353.2)		1 2320	$\left \begin{array}{c} \Xi \end{array} \right $						Į	H = HCI	T = Thiosulfate		
State where sample(s) were collected: NH						ble ES	スプ	Containers	်ပွဲ	(6010C)		6	MS) q	7 mod.)							N = HNO ₃	B = NaOH
	0-11-	-4:-		क		Potable NPDES	iank		(8260C)	Na, K	/ NO3	(300.0)	Carb/Bicarb	4 537							S = H₂SO₄	P = H ₃ PO ₄
	Colle	ection		osií			$ \alpha \rangle$	# of	VOAs	y, Na	102) -40	Carb/	(EPA							O = Other	
Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other:	Total	7CL V	Ca, Mg, I	Total NO2	CI-, SC	ALK +	PFCs						Ì	Ren	narks
SG2-LTB01-161110	11/10/16	(a) - market to the later to t					X	3	X					X								
5G2-RB01-161110	- Common of the	0800	X				ŤΧ							X								
SG2-FTB01-161110	Windows and the second	0805	 			†	X	17						X						\neg		
5G2-LNGMW-H61110		110 S	X			X		111	X	×	X	X	×	X								
SG2-MER45-10-161110		1310	X			X		34	X	X	X	×	X	X								
SG2-LNGMW-3-161110		1315	X			X		Til	X	X	X	×	X	X								
SG2-MER45-1A-161110	No.	1420	\times			X		15	X	X	X	X	×	\times								
SG2-REO2-161110	W PRO LINGS	1440	\times				X	. 1						X								
SG2-MER45-2A-161110		1615	X			X		1	Χ	X	X	X	X	×								
;																						
Turnaround Time Requested (TAT) (please of	heck): Stand	dard 💢	RUSH	1 🗌	Reli	nguishe	d by:	,			Date			Time	1	Rec	eived	d by:			Date	Time
RUSH TAT is subject to Eurofins Lancaster Laboratori	es approval	and surchar	ges.)		QZ Dati	enen		em	N		110/			<u>730</u>		D	_!	J I				T:
Date results are needed: E-mail address to send RUSH results:	Minely) (b aa	110	CON	-1	nquishe	a by:				Date	•	_	Time		Rec	eived	d by:			Date	Time
Data Package Options (please check if require		2 Um	NI C.	CU I		nquishe	d by:				Date		person di sala	Time		Rec	eived	 d by:		74	Date	Time
Type I (Validation/non-CLP)		TX TRRP	- 13				•															
				Reli	nquishe	d by:				Date			Time		Rec	eive	y by:			Date	Time	
	Type in (Neutropa field 221)						,	A ROBERT OF THE SERVICE OF THE SERVI									/					
	уре В 🗌				Reli	nquishe	d by:				Date			Time		Rec	1	d by:			Date	Time २१८
EDD Format. EQuIS		· · · · · · · · · · · · · · · · · · ·			A July 7	II No.:											⇔				11.11.16	
If site-specific QC (MS/MSD/Dup) required, i	ndicate Q(C sample	s and			quished		nmerc Ex			r					Tem	nera	iture i	unon	rece	int Ole - 3	3-) °C



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

167974

Group Number(s): 1732751

Client: C.T. Male

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

<u>11/11/2016 9:25</u>

Number of Packages:

<u>3</u>

Number of Projects:

1

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

Yes

Custody Seal Present:

Yes

Sample Date/Times match COC:

Yes

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

Air Quality Samples Present:

No

Samples Chilled:

Yes

Total Trip Blank Qty:

3

Paperwork Enclosed:

Yes

Trip Blank Type:

See Below No

Samples Intact:

Yes No

Missing Samples: Extra Samples:

No

Discrepancy in Container Qty on COC:

No

Trip Blank Type(s): 2 HCL, 1 250ml Unpreserved plastic bottle.

Unpacked by Timothy Cubberley (6520) at 12:34 on 11/11/2016

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	<u>Ice Type</u>	Ice Present?	Ice Container	Elevated Temp?
1	DT131	1.2	DT	Wet	Υ	Bagged	N
2	DT131	0.6	DT	Wet	Υ	Bagged	N
3	DT131	3.1	. DT	Wet	Υ	Bagged	N

General Comments:

SG2-MER45-10-161110 rec'd a Metals Batch QC



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RLReporting Limit kg **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: January 30, 2017

Project: SGPP - Merrimack

Submittal Date: 11/15/2016 Group Number: 1733211 SDG: MMK13 PO Number: 16.6126 State of Sample Origin: NH

	Lancaster Labs
Client Sample Description	<u>(LL) #</u>
SG2-LTB01-161114 Blank Water	8697066
SG2-MVD4-00-161114 Grab Groundwater	8697067
SG2-MVD4-10-161114 Grab Groundwater	8697068
SG2-MVD4-20-161114 Grab Groundwater	8697069
SG2-MVD4-30-161114 Grab Groundwater	8697070
SG2-FTB01-161114 Grab Blank Water	8697071
SG2-MVD5-00-161114 Grab Groundwater	8697072
SG2-MVD5-10-161114 Grab Groundwater	8697073
SG2-MVD5-20-161114 Grab Groundwater	8697074
SG2-MVD5-30-161114 Grab Groundwater	8697075
SG2-MVD5-30-161114 MS Grab Groundwater	8697076
SG2-MVD5-30-161114 MSD Grab Groundwater	8697077
SG2-MVD5-30-161114 Dupl Grab Groundwater	8697078
SG2-MVDFD01-161114 Grab Groundwater	8697079

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	C. T. Male Associates	Attn: Jeff Marx
Electronic Copy To	C. T. Male Associates	Attn: Dan Reilly
Electronic Copy To	C. T. Male Associates	Attn: Kirk Moline



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250



Project Name: SGPP - Merrimack LL Group #: 1733211

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

EPA 537 Rev. 1.1 modified, Misc. Organics

<u>Sample #s: 8697066, 8697067, 8697068, 8697069, 8697070, 8697071, 8697072, 8697073, 8697074, 8697075, 8697076, 8697077, 8697079</u>

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Batch #: 16327003 (Sample number(s): 8697066-8697077, 8697079 UNSPK: 8697075)

The recovery(ies) for the following analyte(s) in the LCS were below the acceptance window: NEtFOSAA

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: NEtFOSAA, NMeFOSAA

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8697066, 8697067, 8697068, 8697069, 8697070, 8697071, 8697072, 8697073, 8697074, 8697075, 8697076, 8697077, 8697079, Blank, LCS, MS, MSD

EPA 300.0, Wet Chemistry

<u>Batch #: 16331972171A (Sample number(s): 8697067-8697070, 8697072-8697076, 8697078-8697079 UNSPK: 8697075 BKG: 8697075)</u>

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Chloride

EPA 353.2, Wet Chemistry

<u>Batch #: 16325118101B (sample number(s): 8697067-8697070, 8697072-8697076, 8697078-8697079 UNSPK: 8697075 BKG: 8697075)</u>

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Nitrite/Nitrate Nitrogen

SM 2320 B-1997, Wet Chemistry

<u>Batch #: 16326010102A (Sample number(s): 8697075-8697078 UNSPK: 8697075 BKG: P8697075-P697666)</u>

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Total Alkalinity to pH $4.5\,$

v 1.9.4



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-LTB01-161114 Blank Water

SGPP - Merrimack

LL Sample # WW 8697066 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/15/2016 09:40 Reported: 01/30/2017 13:32

M1301 SDG#: MMK13-01TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	Ū	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	Ū	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	IJ	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	Ū	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
11997	2-Hexanone	591-78-6	3	IJ	3	10	1
11997	Isopropylbenzene	98-82-8	1	IJ	1	5	1
11997	Methyl Acetate	79-20-9	1	IJ	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	IJ	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	IJ	1	5	1
11997	Methylene Chloride	75-09-2	2	II	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	Ū	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	IJ	0.5	1	1
11997	Toluene	108-88-3	0.5	Ū	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	IJ	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-00-5	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	IJ	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U II	0.5	1	<u>⊥</u> 1
11997	m+b-vitene	1/2001-23-1	0.5	U	0.5	т.	±

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-LTB01-161114 Blank Water

SGPP - Merrimack

LL Sample # WW 8697066 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/15/2016 09:40

Reported: 01/30/2017 13:32

M1301 SDG#: MMK13-01TB

CAT No.	Analysis Name		CAS Number	Result	=	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles o-Xylene	SW-846	8260C 95-47-6	ug/l 0.5	U	ug/l 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Misc.	Organics EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
	modifie	d					
10954	Perfluorooctanoic acid	335-67-1	1	U	1	2	1
10954	Perfluorononanoic acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid	307-24-4	1	U	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	1	U	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	5	U	5	10	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	1	U	1	3	1
10954	NETFOSAA	2991-50-6	5	U	5	8	1
	NEtFOSAA is the acronym for N	-ethyl perfluorod	octanes	ulfonamido	pacetic Acid.		
10954	NMeFOSAA	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acronym for N	-methyl perfluoro	octane	sulfonamio	doacetic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163281AA	11/23/2016	10:42	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163281AA	11/23/2016	10:42	Kevin A Sposito	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16327003	11/30/2016	05:43	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16327003	11/25/2016	08:45	Robert Brown	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Lab Name: Lancas Lab Code: LANCAS Matrix: (soil/wa Sample wt/vol: Level: (low/med) % Moisture: not Column: (pack/c	5.0 (g/mL)mL La LOW Dat dec. Dat ap) CAP Dil C	Contract: SAS No.: Sample ID: 8	697066 9915.i/16nov23a 1/15/16 1/23/16 1.0 UNITS:	!
! ! CAS NUMBER	! COMPOUND NAME	! ! RT	! EST. CONC. !	! ! Q !
3	!Total VOC TICS ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! !			

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD4-00-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697067 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 13:35 by JD C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/15/2016 09:40 Reported: 01/30/2017 13:32

M1302 SDG#: MMK13-02

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



5.0

5.0

1

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD4-00-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697067 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 13:35 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/15/2016 09:40 Latham NY 12110

Reported: 01/30/2017 13:32

12150 Total Alkalinity to pH 4.5 12149 Bicarbonate Alkalinity 12148 Carbonate Alkalinity

M1302 SDG#: MMK13-02

CAT No.	Analysis Name		CAS Number	As Re Resul	cceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	260C	ug/l		ug/l	ug/l	
•	o-Xylene	2 010 01	95-47-6	0.5	U	0.5	1	1
00882	VOA Library S	learch						
00002	The results from		ibrary search	are list	ed on the at	tached		
	FORM 1 - VOA-TIC on the back of t	. The qualifie						
Misc.	Organics	EPA 537 I	Rev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoi	c acid	335-67-1	60		1	2	1
10954	Perfluorononanoi	c acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoi	c acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecan	oic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecan	oic acid	307-55-1	3	U	3	5	1
10954	Perfluorotrideca	noic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic acid		376-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid		307-24-4	11		1	2	1
10954	Perfluoroheptanoic acid		375-85-9	10		1	2	1
10954	Perfluorobutanesulfonate		375-73-5	4	J	4	10	1
10954	Perfluorohexanesulfonate		355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfonate		1763-23-1	5	J	5	10	1
10954	Perfluorobutanoi		375-22-4	5	J	3	10	1
10954	Perfluoropentano	ic Acid	2706-90-3	7		1	3	1
10954			2991-50-6	5	U	5	8	1
	NEtFOSAA is the	acronym for N-e				etic Acid.		
10954	NMeFOSAA		2355-31-9	4	U	4	8	1
	NMeFOSAA is the	-				etic Acid.		
	stated QC limits			cient da	ta points			
can	be obtained to cal	lculate statist	ical limits.					
Metal	s	SW-846 60)10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	16.0		0.0382	0.400	1
01757	Magnesium		7439-95-4	2.97		0.0190	0.200	1
01762	Potassium		7440-09-7	2.07		0.160	1.00	1
01767	Sodium		7440-23-5	48.8		0.173	2.00	1
Wet C	hemistry	EPA 300.0)	mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	90.5		10.0	20.0	50
00224	Sulfate		14808-79-8	14.7		1.5	5.0	5
00220	Dallace		14000-19-0	±4./		1.5	3.0	5
		2	mg/l		mg/l	mg/l		
07882	Total Nitrite/Ni	trate Nitrogen	n.a.	2.8		0.080	0.20	2
		SM 2320 I	3-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
10150						-	-	

^{*=}This limit was used in the evaluation of the final result

1.7

21.6

1.7

n.a.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD4-00-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697067 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 13:35 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/15/2016 09:40 Latham NY 12110

Reported: 01/30/2017 13:32

M1302 SDG#: MMK13-02

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method Trial# Batch# CAT Dilution Analysis Name Analysis Analyst No. Date and Time Factor 11997 SOM02.2 Volatiles SW-846 8260C L163281AA 11/23/2016 12:33 Kevin A Sposito 01163 GC/MS VOA Water Prep SW-846 5030C L163281AA 11/23/2016 12:33 Kevin A Sposito 10954 16 PFCs EPA 537 Rev. 1.1 16327003 1 11/30/2016 06:04 Marissa C 1 modified Drexinger 14091 PFAA Water Prep EPA 537 Rev. 1.1 1 16327003 11/25/2016 08:45 Robert Brown 1 modified 01750 Calcium SW-846 6010C 163280635001 Elaine F Stoltzfus 11/25/2016 23:52 01757 Magnesium SW-846 6010C 163280635001 11/25/2016 23:52 Elaine F Stoltzfus 1 01762 Potassium SW-846 6010C 163280635001 11/25/2016 23:52 Elaine F Stoltzfus 01767 Sodium SW-846 6010C 163280635001 Elaine F Stoltzfus 1 11/25/2016 23:52 163280635001 James L Mertz 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 11/25/2016 05:14 00224 Chloride EPA 300.0 1 16331972171A 11/26/2016 16:30 Alexandria M 50 Lanager 00228 Sulfate EPA 300.0 16331972171A 11/26/2016 16:16 Alexandria M 5 Lanager 16325118101B 07882 Total Nitrite/Nitrate EPA 353.2 11/20/2016 19:25 Joseph E McKenzie 2 Nitrogen 12150 Total Alkalinity to pH SM 2320 B-1997 1 16324004203A 11/20/2016 04:01 Kenneth A Bell 1 SM 2320 B-1997 12149 Bicarbonate Alkalinity 16324004203A 11/20/2016 04:01 Kenneth A Bell 12148 Carbonate Alkalinity SM 2320 B-1997 16324004203A 11/20/2016 04:01 Kenneth A Bell 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

1E VOLATTLE ORGANICS ANAI	YSIS DATA SHEET	EPA SAM	PLE NO.		
		! ! M13	! 02 !		
5.0 (g/mL)mL) LOW dec. cap) CAP	Lab File ID:HPC Date Received: 1 Date Analyzed: 1 Dilution Factor: CONCENTRATION	!! SDG No.:! 99915.i/16nov23a.b/ln23s08 1/15/16 1/23/16 1.0 UNITS:			
			~		
		- I	!! !! !!		
	VOLATILE ORGANICS ANAI TENTATIVELY IDENTIF: ster Laboratories S	VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS Ster Laboratories	VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS ! M130 ster Laboratories		

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD4-10-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697068 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 13:45 by JD

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 11/15/2016 09:40 Reported: 01/30/2017 13:32

M1303 SDG#: MMK13-03

GC/MS Volatiles SW-846 8260C wo/l 6 20 1 1 1 1 1 1 1 1 1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997 Bromochloromethane	11997	Acetone	67-64-1	6	U	6	20	1
11997 Bromofethane	11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997 Rromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997 Promomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997 Z-Butanone	11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1
11997 Chlorobenzene	11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997 Chlorocthane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997 Chloroform	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997 Chloromethane	11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997 Cyclohexane	11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997 1,2-Ditromo-3-chloropropane 96-12-8 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997 Dibromochloromethane	11997	Cyclohexane	110-82-7	2	U	2	5	1
11997 1,2-Dibromoethane	11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997 1,2-Dichlorobenzene	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997 1,3-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997 1,4-Dichlorobenzene	11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997 Dichlorodifluoromethane	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997 1,1-Dichloroethane	11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997 1,2-Dichloroethane	11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997 1,1-Dichloroethene	11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997 Ethylbenzene	11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 1 1 1 1 1 1 1	11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997 Isopropylbenzene	11997	Freon 113	76-13-1	2	U	2	10	1
11997 Methyl Acetate 79-20-9 1 U 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997	2-Hexanone	591-78-6	3	U	3	10	1
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1	11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1	11997	Methyl Acetate	79-20-9	1	U		5	1
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethane 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichloroethane 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 Trichloroethene 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 <	11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichloroebnzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichloroebnzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichloroethane 75-69-4 0.5 U 0.5 1 1	11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichloroethene 75-69-4 0.5 U 0.5 1 1	11997	Methylcyclohexane	108-87-2		U		5	
11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethane 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1		Methylene Chloride	75-09-2	_	-			1
11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1		-	100-42-5					1
11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U			
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1								
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5		1
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethane 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1				_	Ü			
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethane 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1		• •						
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1								
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1								
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1					-		_	
		-			-			
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1	11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



5.0

5.0

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD4-10-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697068 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 13:45 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/15/2016 09:40 Latham NY 12110

Reported: 01/30/2017 13:32

M1303 SDG#: MMK13-03

12149 Bicarbonate Alkalinity 12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	eceived Lt	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8	260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library S	Search						
	The results from FORM 1 - VOA-TIC on the back of t	. The qualifi	-					
Misc.	Organics	EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoi	c acid	335-67-1	60		1	2	1
10954	Perfluorononanoi	c acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoi	c acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecan	oic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecan	oic acid	307-55-1	3	U	3	5	1
10954	Perfluorotrideca	noic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetrade	canoic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoi	c acid	307-24-4	10		1	2	1
10954	Perfluoroheptano	ic acid	375-85-9	9		1	2	1
10954	Perfluorobutanes	ulfonate	375-73-5	4	J	4	10	1
10954	Perfluorohexanes	ulfonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octane	sulfonate	1763-23-1	5	U	5	10	1
10954			375-22-4	5	J	3	10	1
10954			2706-90-3	7		1	3	1
10954	NETFOSAA		2991-50-6	5	U	5	8	1
10751	NEtFOSAA is the	acronym for N-				~	· ·	=
10954		acronym ror n	2355-31-9	4	U	4	8	1
10751	NMeFOSAA is the	acronym for N-				=	· ·	=
	stated QC limits be obtained to ca	are advisory or	nly until suffic					
Metal	s	SW-846 6	010C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	16.1		0.0382	0.400	1
01757	Magnesium		7439-95-4	3.00		0.0190	0.200	1
01762	Potassium		7440-09-7	2.12		0.160	1.00	1
01767	Sodium		7440-23-5	50.8		0.173	2.00	1
Wet C	hemistry	EPA 300.	0	mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	83.7		4.0	8.0	20
00228	Sulfate		14808-79-8	14.5		1.5	5.0	5
		EPA 353.	2	mg/l		mg/l	mg/l	
07882	Total Nitrite/Ni		_	2.9		0.080	0.20	2
	SM 2320 B-1997			mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity		n.a.	20.1		1.7	5.0	1
	Total Alkalinity	-	11.a.	20.1		1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result

1.7

20.1

1.7

n.a.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD4-10-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697068 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 13:45 by JD C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/15/2016 09:40 Reported: 01/30/2017 13:32

M1303 SDG#: MMK13-03

Sample Comments

All OC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method Trial# Batch# CAT Dilution Analysis Name Analysis Analyst No. Date and Time Factor 11997 SOM02.2 Volatiles SW-846 8260C L163281AA 11/23/2016 12:55 Kevin A Sposito 01163 GC/MS VOA Water Prep SW-846 5030C L163281AA 11/23/2016 12:55 Kevin A Sposito 10954 16 PFCs EPA 537 Rev. 1.1 16327003 11/30/2016 06:24 1 Marissa C 1 modified Drexinger 14091 PFAA Water Prep EPA 537 Rev. 1.1 1 16327003 11/25/2016 08:45 Robert Brown 1 modified 01750 Calcium SW-846 6010C 163280635001 Elaine F Stoltzfus 11/25/2016 23:55 01757 Magnesium SW-846 6010C 163280635001 11/25/2016 23:55 Elaine F Stoltzfus 1 01762 Potassium SW-846 6010C 163280635001 11/25/2016 23:55 Elaine F Stoltzfus 01767 Sodium SW-846 6010C 163280635001 Elaine F Stoltzfus 1 11/25/2016 23:55 163280635001 James L Mertz 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 11/25/2016 05:14 00224 Chloride EPA 300.0 1 16331972171A 11/26/2016 17:29 Alexandria M 2.0 Lanager 00228 Sulfate EPA 300.0 16331972171A 11/26/2016 17:14 Alexandria M 5 Lanager 16325118101B 07882 Total Nitrite/Nitrate EPA 353.2 11/20/2016 19:27 Joseph E McKenzie 2 Nitrogen 12150 Total Alkalinity to pH SM 2320 B-1997 1 16326010103A 11/22/2016 00:42 Kenneth A Bell 1 SM 2320 B-1997 12149 Bicarbonate Alkalinity 16326010103A 11/22/2016 00:42 Kenneth A Bell 12148 Carbonate Alkalinity SM 2320 B-1997 16326010103A 11/22/2016 00:42 Kenneth A Bell 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E VOLATILE ORGANICS ANA:		ΣET .	EPA SAMI	PLE NO.
la Manat Tanan	TENTATIVELY IDENTIF			! ! M130	03 !
	5.0 (g/mL)mL) LOW dec. cap) CAP	Lab File II Date Receive Date Analyze Dilution Fac CONCENTRAT	D:HP09915.i ed: 11/15/1 ed: 11/23/1	SDG No.: /16nov23a 6 6	
	! ! COMPOUND NAME				
1. VOCTIC	!Total VOC TICs	!	•		!=====! ! U !
	_!		<u>-</u>		::
					!!
5		!!	!		!!
5	_!	!!			!!
7	_!	!	!		!!
	_ !				
	_ 				
	_ <u> </u>		-		::
·		i	i		ii
	i				
4 .	i	i	i		ii
5.		i	i		i ——— i
	_!				! !
7	!	!!	!		!!
8	_!	!	!		!!
9	_!	!!	!		!!
	_!		!		!!
	_!		!		!!
	_!		!		!!
	_!		!		!!
	_!		!		!!
	_!		!		!!
6	_!	!	<u></u> !		!!
	_!		!		<u> </u>
8	_ !	<u>!</u>	<u>!</u>		<u> </u>
9.	_!		!		!!
	_!				

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD4-20-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697069 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 13:55 by JD

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 11/15/2016 09:40 Reported: 01/30/2017 13:32

M1304 SDG#: MMK13-04

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

REVISED

Sample Description: SG2-MVD4-20-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697069 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 13:55 by JD C. T. Male Associates

50 Century Hill Drive Submitted: 11/15/2016 09:40 Latham NY 12110

Reported: 01/30/2017 13:32

M1304 SDG#: MMK13-04

CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
846 8260C	ug/l	ug/l	ug/l	
95-47-6	0.5 U	0.5	1	1
	846 8260C	CAS Number Result	As Received Method Detection Limit* 846 8260C ug/l ug/l	As Received Method Limit of Detection Limit* Quantitation 846 8260C ug/l ug/l ug/l ug/l

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined

Misc.	Organics EPA 53	7 Rev. 1.1	ng/l		ng/l	ng/l	
	modifie	ed					
10954	Perfluorooctanoic acid	335-67-1	65		1	2	1
10954	Perfluorononanoic acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid	307-24-4	10		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	9		1	2	1
10954	Perfluorobutanesulfonate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	5	U	5	10	1
10954	Perfluorobutanoic Acid	375-22-4	5	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	7		1	3	1
10954	NETFOSAA	2991-50-6	5	U	5	8	1
	NEtFOSAA is the acronym for	N-ethyl perfluorod	octanes	ulfonamidoa	cetic Acid.		
10954	NMeFOSAA	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acronym for	N-methyl perfluoro	octane	sulfonamido	acetic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Metals	5	SW-846	6010C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	15.7	0.0382	0.400	1
01757	Magnesium		7439-95-4	2.92	0.0190	0.200	1
01762	Potassium		7440-09-7	1.99	0.160	1.00	1
01767	Sodium		7440-23-5	49.7	0.173	2.00	1
Wet Ch	nemistry	EPA 300	.0	mg/l	mg/l	mg/l	
00224	Chloride		16887-00-6	87.3	4.0	8.0	20
00228	Sulfate		14808-79-8	14.2	1.5	5.0	5
		EPA 353	.2	mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrat	e Nitroge	n n.a.	2.7	0.080	0.20	2
		SM 2320	в-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	pH 4.5	n.a.	20.4	1.7	5.0	1
12149	Bicarbonate Alkalini	ty	n.a.	20.4	1.7	5.0	1
12148	Carbonate Alkalinity	•	n.a.	1.7 U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD4-20-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697069 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 13:55 by JD C

C. T. Male Associates
50 Century Hill Drive

Submitted: 11/15/2016 09:40 Latham NY 12110

Reported: 01/30/2017 13:32

M1304 SDG#: MMK13-04

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method Trial# Batch# CAT Dilution Analysis Name Analysis Analyst No. Date and Time Factor 11997 SOM02.2 Volatiles SW-846 8260C L163281AA 11/23/2016 13:17 Kevin A Sposito 01163 GC/MS VOA Water Prep SW-846 5030C L163281AA 11/23/2016 13:17 Kevin A Sposito 10954 16 PFCs EPA 537 Rev. 1.1 16327003 1 11/30/2016 06:45 Marissa C 1 modified Drexinger 14091 PFAA Water Prep EPA 537 Rev. 1.1 1 16327003 11/25/2016 08:45 Robert Brown 1 modified 01750 Calcium SW-846 6010C 163280635001 Elaine F Stoltzfus 11/26/2016 00:04 01757 Magnesium SW-846 6010C 163280635001 11/26/2016 00:04 Elaine F Stoltzfus 1 01762 Potassium SW-846 6010C 163280635001 11/26/2016 00:04 Elaine F Stoltzfus 01767 Sodium SW-846 6010C 163280635001 Elaine F Stoltzfus 1 11/26/2016 00:04 163280635001 James L Mertz 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 11/25/2016 05:14 00224 Chloride EPA 300.0 1 16331972171A 11/26/2016 18:56 Alexandria M 2.0 Lanager 00228 Sulfate EPA 300.0 16331972171A 11/26/2016 18:42 Alexandria M 5 Lanager 16325118101B 07882 Total Nitrite/Nitrate EPA 353.2 11/20/2016 19:29 Joseph E McKenzie 2 Nitrogen 12150 Total Alkalinity to pH SM 2320 B-1997 1 16324004203A 11/20/2016 04:18 Kenneth A Bell 1 SM 2320 B-1997 12149 Bicarbonate Alkalinity 16324004203A 11/20/2016 04:18 Kenneth A Bell 12148 Carbonate Alkalinity SM 2320 B-1997 16324004203A 11/20/2016 04:18 Kenneth A Bell 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Lab Name: Lancas Lab Code: LANCAS Matrix: (soil/wa Sample wt/vol: Level: (low/med) % Moisture: not Column: (pack/c Number TICs fou	5.0 (g/mL)mL Lab LOW Date dec. Date ap) CAP Dilu CO	Sample ID: 80 File ID:HP00 Received: 1 Analyzed: 1 tion Factor: NCENTRATION g/L or ug/Kg	597069 9915.i/16nov238 1/15/16 1/23/16 1.0 JNITS:) ug/L	
: ! CAS NUMBER	! COMPOUND NAME	! RT	! EST. CONC.	! Q !
! 1. VOCTIC ! 2	Total VOC TICS			U ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! !

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD4-30-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697070 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 14:05 by JD

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 11/15/2016 09:40 Reported: 01/30/2017 13:32

M1305 SDG#: MMK13-05

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



As Received

Limit of

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Dilution

Sample Description: SG2-MVD4-30-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697070 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 14:05 by JD

C. T. Male Associates

50 Century Hill Drive

As Received

Method

1.5

mg/l

1.7

1.7

1.7

0.080

mg/l as CaCO3

5.0

mg/l

0.20

5.0

5.0

5.0

mg/l as CaCO3

1

1

Latham NY 12110

Submitted: 11/15/2016 09:40 Reported: 01/30/2017 13:32

M1305 SDG#: MMK13-05

CAT

00228 Sulfate

No.	Analysis Name		CAS Number	Resu	lt	Detection Limit*	Quantitation	Factor
GC/MS	Volatiles	SW-846 8	260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Se	earch						
	The results from FORM 1 - VOA-TIC. on the back of th	The qualifie						
Misc.	Organics	EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic	acid	335-67-1	65		1	2	1
10954	Perfluorononanoic	acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic	acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecano	ic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecano	ic acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecan	oic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradec	anoic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic	acid	307-24-4	12		1	2	1
10954	Perfluoroheptanoi	c acid	375-85-9	8		1	2	1
10954	Perfluorobutanesu	lfonate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesu	lfonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanes	ulfonate	1763-23-1	5	U	5	10	1
10954	Perfluorobutanoic	Acid	375-22-4	5	J	3	10	1
10954	Perfluoropentanoi	c Acid	2706-90-3	8		1	3	1
10954	NEtFOSAA		2991-50-6	5	U	5	8	1
	NEtFOSAA is the a	cronym for N-	ethyl perfluoro	octanes	ulfonamidoa	acetic Acid.		
10954	NMeFOSAA	-	2355-31-9	4	U	4	8	1
	NMeFOSAA is the a	cronym for N-1	methyl perfluoro	octane	sulfonamido	pacetic Acid.		
The	stated OC limits an	-						
	be obtained to calc				[
Metal	s	SW-846 6	010C	mg/l		mg/l	mg/l	
	Calcium		7440-70-2	16.5		0.0382	0.400	1
01757	Magnesium		7439-95-4	3.08		0.0190	0.200	1
01762	Potassium		7440-09-7	2.14		0.160	1.00	1
01767	Sodium		7440-23-5	52.4		0.173	2.00	1
Wet Cl	hemistry	EPA 300.	0	mg/l		mg/l	mg/l	
	Chloride		16887-00-6	87.6		4.0	8.0	20
00227	CIIIOI IUC		10007 00-0	07.0		T. U	0.0	20

As Received

IJ

mg/l as CaCO3

14.1

2.8

20.3

20.3

1.7

14808-79-8

n.a.

n.a.

n.a.

EPA 353.2

SM 2320 B-1997

07882 Total Nitrite/Nitrate Nitrogen n.a.

12150 Total Alkalinity to pH 4.5

12149 Bicarbonate Alkalinity

12148 Carbonate Alkalinity

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD4-30-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697070 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 14:05 by JD

C. T. Male Associates
50 Century Hill Drive

Submitted: 11/15/2016 09:40 Latham NY 12110

Reported: 01/30/2017 13:32

M1305 SDG#: MMK13-05

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method Trial# Batch# CAT Dilution Analysis Name Analysis Analyst No. Date and Time Factor 11997 SOM02.2 Volatiles SW-846 8260C L163281AA 11/23/2016 13:39 Kevin A Sposito 01163 GC/MS VOA Water Prep SW-846 5030C L163281AA 11/23/2016 13:39 Kevin A Sposito 10954 16 PFCs EPA 537 Rev. 1.1 16327003 1 11/30/2016 01:57 Marissa C 1 modified Drexinger 14091 PFAA Water Prep EPA 537 Rev. 1.1 1 16327003 11/25/2016 08:45 Robert Brown 1 modified 01750 Calcium SW-846 6010C 163280635001 Elaine F Stoltzfus 11/26/2016 00:07 01757 Magnesium SW-846 6010C 163280635001 11/26/2016 00:07 Elaine F Stoltzfus 1 01762 Potassium SW-846 6010C 163280635001 11/26/2016 00:07 Elaine F Stoltzfus 01767 Sodium SW-846 6010C 163280635001 Elaine F Stoltzfus 1 11/26/2016 00:07 163280635001 James L Mertz 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 11/25/2016 05:14 00224 Chloride EPA 300.0 1 16331972171A 11/26/2016 19:25 Alexandria M 2.0 Lanager 00228 Sulfate EPA 300.0 16331972171A 11/26/2016 19:11 Alexandria M 5 Lanager 16325118101B 07882 Total Nitrite/Nitrate EPA 353.2 11/20/2016 19:34 Joseph E McKenzie 2 Nitrogen 12150 Total Alkalinity to pH SM 2320 B-1997 1 16326010103A 11/22/2016 00:50 Kenneth A Bell 1 SM 2320 B-1997 12149 Bicarbonate Alkalinity 16326010103A 11/22/2016 00:50 Kenneth A Bell 12148 Carbonate Alkalinity SM 2320 B-1997 16326010103A 11/22/2016 00:50 Kenneth A Bell 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

7	TE VOLATILE ORGANICS ANALYSIS	ייים מוויים מייומים יי	EPA SAMI	PLE NO.
· ·	VOLATILE ORGANICS ANALYSIS TENTATIVELY IDENTIFIED (
	TENTALIVELL IDENTIFIED (.OMPOUNDS	: ! M130)5 i
Lab Name: Lancas Lab Code: LANCAS Matrix: (soil/wa		Contract: SAS No.: Sample ID: 86	! SDG No.	:!
	5.0 (g/mL)mL La) LOW Dat dec. Dat		9915.i/16nov23a L/15/16 L/23/16	a.b/ln23s1
Number TICs for		CONCENTRATION (ug/L or ug/Kg)		
CAS NUMBER	! ! COMPOUND NAME	! ! RT !	EST. CONC.	! !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
1 VOCTIC	!Total VOC TICs _!	i	0	! TT !
3	!	!!		!!
5 6	_ ! !	!! !!		!!
8	- 	!!		!!
10	_! !	!!		!!
12	_! _!!	!!		!!
14	_! _!	!!		!!
16	_!	!!		!!
18	.! .!	!!		!!
20	_! _!!	!		!!
22	_!! _!	!!		!!
24	.! .!	!!		!!
25 26	_!! _!	!! !		!!
27 28.	_! !	! !		!!
29	!	!!	!!	!!
age 1 of 1	!	!!		

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-FTB01-161114 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8697071 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 14:45

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/15/2016 09:40

Reported: 01/30/2017 13:32

M1306 SDG#: MMK13-06TB

CAT No.	Analysis Name	CAS Number	Resu	lt	Method Detection Limi	Limit of t* Quantitation	Dilution Factor
Misc.	Organics EPA 537 F	Rev. 1.1	ng/l	•	ng/l	ng/l	
	modified						
10954	Perfluorooctanoic acid	335-67-1	1	U	1	2	1
10954	Perfluorononanoic acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid	307-24-4	1	U	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	1	U	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	5	U	5	10	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	1	U	1	3	1
10954	NETFOSAA	2991-50-6	5	U	5	8	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroc	ctanes	ulfonamido	acetic Acid.		
10954	NMeFOSAA	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acronym for N-m	ethyl perfluoro	octane	sulfonamid	loacetic Acid.		
The	stated OC limits are advisory on	ly until suffic	ient d	ata points			

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	e	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16327003	11/30/2016	08:07	Marissa C Drexinger	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16327003	11/25/2016	08:45	Robert Brown	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-00-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697072 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 15:30 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/15/2016 09:40

Reported: 01/30/2017 13:32

M1307 SDG#: MMK13-07

GC/MS Volatiles SW-846 8260C ug/l ug/l ug/l 11997 Acetone 67-64-1 6 U 6 20	1
11007 Agetons	1
11997 Acetone 67-64-1 6 U 6 20	1
11997 Benzene 71-43-2 0.5 U 0.5 1	1
11997 Bromochloromethane 74-97-5 1 U 1 5	1
11997 Bromodichloromethane 75-27-4 0.5 U 0.5 1	1
11997 Bromoform 75-25-2 0.5 U 0.5 4	1
11997 Bromomethane 74-83-9 0.5 U 0.5 1	1
11997 2-Butanone 78-93-3 3 U 3 10	1
11997 Carbon Disulfide 75-15-0 1 U 1 5	1
11997 Carbon Tetrachloride 56-23-5 0.5 U 0.5 1	1
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1	1
11997 Chloroethane 75-00-3 0.5 U 0.5 1	1
11997 Chloroform 67-66-3 0.5 U 0.5 1	1
11997 Chloromethane 74-87-3 0.5 U 0.5 1	1
11997 Cyclohexane 110-82-7 2 U 2 5	1
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5	1
11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1	1
11997 1,2-Dibromoethane 106-93-4 0.5 U 0.5 1	1
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5	1
11997 1,3-Dichlorobenzene 541-73-1 1 U 1 5	1
11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5	1
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1	1
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1	1
11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1	1
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1	1
11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1	1
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1	1
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1	1
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1	1
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1	1
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1	1
11997 Freon 113 76-13-1 2 U 2 10	1
11997 2-Hexanone 591-78-6 3 U 3 10	1
11997 Isopropylbenzene 98-82-8 1 U 1 5	1
11997 Methyl Acetate 79-20-9 1 U 1 5	1
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	1
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10	1
11997 Methylcyclohexane 108-87-2 1 U 1 5	1
11997 Methylene Chloride 75-09-2 2 U 2 4	1
11997 Styrene 100-42-5 1 U 1 5	1
11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1	1
11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1	1
11997 Toluene 108-88-3 0.5 U 0.5 1	1
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5	1
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5	1
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1	1
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1	1
11997 Trichloroethene 79-01-6 0.5 U 0.5 1	1
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1	1
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1	1
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1	1

^{*=}This limit was used in the evaluation of the final result



5.0

5.0

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-00-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697072 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 15:30 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/15/2016 09:40 Latham NY 12110

Reported: 01/30/2017 13:32

M1307 SDG#: MMK13-07

12149 Bicarbonate Alkalinity 12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	eceived Lt	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8	260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library	Search						
	The results from FORM 1 - VOA-TION on the back of the	C. The qualifi	-					
Misc.	Organics	EPA 537	Rev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctano:	ic acid	335-67-1	45		1	2	1
10954	Perfluorononano:		375-95-1	1	U	1	2	1
10954	Perfluorodecano		335-76-2	1	Ū	1	2	1
10954	Perfluoroundecar		2058-94-8	2	IJ	2	4	1
10954	Perfluorododecar		307-55-1	3	Ū	3	5	1
10954	Perfluorotrideca		72629-94-8	2	Ū	2	4	1
10954	Perfluorotetrade		376-06-7	3	Ū	3	5	1
10954	Perfluorohexano		307-24-4	10		1	2	1
10954	Perfluoroheptano		375-85-9	8		1	2	1
10954	Perfluorobutanes		375-73-5	4	U	4	10	1
10954	Perfluorohexanes		355-46-4	4	Ū	4	10	1
10954	Perfluoro-octane		1763-23-1	5	Ū	5	10	1
10954			375-22-4	4	J	3	10	1
10954			2706-90-3	8	O	1	3	1
10954	NETFOSAA	oic neid	2991-50-6	5	U	5	8	1
10004	NEtFOSAA is the	agronum for N-					0	_
10954	NMeFOSAA IS CHE	acronym for N-	2355-31-9	4	U U	Acid.	8	1
10934	NMeFOSAA is the	agronum for N-				getig Naid	O	Δ.
	stated QC limits be obtained to ca	are advisory or	nly until suffic			eccic neia.		
Metal	s	SW-846 6	010C	mg/1		mg/l	mg/l	
01750	Calcium		7440-70-2	18.3		0.0382	0.400	1
01757	Magnesium		7439-95-4	3.26		0.0190	0.200	1
01762	Potassium		7440-09-7	2.45		0.160	1.00	1
01767	Sodium		7440-23-5	58.1		0.173	2.00	1
Wet C	hemistry	EPA 300.	0	mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	117		20.0	40.0	100
00228	Sulfate		14808-79-8	13.6		1.5	5.0	5
		EPA 353.	2	mg/l		mg/l	mg/l	
07882	Total Nitrite/N:	itrate Nitrogen	n.a.	2.2		0.080	0.20	2
		SM 2320	B-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity		n.a.	21.7		1.7	5.0	1
12130	Digarbanata Alla		n.a.	21.7		1 7	5.0	1

^{*=}This limit was used in the evaluation of the final result

1.7

21.7

1.7

n.a.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-00-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697072 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 15:30 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/15/2016 09:40 Latham NY 12110

Reported: 01/30/2017 13:32

M1307 SDG#: MMK13-07

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method Trial# Batch# CAT Dilution Analysis Name Analysis Analyst No. Date and Time Factor 11997 SOM02.2 Volatiles SW-846 8260C L163281AA 11/23/2016 14:01 Kevin A Sposito 01163 GC/MS VOA Water Prep SW-846 5030C L163281AA 11/23/2016 14:01 Kevin A Sposito 10954 16 PFCs EPA 537 Rev. 1.1 16327003 11/30/2016 08:28 1 Marissa C 1 modified Drexinger 14091 PFAA Water Prep EPA 537 Rev. 1.1 1 16327003 11/25/2016 08:45 Robert Brown 1 modified 01750 Calcium SW-846 6010C 163280635001 Elaine F Stoltzfus 11/26/2016 00:11 01757 Magnesium SW-846 6010C 163280635001 11/26/2016 00:11 Elaine F Stoltzfus 1 01762 Potassium SW-846 6010C 163280635001 11/26/2016 00:11 Elaine F Stoltzfus 01767 Sodium SW-846 6010C 163280635001 Elaine F Stoltzfus 1 11/26/2016 00:11 163280635001 James L Mertz 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 11/25/2016 05:14 00224 Chloride EPA 300.0 1 16331972171A 11/26/2016 19:55 Alexandria M 100 Lanager 00228 Sulfate EPA 300.0 16331972171A 11/26/2016 19:40 Alexandria M 5 Lanager 16325118101B 07882 Total Nitrite/Nitrate EPA 353.2 11/20/2016 19:36 Joseph E McKenzie 2 Nitrogen 12150 Total Alkalinity to pH SM 2320 B-1997 1 16324004201A 11/19/2016 18:56 Kenneth A Bell 1 SM 2320 B-1997 12149 Bicarbonate Alkalinity 16324004201A 11/19/2016 18:56 Kenneth A Bell 12148 Carbonate Alkalinity SM 2320 B-1997 16324004201A 11/19/2016 18:56 Kenneth A Bell 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E VOLATILE ORGANICS ANA	LYSIS DATA SHEET	EPA SAMI	PLE NO.
	TENTATIVELY IDENTIF	IED COMPOUNDS	! ! M130	
	dec. cap) CAP	Contract: SAS No.: Lab Sample ID: 8 Lab File ID:HPO Date Received: 1 Date Analyzed: 1 Dilution Factor: CONCENTRATION (ug/L or ug/Kg	9915.i/16nov23a 1/15/16 1/23/16 1.0 UNITS:	:
	! COMPOUND NAME	! RT		
! 1. VOCTIC	!Total VOC TICs	į	•	!=====! ! U !
3	!!	; !	!	!! !!
	_!	!	!	
	! !			
	i		·	:i
	_!		!	ii
	_!			
	_!			!!
	_ !		!	<u> </u>
				· ——— ·
14.	i	i	i	ii
15	!	!	!	ii
16	!	!!	!	!!
17	_!	!	!	!!
18	_!	!	!	!!
	_!			!
	_ !			¦
	_ i		·	:i
	_ i		!	ii
	i		!	ii
	!		!	!
26.	!	!	!	!!
	_!		!	!!
28	_!	!	!	!!
	_!		!	!!
			1	

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-10-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697073 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 15:40 by JD

C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/15/2016 09:40 Reported: 01/30/2017 13:32

M1308 SDG#: MMK13-08

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	Li	Received mit of mantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug	r/l	
11997	Acetone	67-64-1	6	U	6	20)	1
11997	Benzene	71-43-2	0.5	IJ	0.5	1		1
11997	Bromochloromethane	74-97-5	1	IJ	1	5		1
11997	Bromodichloromethane	75-27-4	0.5	IJ	0.5	1		1
11997	Bromoform	75-25-2	0.5	U	0.5	4		1
11997	Bromomethane	74-83-9	0.5	U	0.5	1		1
11997	2-Butanone	78-93-3	3	IJ	3	10)	1
11997	Carbon Disulfide	75-15-0	1	U	1	5		1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1		1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1		1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1		1
11997	Chloroform	67-66-3	0.5	U	0.5	1		1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1		1
11997	Cyclohexane	110-82-7	2	IJ	2	5		1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5		1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5	1		1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5	1		1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5		1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1	5		1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1	5		1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5	1		1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5	1		1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1		1
11997	,	75-35-4	0.5	Ū	0.5	1		1
11997	1,1-Dichloroethene		0.5	Ū	0.5	1		1
	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1		1
11997	trans-1,2-Dichloroethene	156-60-5		IJ		1		
11997	1,2-Dichloropropane	78-87-5	0.5	-	0.5	_		1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1		1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1		1
11997	Ethylbenzene	100-41-4	0.5	U 	0.5	1		1
11997	Freon 113	76-13-1	2	U 	2	10		1
11997	2-Hexanone	591-78-6	3	U 	3	10)	1
11997	Isopropylbenzene	98-82-8	1	Ū	1	5		1
11997	Methyl Acetate	79-20-9	1	U	1	5		1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1		1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10)	1
11997	Methylcyclohexane	108-87-2	1	U	1	5		1
11997	Methylene Chloride	75-09-2	2	U	2	4		1
11997	Styrene	100-42-5	1	U	1	5		1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1		1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1		1
11997	Toluene	108-88-3	0.5	U	0.5	1		1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5		1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5		1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1		1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1		1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1		1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1		1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1		1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1		1

^{*=}This limit was used in the evaluation of the final result



As Received

As Received

mg/l as CaCO3

1.7

1.7

mg/l as CaCO3

1

1

5.0

5.0

5.0

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-10-161114 Grab Groundwater

SGPP - Merrimack

SM 2320 B-1997

n.a.

n.a.

n.a.

12150 Total Alkalinity to pH 4.5

12149 Bicarbonate Alkalinity 12148 Carbonate Alkalinity LL Sample # GW 8697073 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 15:40 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/15/2016 09:40 Latham NY 12110

Reported: 01/30/2017 13:32

M1308 SDG#: MMK13-08

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library	Search						
		m the volatile l C. The qualifie this form.						
Misc.	Organics	EPA 537 F	Rev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctano	ic acid	335-67-1	48		1	2	1
10954	Perfluorononano	ic acid	375-95-1	1	U	1	2	1
10954	Perfluorodecano	ic acid	335-76-2	1	U	1	2	1
10954	Perfluoroundeca	noic acid	2058-94-8	2	Ū	2	4	1
10954			307-55-1	3	Ū	3	5	1
10954			72629-94-8	2	U	2	4	1
10954			376-06-7	3	U	3	5	1
10954			307-24-4	10	•	1	2	1
10954			375-85-9	7		1	2	1
10954	-		375-73-5	4	U	4	10	1
10954			355-46-4	4	Ū	4	10	1
10954				5	Ū	5	10	1
			1763-23-1	5 5		3	10	1
10954			375-22-4	5 7	J			
10954	-	OIC ACIA	2706-90-3			1	3	1
10954		<u> </u>	2991-50-6	. 5	U	5	8	1
		acronym for N-e					•	
10954			2355-31-9	4	U	4	8	1
		acronym for N-m				cetic Acid.		
	stated QC limits be obtained to ca			eient da	ta points			
Metal	s	SW-846 60	010C	mg/l		mg/l	mg/l	
01750			7440-70-2	18.0		0.0382	0.400	1
01757	Magnesium		7439-95-4	3.21		0.0382	0.200	1
01762	Potassium		7440-09-7	2.39		0.160	1.00	1
01762			7440-09-7	58.9		0.173	2.00	1
01/0/	SOCIUII		7440-23-3	50.9		0.1/3	2.00	1
Wet C	hemistry	EPA 300.0)	mg/l		mg/l	mg/l	
	Chloride		16887-00-6	105		10.0	20.0	50
00228	Sulfate		14808-79-8	13.8		1.5	5.0	5
		EPA 353.2	2	mg/l		mg/l	mg/l	
07000	matal Withit (27			_		_	_	2
07882	Total Nitrite/N	ıtrate Nitrogen	n.a.	2.3		0.080	0.20	2

mg/l as CaCO3

18.1

18.1

1.7

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-10-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697073 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 15:40 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/15/2016 09:40

Reported: 01/30/2017 13:32

M1308 SDG#: MMK13-08

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method Trial# Batch# CAT Dilution Analysis Name Analysis Analyst No. Date and Time Factor 11997 SOM02.2 Volatiles SW-846 8260C L163281AA 11/23/2016 14:24 Kevin A Sposito 01163 GC/MS VOA Water Prep SW-846 5030C L163281AA 11/23/2016 14:24 Kevin A Sposito 10954 16 PFCs EPA 537 Rev. 1.1 16327003 11/30/2016 08:48 1 Marissa C 1 modified Drexinger 14091 PFAA Water Prep EPA 537 Rev. 1.1 1 16327003 11/25/2016 08:45 Robert Brown 1 modified 01750 Calcium SW-846 6010C 163280635001 Elaine F Stoltzfus 11/26/2016 00:14 01757 Magnesium SW-846 6010C 163280635001 11/26/2016 00:14 Elaine F Stoltzfus 1 01762 Potassium SW-846 6010C 163280635001 11/26/2016 00:14 Elaine F Stoltzfus 01767 Sodium SW-846 6010C 163280635001 Elaine F Stoltzfus 1 11/26/2016 00:14 163280635001 James L Mertz 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 11/25/2016 05:14 00224 Chloride EPA 300.0 1 16331972171A 11/26/2016 20:24 Alexandria M 50 Lanager 00228 Sulfate EPA 300.0 16331972171A 11/26/2016 20:09 Alexandria M 5 Lanager 16325118101B 07882 Total Nitrite/Nitrate EPA 353.2 11/20/2016 19:37 Joseph E McKenzie 2 Nitrogen 12150 Total Alkalinity to pH SM 2320 B-1997 1 16326010103A 11/22/2016 00:57 Kenneth A Bell 1 SM 2320 B-1997 12149 Bicarbonate Alkalinity 16326010103A 11/22/2016 00:57 Kenneth A Bell 12148 Carbonate Alkalinity SM 2320 B-1997 16326010103A 11/22/2016 00:57 Kenneth A Bell 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Lab Name: Lancast	5.0 (g/mL)mL LOW lec. np) CAP	Contragon Contragon Contragon Concentragon C	NDS act: No.: le ID: 80 e ID:HP00 eived: 10 lyzed: 10	SDG No.: 697073 9915.i/16nov23a 1/15/16 1/23/16 1.0 UNITS:	!
	COMPOUND NAME			! EST. CONC.	
3	Total VOC TICS				

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-20-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697074 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 15:50 by JD

C. T. Male Associates
50 Century Hill Drive

Submitted: 11/15/2016 09:40

Latham NY 12110

Reported: 01/30/2017 13:32

M1309 SDG#: MMK13-09

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	Li	Received mit of mantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug	r/l	
11997	Acetone	67-64-1	6	U	6	20)	1
11997	Benzene	71-43-2	0.5	IJ	0.5	1		1
11997	Bromochloromethane	74-97-5	1	IJ	1	5		1
11997	Bromodichloromethane	75-27-4	0.5	IJ	0.5	1		1
11997	Bromoform	75-25-2	0.5	U	0.5	4		1
11997	Bromomethane	74-83-9	0.5	U	0.5	1		1
11997	2-Butanone	78-93-3	3	IJ	3	10)	1
11997	Carbon Disulfide	75-15-0	1	U	1	5		1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1		1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1		1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1		1
11997	Chloroform	67-66-3	0.5	U	0.5	1		1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1		1
11997	Cyclohexane	110-82-7	2	IJ	2	5		1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5		1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5	1		1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5	1		1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5		1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1	5		1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1	5		1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5	1		1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5	1		1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1		1
11997	,	75-35-4	0.5	Ū	0.5	1		1
11997	1,1-Dichloroethene		0.5	Ū	0.5	1		1
	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1		1
11997	trans-1,2-Dichloroethene	156-60-5		IJ		1		
11997	1,2-Dichloropropane	78-87-5	0.5	-	0.5	_		1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1		1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1		1
11997	Ethylbenzene	100-41-4	0.5	U 	0.5	1		1
11997	Freon 113	76-13-1	2	U 	2	10		1
11997	2-Hexanone	591-78-6	3	U 	3	10)	1
11997	Isopropylbenzene	98-82-8	1	Ū	1	5		1
11997	Methyl Acetate	79-20-9	1	U	1	5		1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1		1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10)	1
11997	Methylcyclohexane	108-87-2	1	U	1	5		1
11997	Methylene Chloride	75-09-2	2	U	2	4		1
11997	Styrene	100-42-5	1	U	1	5		1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1		1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1		1
11997	Toluene	108-88-3	0.5	U	0.5	1		1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5		1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5		1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1		1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1		1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1		1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1		1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1		1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1		1

^{*=}This limit was used in the evaluation of the final result



5.0

5.0

1

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-20-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697074 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 15:50 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/15/2016 09:40 Latham NY 12110

Reported: 01/30/2017 13:32

M1309 SDG#: MMK13-09

12149 Bicarbonate Alkalinity 12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
•	o-Xylene		95-47-6	0.5	U	0.5	1	1
00000	VOA Library Sea	rah						
00002	-							
	The results from the FORM 1 - VOA-TIC. on the back of this	The qualifier						
Misc.	Organics	EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
		modified						
10954	Perfluorooctanoic a	cid	335-67-1	47		1	2	1
10954	Perfluorononanoic a	cid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic a	cid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic	acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic	acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoi	c acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecan	oic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic a	cid	307-24-4	10		1	2	1
10954	Perfluoroheptanoic	acid	375-85-9	8		1	2	1
10954	Perfluorobutanesulf	onate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesulf	onate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesul	fonate	1763-23-1	5	U	5	10	1
10954			375-22-4	5	J	3	10	1
10954	Perfluoropentanoic	Acid	2706-90-3	7		1	3	1
10954	NEtFOSAA		2991-50-6	5	U	5	8	1
	NEtFOSAA is the acr	onvm for N-et		ctanesu	lfonamidoacet	ic Acid.		
10954	NMeFOSAA		2355-31-9	4	U	4	8	1
	NMeFOSAA is the acr	onvm for N-me		octanes	ulfonamidoace	etic Acid.		
The	stated OC limits are	-						
	be obtained to calcu			reire aat	a points			
Metal	3	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	18.3		0.0382	0.400	1
01757	Magnesium		7439-95-4	3.27		0.0190	0.200	1
01762	Potassium		7440-09-7	2.43		0.160	1.00	1
01767	Sodium		7440-23-5	61.4		0.173	2.00	1
Wet C	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	109		10.0	20.0	50
00224	Sulfate		14808-79-8	14.2		1.5	5.0	5
00220	Dailace		11000 /2 0	14.2		1.5	3.0	3
		EPA 353.2		mg/1		mg/l	mg/l	
07882	Total Nitrite/Nitra	te Nitrogen	n.a.	2.3		0.080	0.20	2
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to		n.a.	28.9		1.7	5.0	1
12130	TOTAL AINALLIITLY LO	, bii 4.0	11.a.	20.9		1./	5.0	_

^{*=}This limit was used in the evaluation of the final result

1.7

28.9

1.7

n.a.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-20-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697074 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 15:50 by JD

C. T. Male Associates
50 Century Hill Drive

Submitted: 11/15/2016 09:40 Latham NY 12110

Reported: 01/30/2017 13:32

M1309 SDG#: MMK13-09

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

	Laboratory Sample Analysis Record											
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor				
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163281AA	11/23/2016	14:46	Kevin A Sposito	1				
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163281AA	11/23/2016	14:46	Kevin A Sposito	1				
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16327003	11/30/2016	09:09	Marissa C Drexinger	1				
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16327003	11/25/2016	08:45	Robert Brown	1				
01750	Calcium	SW-846 6010C	1	163280635001	11/26/2016	00:17	Elaine F Stoltzfus	1				
01757	Magnesium	SW-846 6010C	1	163280635001	11/26/2016	00:17	Elaine F Stoltzfus	1				
01762	Potassium	SW-846 6010C	1	163280635001	11/26/2016	00:17	Elaine F Stoltzfus	1				
01767	Sodium	SW-846 6010C	1	163280635001	11/26/2016	00:17	Elaine F Stoltzfus	1				
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163280635001	11/25/2016	05:14	James L Mertz	1				
00224	Chloride	EPA 300.0	1	16331972171A	11/26/2016	21:22	Alexandria M Lanager	50				
00228	Sulfate	EPA 300.0	1	16331972171A	11/26/2016	21:08	Alexandria M Lanager	5				
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101B	11/20/2016	19:39	Joseph E McKenzie	2				
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16324004203A	11/20/2016	04:12	Kenneth A Bell	1				
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16324004203A	11/20/2016	04:12	Kenneth A Bell	1				
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16324004203A	11/20/2016	04:12	Kenneth A Bell	1				

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E		EPA SAM	PLE NO.
7	OLATILE ORGANICS ANAI TENTATIVELY IDENTIFI		! ! M13	! 09 !
	Case No.: ater) WATER 5.0 (g/mL)mL 5.0 LOW dec. cap) CAP	Lab Sample ID:	SDG No. 8697074 09915.i/16nov23: 11/15/16 11/23/16 : 1.0 UNITS:	:!
CAS NUMBER	! ! COMPOUND NAME	! ! RT	! ! EST. CONC.	! !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
2	Total VOC TICS			
29. 30. age 1 of 1	! !	!! !	_ ! _ !	!! !! !!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-30-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697075 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 16:00 by JD

C. T. Male Associates

50 Century Hill Drive Submitted: 11/15/2016 09:40 Latham NY 12110

Reported: 01/30/2017 13:32

M1310 SDG#: MMK13-10BKG

CAT			la De	ceived	As Received Method	As Received Limit of	Dilution
No.	Analysis Name	CAS Number	Resul		Detection Limit*	Quantitation	Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	Ū	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1
	17					*	-

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-30-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697075 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 16:00 by JD C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 11/15/2016 09:40 Reported: 01/30/2017 13:32

M1310 SDG#: MMK13-10BKG

CAT No.	Analysis Name		CAS Number	As Rec Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined

Misc.	Organics	EPA 537 R	ev. 1.1	ng/l		ng/l	ng/l	
		${ t modified}$						
10954	Perfluorooctanoic ad	cid	335-67-1	45		1	2	1
10954	Perfluorononanoic ad	cid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic ad	cid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic	acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic	acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoio	c acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecand	oic acid	376-06-7	3	U	3	5	1
10954	Perfluorohexanoic ad	cid	307-24-4	10		1	2	1
10954	Perfluoroheptanoic a	acid	375-85-9	7		1	2	1
10954	Perfluorobutanesulfo	onate	375-73-5	4	U	4	10	1
10954	Perfluorohexanesulfo	onate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulf	onate	1763-23-1	5	U	5	10	1
10954	Perfluorobutanoic Ad	cid	375-22-4	5	J	3	10	1
10954	Perfluoropentanoic A	Acid	2706-90-3	7		1	3	1
10954	NEtFOSAA		2991-50-6	5	U	5	8	1
	NEtFOSAA is the acro	onym for N-et	hyl perfluoroc	ctanesu	lfonamidoa	acetic Acid.		
10954	NMeFOSAA	-	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acro	onym for N-me	thyl perfluoro	octanes	ulfonamido	pacetic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Metals	s SW-846 6	010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	19.0	0.0382	0.400	1
01757	Magnesium	7439-95-4	3.37	0.0190	0.200	1
01762	Potassium	7440-09-7	2.57	0.160	1.00	1
01767	Sodium	7440-23-5	64.4	0.173	2.00	1
Wet Cl	nemistry EPA 300.	0	mg/l	mg/l	mg/l	
00224	Chloride	16887-00-6	112	4.0	8.0	20
00228	Sulfate	14808-79-8	14.0	1.5	5.0	5
	EPA 353.	2	mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	2.2	0.080	0.20	2
	SM 2320	B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	17.6	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	17.6	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-30-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697075 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 16:00 by JD

C. T. Male Associates
50 Century Hill Drive

Submitted: 11/15/2016 09:40 Latham NY 12110

Reported: 01/30/2017 13:32

M1310 SDG#: MMK13-10BKG

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method Trial# Batch# CAT Dilution Analysis Name Analysis Analyst No. Date and Time Factor 11997 SOM02.2 Volatiles SW-846 8260C L163281AA 11/23/2016 11:26 Kevin A Sposito 01163 GC/MS VOA Water Prep SW-846 5030C L163281AA 11/23/2016 11:26 Kevin A Sposito 10954 16 PFCs EPA 537 Rev. 1.1 16327003 11/30/2016 02:18 1 Marissa C 1 modified Drexinger 14091 PFAA Water Prep EPA 537 Rev. 1.1 1 16327003 11/25/2016 08:45 Robert Brown 1 modified 01750 Calcium SW-846 6010C 163280635001 Elaine F Stoltzfus 11/25/2016 23:34 01757 Magnesium SW-846 6010C 163280635001 11/25/2016 23:34 Elaine F Stoltzfus 1 01762 Potassium SW-846 6010C 163280635001 11/25/2016 23:34 Elaine F Stoltzfus 01767 Sodium SW-846 6010C 163280635001 Elaine F Stoltzfus 1 11/25/2016 23:34 163280635001 James L Mertz 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 11/25/2016 05:14 00224 Chloride EPA 300.0 1 16331972171A 11/26/2016 15:03 Alexandria M 2.0 Lanager 00228 Sulfate EPA 300.0 16331972171A 11/26/2016 14:48 Alexandria M 5 Lanager 16325118101B 07882 Total Nitrite/Nitrate EPA 353.2 11/20/2016 19:20 Joseph E McKenzie 2 Nitrogen 12150 Total Alkalinity to pH SM 2320 B-1997 1 16326010102A 11/21/2016 17:46 Kenneth A Bell 1 SM 2320 B-1997 12149 Bicarbonate Alkalinity 16326010102A 11/21/2016 17:46 Kenneth A Bell 12148 Carbonate Alkalinity SM 2320 B-1997 16326010102A 11/21/2016 17:46 Kenneth A Bell 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E		EPA SAM	PLE NO.
	VOLATILE ORGANICS ANAI TENTATIVELY IDENTIF	IED COMPOUNDS	! ! ! M13:	! !
ab Code: LANCA atrix: (soil/w	ater) WATER 5.0 (g/mL)mL) LOW dec. cap) CAP	Contract: SAS No.: Lab Sample ID: 86 Lab File ID:HP09 Date Received: 11 Date Analyzed: 11 Dilution Factor: CONCENTRATION ((ug/L or ug/Kg)	SDG No. 597075 9915.i/16nov236 1/15/16 1/23/16 1.0 JNITS:	:!
	! ! COMPOUND NAME =!===========		EST. CONC.	
2.	!Total VOC TICs			
8 9		!! !		!! !! !!
	! !			

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-30-161114 MS Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697076 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 16:00 by JD

C. T. Male Associates

Latham NY 12110

50 Century Hill Drive

Submitted: 11/15/2016 09:40 Reported: 01/30/2017 13:32

M1310 SDG#: MMK13-10MS

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l	ug/l	ug/l	
11997	Acetone	67-64-1	140	6	20	1
11997	Benzene	71-43-2	21	0.5	1	1
11997	Bromochloromethane	74-97-5	21	1	5	1
11997	Bromodichloromethane	75-27-4	20	0.5	1	1
11997	Bromoform	75-25-2	17	0.5	4	1
11997	Bromomethane	74-83-9	21	0.5	1	1
11997	2-Butanone	78-93-3	140	3	10	1
11997	Carbon Disulfide	75-15-0	22	1	5	1
11997	Carbon Tetrachloride	56-23-5	23	0.5	1	1
11997	Chlorobenzene	108-90-7	19	0.5	1	1
11997	Chloroethane	75-00-3	20	0.5	1	1
11997	Chloroform	67-66-3	21	0.5	1	1
11997	Chloromethane	74-87-3	19	0.5	1	1
11997	Cyclohexane	110-82-7	23	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	15	2	5	1
11997	Dibromochloromethane	124-48-1	18	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	19	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	18	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	18	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	19	1	5	1
11997	Dichlorodifluoromethane	75-71-8	21	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	21	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	21	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	23	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	21	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	22	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	20	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	19	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	18	0.5	1	1
11997	Ethylbenzene	100-41-4	19	0.5	1	1
11997	Freon 113	76-13-1	24	2	10	1
11997	2-Hexanone	591-78-6	79	3	10	1
11997	Isopropylbenzene	98-82-8	20	1	5	1
11997	Methyl Acetate	79-20-9	20	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	20	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	86	3	10	1
11997	Methylcyclohexane	108-87-2	24	1	5	1
11997	Methylene Chloride	75-09-2	20	2	4	1
11997	Styrene	100-42-5	19	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	17	0.5	1	1
11997	Tetrachloroethene	127-18-4	20	0.5	1	1
11997	Toluene	108-88-3	20	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	17	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	17	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	19	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	18	0.5	1	1
11997	Trichloroethene	79-01-6	21	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	26	0.5	1	1
11997	Vinyl Chloride	75-01-4	21	0.5	1	1
11997	m+p-Xylene	179601-23-1	39	0.5	1	1
	1 1					

^{*=}This limit was used in the evaluation of the final result



As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-30-161114 MS Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697076 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 16:00 by JD

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

As Received

Submitted: 11/15/2016 09:40

Reported: 01/30/2017 13:32

M1310 SDG#: MMK13-10MS

CAT No.	Analysis Name		CAS Number	As Received Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	0C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	19	0.5	1	1
Misc.	Organics	EPA 537 Re	v. 1.1	ng/l	ng/l	ng/l	
		modified					
10954	Perfluorooctanoic a	cid	335-67-1	260	1	2	1
10954			375-95-1	230	1	2	1
10954	Perfluorodecanoic a	cid	335-76-2	200	1	2	1
10954	Perfluoroundecanoic	acid	2058-94-8	240	2	4	1
10954	Perfluorododecanoic		307-55-1	240	3	5	1
10954	Perfluorotridecanoi		72629-94-8	240	2	4	1
10954			376-06-7	220	3	5	1
10954	Perfluorohexanoic a		307-24-4	250	1	2	1
10954			375-85-9	240	1	2	1
10954	Perfluorobutanesulf		375-73-5	220	4	10	1
10954	Perfluorohexanesulf		355-46-4	220	4	10	1
10954			1763-23-1	200	5	10	1
10954	Perfluorobutanoic A		375-22-4	240	3	10	1
10954	Perfluoropentanoic	Acid	2706-90-3	240	1	3	1
10954			2991-50-6	140	5	8	1
10954	NMeFOSAA		2355-31-9	tanesulfonamidoacetic 140	4	8	1
				ctanesulfonamidoaceti	c Acid.		
	stated QC limits are be obtained to calcui			ent data points			
Metals	5	SW-846 601	.0C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	23.5	0.0382	0.400	1
01757	Magnesium		7439-95-4	5.51	0.0190	0.200	1
01762	Potassium		7440-09-7	13.4	0.160	1.00	1
01767	Sodium		7440-23-5	76.1	0.173	2.00	1
Wet Ch	nemistry	EPA 300.0		mg/l	mg/l	mg/l	
00224	Chloride		16887-00-6	181	8.0	16.0	40
00228	Sulfate		14808-79-8	63.2	3.0	10.0	10
		EPA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitra	te Nitrogen	n.a.	4.8	0.080	0.20	2
		SM 2320 B-	1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	рн 4.5	n.a.	183	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-30-161114 MS Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697076 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 16:00 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/15/2016 09:40

Reported: 01/30/2017 13:32

M1310 SDG#: MMK13-10MS

	Laboratory Sample Analysis Record											
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor				
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163281AA	11/23/2016	11:48	Kevin A Sposito	1				
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163281AA	11/23/2016	11:48	Kevin A Sposito	1				
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16327003	11/30/2016	02:39	Marissa C Drexinger	1				
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16327003	11/25/2016	08:45	Robert Brown	1				
01750	Calcium	SW-846 6010C	1	163280635001	11/25/2016	23:43	Elaine F Stoltzfus	1				
01757	Magnesium	SW-846 6010C	1	163280635001	11/25/2016	23:43	Elaine F Stoltzfus	1				
01762	Potassium	SW-846 6010C	1	163280635001	11/25/2016	23:43	Elaine F Stoltzfus	1				
01767	Sodium	SW-846 6010C	1	163280635001	11/25/2016	23:43	Elaine F Stoltzfus	1				
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163280635001	11/25/2016	05:14	James L Mertz	1				
00224	Chloride	EPA 300.0	1	16331972171A	11/26/2016	16:01	Alexandria M Lanager	40				
00228	Sulfate	EPA 300.0	1	16331972171A	11/26/2016	15:47	Alexandria M Lanager	10				
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101B	11/20/2016	19:22	Joseph E McKenzie	2				
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16326010102A	11/21/2016	18:02	Kenneth A Bell	1				

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-30-161114 MSD Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697077 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 16:00 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/15/2016 09:40 Reported: 01/30/2017 13:32

M1310 SDG#: MMK13-10MSD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 82	260C	ug/l	ug/l	ug/l	
11997	Acetone	67-64-1	140	6	20	1
11997	Benzene	71-43-2	20	0.5	1	1
11997	Bromochloromethane	74-97-5	21	1	5	1
11997	Bromodichloromethane	75-27-4	20	0.5	1	1
11997	Bromoform	75-25-2	16	0.5	4	1
11997	Bromomethane	74-83-9	21	0.5	1	1
11997	2-Butanone	78-93-3	140	3	10	1
11997	Carbon Disulfide	75-15-0	22	1	5	1
11997	Carbon Tetrachloride	56-23-5	22	0.5	1	1
11997	Chlorobenzene	108-90-7	19	0.5	1	1
11997	Chloroethane	75-00-3	20	0.5	1	1
11997	Chloroform	67-66-3	21	0.5	1	1
11997	Chloromethane	74-87-3	19	0.5	1	1
11997	Cyclohexane	110-82-7	22	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	16	2	5	1
11997	Dibromochloromethane	124-48-1	18	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	19	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	19	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	18	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	19	1	5	1
11997	Dichlorodifluoromethane	75-71-8	22	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	21	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	20	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	22	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	20	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	21	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	20	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	19	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	18	0.5	1	1
11997	Ethylbenzene	10001 02 0	19	0.5	1	1
11997	Freon 113	76-13-1	25	2	10	1
11997	2-Hexanone	591-78-6	78	3	10	1
11997	Isopropylbenzene	98-82-8	19	1	5	1
11997	Methyl Acetate	79-20-9	20	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	20	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	86	3	10	1
11997	Methylcyclohexane	108-87-2	24	1	5	1
11997	Methylene Chloride	75-09-2	20	2	4	1
11997	Styrene	100-42-5	19	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	17	0.5	1	1
11997	Tetrachloroethene	127-18-4	20	0.5	1	1
11997	Toluene	108-88-3	19	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	17	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	18	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	18	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	18	0.5	1	1
11997	Trichloroethene	79-00-5	21	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	25	0.5	1	1
11997	Vinyl Chloride	75-09-4	21	0.5	1	1
11997	m+p-Xylene	179601-23-1	38	0.5	1	1
11221	W. P WATCHC	1,7001-23-1	30	··J	_	_

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-30-161114 MSD Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697077 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 16:00 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/15/2016 09:40

Reported: 01/30/2017 13:32

M1310 SDG#: MMK13-10MSD

CAT No.	Analysis Name	CAS	Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW	V-846 8260C		ug/l	ug/l	ug/l	
11997	o-Xylene	95-	47-6	19	0.5	1	1
Misc.		PA 537 Rev.	1.1	ng/l	ng/l	ng/l	
	mo	odified					
10954	Perfluorooctanoic acid	. 335	-67-1	270	1	2	1
10954	Perfluorononanoic acid	375	-95-1	210	1	2	1
10954	Perfluorodecanoic acid	. 335	-76-2	240	1	2	1
10954	Perfluoroundecanoic ac	id 205	8-94-8	260	2	4	1
10954	Perfluorododecanoic ac	id 307	-55-1	230	3	5	1
10954	Perfluorotridecanoic a	cid 726	29-94-8	230	2	4	1
10954	Perfluorotetradecanoic		-06-7	220	3	5	1
10954	Perfluorohexanoic acid	307	-24-4	240	1	2	1
10954	Perfluoroheptanoic acid	d 375	-85-9	230	1	2	1
10954	Perfluorobutanesulfona	te 375	-73-5	210	4	10	1
10954	Perfluorohexanesulfona	te 355	-46-4	200	4	10	1
10954	Perfluoro-octanesulfon	ate 176	3-23-1	220	5	10	1
10954	Perfluorobutanoic Acid	. 375	-22-4	230	3	10	1
10954	Perfluoropentanoic Acid	d 270	6-90-3	230	1	3	1
10954	NETFOSAA	299	1-50-6	130	5	8	1
	NEtFOSAA is the acrony	m for N-ethyl p	perfluorooct		Acid.		
10954	NMeFOSAA	235	5-31-9	150	4	8	1
	NMeFOSAA is the acrony	m for N-methyl	perfluorood	ctanesulfonamidoacetic	c Acid.		
The :	stated QC limits are adv	visory only unt	il sufficie	ent data points			
can l	be obtained to calculate	e statistical l	imits.				
Metals	s Sw	V-846 6010C		mg/l	mg/l	mg/l	
01750	Calcium	744	0-70-2	23.0	0.0382	0.400	1
01757	Magnesium	743	9-95-4	5.42	0.0190	0.200	1
01762	Potassium	744	0-09-7	13.3	0.160	1.00	1
01767	Sodium	744	0-23-5	74.3	0.173	2.00	1
Wet Ch	nemistry SM	4 2320 B-199	7	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH	4.5 n.a	•	191	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time		Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163281AA	11/23/2016 12	2:11	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163281AA	11/23/2016 12	2:11	Kevin A Sposito	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16327003	11/30/2016 02	2:59	Marissa C Drexinger	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-30-161114 MSD Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697077 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 16:00 by JD C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 11/15/2016 09:40

Reported: 01/30/2017 13:32

M1310 SDG#: MMK13-10MSD

	Laboratory Sample Analysis Record											
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor				
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16327003	11/25/2016	08:45	Robert Brown	1				
01750	Calcium	SW-846 6010C	1	163280635001	11/25/2016	23:46	Elaine F Stoltzfus	1				
01757	Magnesium	SW-846 6010C	1	163280635001	11/25/2016	23:46	Elaine F Stoltzfus	1				
01762	Potassium	SW-846 6010C	1	163280635001	11/25/2016	23:46	Elaine F Stoltzfus	1				
01767	Sodium	SW-846 6010C	1	163280635001	11/25/2016	23:46	Elaine F Stoltzfus	1				
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163280635001	11/25/2016	05:14	James L Mertz	1				
12150	Total Alkalinity to pH	SM 2320 B-1997	1	16326010102A	11/21/2016	18:11	Kenneth A Bell	1				

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVD5-30-161114 Dupl Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697078 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 16:00 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/15/2016 09:40 Reported: 01/30/2017 13:32

M1310 SDG#: MMK13-10DUP

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	5	SW-846 6	6010C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	18.0	0.0382	0.400	1
01757	Magnesium		7439-95-4	3.17	0.0190	0.200	1
01762	Potassium		7440-09-7	2.41	0.160	1.00	1
01767	Sodium		7440-23-5	61.1	0.173	2.00	1
Wet Ch	nemistry	EPA 300	.0	mg/l	mg/l	mg/l	
00224	Chloride		16887-00-6	113	4.0	8.0	20
00228	Sulfate		14808-79-8	14.0	1.5	5.0	5
		EPA 353	. 2	mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrat	te Nitroger	n n.a.	2.3	0.080	0.20	2
		SM 2320	B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	pH 4.5	n.a.	20.4	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

	Laboratory Sample Analysis Record										
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor			
01750	Calcium	SW-846 6010C	1	163280635001		23:40	Elaine F Stoltzfus				
01757	Magnesium	SW-846 6010C	1	163280635001	11/25/2016	23:40	Elaine F Stoltzfus	1			
01762	Potassium	SW-846 6010C	1	163280635001	11/25/2016	23:40	Elaine F Stoltzfus	1			
01767	Sodium	SW-846 6010C	1	163280635001	11/25/2016	23:40	Elaine F Stoltzfus	1			
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	163280635001	11/25/2016	05:14	James L Mertz	1			
00224	Chloride	EPA 300.0	1	16331972171A	11/26/2016	15:32	Alexandria M Lanager	20			
00228	Sulfate	EPA 300.0	1	16331972171A	11/26/2016	15:18	Alexandria M Lanager	5			
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101B	11/20/2016	19:23	Joseph E McKenzie	2			
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16326010102A	11/21/2016	17:53	Kenneth A Bell	1			

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVDFD01-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697079 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 by JD

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 11/15/2016 09:40 Reported: 01/30/2017 13:32

M1311 SDG#: MMK13-11FD

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

REVISED

Sample Description: SG2-MVDFD01-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697079 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 11/15/2016 09:40 Latham NY 12110

Reported: 01/30/2017 13:32

M1311 SDG#: MMK13-11FD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
	Volatiles	SW-846 8260C	ug/l	ug/l	ug/l	
11997	o-Xylene	95-47-6	0.5 U	0.5	1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined

Misc.	Organics EPA	537 Rev. 1.1	ng/l		ng/l	ng/l	
	modi						
10954	Perfluorooctanoic acid	335-67-1	60		1	2	1
10954	Perfluorononanoic acid	375-95-1	1	U	1	2	1
10954	Perfluorodecanoic acid	335-76-2	1	U	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	2	U	2	4	1
10954	Perfluorododecanoic acid	307-55-1	3	U	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	2	U	2	4	1
10954	Perfluorotetradecanoic ac	id 376-06-7	3	U	3	5	1
10954	Perfluorohexanoic acid	307-24-4	10		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	9		1	2	1
10954	Perfluorobutanesulfonate	375-73-5	4	J	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	4	U	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	5	U	5	10	1
10954	Perfluorobutanoic Acid	375-22-4	5	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	6		1	3	1
10954	NETFOSAA	2991-50-6	5	U	5	8	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.						
10954	NMeFOSAA	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.						

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Metals	s SV	√-846 60	10C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	16.8	0.0382	0.400	1
01757	Magnesium		7439-95-4	3.14	0.0190	0.200	1
01762	Potassium		7440-09-7	2.31	0.160	1.00	1
01767	Sodium		7440-23-5	53.0	0.173	2.00	1
Wet Chemistry EPA 300.0		mg/l	mg/l	mg/l			
00224	Chloride		16887-00-6	86.8	4.0	8.0	20
00228	Sulfate		14808-79-8	14.7	1.5	5.0	5
	EI	PA 353.2		mg/l	mg/l	mg/l	
07882	Total Nitrite/Nitrate	Nitrogen	n.a.	2.9	0.080	0.20	2
SM 2320 B-1997			-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH	4.5	n.a.	20.2	1.7	5.0	1
12149	Bicarbonate Alkalinity		n.a.	20.2	1.7	5.0	1
12148	Carbonate Alkalinity		n.a.	1.7 U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Sample Description: SG2-MVDFD01-161114 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8697079 LL Group # 1733211 Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/14/2016 by JD

50 Century Hill Drive Submitted: 11/15/2016 09:40 Latham NY 12110

Reported: 01/30/2017 13:32

M1311 SDG#: MMK13-11FD

Sample Comments

C. T. Male Associates

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method Trial# Batch# CAT Dilution Analysis Name Analysis Analyst No. Date and Time Factor 11997 SOM02.2 Volatiles SW-846 8260C L163281AA 11/23/2016 15:08 Kevin A Sposito 01163 GC/MS VOA Water Prep SW-846 5030C L163281AA 11/23/2016 15:08 Kevin A Sposito 10954 16 PFCs EPA 537 Rev. 1.1 16327003 11/30/2016 09:29 1 Marissa C 1 modified Drexinger 14091 PFAA Water Prep EPA 537 Rev. 1.1 1 16327003 11/25/2016 08:45 Robert Brown 1 modified 01750 Calcium SW-846 6010C 163280635001 Elaine F Stoltzfus 11/26/2016 00:20 01757 Magnesium SW-846 6010C 163280635001 11/26/2016 00:20 Elaine F Stoltzfus 1 01762 Potassium SW-846 6010C 163280635001 11/26/2016 00:20 Elaine F Stoltzfus 01767 Sodium SW-846 6010C 163280635001 Elaine F Stoltzfus 1 11/26/2016 00:20 163280635001 James L Mertz 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 11/25/2016 05:14 00224 Chloride EPA 300.0 1 16331972171A 11/26/2016 21:51 Alexandria M 2.0 Lanager 00228 Sulfate EPA 300.0 1 16331972171A 11/26/2016 21:37 Alexandria M 5 Lanager 16325118101B 07882 Total Nitrite/Nitrate EPA 353.2 11/20/2016 19:41 Joseph E McKenzie 2 Nitrogen 12150 Total Alkalinity to pH SM 2320 B-1997 1 16326010103A 11/22/2016 00:35 Kenneth A Bell 1 SM 2320 B-1997 12149 Bicarbonate Alkalinity 16326010103A 11/22/2016 00:35 Kenneth A Bell SM 2320 B-1997 16326010103A 12148 Carbonate Alkalinity 11/22/2016 00:35 Kenneth A Bell 1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

	1E		EPA SAM	PLE NO.
7	OLATILE ORGANICS ANA TENTATIVELY IDENTIF	IED COMPOUNDS	! ! M13:	
ab Code: LANCAS atrix: (soil/wa	ater) WATER 5.0 (g/mL)mL) LOW dec. cap) CAP	Contract: SAS No.: Lab Sample ID: 8 Lab File ID:HPO Date Received: 1 Date Analyzed: 1 Dilution Factor: CONCENTRATION (ug/L or ug/Kg	SDG No. 697079 9915.i/16nov238 1/15/16 1/23/16 1.0 UNITS:	:!
	! ! COMPOUND NAME =!===================================		! EST. CONC.	
2. 3. 4. 5. 6. 7. 8. 9. 0. 11. 22. 33. 44. 55. 66. 77. 88. 99. 90. 90. 90. 90. 90. 90. 90	!Total VOC TICS			
21. 22. 23. 24. 25. 26. 77.			!	

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1733211

Reported: 01/30/2017 13:32

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Batch number: L163281AA	Sample	number	(s): 86970	66-8697070,8697072-8697077,8697079
Acetone	6	U	6	20
Benzene	0.5	U	0.5	1
Bromochloromethane	1	U	1	5
Bromodichloromethane	0.5	U	0.5	1
Bromoform	0.5	U	0.5	4
Bromomethane	0.5	U	0.5	1
2-Butanone	3	U	3	10
Carbon Disulfide	1	U	1	5
Carbon Tetrachloride	0.5	U	0.5	1
Chlorobenzene	0.5	U	0.5	1
Chloroethane	0.5	U	0.5	1
Chloroform	0.5	U	0.5	1
Chloromethane	0.5	U	0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	U	2	5
Dibromochloromethane	0.5	U	0.5	1
1,2-Dibromoethane	0.5	U	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5
Dichlorodifluoromethane	0.5	U	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	U	0.5	1
trans-1,2-Dichloroethene	0.5	U	0.5	1
1,2-Dichloropropane	0.5	U	0.5	1
cis-1,3-Dichloropropene	0.5	U	0.5	1
trans-1,3-Dichloropropene	0.5	U	0.5	1
Ethylbenzene	0.5	U	0.5	1
Freon 113	2	U	2	10
2-Hexanone	3	U	3	10
Isopropylbenzene	1	U	1	5
Methyl Acetate	1	U	1	5
Methyl Tertiary Butyl Ether	0.5	U	0.5	1
4-Methyl-2-pentanone	3	U	3	10
Methylcyclohexane	1	U	1	5
Methylene Chloride	2	U	2	4
Styrene	1	U	1	5
1,1,2,2-Tetrachloroethane	0.5	U	0.5	1

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1733211

Reported: 01/30/2017 13:32

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Tetrachloroethene	0.5	U	0.5	1
Toluene	0.5	IJ	0.5	1
1,2,3-Trichlorobenzene	1	U	1	5
1,2,4-Trichlorobenzene	1	IJ	1	5
1,1,1-Trichloroethane	0.5	U	0.5	1
1,1,2-Trichloroethane	0.5	IJ	0.5	1
Trichloroethene	0.5	U	0.5	1
Trichlorofluoromethane	0.5	U	0.5	1
Vinyl Chloride	0.5	U	0.5	1
m+p-Xylene	0.5	U	0.5	1
o-Xylene	0.5	Ū	0.5	1
	ng/l		ng/l	ng/l
Batch number: 16327003	_	number	_	66-8697077,8697079
Perfluorooctanoic acid	1	U	1	2
Perfluorononanoic acid	1	U	1	2
Perfluorodecanoic acid	1	U	1	2
Perfluoroundecanoic acid	2	IJ	2	4
Perfluorododecanoic acid	3	IJ	3	5
Perfluorotridecanoic acid	2	U	2	4
Perfluorotetradecanoic acid	3	U	3	5
Perfluorohexanoic acid	1	IJ	1	2
Perfluoroheptanoic acid	1	IJ	1	2
Perfluorobutanesulfonate	4	U	4	10
Perfluorohexanesulfonate	4	IJ	4	10
Perfluoro-octanesulfonate	5	IJ	5	10
Perfluorobutanoic Acid	3	IJ	3	10
Perfluoropentanoic Acid	1	U	1	3
NEtFOSAA	5	U	5	8
NMeFOSAA	4	IJ	4	8
Intel oblat	=	O	_	
	mg/l		mg/l	mg/l
Batch number: 163280635001				67-8697070,8697072-8697079
Calcium	0.0472		0.0382	0.400
Magnesium	0.0190		0.0190	0.200
Potassium	0.160		0.160	1.00
Sodium	0.173	U	0.173	2.00
Batch number: 16325118101B	Sample	number	(s): 86970	67-8697070,8697072-8697076,8697078-8697079
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 16331972171A	0 1	,	/) - 06050	
Chloride	0.20	number		67-8697070,8697072-8697076,8697078-8697079
Sulfate	0.20	U	0.20	0.40
Sullate	0.30	U	0.30	1.0
	mg/l a	s CaCO3	mg/l as	mg/l as
			CaCO3	CaCO3
Batch number: 16324004201A	_		(s): 86970	
Total Alkalinity to pH 4.5	1.7	U	1.7	5.0

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1733211

Reported: 01/30/2017 13:32

Method Blank (continued)

Analysis Name	Result	MDL**	LOQ	
	mg/l as Ca	CO3 mg/l CaCO3	-	
Batch number: 16324004203A Total Alkalinity to pH 4.5	Sample num		3697067,8697069, 5.0	8697074
Batch number: 16326010102A	-		8697075-8697078	
Total Alkalinity to pH 4.5	1.7 U	1.7	5.0	
Batch number: 16326010103A	-	. ,		8697073,8697079
Total Alkalinity to pH 4.5	1.7 U	1.7	5.0	

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: L163281AA	Sample number	r(s): 86970	066-8697070,86	97072-8697	7077.8697	079			
Acetone	150	132.7			88		50-168		
Benzene	20	19.12			96		78-120		
Bromochloromethane	20	20.69			103		80-125		
Bromodichloromethane	20	19.19			96		80-120		
Bromoform	20	16.47			82		59-120		
Bromomethane	20	18.77			94		55-123		
2-Butanone	150	139.59			93		57-145		
Carbon Disulfide	20	20.53			103		58-120		
Carbon Tetrachloride	20	20.41			102		74-130		
Chlorobenzene	20	18.17			91		80-120		
Chloroethane	20	18.69			93		56-120		
Chloroform	20	19.54			98		80-120		
Chloromethane	20	17.31			87		59-127		
Cyclohexane	20	20.89			104		65-131		
1,2-Dibromo-3-chloropropane	20	16.62			83		59-120		
Dibromochloromethane	20	18.05			90		78-120		
1,2-Dibromoethane	20	18.32			92		80-120		
1,2-Dichlorobenzene	20	18.54			93		80-120		
1,3-Dichlorobenzene	20	18.18			91		80-120		
1,4-Dichlorobenzene	20	18.49			92		80-120		
Dichlorodifluoromethane	20	18.82			94		49-134		
1,1-Dichloroethane	20	19.55			98		80-120		
1,2-Dichloroethane	20	19.93			100		66-128		
1,1-Dichloroethene	20	20.86			104		76-124		
cis-1,2-Dichloroethene	20	19.79			99		80-120		
trans-1,2-Dichloroethene	20	20.08			100		80-120		
1,2-Dichloropropane	20	19.17			96		80-120		
cis-1,3-Dichloropropene	20	18.1			90		80-120		
trans-1,3-Dichloropropene	20	17.62			88		76-120		
Ethylbenzene	20	18.13			91		78-120		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1733211

Reported: 01/30/2017 13:32

LCS/LCSD (continued)

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Freon 113	20	22.12			111		64-136		
2-Hexanone	100	79.34			79		49-146		
Isopropylbenzene	20	18.54			93		80-120		
Methyl Acetate	20	20.47			102		61-137		
Methyl Tertiary Butyl Ether	20	19.96			100		75-120		
4-Methyl-2-pentanone	100	85.19			85		55-141		
Methylcyclohexane	20	21.6			108		66-126		
Methylene Chloride	20	19.87			99		80-120		
Styrene	20	18.42			92		80-120		
1,1,2,2-Tetrachloroethane	20	17.66			88		72-120		
Tetrachloroethene	20	19.26			96		80-129		
Toluene	20	18.52			93		80-120		
1,2,3-Trichlorobenzene	20	17.29			86		69-120		
1,2,4-Trichlorobenzene	20	17.28			86		72-120		
1,1,1-Trichloroethane	20	17.16			86		66-126		
1,1,2-Trichloroethane	20	18.04			90		80-120		
Trichloroethene	20	19.16			96		80-120		
Trichlorofluoromethane	20	22.99			115		67-129		
Vinyl Chloride	20	19.22			96		63-121		
m+p-Xylene	40	36.74			92		80-120		
o-Xylene	20	18.01			90		80-120		
	ng/l	ng/l	ng/l	ng/l					
Batch number: 16327003	Sample numbe	r(s): 86970	66-8697077,86	97079					
Perfluorooctanoic acid	200	198.09			99		70-130		
Perfluorononanoic acid	200	212.6			106		70-130		
Perfluorodecanoic acid	200	228.72			114		70-130		
Perfluoroundecanoic acid	200	229.67			115		70-130		
Perfluorododecanoic acid	200	227.34			114		70-130		
Perfluorotridecanoic acid	200	231.53			116		70-130		
Perfluorotetradecanoic acid	200	222.69			111		70-130		
Perfluorohexanoic acid	200	222.61			111		70-130		
Perfluoroheptanoic acid	200	213.69			107		70-130		
Perfluorobutanesulfonate	176.8	192.54			109		70-130		
Perfluorohexanesulfonate	189.2	217.64			115		70-130		
Perfluoro-octanesulfonate	191.2	221.98			116		70-130		
Perfluorobutanoic Acid	200	219.2			110		70-130		
Perfluoropentanoic Acid	200	216.76			108		70-130		
NEtFOSAA	200	131.51			66*		70-130		
NMeFOSAA	200	146.36			73		70-130		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 163280635001	Sample numbe	r(s): 86970	67-8697070,86	97072-8697	7079				
Calcium	4.00	4.11			103		80-120		
Magnesium	2.00	2.03			101		80-120		
Potassium	10	10.03			100		80-120		
Sodium	10	10.0			100		80-120		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1733211

Reported: 01/30/2017 13:32

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/l	LCS Conc mg/l	LCSD Spike Added mg/l	LCSD Conc mg/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 16325118101B	Sample numbe	er(s): 86970	067-8697070,86	97072-8697	076,8697	078-8697	079		
Total Nitrite/Nitrate Nitrogen	2.50	2.43			97		90-110		
Batch number: 16331972171A	Sample numbe	er(s): 86970	067-8697070,86	97072-8697	076,8697	078-8697	079		
Chloride	3.00	3.04			101		90-110		
Sulfate	7.50	7.49			100		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16324004201A	Sample number	er(s): 86970	072						
Total Alkalinity to pH 4.5	188	185.14			98		84-110		
Batch number: 16324004203A	Sample numbe	er(s): 86970	067,8697069,86	97074					
Total Alkalinity to pH 4.5	188	185.39			99		84-110		
Batch number: 16326010102A	Sample numbe	er(s): 86970	075-8697078						
Total Alkalinity to pH 4.5	188	181.54			97		84-110		
Batch number: 16326010103A	Sample number	er(s): 86970	068,8697070,86	97073,8697	079				
Total Alkalinity to pH 4.5	188	183.02			97		84-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspi Cor ug/	C	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: L163281AA	Sample	numb	er(s): 8697	7066-8697	070,8697072-	-8697077,8	3697079	UNSPK: 8	697075		
Acetone	6	U	150	135.14	150	142.98	90	95	50-168	6	30
Benzene	0.5	U	20	20.55	20	20.29	103	101	78-120	1	30
Bromochloromethane	1	U	20	21.49	20	21.29	107	106	80-125	1	30
Bromodichloromethane	0.5	U	20	19.58	20	19.6	98	98	80-120	0	30
Bromoform	0.5	U	20	16.57	20	16.29	83	81	59-120	2	30
Bromomethane	0.5	U	20	20.78	20	20.93	104	105	55-123	1	30
2-Butanone	3	U	150	140.7	150	139.59	94	93	57-145	1	30
Carbon Disulfide	1	U	20	22.12	20	21.58	111	108	58-120	2	30
Carbon Tetrachloride	0.5	U	20	22.55	20	22.06	113	110	74-130	2	30
Chlorobenzene	0.5	U	20	19.01	20	18.67	95	93	80-120	2	30
Chloroethane	0.5	U	20	20.17	20	20.3	101	101	56-120	1	30
Chloroform	0.5	U	20	20.82	20	20.59	104	103	80-120	1	30
Chloromethane	0.5	U	20	18.8	20	19.15	94	96	59-127	2	30
Cyclohexane	2	U	20	22.94	20	22.49	115	112	65-131	2	30
1,2-Dibromo-3-chloropropane	2	U	20	15.46	20	15.63	77	78	59-120	1	30
Dibromochloromethane	0.5	U	20	18.09	20	18.06	90	90	78-120	0	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1733211

Reported: 01/30/2017 13:32

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspi Con ug/	C	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
1,2-Dibromoethane	0.5	U	20	18.59	20	18.63	93	93	80-120	0	30
1,2-Dichlorobenzene	1	U	20	18.48	20	18.53	92	93	80-120	0	30
1,3-Dichlorobenzene	1	U	20	18.44	20	18.48	92	92	80-120	0	30
1,4-Dichlorobenzene	1	U	20	18.63	20	18.6	93	93	80-120	0	30
Dichlorodifluoromethane	0.5	U	20	21.31	20	21.59	107	108	49-134	1	30
1,1-Dichloroethane	0.5	Ū	20	20.85	20	20.72	104	104	80-120	1	30
1,2-Dichloroethane	0.5	U	20	20.51	20	20.48	103	102	66-128	0	30
1,1-Dichloroethene	0.5	U	20	22.75	20	22.33	114	112	76-124	2	30
cis-1,2-Dichloroethene	0.5	U	20	20.78	20	20.46	104	102	80-120	2	30
trans-1,2-Dichloroethene	0.5	U	20	21.95	20	21.44	110	107	80-120	2	30
1,2-Dichloropropane	0.5	U	20	19.74	20	19.85	99	99	80-120	1	30
cis-1,3-Dichloropropene	0.5	U	20	18.91	20	18.79	95	94	80-120	1	30
trans-1,3-Dichloropropene	0.5	U	20	17.72	20	17.72	89	89	76-120	0	30
Ethylbenzene	0.5	U	20	19.19	20	18.99	96	95	78-120	1	30
Freon 113	2	U	20	24.02	20	24.51	120	123	64-136	2	30
2-Hexanone	3	U	100	79.48	100	78.21	79	78	49-146	2	30
Isopropylbenzene	1	U	20	19.68	20	19.47	98	97	80-120	1	30
Methyl Acetate	1	U	20	20.06	20	19.88	100	99	61-137	1	30
Methyl Tertiary Butyl Ether	0.5	U	20	20.13	20	20.09	101	100	75-120	0	30
4-Methyl-2-pentanone	3	U	100	86.32	100	85.75	86	86	55-141	1	30
Methylcyclohexane	1	U	20	24.25	20	23.85	121	119	66-126	2	30
Methylene Chloride	2	U	20	20.47	20	20.12	102	101	80-120	2	30
Styrene	1	U	20	19.18	20	19.08	96	95	80-120	0	30
1,1,2,2-Tetrachloroethane	0.5	U	20	17.23	20	16.84	86	84	72-120	2	30
Tetrachloroethene	0.5	U	20	20.09	20	20.08	100	100	80-129	0	30
Toluene	0.5	U	20	19.58	20	19.16	98	96	80-120	2	30
1,2,3-Trichlorobenzene	1	U	20	16.86	20	17.16	84	86	69-120	2	30
1,2,4-Trichlorobenzene	1	U	20	17.25	20	17.5	86	88	72-120	1	30
1,1,1-Trichloroethane	0.5	U	20	18.63	20	18.45	93	92	66-126	1	30
1,1,2-Trichloroethane	0.5	U	20	18.21	20	17.97	91	90	80-120	1	30
Trichloroethene	0.5	U	20	20.7	20	20.56	104	103	80-120	1	30
Trichlorofluoromethane	0.5	U	20	25.58	20	25.28	128	126	67-129	1	30
Vinyl Chloride	0.5	U	20	21.15	20	21.33	106	107	63-121	1	30
m+p-Xylene	0.5	U	40	38.62	40	38.33	97	96	80-120	1	30
o-Xylene	0.5	U	20	18.94	20	18.67	95	93	80-120	1	30
	ng/	1	ng/l	ng/l	ng/l	ng/l					
Batch number: 16327003	Sample	numb	er(s): 8697	066-8697	077,8697079	UNSPK: 86	597075				
Perfluorooctanoic acid	45.3	4	200.54	256.33	200.7	274.78	105	114	70-130	7	30
Perfluorononanoic acid	1	U	200.54	234.57	200.7	206.79	117	103	70-130	1.3	30
Perfluorodecanoic acid	1	U	200.54	198.65	200.7	236.9	99	118	70-130	18	30
Perfluoroundecanoic acid	2	U	200.54	241.04	200.7	259.8	120	129	70-130	7	30
Perfluorododecanoic acid	3	U	200.54	240.53	200.7	230.68	120	115	70-130	4	30
Perfluorotridecanoic acid	2	U	200.54	240.34	200.7	226.68	120	113	70-130	6	30
Perfluorotetradecanoic acid	3	U	200.54	220.77	200.7	217.87	110	109	70-130	1	30
Perfluorohexanoic acid	10.1	.9	200.54	249.55	200.7	236.09	119	113	70-130	6	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1733211

Reported: 01/30/2017 13:32

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ng/l	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Perfluoroheptanoic acid	7.45	200.54	238.66	200.7	228.5	115	110	70-130	4	30
Perfluorobutanesulfonate	4 U	177.28	215.88	177.42	212.64	122	120	70-130	2	30
Perfluorohexanesulfonate	4 U	189.71	223.88	189.87	203.47	118	107	70-130	10	30
Perfluoro-octanesulfonate	5 U	191.72	199.12	191.87	216.68	104	113	70-130	8	30
Perfluorobutanoic Acid	5.16	200.54	240.99	200.7	230.56	118	112	70-130	4	30
Perfluoropentanoic Acid	6.98	200.54	240.53	200.7	230.55	116	111	70-130	4	30
NETFOSAA	5 U	200.54	140.19	200.7	131.66	70	66*	70-130	6	30
NMeFOSAA	4 U	200.54	137.43	200.7	145.16	69*	72	70-130	5	30
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 163280635001	Sample numb	er(s): 8697	7067-8697	070,8697072	-8697079	UNSPK: 8	697075			
Calcium	18.99	4.00	23.47	4.00	22.99	112 (2)	100 (2)	75-125	2	20
Magnesium	3.37	2.00	5.51	2.00	5.42	107	102	75-125	2	20
Potassium	2.57	10	13.44	10	13.26	109	107	75-125	1	20
Sodium	64.4	10	76.11	10	74.34	117 (2)	99 (2)	75-125	2	20
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 16325118101B	Sample numb	er(s): 8697	7067-8697	070,8697072	-8697076,	8697078-8	8697079 t	NSPK: 869	7075	
Total Nitrite/Nitrate Nitrogen	2.23	2.00	4.78			128*		90-110		
Batch number: 16331972171A Chloride Sulfate	Sample numb 112.32 13.97	er(s): 8697 80 50	7067-8697 181.49 63.18	070,8697072	-8697076,	8697078-8 86* 98	8697079 ti	NSPK: 869 90-110 90-110	7075	
	mg/l as CaCO3	mg/l as CaCO3	mg/l as	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16324004201A	Sample numb									
Total Alkalinity to pH 4.5	16.67	188	185.69	188	195.59	90	95	84-110	5	5
Batch number: 16324004203A Total Alkalinity to pH 4.5	Sample numb	er(s): 8697 188	7067,8697 194.55	069,8697074	UNSPK: P	697170 85		84-110		
D-+-h 162260101027	Sample numb	/-). 0605	7075 0607	070 INCDI.	0607075					
Batch number: 16326010102A Total Alkalinity to pH 4.5	17.59	er(s): 869. 188	183.25	188	191.31	88	92	84-110	4	5
Batch number: 16326010103A Total Alkalinity to pH 4.5	Sample numb	er(s): 8697 188	7068,8697 253.74	070,8697073	,8697079	UNSPK: PO	697734	84-110		

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name BKG Conc DUP Conc DUP RPD DUP RPD Max

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1733211

Reported: 01/30/2017 13:32

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD D	DUP RPD Max
	mg/l	mg/l		
Batch number: 163280635001 Calcium Magnesium Potassium Sodium	Sample number(s): 18.99 3.37 2.57 64.4	8697067-8697070,8697 17.97 3.17 2.41 61.07	072-8697079 F 6 6 6 (1) 5	BKG: 8697075 20 20 20 20 20
	mg/l	mg/l		
Batch number: 16325118101B Total Nitrite/Nitrate Nitrogen	Sample number(s): 2.23	8697067-8697070,8697 2.25	072-8697076,8 1	8697078-8697079 BKG: 8697075 2
Batch number: 16331972171A Chloride Sulfate	Sample number(s): 112.32 13.97	8697067-8697070,8697 112.51 13.96	072-8697076,8 0 0 (1)	8697078-8697079 BKG: 8697075 15 15
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 16324004201A Total Alkalinity to pH 4.5	Sample number(s): 16.67	8697072 BKG: P695182 16.81	1 (1)	5
Batch number: 16324004203A Total Alkalinity to pH 4.5	Sample number(s): 34.14	8697067,8697069,8697 34.47	074 BKG: P697	7170 5
Batch number: 16326010102A Total Alkalinity to pH 4.5	Sample number(s): 17.59	8697075-8697078 BKG: 20.4	8697075 15* (1)	5
Batch number: 16326010103A Total Alkalinity to pH 4.5	Sample number(s): 84	8697068,8697070,8697 85.11	073,8697079 E	BKG: P697734 5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: L163281AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8697066	103	101	97	98
8697067	101	101	98	98
8697068	102	99	99	98
8697069	102	101	97	98
8697070	102	101	97	98
8697072	102	100	98	98
8697073	102	101	96	97
8697074	103	102	97	98
8697075	104	104	97	99

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1733211

Reported: 01/30/2017 13:32

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: L163281AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8697076	104	102	98	100
8697077	104	101	98	99
8697079	103	99	98	97
Blank	103	101	98	98
LCS	102	102	99	99
MS	104	102	98	100
MSD	104	101	98	99

Limits: 80-116 77-113 80-113 78-113

Analysis Name: 16 PFCs Batch number: 16327003

Batch num	ber: 16327003					
	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8697066	73	74	71	73	67*	82
8697067	68*	77	82	65*	69*	67*
8697068	66*	75	78	65*	61*	66*
8697069	58*	65*	70	59*	61*	64*
8697070	70	84	89	66*	70	76
8697071	66*	67*	63*	62*	58*	66*
8697072	63*	71	75	61*	59*	64*
8697073	59*	64*	71	53*	61*	64*
8697074	65*	72	72	61*	64*	66*
8697075	74	88	90	66*	69*	71
8697076	65*	71	78	63*	74	71
8697077	68*	76	77	59*	68*	69*
8697079	69*	80	79	64*	55*	68*
Blank	68*	70	69*	67*	67*	71
LCS	63*	61*	65*	53*	59*	60*
MS	65*	71	78	63*	74	71
MSD	68*	76	77	59*	69*	69*
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8697066	75	82	85	78	79	69*
8697067	71	71	65*	71	67*	65*
8697068	65*	77	69*	71	76	65*
8697069	57*	57*	50*	58*	57*	53*
0.007.070	C O +	0.5			D1	E0

	13C0-11 OA	1300-1103	1307-111NA	13C0-11 DA	UJ-NIVICI OJAA	13C7-11 OHDA
8697066	75	82	85	78	79	69*
8697067	71	71	65*	71	67*	65*
8697068	65*	77	69*	71	76	65*
8697069	57*	57*	50*	58*	57*	53*
8697070	68*	85	77	77	71	72
8697071	62*	73	74	76	69*	68*
8697072	66*	66*	67*	64*	61*	59*
8697073	63*	68*	59*	61*	69*	58*
8697074	60*	70	64*	64*	64*	63*
8697075	72	77	73	78	75	68*
8697076	71	79	63*	73	72	67*

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

REVISED

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1733211

Reported: 01/30/2017 13:32

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 16327003

	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8697077	65*	74	66*	69*	78	68*
8697079	67*	78	74	71	67*	64*
Blank	74	69*	69*	69*	69*	58*
LCS	66*	64*	69*	62*	76	65*
MS	71	79	63*	73	72	67*
MSD	65*	74	66*	69*	78	68*
Limits:	70-130	70-130	70-130	70-130	70-130	70-130

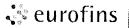
	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
8697066	83	67*	63*	
8697067	76	61*	65*	
8697068	70	61*	64*	
8697069	60*	56*	54*	
8697070	85	65*	70	
8697071	73	64*	62*	
8697072	64*	54*	51*	
8697073	74	60*	57*	
8697074	66*	61*	59*	
8697075	82	75	72	
8697076	79	63*	65*	
8697077	89	67*	68*	
8697079	67*	61*	63*	
Blank	73	61*	61*	
LCS	85	65*	67*	
MS	79	63*	65*	
MSD	89	67*	68*	
Limits:	70-130	70-130	70-130	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

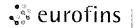
⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



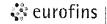
Lancaster Environmental Services Analysis Request/Chain of Custody

Acct. #:	37191		Grou	ıp #:	17	332			Sam	ple #:	86	9	10(06	-7	9					COC#: 1	15595
Client: C.T. Male Associates						Matrix					•			ses F					·	٦	For Lab Us	e Only
Project Name/#: SGPP - Merrimack	Site ID:					D (Z)						Pı	ese	rvati	on (Code	 ≥s				SF#: <u>285327</u>	
Project Manager: Kirk Moline	P.O. #:	16.6126	,		١ _٢	age and			Н	N		s									SCR#: <u>196069</u>	
Sampler: Jon Differt, Ryan Hubberd					Sediment	Ground	1					N									Preservati	on Codes
Phone #: \$78 - 786 - 7410	Quote #:	214135			Sed		Just	Jers		ပြွ		2 45		<u>@</u>	(;					İ	H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						lble ES	X	Containers	(S	(6010C)	$^{\circ}$	×	6	320	7 mod.)						N = HNO ₃	B = NaOH
	Colle	ction				Potable NPDES	The state of the s	ပ္ပြ	(8260C)			2) 💠	(300.0)	SMS	A 537						S = H ₂ SO ₄	P = H ₃ PO ₄
	Colle	CHOH		posi		_	:	#	VOAs	Mg, Na,	(353.2)	(353.	-40) ity	(EPA						O = Other	
Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other	Total	TCL V	Ca, M	NOŝ	NO3	CI-, S(Alkalinity (SM 2320B)	PFCs						Rem	arks
SG 2 -AP - LT801 - 16/1/4	11/4/16	***************************************					X	3	X						X					\exists		
SG 2 -AP - MVD4 - 00 - 16/1/4	11/14/16	1335	X			X		1/	X	×		×	×	XI	X							
SG2 -AR - MVD4 - 10 - 16 1114		1345	Х			×		11	X	×		×	X	×	X					\Box		
SG 2 - AND - MVDY - 20 - 16/114		1358	X			X		11	X	X		×	×	X	X							
SG2 - MVBY - 30 - 16/1/4 SGZ - AP - PTBO/ - 16/1/4	e de la composiçõe de l	1405	×			X		11	Х	X		\times	X	X	X							
SGZ - XP - FTBO/ - 16/11/4		1445	X				X								×							
SG 2 -AX60 - MVD5-00-16/114	W. Carlotte	1530	X			×	ļ	11	X	X		χ	X	X	X							
SG2 -ARS -MVD5-10-16//14	e constant de la cons	1540	X			Х		12	X	X		X	X	X	<u>X</u>						Metals Q	ARC
SG2 -AP60 -MVD5-20 = 16/1/4	<u> </u>	1550	X			X		11	X	X		X	\times	X	X]		
SG2 -AFS0 -191055-30 101114			X			X		\mathcal{B}	X	X		X	X	X	X						MS/MS	
Turnaround Time Requested (TAT) (please of		-		4					60	١ >	Date			Time		Rece	eived	by:			Date	Time
(RUSH TAT is subject to Eurofins L⊛ncaster Laboratori Date results are needed:	es approval	and surchar	rges.)		Relig	guished	<i>[][<u>b]</u>]</i> by:	<u>Hirm</u>	relig		//2/ Date			7.2/ Time	2	Rece	eivec	l hv		\dashv	Date	Time
	Moline	e cAm	le en	.ms			7 >	V	U	`	14/1	'.·		70				\				
Data Package Options (please check if requi					Relin	iquish⊖å	фу:	Est - Marie Control	-	1.7	Date			Time		Rece	eived	by:		\neg	Date	Time
Type I (Validation/non-CLP) 📈 MA MC	P	TX TRRP	- 13																			
Type III (Reduced non-CLP)	Р 🗌				Relir	nquished	by:		_		Date			Time		Rece	eived	by:			Date	Time
	ype A 🗌																			_		
	уре В 🗌				Kelir	nquished	by:				Date			Time		Rece		i by:	AL	01	Date 11/15/1/	Time
	-				Airbil	l No.:				<u> </u>						-	ny	un	<i>y</i>	4	111/1/6	0170
lf site-specific QC (MS/MSD/Dup) required, i submit triplicate volume.	ndicate Q	C sample	s and			quished b	•	merc		rrier: Othe	ır					Tem	pera	ture i	upon r	rece	کے . 3 • pipt	1.5°c



Lancaster Environmental Services Analysis Request/Chain of Custody

Acct.	#: 37191		Gro	up #:	17	33	21)	Sam	ple#:	80	09	70	66	9-	79				CÓC#:	15595
Client: C.T. Male Associates						Matri	x									ueste				For Lab Use Only	
Project Name/#: SGPP - Merrimack	Site ID:					M		1				Pı	rese	rvati	on (Code	s			SF#: <u>285327</u>	
Project Manager: Kirk Moline	P.O. #:	16.612	26] =	pu g			Н	Ν		s								SCR#: <u>19606</u>	9
Sampler: In Dippert, Ryan Hobbs	£				Sediment	Ground						4								Preserva	ion Codes
Phone #: 578-786-7400	Quote #:	214135			Sed			ers		်ပွဲ		3		<u></u>	G.					H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						ble		Containers	ပွ	(6010C)	١	Naz	(6	320	7 mod.)					N = HNO ₃	B = NaOH
	Colle	ection		Composite		Potable NPDES		# of	VOAs (8260C)	Ca, Mg, Na, K	(353.2)	(353.2) 🛧	0.000)	Alkalinity (SM 2320B)	(EPA 537					S = H ₂ SO ₄ O = Other	P = H ₃ PO ₄
Sample Identification	Date	Time	Grab	Com	Soil	Water	Other:	Total	TCL V	Ca, M	NG2	NO3	CI-, SC	Alkalir	PFCs					Ren	narks
SGZ - MYDFOO! - 16/11	d 11 /14 his	формиссионые	\mathcal{X}			X		11	X	X		X	X	\times	X						
SG -AP - 16																					
SG -AP - 16																					
SG -AP - 16																					
SG -AP - 16																					
SG -AP - 16																					
SG -AP - 16																					
SG -AP - 16									<u> </u>												
SG -AP - 16																					www.
SG -AP - 16		L	<u> </u>																		
Turnaround Time Requested (TAT) (pleas (RUSH TAT is subject to Eurofins Lancaster Laborat				Η	Reli	nquishe	d by:				Date //4/	1		Time ン٥		Rece	eivec	l by:		Date	Time
Date results are needed:	one approvan	and odronar	900.7		Relin	1quishe	a by:	William Charles Charles			Date			Time		Rece	eivec	by:		Date	Time
E-mail address to send RUSH results:	noline E	strule.	. COM																		
Data Package Options (please check if req	uired)		,		Relin	nquishe	d by:				Date		,	Time		Rece	eivec	l by: `		Date	Time
Type I (Validation/non-CLP) 📈 MA M		TX TRRP	- 13		<u> </u>						<u> </u>							11	$\overline{}$		
Type III (Reduced non-CLP) CT F					Relii	nquishe	a by:			E	Date			Time		Rece	eivec	ı by:)	Date	. Time
· · · · · · · · · · · · · · · · · · ·	Type A Type B				Reli	nquishe	d hv				Date			Time		Rece	eivec	l bv		Date	Time
EDD Format: EQuIS	· ypc b 🗀				1		~ J.											Two	7601	11/25/16	7947
site-specific QC (MS/MSD/Dup) required, indicate QC samples and						l No.: quished	by Cor	mmerc Ex	ial Ca	rrier: Othe	:r					Tem	pera	ture u	pon rece	ک , ک eipt 4	



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

168176

Group Number(s): 1733211

Client: C.T Male

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

11/15/2016 9:40

Number of Packages:

3

Number of Projects:

1

State/Province of Origin:

<u>NH</u>

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

Yes

Custody Seal Present:

Yes

Sample Date/Times match COC:

Yes

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

No

Samples Chilled:
Paperwork Enclosed:

Yes Yes Total Trip Blank Qty:

See Below

Samples Intact:

Yes

Trip Blank Type:

Air Quality Samples Present:

No

3

Missing Samples:

No

Extra Samples:

No

Discrepancy in Container Qty on COC:

No

Trip Blank Type(s): 2 HCL, 1 unpres.

Unpacked by Krista Abel (3058) at 11:17 on 11/15/2016

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler#	Thermometer ID	Corrected Temp	Therm. Type	<u>Ice Type</u>	Ice Present?	Ice Container	Elevated Temp?
1	DT146	2.8	DT	Wet	Υ	Bagged	N
2	DT146	3.6	DT	Wet	Υ	Bagged	N
3	DT146	4.5	DT	Wet	Υ	Bagged	N



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RLReporting Limit kg **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight Besults printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: February 15, 2017

Project: SGPP - Merrimack

Submittal Date: 01/14/2017 Group Number: 1754371 SDG: MMK14 PO Number: 16.6126 State of Sample Origin: NH

Client Sample Description SG2-RB-ROPE-170113 Grab Blank Water Lancaster Labs (LL) # 8787450

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To Barr Engineering Company Attn: Jonathon Carter Electronic Copy To Barr Engineering Company Attn: Lauren Brady Electronic Copy To C. T. Male Associates Attn: Jeff Marx Electronic Copy To C. T. Male Associates Attn: Dan Reilly Electronic Copy To C. T. Male Associates Attn: Kirk Moline

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250



Project Name: SGPP - Merrimack LL Group #: 1754371

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

EPA 537 Rev 1.1, Misc. Organics

<u>Sample #s: 8787450</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits. The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: the sample was reinjected and similar recoveries were observed for the internal standards.

Batch #: 17018004 (Sample number(s): 8787450 UNSPK: P787485)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: $\mbox{NMeFOSAA}$

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8787450, Blank, LCS, LCSD, MS



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-RB-ROPE-170113 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8787450 LL Group # 1754371 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/13/2017 16:00 by JD C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/15/2017 17:05

RROPE SDG#: MMK14-01RB

CAT No.	Analysis Name	CAS Number	Resul	E	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 Re	v 1.1	ng/l		ng/l	ng/l	
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	hyl perfluorood	ctanesu.	lfonamidoacetic	Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanes	ılfonamidoaceti	c Acid.		
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic	376-06-7	5		0.5	2	1
	acid						
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
The	stated OC limits are advisory only	vuntil suffici	ent dat	a points			

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

The recovery for the sample internal standard is outside the $\ensuremath{\mathsf{QC}}$ acceptance limits. The following corrective action was taken: the sample was reinjected and similar recoveries were observed for the internal standards.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
	16 PFCs PFAA Water Prep	EPA 537 Rev 1.1 EPA 537 Rev 1.1	1 1	17018004 17018004	01/29/2017 17:39 01/18/2017 19:50		1 1

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1754371

Reported: 02/15/2017 17:05

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	:	MDL;	** LOQ
	ng/l		ng/	l ng/l
Batch number: 17018004	Sample	numbe	r(s):	8787450
Perfluorooctanoic acid	0.5	U	0.5	2
Perfluorononanoic acid	0.6	U	0.6	2
Perfluorodecanoic acid	0.5	U	0.5	2
Perfluoroundecanoic acid	1	U	1	3
Perfluorododecanoic acid	0.5	U	0.5	2
Perfluorotridecanoic acid	0.5	U	0.5	2
Perfluorotetradecanoic acid	0.5	U	0.5	2
Perfluorohexanoic acid	0.5	U	0.5	2
Perfluoroheptanoic acid	0.5	U	0.5	2
Perfluorobutanesulfonate	0.7	U	0.7	2
Perfluorohexanesulfonate	1	U	1	3
Perfluoro-octanesulfonate	2	U	2	6
Perfluorobutanoic Acid	3	U	3	10
Perfluoropentanoic Acid	0.5	U	0.5	2
NETFOSAA	1	U	1	3
NMeFOSAA	1	U	1	3

LCS/LCSD

Analysis Name	LCS Spike Added ng/l	LCS Conc ng/l	LCSD Spike Added ng/l	LCSD Conc ng/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 17018004	Sample numbe	r(s): 87874	:50						
Perfluorooctanoic acid	200	172.03	200	192.01	86	96	70-130	11	30
Perfluorononanoic acid	200	186.94	200	178.02	93	89	70-130	5	30
Perfluorodecanoic acid	200	184	200	159.79	92	80	70-130	14	30
Perfluoroundecanoic acid	200	186.08	200	184.71	93	92	70-130	1	30
Perfluorododecanoic acid	200	196.08	200	198.78	98	99	70-130	1	30
Perfluorotridecanoic acid	200	216.61	200	224.28	108	112	70-130	3	30
Perfluorotetradecanoic acid	200	191.88	200	179.71	96	90	70-130	7	30
Perfluorohexanoic acid	200	175.85	200	153.64	88	77	70-130	13	30
Perfluoroheptanoic acid	200	192.57	200	181.83	96	91	70-130	6	30
Perfluorobutanesulfonate	176.8	190.83	176.8	167.55	108	95	70-130	13	30
Perfluorohexanesulfonate	189.2	169.89	189.2	141.81	90	75	70-130	18	30
Perfluoro-octanesulfonate	191.2	163.08	191.2	196.48	85	103	70-130	19	30
Perfluorobutanoic Acid	200	194.14	200	175.25	97	88	70-130	10	30
Perfluoropentanoic Acid	200	195.66	200	178.39	98	89	70-130	9	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1754371

Reported: 02/15/2017 17:05

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ng/l	LCS Conc ng/l	LCSD Spike Added ng/l	LCSD Conc ng/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
NEtFOSAA	200	237.57	200	227.92	119	114	70-130	4	30
NMeFOSAA	200	249.32	200	219.14	125	110	70-130	13	30

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspil Cond ng/l	c	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 17018004	Sample	numb	er(s): 8787	7450 UNSE	PK: P787485						
Perfluorooctanoic acid	25.0	2	200.06	207.11			91		70-130		
Perfluorononanoic acid	0.6	U	200.06	190.88			95		70-130		
Perfluorodecanoic acid	0.5	U	200.06	198.08			99		70-130		
Perfluoroundecanoic acid	1	U	200.06	202.98			101		70-130		
Perfluorododecanoic acid	0.5	U	200.06	188.84			94		70-130		
Perfluorotridecanoic acid	0.5	U	200.06	218.34			109		70-130		
Perfluorotetradecanoic acid	0.5	U	200.06	184.62			92		70-130		
Perfluorohexanoic acid	4.53	3	200.06	202.6			99		70-130		
Perfluoroheptanoic acid	4.12	2	200.06	170.27			83		70-130		
Perfluorobutanesulfonate	2.88	3	176.85	175.55			98		70-130		
Perfluorohexanesulfonate	1.48	3	189.26	155.73			82		70-130		
Perfluoro-octanesulfonate	2	U	191.26	166.77			87		70-130		
Perfluorobutanoic Acid	3.40)	200.06	193.06			95		70-130		
Perfluoropentanoic Acid	4.70)	200.06	186.65			91		70-130		
NETFOSAA	1	U	200.06	231.87			116		70-130		
NMeFOSAA	1	U	200.06	264.5			132*		70-130		

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 17018004

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8787450	61*	86	73	58*	45*	59*
Blank	77	73	78	84	85	92
LCS	64*	71	65*	62*	56*	62*
LCSD	79	81	83	79	75	75
MS	62*	70	66*	64*	76	77

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1754371

Reported: 02/15/2017 17:05

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 17018004

Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8787450	60*	68*	96	69*	77	55*
Blank	81	69*	81	71	61*	62*
LCS	64*	72	77	60*	51*	58*
LCSD	73	63*	79	76	63*	67*
MS	69*	57*	70	61*	59*	60*
Limits:	70-130	70-130	70-130	70-130	70-130	70-130

	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
8787450	86	51*	43*	
Blank	79	56*	56*	
LCS	53*	55*	52*	
LCSD	59*	60*	63*	
MS	69*	57*	53*	
Limits:	70-130	70-130	70-130	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

Environmental Analysis Request/Chain of Custody

	6		ra	fi	n	•
49.6	C	u	ru		п	3

For Eurofins Lancaster Laboratories Environmental use only

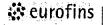
Lancaster Laboratories

Acct. # 37191 Group # 1754371 Sample # 8787450

COC #517820

Client Information	n			***************************************		Ma	trix	en en en en en en en en en en en en en e				Α	nalv	sis F	Reques	sted	AND CONTRACTOR STATE		For Lab	Use Only	
Client:	Acct. #:		AMANANA SASA		П					galatinocoanus/sca		er and a series of the series of the	Cycle Statement of Colored	epocociónico pristago	on Cod	************			FSC:		
Project Name/#: SCPP-Merinack Project Manager: Kink Moline				1		Ш												Socialismosismosis	SCR#:_		
Project Name/#:	PWSID #:		<u> </u>		Tissue	Ground	Surface								Assessment description of the second				Pro	eservation	Codes
SOPP-Merinack					Į ≝] []	ırfa 					ı							H=H0		Thiosulfate
Project Manager:	P.O. #:	-	-	ı	$I \sqcap $	ত	Š		ا ا			i I				-			N=HI	-	NaOH
Sampler:	Quote #:	6.6126			ا ليا ب	П		/	ĕ										S=H ₂	DESCRIPTION OF THE PROPERTY OF	Other
Sampler.	Quote #:			1	l e		<u></u>		air						.				-	Remark	S
State where samples were collected: For Compliance:				ļ		[출	Ä	12	Containers												
NY Yes □	No □	1		ite	Sediment	Potable	NPDES	Bla	C												Militaria
	Colle	ected		Composite					Total # of	13											
Sample Identification			Grab	E I	Soil	Water	שׁבַּר	Other:	ota	PF											
612 00 000 000	Date	Time		ပ	S	2	5	The same of the sa	H						***************************************	_					
S62 - RB-ROPE-170113	1/13/17	1600	X					X	4	X	 	 				_	+			Bendania wa Ayaran a wa a wa a wa a wa a wa a wa a wa	
	-				<u> </u>			 			 					+	\bot	—	_		
		ļ			<u> </u>							<u> </u>									
		ļ!			'												\bot				
		ļ!			<u> </u>												\perp				
					'																
		/			/'																
		1																ACCURATION DESCRIPTION OF THE PARTY OF THE P			
																				acont recent rec	
Turnaround Time (TAT) Requested	(please circl	e)	Relinqı	uished l	by	<u> </u>		STEERING STATES		Ì	Date	/ ,	Time		Received	by		<u> </u>		Date	Time
<i>(</i>	ush	,		_	25	12			1		1/1:	3/12	160	38					····		
(Rush TAT is subject to laboratory approval and surcharge	3.)	!	Relinqu	juished l	by	and the same					Date		Time		Received	by				Date	Time
B. C. C. C. C. C. C. C. C. C. C. C. C. C.		,	Delina	labad	L.,,						244				D sankersh	t		······		Della	
Date results are needed:			Helinqu	uished t	οу						Date		Time	,	Received	by				Date	Time
E-mail address: K. maline @ comule	. Cin	ı	Reling	uished l	by						Date		Time		Received	бу			***************************************	Date	Time
Data Package Options (circle if re			ĺ										***************************************			· (~~				111	
Type I (FPA Level 3	, ,	O=6.0	Relinqu	uished l	by	***************************************					Date	The second	Time		Received	by		Λ		Date	Time /
Equivalent/non-CLP)	(Raw Data C	Jniy)					and the second second								1	٧	~	1		1/14/17	10111
Type III (Reduced non-CLP) NJ DKQF	r XT	RRP-13						uired	l? \	res .	No	January	<u> </u>						ercial Car		
() po in (i.i.a.a.a.a.a)	.,	,	<u></u>			, forma							_					edEx_			
NYSDEC Category A or B MA MCP	CT R	(CP ¹									Υe		No .			Temp	oeratı	ure upc	on receipt	0.3-1.6	∠ °C
-			1	(It yes	, indica	ate QC	sampl	e and	submit	triplica	ate sam	iple vol	iume.)			•					

7044 0216



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

173092

Group Number(s): 1754371

Client: C.T Male

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

01/14/2017 10:10

Number of Packages:

<u>5</u>

Number of Projects:

2

State/Province of Origin:

<u>NY</u>

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

Yes

Custody Seal Present:

No

Sample Date/Times match COC:

Yes

Samples Chilled:

Yes

VOA Vial Headspace ≥ 6mm:

No

Paperwork Enclosed: Samples Intact: Yes

Total Trip Blank Qty: Trip Blank Type:

HCI

Missing Samples:

Yes No

Air Quality Samples Present:

No

Extra Samples:

No No

Discrepancy in Container Qty on COC:

Unpacked by Karen Diem (3060) at 11:44 on 01/14/2017

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler#	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	1.4	DT	Wet	Ý	Bagged .	N
2	DT121	0.6	DT	Wet	Υ .	Bagged	N
3	DT121	1.2	DT	. Wet	· Y	Bagged	N
4.	DT121	1.6	DT '	Wet	Υ	Bagged	N
5	DT121	0.3 _	, DT .	Wet	Υ	Bagged	· N -



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) C cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RLkg Reporting Limit **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: February 17, 2017

Project: SGPP - Merrimack

Submittal Date: 01/14/2017 Group Number: 1754381 SDG: MMK15 PO Number: 16.6126 State of Sample Origin: NH

	Lancaster Labs
Client Sample Description	<u>(LL) #</u>
SG2-AP01-45-46-170110 Grab Groundwater	8787481
SG2-AP01-45-46-170110 Filtered Grab Groundwater	8787482
SG2-AP01-55-56-170110 Grab Groundwater	8787483
SG2-AP01-55-56-170110 Filtered Grab Groundwater	8787484
SG2-AP01-65-66-170111 Grab Groundwater	8787485
SG2-AP01-65-66-170111 Filtered Grab Groundwater	8787486
SG2-AP01-75-76-170111 Grab Groundwater	8787487
SG2-AP01-75-76-170111 Filtered Grab Groundwater	8787488
SG2-AP01-79-80-170111 Grab Groundwater	8787489
SG2-AP01-79-80-170111 Filtered Grab Groundwater	8787490
SG2-AP02-24-25-170112 Grab Groundwater	8787491
SG2-AP02-34-35-170112 Grab Groundwater	8787492
SG2-AP02-44-45-170112 Grab Groundwater	8787493
SG2-FB02-170112 Grab Blank Water	8787494
SG2-AP02-54-55-170113 Grab Groundwater	8787495
SG2-AP02-64-65-170113 Grab Groundwater	8787496
SG2-AP02-64-65-170113 Filtered Grab Groundwater	8787497
TRIP BLANK PFCs Blank Water	8787498
SG2-EBWP01-170113 Grab Blank Water	8787499
SG2-EBPP01-170113 Grab Blank Water	8787500
Trip Blank VOCs Blank Water	8787501

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Electronic Copy To Barr Engineering Company Attn: Jonathon Carter Electronic Copy To Barr Engineering Company Attn: Lauren Brady Electronic Copy To C. T. Male Associates Attn: Jeff Marx Electronic Copy To C. T. Male Associates Attn: Dan Reilly Electronic Copy To C. T. Male Associates Attn: Kirk Moline

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250



Project Name: SGPP - Merrimack LL Group #: 1754381

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260C, GC/MS Volatiles

Sample #s: 8787481

The referenced method allows a maximum of 20% of the analytes in the calibration to exceed the 20% Drift continuing calibration verification criteria. The reported concentration in the associated sample(s) is considered to be estimated. Therefore the result for the following analyte(s) is estimated: acetone.

EPA 537 Rev 1.1, Misc. Organics

<u>Sample #s: 8787481, 8787485, 8787487, 8787489, 8787491, 8787492, 8787493, 8787494, 8787495, 8787498, 8787499, 8787500</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

<u>Sample #s: 8787483</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits. The recovery for the sample internal standard is outside the QC acceptance limits. The following corrective action was taken: the sample was reinjected and internal standard recoveries were again outside of the QC acceptance limits.

<u>Batch #: 17018004 (Sample number(s): 8787481, 8787483, 8787485, 8787487, 8787489, 8787491-8787496, 8787498-8787500 UNSPK: 8787485)</u>

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: NMeFOSAA

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8787481, 8787483, 8787485, 8787487, 8787489, 8787491, 8787492, 8787493, 8787494, 8787495, 8787498, 8787499, 8787500, Blank, LCS, LCSD, MS

EPA 353.2, Wet Chemistry

Batch #: 17019118102B (Sample number(s): 8787496 UNSPK: P787996 BKG: P787996)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Total Nitrite/Nitrate Nitrogen

SM 2320 B-1997, Wet Chemistry

Batch #: 17017012201A (Sample number(s): 8787481, 8787489, 8787493, 8787496 UNSPK: P787311 BKG: P787311, P787332)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Alkalinity to pH $4.5\,$

v 1.9.4



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-45-46-170110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787481 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/10/2017 11:03 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1501 SDG#: MMK15-01

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	9	J	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-45-46-170110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787481 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/10/2017 11:03 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1501 SDG#: MMK15-01

CAT No.	Analysis Name	CAS Number	As Rec Result		As Received Method Detection Limit	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 82	60C	ug/l		ug/l	ug/l	
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1
11997	o-Xylene	95-47-6	0.5	U	0.5	1	1
in t veri asso	referenced method allows a maximum he calibration to exceed the 20% fication criteria. The reported ciated sample(s) is considered to result for the following analyte(one.	Drift continuing concentration to be estimated.	ng calib in the Theref	ration			
Misc.	Organics EPA 537 R	ev 1.1	ng/l		ng/l	ng/l	
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	hyl perfluoroo	ctanesu:	Lfonamidoad	cetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me		octanesı	ulfonamidoa			
10954	Perfluorobutanesulfonate	375-73-5	1	J	0.7	2	1
10954	Perfluorobutanoic Acid	375-22-4	11		3	10	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	9		0.5	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	J	1	3	1
10954	Perfluorohexanoic acid	307-24-4	16		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorooctanoic acid	335-67-1	59		0.5	2	1
10954	Perfluoropentanoic Acid	2706-90-3	12		0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954		72629-94-8	0.5	U	0.5	2	1
10954		2058-94-8	. 1	Ū.	1	3	1
	stated QC limits are advisory onl be obtained to calculate statisti	-	ient dat	a points			
Metal	s SW-846 60	10C	mg/1		mg/l	mg/l	
01750	Calcium	7440-70-2	46.6		0.0382	0.400	1
01757	Magnesium	7439-95-4	21.1		0.0190	0.200	1
01762	Potassium	7440-09-7	25.7		0.160	1.00	1
01767	Sodium	7440-23-5	20.9		0.173	2.00	1
	Douran		20.5				
Wet C	hemistry EPA 300.0		mg/1		mg/l	mg/l	
00224	Chloride	16887-00-6	3.3		1.0	2.0	5
00228	Sulfate	14808-79-8	6.8		1.5	5.0	5
			/7		(1	/3	
	EPA 353.2		mg/1		mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	0.98		0.040	0.10	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-45-46-170110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787481 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/10/2017 11:03 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1501 SDG#: MMK15-01

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Ch	nemistry SM 2320 B-	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	37.8	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	37.8	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Campla	Analwaia	Pogord
Laboratory	Samble	Anaivsis	Record

		Method						
CAT	Analysis Name	11001104	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Ti			Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170231AA	01/23/2017	11:53	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170231AA	01/23/2017	11:53	Angela D Sneeringer	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17018004	02/02/2017	05:39	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17018004	01/18/2017	19:50	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170180635002	01/22/2017	15:29	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	170180635002	01/22/2017	15:29	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	170180635002	01/22/2017	15:29	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	170180635002	01/22/2017	15:29	Elaine F Stoltzfus	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170180635002	01/20/2017	07:30	Lisa J Cooke	1
00224	Chloride	EPA 300.0	1	17018987131A	01/19/2017	00:36	Hallie A Burnett	5
00228	Sulfate	EPA 300.0	1	17018987131A	01/19/2017	00:36	Hallie A Burnett	5
07882	Total Nitrite/Nitrate	EPA 353.2	1	17019118101B	01/19/2017	03:54	Joseph E McKenzie	1
	Nitrogen				. , . , .		-	
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17017012201A	01/17/2017	21:38	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17017012201A	01/17/2017	21:38	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17017012201A	01/17/2017	21:38	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-45-46-170110 Filtered Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787482 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/10/2017 11:03 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1502 SDG#: MMK15-02

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	s Dissolved	SW-846 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	4.10	0.0382	0.400	1
01757	Magnesium	7439-95-4	0.740	0.0190	0.200	1
01762	Potassium	7440-09-7	3.38	0.160	1.00	1
01767	Sodium	7440-23-5	7.67	0.173	2.00	1

Sample Comments

This sample was filtered in the lab for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

	Laboratory Sample Analysis Record								
CAT	Analysis Name	Method		Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
01750	Calcium	SW-846	6010C	1	170180635002	01/22/2017	15:32	Elaine F Stoltzfus	1
01757	Magnesium	SW-846	6010C	1	170180635002	01/22/2017	15:32	Elaine F Stoltzfus	1
01762	Potassium	SW-846	6010C	1	170180635002	01/22/2017	15:32	Elaine F Stoltzfus	1
01767	Sodium	SW-846	6010C	1	170180635002	01/22/2017	15:32	Elaine F Stoltzfus	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846	3005A	1	170180635002	01/20/2017	07:30	Lisa J Cooke	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-55-56-170110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787483 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/10/2017 14:21 by STJ C. T. Male Associates

50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110 Reported: 02/17/2017 14:33

M1503 SDG#: MMK15-03

Section Sect	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
11897 Bennene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997 Bromochloromethane	11997	Acetone	67-64-1	6	U	6	20	1
11997 Bromoform 75-27-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997 Rromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997 Stutanone	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997 2-Butanome 78-93-3 3 U 3 10 1 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	Ū	0.5	1	1
11997 Carbon Disulfide	11997	2-Butanone	78-93-3	3	IJ	3	10	1
11997 Carbon Tetrachloride								
11997 Chlorobehane					-			_
11997 Chlorochame					-			
11997 Chloroform					-			
11997 Cyclohexane								
11997 Cyclohexane					-		_	=
11997 1,2-Dithromo-3-chloropropane								
11997 1.2-Dibromoethane					-			_
11997 1,2-Diblromoethane								
11997 1,2-Dichlorobenzene					-			
11997 1,3-Dichlorobenzene		•						
11997 1.4-Dichlorobenzene		,			-			
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1		•						
11997 1,1-Dichloroethane		,			-			
11997 1,2-Dichloroethane								
11997 1,1-Dichloroethene		,			-			
11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 1 1 1 1 1 1 1		•						
11997 trans-1,2-Dichloroethene		•						
11997								
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 1 1 1 1 1 1 1		•			-			
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1								
11997 Ethylbenzene					-			
11997 Freon 113 76-13-1 2 U 2 10 1					Ü			
11997 2-Hexanone 591-78-6 3	11997	Ethylbenzene	100-41-4	0.5	U		1	1
11997 Isopropylbenzene	11997	Freon 113	76-13-1		-			1
11997 Methyl Acetate 79-20-9 1 U 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		2-Hexanone			-			
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 Trichloroethane 79-00-5 0.5 U 0.5 1 1	11997	Isopropylbenzene	98-82-8	_	U			_
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 <t< td=""><td>11997</td><td>Methyl Tertiary Butyl Ether</td><td>1634-04-4</td><td>0.5</td><td>U</td><td>0.5</td><td>1</td><td>1</td></t<>	11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 Trichloroethene 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 <tr< td=""><td>11997</td><td>4-Methyl-2-pentanone</td><td>108-10-1</td><td>3</td><td>U</td><td>3</td><td>10</td><td>1</td></tr<>	11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethane 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Styrene	100-42-5	1	U	1	5	1
11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethane 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethane 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethane 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1	11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1		• •						
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1								
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		• •			-			
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1					-			
•								
1/9601-23-1 0.5 U 0.5 1	11997	m+p-Xylene	179601-23-1	0.5	Ū	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-55-56-170110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787483 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/10/2017 14:21 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1503 SDG#: MMK15-03

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8	260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
Misc.	Organics	EPA 537	Rev 1.1	ng/l		ng/l	ng/l	
10954	NETFOSAA		2991-50-6	1	U	1	3	1
	NEtFOSAA is the acr	onym for N-						
10954	NMeFOSAA	_	2355-31-9	1	U	1	3	1
10054	NMeFOSAA is the acr				ulfonamidoac		0	1
10954	Perfluorobutanesu		375-73-5	2		0.7	2	1
10954	Perfluorobutanoic		375-22-4	5	J	3	10	1
10954	Perfluorodecanoic a		335-76-2	0.5	U	0.5	2	1
10954	Perfluorododecanoic		307-55-1	0.5	U	0.5	2	1
10954	Perfluoroheptanoi		375-85-9	6		0.5	2	1
10954	Perfluorohexanesu		355-46-4	1	J	1	3	1
10954	Perfluorohexanoic	acid	307-24-4	8		0.5	2	1
10954	Perfluorononanoic a	cid	375-95-1	0.6	U	0.6	2	1
10954	Perfluoro-octanesul:		1763-23-1	2	U	2	6	1
10954	Perfluorooctanoic	acid	335-67-1	30		0.5	2	1
10954	Perfluoropentanoi	c Acid	2706-90-3	7		0.5	2	1
10954	Perfluorotetradecan		376-06-7	0.5	U	0.5	2	1
10954	Perfluorotridecanoi		72629-94-8	0.5	U	0.5	2	1
10954	Perfluoroundecanoic		2058-94-8	. 1	U .	1	3	1
can The acce the	stated QC limits are be obtained to calcul recovery for the samp ptance limits. The for sample was reinjected noutside of the QC a	late statis ple interna pllowing co nd and inter	tical limits. l standard is ou rrective action nal standard rec	tside th	ne QC en:			
Metal	s	SW-846 6	010C	mg/l		mg/l	mg/l	
01750	Calcium	, ·	7440-70-2	35.0		0.0382	0.400	1
01757	Magnesium		7439-95-4	15.7		0.0190	0.200	1
01762	Potassium		7440-09-7	19.1		0.160	1.00	1
01762			7440-23-5	87.6		0.173	2.00	1
01/6/	Sodium		7440-23-5	87.6		0.173	2.00	Τ
7.7. L O	h	TD3 200	•	mg/l		mg/l	mg/l	
	hemistry	EPA 300.		_		_	_	5.0
00224	Chloride		16887-00-6	162		10.0	20.0	50
00228	Sulfate		14808-79-8	8.8		1.5	5.0	5
		EPA 353.	2	mg/l		mg/l	mg/l	
07882	Total Nitrite/Nit	rate	n.a.	2.0		0.040	0.10	1
	Nitrogen			-••				
			-	m m / 1	as CaCO3	(1,, g, go)	/3	
		SM 2320	B-1997	mg/I	as cacos	mg/l as CaCO3	mg/l as CaCO3	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-55-56-170110 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787483 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/10/2017 14:21 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1503 SDG#: MMK15-03

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet C	hemistry SM 2320	B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12149	Bicarbonate Alkalinity	n.a.	25.1	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Gample	Analweie	Pecord
Habot acor y	Sambre	MIGTABLE	Kecora

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution Factor
No. 11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170231AA		12:15	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170231AA	01/23/2017	12:15	Angela D Sneeringer	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17018004	02/02/2017	06:00	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17018004	01/18/2017	19:50	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170180635002	01/22/2017	15:41	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	170180635002	01/22/2017	15:41	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	170180635002	01/22/2017	15:41	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	170180635002	01/22/2017	15:41	Elaine F Stoltzfus	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170180635002	01/20/2017	07:30	Lisa J Cooke	1
00224	Chloride	EPA 300.0	1	17018987131A	01/19/2017	01:20	Hallie A Burnett	50
00228	Sulfate	EPA 300.0	1	17018987131A	01/19/2017	01:05	Hallie A Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17019118101B	01/19/2017	03:56	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17017012202A	01/18/2017	01:28	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17017012202A	01/18/2017	01:28	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17017012202A	01/18/2017	01:28	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-55-56-170110 Filtered Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787484 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/10/2017 14:21 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1504 SDG#: MMK15-04

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	s Dissolved	SW-846 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	21.3	0.0382	0.400	1
01757	Magnesium	7439-95-4	4.95	0.0190	0.200	1
01762	Potassium	7440-09-7	4.46	0.160	1.00	1
01767	Sodium	7440-23-5	81.9	0.173	2.00	1

Sample Comments

This sample was filtered in the lab for dissolved metals.

	Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor				
01750	Calcium	SW-846 6010	C 1	170180635002	01/22/2017 15:44	Elaine F Stoltzfus	1				
01757	Magnesium	SW-846 6010	C 1	170180635002	01/22/2017 15:44	Elaine F Stoltzfus	1				
01762	Potassium	SW-846 6010	C 1	170180635002	01/22/2017 15:44	Elaine F Stoltzfus	1				
01767	Sodium	SW-846 6010	C 1	170180635002	01/22/2017 15:44	Elaine F Stoltzfus	1				
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005	A 1	170180635002	01/20/2017 07:30	Lisa J Cooke	1				

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-65-66-170111 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787485 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/11/2017 09:04 by STJ

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1505 SDG#: MMK15-05

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	3260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	IJ	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	tī	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	τι	0.5	1	1
			0.5	Ū	0.5	1	1
11997 11997	1,2-Dibromoethane	106-93-4 95-50-1	0.5 1	ττ	0.5	5	1
	1,2-Dichlorobenzene			-			
11997	1,3-Dichlorobenzene	541-73-1	1	U 	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U 	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	Ū	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	Ū	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	Ū	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	IJ	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	tī	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	Ū	0.5	1	1
1122/	m+b-virene	1/9001-23-1	0.5	U	0.5	1	±

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-65-66-170111 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787485 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/11/2017 09:04 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1505 SDG#: MMK15-05

CAT No.	Analysis Name		CAS Number	As Rec Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	50C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
Misc.	Organics	EPA 537 R	ev 1.1	ng/l		ng/l	ng/l	
10954			2991-50-6	1	U	1	3	1
	NEtFOSAA is the acr	onym for N-et						
10954		6 37	2355-31-9	1	U	1	3	1
10954	NMeFOSAA is the acr	-	375-73-5		ulionamidoace	0.7	2	1
10954	Perfluorobutanesu		375-22-4	3	_	3	10	1
				3	J			
10954	Perfluorodecanoic a		335-76-2	0.5 0.5	U U	0.5 0.5	2 2	1
10954 10954			307-55-1 375-85-9	0.5 4	U	0.5	2	1
	Perfluoroheptano			_	_	1	3	1
10954	Perfluorohexanesu		355-46-4	1	J			
10954	Perfluorohexanoio		307-24-4	5		0.5	2	1
10954	Perfluorononanoic a		375-95-1	0.6	U 	0.6	2	1
10954			1763-23-1	2	U	2	6 2	1
10954			335-67-1	25				
10954	Perfluoropentano		2706-90-3	5		0.5	2	1
10954			376-06-7	0.5	U	0.5	2	1
10954	Perfluorotridecanoi		72629-94-8	0.5	U 	0.5	2	1
10954			2058-94-8	1	U	1	3	1
	stated QC limits are be obtained to calcu			ient dat	a points			
Metals	5	SW-846 603	10C	mg/1		mg/l	mg/l	
01750	Calcium	2 010 00.	7440-70-2	26.2		0.0382	0.400	1
01757	Magnesium		7439-95-4	10.1		0.0190	0.200	1
01762	Potassium		7440-09-7	7.12		0.160	1.00	1
01767	Sodium		7440-23-5	114		0.173	2.00	1
01707	SOCIUM		7440 25 5	114		0.175	2.00	±
Wet Ch	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	215		10.0	20.0	50
00228	Sulfate		14808-79-8	11.3		1.5	5.0	5
		EPA 353.2		mg/1		mg/l	mg/l	
07882	Total Nitrite/Nit Nitrogen	crate	n.a.	2.0		0.040	0.10	1
		SM 2320 B	-1997	mg/l a	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity	to pH 4.5	n.a.	21.2		1.7	5.0	1
12149	Bicarbonate Alkal	-	n.a.	21.2		1.7	5.0	1
12148	Carbonate Alkalinit	-	n.a.	1.7	Ū	1.7	5.0	1
12110	Carbonace Arkarini	1	π.α.	±.,	J	± • /	3.0	_

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-65-66-170111 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787485 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/11/2017 09:04 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1505 SDG#: MMK15-05

Sample Comments

	Laboratory Sample Analysis Record									
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor		
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170231AA	01/23/2017	12:37	Angela D Sneeringer	1		
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170231AA	01/23/2017	12:37	Angela D Sneeringer	1		
10954	16 PFCs	EPA 537 Rev 1.1	1	17018004	02/02/2017	05:19	Jason W Knight	1		
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17018004	01/18/2017	19:50	Devon M Whooley	1		
01750	Calcium	SW-846 6010C	1	170180635002	01/22/2017	15:47	Elaine F Stoltzfus	1		
01757	Magnesium	SW-846 6010C	1	170180635002	01/22/2017	15:47	Elaine F Stoltzfus	1		
01762	Potassium	SW-846 6010C	1	170180635002	01/22/2017	15:47	Elaine F Stoltzfus	1		
01767	Sodium	SW-846 6010C	1	170180635002	01/22/2017	15:47	Elaine F Stoltzfus	1		
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170180635002	01/20/2017	07:30	Lisa J Cooke	1		
00224	Chloride	EPA 300.0	1	17018987131A	01/19/2017	01:50	Hallie A Burnett	50		
00228	Sulfate	EPA 300.0	1	17018987131A	01/19/2017	01:35	Hallie A Burnett	5		
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17019118102A	01/19/2017	04:13	Joseph E McKenzie	1		
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17017012202A	01/18/2017	00:53	Brandon P Costik	1		
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17017012202A	01/18/2017	00:53	Brandon P Costik	1		
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17017012202A	01/18/2017	00:53	Brandon P Costik	1		

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-65-66-170111 Filtered Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787486 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/11/2017 09:04 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1506 SDG#: MMK15-06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	s Dissolved	SW-846 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	24.3	0.0382	0.400	1
01757	Magnesium	7439-95-4	5.48	0.0190	0.200	1
01762	Potassium	7440-09-7	3.03	0.160	1.00	1
01767	Sodium	7440-23-5	116	0.173	2.00	1

Sample Comments

This sample was filtered in the lab for dissolved metals.

	Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method		Trial#	Batch#	Analysis Date and Tir	me	Analyst	Dilution Factor		
01750	Calcium	SW-846	6010C	1	170180635002	01/22/2017	15:50	Elaine F Stoltzfus	1		
01757	Magnesium	SW-846	6010C	1	170180635002	01/22/2017	15:50	Elaine F Stoltzfus	1		
01762	Potassium	SW-846	6010C	1	170180635002	01/22/2017	15:50	Elaine F Stoltzfus	1		
01767	Sodium	SW-846	6010C	1	170180635002	01/22/2017	15:50	Elaine F Stoltzfus	1		
10635	ICP-WW, 3005A (tot rec) - U4	SW-846	3005A	1	170180635002	01/20/2017	07:30	Lisa J Cooke	1		

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-75-76-170111 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787487 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/11/2017 11:51 by STJ C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/14/2017 10:10 Reported: 02/17/2017 14:33

M1507 SDG#: MMK15-07

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	Ū	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	ττ	0.5	1	1
11997	1,2-Dibromoethane 1,2-Dichlorobenzene	95-50-1	0.5 1	U	1	5	1
11997	•		1	ττ	1	5 5	1
	1,3-Dichlorobenzene	541-73-1		-			
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U 	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ū	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	Ū	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ū	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	IJ	0.5	1	1
		1,,001 20 1	0.0		<u> </u>		

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-75-76-170111 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787487 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/11/2017 11:51 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1507 SDG#: MMK15-07

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
Misc.	Organics	EPA 537 R	ev 1.1	ng/l		ng/l	ng/l	
10954	NETFOSAA		2991-50-6	1	U	1	3	1
	NEtFOSAA is the acro	nym for N-e	thyl perfluoroc	ctanesu	lfonamidoacet	ic Acid.		
10954			2355-31-9	1	U	1	3	1
	NMeFOSAA is the acro	-			ulfonamidoace			
10954	Perfluorobutanesul		375-73-5	4		0.7	2	1
10954	Perfluorobutanoic		375-22-4	4	J	3	10	1
10954	Perfluorodecanoic ac		335-76-2	0.5	U	0.5	2	1
10954	Perfluorododecanoic		307-55-1	0.5	U	0.5	2	1
10954	Perfluoroheptanoio		375-85-9	5		0.5	2	1
10954	Perfluorohexanesul	Lfonate	355-46-4	2	J	1	3	1
10954	Perfluorohexanoic	acid	307-24-4	7		0.5	2	1
10954	Perfluorononanoic ac		375-95-1	0.6	U	0.6	2	1
10954	Perfluoro-octanesulf		1763-23-1	2	U	2	6	1
10954		acid	335-67-1	30		0.5	2	1
10954			2706-90-3	6		0.5	2	1
10954	Perfluorotetradecano		376-06-7	0.5	U	0.5	2	1
10954	Perfluorotridecanoic		72629-94-8	0.5	U	0.5	2	1
10954	Perfluoroundecanoic		2058-94-8	1	U	1	3	1
	stated QC limits are a be obtained to calcula	-	-	ient dat	ta points			
Metals	5	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	29.0		0.0382	0.400	1
01757	Magnesium		7439-95-4	14.9		0.0190	0.200	1
01762	Potassium		7440-09-7	16.6		0.160	1.00	1
01762	Sodium		7440-23-5	131		0.173	2.00	1
01707	SOCIUM		7440-23-3	131		0.173	2.00	1
Wet Cl	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	222		10.0	20.0	50
00228	Sulfate		14808-79-8	12.6		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitr		n.a.	1.9		0.040	0.10	1
0,002	Nitrogen	. a.c		1.3		3.010	3.10	<u>-</u>
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity t	O DH 4.5	n.a.	26.3		1.7	5.0	1
12149	Bicarbonate Alkali	_	n.a.	26.3		1.7	5.0	1
12148	Carbonate Alkalinity	-	n.a.	1.7	U	1.7	5.0	1
12110	carbonace Arnarinity		11.4.	±.,	5	± • /	5.0	±

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-75-76-170111 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787487 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/11/2017 11:51 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1507 SDG#: MMK15-07

Sample Comments

	Laboratory Sample Analysis Record									
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor		
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170231AA	01/23/2017	12:59	Angela D Sneeringer	1		
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170231AA	01/23/2017	12:59	Angela D Sneeringer	1		
10954	16 PFCs	EPA 537 Rev 1.1	1	17018004	02/02/2017	06:20	Jason W Knight	1		
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17018004	01/18/2017	19:50	Devon M Whooley	1		
01750	Calcium	SW-846 6010C	1	170180635002	01/22/2017	15:53	Elaine F Stoltzfus	1		
01757	Magnesium	SW-846 6010C	1	170180635002	01/22/2017	15:53	Elaine F Stoltzfus	1		
01762	Potassium	SW-846 6010C	1	170180635002	01/22/2017	15:53	Elaine F Stoltzfus	1		
01767	Sodium	SW-846 6010C	1	170180635002	01/22/2017	15:53	Elaine F Stoltzfus	1		
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170180635002	01/20/2017	07:30	Lisa J Cooke	1		
00224	Chloride	EPA 300.0	1	17018987131A	01/19/2017	02:20	Hallie A Burnett	50		
00228	Sulfate	EPA 300.0	1	17018987131A	01/19/2017	02:05	Hallie A Burnett	5		
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17019118102A	01/19/2017	04:15	Joseph E McKenzie	1		
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17017012202A	01/18/2017	00:47	Brandon P Costik	1		
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17017012202A	01/18/2017	00:47	Brandon P Costik	1		
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17017012202A	01/18/2017	00:47	Brandon P Costik	1		

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-75-76-170111 Filtered Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787488 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/11/2017 11:51 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1508 SDG#: MMK15-08

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	s Dissolved	SW-846 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	17.7	0.0382	0.400	1
01757	Magnesium	7439-95-4	4.30	0.0190	0.200	1
01762	Potassium	7440-09-7	3.69	0.160	1.00	1
01767	Sodium	7440-23-5	127	0.173	2.00	1

Sample Comments

This sample was filtered in the lab for dissolved metals.

	Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor				
01750	Calcium	SW-846 6010C	1	170180635002	01/22/2017 15:56	Elaine F Stoltzfus	1				
01757	Magnesium	SW-846 6010C	1	170180635002	01/22/2017 15:56	Elaine F Stoltzfus	: 1				
01762	Potassium	SW-846 6010C	1	170180635002	01/22/2017 15:56	Elaine F Stoltzfus	1				
01767	Sodium	SW-846 6010C	1	170180635002	01/22/2017 15:56	Elaine F Stoltzfus	: 1				
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170180635002	01/20/2017 07:30	Lisa J Cooke	1				

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-79-80-170111 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787489 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/11/2017 15:22 by STJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/14/2017 10:10 Reported: 02/17/2017 14:33

M1509 SDG#: MMK15-09

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	IJ	0.5	1	1
11997	Bromochloromethane	74-97-5	1	IJ	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	IJ	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	II	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	IJ	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	II	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	IJ	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1	1
11997	,	75-35-4	0.5	Ū	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1	1
11997	trans-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1	1
11997	•	78-87-5	0.5	IJ	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5	1	1
11997		10061-01-5	0.5	IJ	0.5	1	1
11997	trans-1,3-Dichloropropene Ethylbenzene	10061-02-6	0.5	IJ	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
				IJ		10	
11997	2-Hexanone	591-78-6	3 1	Ū	3 1	5	1
11997	Isopropylbenzene	98-82-8	1	IJ	1	5 5	1 1
11997	-	79-20-9	0.5	IJ	0.5		
11997	Methyl Tertiary Butyl Ether	1634-04-4		U	0.5 3	1	1
11997	4-Methyl-2-pentanone	108-10-1	3 1	IJ	1	10 5	1
11997	Methylcyclohexane	108-87-2		IJ	2		1
11997	Methylene Chloride	75-09-2	2	-		4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U 	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U 	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U 	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U 	1	5	1
11997		71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-79-80-170111 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787489 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/11/2017 15:22 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1509 SDG#: MMK15-09

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
Misc.	Organics	EPA 537 R	ev 1.1	ng/l		ng/l	ng/l	
10954			2991-50-6	1	U	1	3	1
	NEtFOSAA is the acr	ronym for N-et						
10954		C 27	2355-31-9	1	U	1	3	1
10954	NMeFOSAA is the acr		thyl periluoro		ulionamidoace	0.7	2	1
	Perfluorobutanes			2				
10954 10954			375-22-4	3	U U	3 0.5	10 2	1 1
10954			335-76-2 307-55-1	0.5 0.5	Ū	0.5	2	1
10954			375-85-9	1.5	J	0.5	2	1
10954	Perfluorohexanesuli		355-46-4	1	IJ	1	3	1
10954	Perfluoronexanesui		307-24-4	3	U	0.5	2	1
10954	Perfluorononanoic a		375-95-1	0.6	IJ	0.6	2	1
10954	Perfluoro-octanesu		1763-23-1	2	IJ	2	6	1
10954			335-67-1	6	O	0.5	2	1
10954			2706-90-3	8		0.5	2	1
				8 0.5	U	0.5	2	1
10954 10954			376-06-7 72629-94-8	0.5	IJ	0.5	2	1
10954	Perfluoroundecanoi		2058-94-8	1	IJ	1	3	1
	stated OC limits are			_	•	1	3	_
	be obtained to calcu			10110 00	oa poince			
Metals	3	SW-846 603	10C	mg/l		mg/l	mg/l	
01750	Calcium	2 020 00.	7440-70-2	37.0		0.0382	0.400	1
01757	Magnesium		7439-95-4	29.8		0.0190	0.200	1
01762	Potassium		7440-09-7	26.0		0.160	1.00	1
01767	Sodium		7440-23-5	118		0.173	2.00	1
	boaram			110				
Wet Cl	nemistry	EPA 300.0		mg/1		mg/l	mg/l	
00224	Chloride		16887-00-6	231		10.0	20.0	50
00228	Sulfate		14808-79-8	12.6		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	m - 1 - 2 - 22 1 1 /22 1		n.a.	_		0.040	0.10	1
07882	Total Nitrite/Ni Nitrogen	trate	n.a.	1.7		0.040	0.10	1
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity	to pH 4.5	n.a.	34.8		1.7	5.0	1
12149	Bicarbonate Alka	linity	n.a.	34.8		1.7	5.0	1
12148	Carbonate Alkalinit		n.a.	1.7	U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-79-80-170111 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787489 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/11/2017 15:22 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1509 SDG#: MMK15-09

Sample Comments

	Laboratory Sample Analysis Record											
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor				
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170231AA	01/23/2017	13:21	Angela D Sneeringer	1				
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170231AA	01/23/2017	13:21	Angela D Sneeringer	1				
10954	16 PFCs	EPA 537 Rev 1.1	1	17018004	01/29/2017	19:01	Jason W Knight	1				
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17018004	01/18/2017	19:50	Devon M Whooley	1				
01750	Calcium	SW-846 6010C	1	170180635002	01/22/2017	15:59	Elaine F Stoltzfus	1				
01757	Magnesium	SW-846 6010C	1	170180635002	01/22/2017	15:59	Elaine F Stoltzfus	1				
01762	Potassium	SW-846 6010C	1	170180635002	01/22/2017	15:59	Elaine F Stoltzfus	1				
01767	Sodium	SW-846 6010C	1	170180635002	01/22/2017	15:59	Elaine F Stoltzfus	1				
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170180635002	01/20/2017	07:30	Lisa J Cooke	1				
00224	Chloride	EPA 300.0	1	17018987131A	01/19/2017	03:19	Hallie A Burnett	50				
00228	Sulfate	EPA 300.0	1	17018987131A	01/19/2017	03:04	Hallie A Burnett	5				
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17019118102A	01/19/2017	04:17	Joseph E McKenzie	1				
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17017012201A	01/17/2017	23:32	Brandon P Costik	1				
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17017012201A	01/17/2017	23:32	Brandon P Costik	1				
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17017012201A	01/17/2017	23:32	Brandon P Costik	1				

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP01-79-80-170111 Filtered Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787490 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/11/2017 15:22 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1510 SDG#: MMK15-10

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	s Dissolved	SW-846 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	20.7	0.0382	0.400	1
01757	Magnesium	7439-95-4	5.19	0.0190	0.200	1
01762	Potassium	7440-09-7	4.13	0.160	1.00	1
01767	Sodium	7440-23-5	125	0.173	2.00	1

Sample Comments

This sample was filtered in the lab for dissolved metals.

	Laboratory Sample Analysis Record											
CAT	Analysis Name	Method		Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor			
01750	Calcium	SW-846	6010C	1	170180635002		16:02	Elaine F Stoltzfus				
01757	Magnesium	SW-846	6010C	1	170180635002	01/22/2017	16:02	Elaine F Stoltzfus	1			
01762	Potassium	SW-846	6010C	1	170180635002	01/22/2017	16:02	Elaine F Stoltzfus	1			
01767	Sodium	SW-846	6010C	1	170180635002	01/22/2017	16:02	Elaine F Stoltzfus	1			
10635	ICP-WW, 3005A (tot rec) - U4	SW-846	3005A	1	170180635002	01/20/2017	07:30	Lisa J Cooke	1			

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-24-25-170112 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787491 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/12/2017 10:37 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1511 SDG#: MMK15-11

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	3260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	IJ	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	tī	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	τι	0.5	1	1
			0.5	Ū	0.5	1	1
11997 11997	1,2-Dibromoethane	106-93-4 95-50-1	0.5 1	ττ	0.5	5	1
	1,2-Dichlorobenzene			-			
11997	1,3-Dichlorobenzene	541-73-1	1	U 	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U 	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	Ū	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	Ū	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	Ū	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	IJ	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	tī	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	Ū	0.5	1	1
1122/	m+b-virene	1/9001-23-1	0.5	U	0.5	1	±

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-24-25-170112 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787491 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/12/2017 10:37 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1511 SDG#: MMK15-11

CAT No.	Analysis Name		CAS Number	As Rec Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	50C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
Misc.	Organics	EPA 537 Re	ev 1.1	ng/l		ng/l	ng/l	
10954			2991-50-6	1	U	1	3	1
	NEtFOSAA is the acr	conym for N-et						
10954		C 37	2355-31-9	1	U	1	3	1
10954	NMeFOSAA is the acr		thyl periluoro			tic Acid. 0.7	2	1
	Perfluorobutanesu			2	J			
10954			375-22-4	3	U	3	10	1 1
10954 10954			335-76-2 307-55-1	0.5 0.5	U U	0.5 0.5	2 2	1
10954			375-85-9	1.5	J	0.5	2	1
10954	Perfluorohexanesulf		355-46-4	1	τı	1	3	1
10954	Perfluorohexanoio		307-24-4	3	U	0.5	2	1
10954	Perfluorononanoic a		375-95-1	0.6	ŢŢ	0.6	2	1
10954	Perfluoro-octanesul		1763-23-1	2	IJ	2	6	1
10954			335-67-1	6	O	0.5	2	1
10954			2706-90-3	9		0.5	2	1
10954	Perfluoropentano		376-06-7	9 0.5	U	0.5	2	1
10954			72629-94-8	0.5	IJ	0.5	2	1
10954	Perfluoroundecanoio		2058-94-8	1	IJ	1	3	1
	stated OC limits are			_	-	1	3	_
	be obtained to calcu				F			
Metals	3	SW-846 603	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	11.9		0.0382	0.400	1
01757	Magnesium		7439-95-4	1.91		0.0190	0.200	1
01762	Potassium		7440-09-7	1.07		0.160	1.00	1
01767	Sodium		7440-23-5	11.8		0.173	2.00	1
01.07	boaran		, 110 25 5	11.0		0.175	2.00	-
Wet Cl	nemistry	EPA 300.0		mg/1		mg/l	mg/l	
00224	Chloride		16887-00-6	36.8		10.0	20.0	50
00228	Sulfate		14808-79-8	4.4	J	1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nit		n.a.	0.38		0.040	0.10	1
07002	Nitrogen	LIACE		0.36		0.010	0.10	_
		SM 2320 B	-1997	mg/l a	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity	to pH 4.5	n.a.	17.9		1.7	5.0	1
12149	Bicarbonate Alkal	linity	n.a.	17.9		1.7	5.0	1
12148	Carbonate Alkalinit		n.a.	1.7	U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-24-25-170112 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787491 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/12/2017 10:37 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1511 SDG#: MMK15-11

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor No. 11997 SOM02.2 Volatiles SW-846 8260C Y170231AA 01/23/2017 13:43 Angela D 1 Sneeringer 01163 GC/MS VOA Water Prep SW-846 5030C Y170231AA 01/23/2017 13:43 1 Angela D Sneeringer EPA 537 Rev 1.1 10954 16 PFCs 1 17018004 Jason W Knight 1 02/02/2017 06:41 14091 PFAA Water Prep EPA 537 Rev 1.1 1 17018004 01/18/2017 19:50 Devon M Whooley 01750 Calcium SW-846 6010C 1 170180635002 01/22/2017 16:05 Elaine F Stoltzfus 01757 Magnesium SW-846 6010C 170180635002 01/22/2017 16:05 Elaine F Stoltzfus 1 01762 Potassium SW-846 6010C 1 170180635002 01/22/2017 16:05 Elaine F Stoltzfus 1 01767 Sodium SW-846 6010C 170180635002 Elaine F Stoltzfus 1 01/22/2017 16:05 10635 ICP-WW, 3005A (tot rec) - SW-846 3005A 1 170180635002 01/20/2017 07:30 Lisa J Cooke 1 U4 00224 Chloride EPA 300.0 17018987131A 01/19/2017 03:49 Hallie A Burnett 00228 Sulfate EPA 300.0 17018987131A 01/19/2017 03:34 Hallie A Burnett 1 5 EPA 353.2 17019118102A 07882 Total Nitrite/Nitrate 1 01/19/2017 04:18 Joseph E McKenzie 1 Nitrogen SM 2320 B-1997 17017012202A 12150 Total Alkalinity to pH 01/18/2017 00:07 Brandon P Costik 17017012202A 12149 Bicarbonate Alkalinity SM 2320 B-1997 1 Brandon P Costik 01/18/2017 00:07 1 12148 Carbonate Alkalinity SM 2320 B-1997 1 17017012202A 01/18/2017 00:07 Brandon P Costik 1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-34-35-170112 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787492 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/12/2017 12:12 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1512 SDG#: MMK15-12

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.8	J	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	Ū	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	Ū	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	Ū	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-34-35-170112 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787492 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/12/2017 12:12 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1512 SDG#: MMK15-12

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	260C	ug/l		ug/l	ug/l	
11997	m+p-Xylene		179601-23-1	0.5	U	0.5	1	1
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
Misc.	Organics	EPA 537 I	Rev 1.1	ng/l		ng/l	ng/l	
10954	NEtFOSAA		2991-50-6	1	U	1	3	1
	NEtFOSAA is the	acronym for N-e	thyl perfluoroc	ctanesu	lfonamidoace	tic Acid.		
10954			2355-31-9	1	U	1	3	1
	NMeFOSAA is the	-			ulfonamidoac			
10954	Perfluorobutan	esulfonate	375-73-5	6		0.7	2	1
10954	Perfluorobutan	oic Acid	375-22-4	10		3	10	1
10954	Perfluorodecanoi		335-76-2	0.5	U	0.5	2	1
10954	Perfluorododecan		307-55-1	0.5	U	0.5	2	1
10954	Perfluorohepta	noic acid	375-85-9	7		0.5	2	1
10954	Perfluorohexan	esulfonate	355-46-4	3	J	1	3	1
10954	Perfluorohexan	oic acid	307-24-4	12		0.5	2	1
10954	Perfluorononan	oic acid	375-95-1	1	J	0.6	2	1
10954	Perfluoro-octane	sulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorooctan	oic acid	335-67-1	45		0.5	2	1
10954	Perfluoropenta	noic Acid	2706-90-3	9		0.5	2	1
10954	Perfluorotetrade		376-06-7	0.5	IJ	0.5	2	1
10954	Perfluorotrideca		72629-94-8	0.5	Ū	0.5	2	1
10954	Perfluoroundecan	oic acid	2058-94-8	1	U	1	3	1
	stated QC limits a be obtained to cal			ient da	ta points			
Metals	3	SW-846 60	010C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	26.0		0.0382	0.400	1
01757	Magnesium		7439-95-4	5.84		0.0190	0.200	1
01762	Potassium		7440-09-7	3.40		0.160	1.00	1
01767	Sodium		7440-23-5	111		0.173	2.00	1
Wet Ch	nemistry	EPA 300.0	0	mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	217		10.0	20.0	50
00228	Sulfate		14808-79-8	13.4		1.5	5.0	5
00220	Sullace		14000 75 0	13.4		1.3	5.0	3
		EPA 353.2	2	mg/l		mg/l	mg/l	
07882	Total Nitrite/	Nitrate	n.a.	7.6		0.20	0.50	5
		SM 2320 I	B-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalini	ty to pH 4.5	n.a.	22.5		1.7	5.0	1
12149	Bicarbonate All	kalinity	n.a.	22.5		1.7	5.0	1
12148	Carbonate Alkali	-	n.a.	1.7	U	1.7	5.0	1
		-						

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-34-35-170112 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787492 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/12/2017 12:12 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1512 SDG#: MMK15-12

Sample Comments

	Laboratory Sample Analysis Record											
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor				
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170231AA	01/23/2017	14:06	Angela D Sneeringer	1				
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170231AA	01/23/2017	14:06	Angela D Sneeringer	1				
10954	16 PFCs	EPA 537 Rev 1.1	1	17018004	01/29/2017	20:43	Jason W Knight	1				
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17018004	01/18/2017	19:50	Devon M Whooley	1				
01750	Calcium	SW-846 6010C	1	170180635002	01/22/2017	16:08	Elaine F Stoltzfus	1				
01757	Magnesium	SW-846 6010C	1	170180635002	01/22/2017	16:08	Elaine F Stoltzfus	1				
01762	Potassium	SW-846 6010C	1	170180635002	01/22/2017	16:08	Elaine F Stoltzfus	1				
01767	Sodium	SW-846 6010C	1	170180635002	01/22/2017	16:08	Elaine F Stoltzfus	1				
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170180635002	01/20/2017	07:30	Lisa J Cooke	1				
00224	Chloride	EPA 300.0	1	17018987131A	01/19/2017	04:18	Hallie A Burnett	50				
00228	Sulfate	EPA 300.0	1	17018987131A	01/19/2017	04:04	Hallie A Burnett	5				
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17019118102A	01/19/2017	04:20	Joseph E McKenzie	5				
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17017012202A	01/18/2017	01:35	Brandon P Costik	1				
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17017012202A	01/18/2017	01:35	Brandon P Costik	1				
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17017012202A	01/18/2017	01:35	Brandon P Costik	1				

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-44-45-170112 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787493 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/12/2017 13:48 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1513 SDG#: MMK15-13

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.7	J	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	Ū	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	IJ	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	IJ	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	IJ	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	Ū	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	Ū	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	IJ	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	Ū	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	IJ	0.5	1	1
11997	Freon 113	76-13-1	2	11	2	10	1
11997	2-Hexanone	591-78-6	3	Ū	3	10	1
11997	Isopropylbenzene	98-82-8	1	IJ	1	5	1
11997	Methyl Acetate	79-20-9	1	IJ	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	Ū	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	IJ	1	5	1
11997	Methylene Chloride	75-09-2	2	Ū	2	4	1
11997	Styrene	100-42-5	1	IJ	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	IJ	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	IJ	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	Ū	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	Ū	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ū	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	Ū	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ū	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-44-45-170112 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787493 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/12/2017 13:48 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1513 SDG#: MMK15-13

CAT No.	Analysis Name		CAS Number	As Rec Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	0C	ug/l		ug/l	ug/l	
11997	m+p-Xylene		179601-23-1	0.5	U	0.5	1	1
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
Misc.	Organics	EPA 537 Re	v 1.1	ng/l		ng/l	ng/l	
10954	NETFOSAA		2991-50-6	1	U	1	3	1
	NEtFOSAA is the acro	nym for N-eth	yl perfluorood	ctanesu:	fonamidoaceti	c Acid.		
10954			2355-31-9	1	U	1	3	1
	NMeFOSAA is the acro	nym for N-met			ılfonamidoacet			
10954	Perfluorobutanesul	.fonate	375-73-5	5		0.7	2	1
10954	Perfluorobutanoic	Acid	375-22-4	5	J	3	10	1
10954	Perfluorodecanoic ac	id	335-76-2	0.5	U	0.5	2	1
10954	Perfluorododecanoic	acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluoroheptanoio	e acid	375-85-9	6		0.5	2	1
10954	Perfluorohexanesul	.fonate	355-46-4	2	J	1	3	1
10954	Perfluorohexanoic		307-24-4	9		0.5	2	1
10954			375-95-1	0.6	U	0.6	2	1
10954	Perfluoro-octanesulf		1763-23-1	2	IJ	2	6	1
10954			335-67-1	32	· ·	0.5	2	1
10954	Perfluoropentanoio		2706-90-3	7		0.5	2	1
10954	_		376-06-7	0.5	IJ	0.5	2	1
10954	Perfluorotridecanoic		72629-94-8	0.5	IJ	0.5	2	1
10954			2058-94-8	1	IJ	1	3	1
	stated QC limits are a			_	-	-	3	<u> </u>
	be obtained to calcula			circ dae	a points			
Metals	5	SW-846 601	0C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	24.4		0.0382	0.400	1
01757	Magnesium		7439-95-4	5.54		0.0190	0.200	1
01762	Potassium		7440-09-7	3.33		0.160	1.00	1
01767	Sodium		7440-23-5	110		0.173	2.00	1
01707	SOCIUM		7440-23-3	110		0.173	2.00	1
Wet Cl	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	215		10.0	20.0	50
00228	Sulfate		14808-79-8	14.2		1.5	5.0	5
		ED3 252 2		mg/l		mg/l	mg/l	
		EPA 353.2		-				
07882	Total Nitrite/Nitr	ate	n.a.	1.6		0.040	0.10	1
	Nitrogen							
		SM 2320 B-	1997	mg/l a	s CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity t	о рн 4.5	n.a.	23.4		1.7	5.0	1
12149	Bicarbonate Alkali	_	n.a.	23.4		1.7	5.0	1
12148	Carbonate Alkalinity	-	n.a.	1.7	U	1.7	5.0	1
-								

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-44-45-170112 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787493 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/12/2017 13:48 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1513 SDG#: MMK15-13

Sample Comments

	Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor			
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170231AA	01/23/2017	14:28	Angela D Sneeringer	1			
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170231AA	01/23/2017	14:28	Angela D Sneeringer	1			
10954	16 PFCs	EPA 537 Rev 1.1	1	17018004	01/29/2017	21:04	Jason W Knight	1			
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17018004	01/18/2017	19:50	Devon M Whooley	1			
01750	Calcium	SW-846 6010C	1	170180635002	01/22/2017	15:11	Elaine F Stoltzfus	1			
01757	Magnesium	SW-846 6010C	1	170180635002	01/22/2017	15:11	Elaine F Stoltzfus	1			
01762	Potassium	SW-846 6010C	1	170180635002	01/22/2017	15:11	Elaine F Stoltzfus	1			
01767	Sodium	SW-846 6010C	1	170180635002	01/22/2017	15:11	Elaine F Stoltzfus	1			
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170180635002	01/20/2017	07:30	Lisa J Cooke	1			
00224	Chloride	EPA 300.0	1	17018987131A	01/19/2017	04:48	Hallie A Burnett	50			
00228	Sulfate	EPA 300.0	1	17018987131A	01/19/2017	04:33	Hallie A Burnett	5			
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17019118102A	01/19/2017	04:22	Joseph E McKenzie	1			
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17017012201A	01/17/2017	23:14	Brandon P Costik	1			
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17017012201A	01/17/2017	23:14	Brandon P Costik	1			
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17017012201A	01/17/2017	23:14	Brandon P Costik	1			

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-FB02-170112 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8787494 LL Group # 1754381

Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/12/2017 15:48 by STJ

C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/14/2017 10:10

Reported: 02/17/2017 14:33

M1514 SDG#: MMK15-14FB

CAT No.	Analysis Name	CAS Number	Result	=	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 Re	ev 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	0.7	J	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.8	U	0.8	3	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	hyl perfluoroc	ctanesu	lfonamidoacet	ic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanes	ulfonamidoace	tic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev 1.1	1	17018004	02/14/2017 14:10	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17018004	01/18/2017 19:50	Devon M Whooley	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-54-55-170113 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787495 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/13/2017 09:15 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1515 SDG#: MMK15-15

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.6	J	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	IJ	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	IJ	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	IJ	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	Ū	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	IJ	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	Ū	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	Ū	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	IJ	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	IJ	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	IJ	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	IJ	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
11997	2-Hexanone	591-78-6	3	IJ	3	10	1
11997	Isopropylbenzene	98-82-8	1	Ū	1	5	1
11997	Methyl Acetate	79-20-9	1	Ū	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	IJ	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	IJ	3	10	1
11997	Methylcyclohexane	108-87-2	1	Ū	1	5	1
11997	Methylene Chloride	75-09-2	2	IJ	2	4	1
11997	Styrene	100-42-5	1	IJ	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	IJ	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	IJ	0.5	1	1
11997	Toluene	108-88-3	0.5	Ū	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	IJ	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	IJ	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	IJ	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ū	0.5	1	1
11997	Trichloroethene	79-00-5	0.5	Ū	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	IJ	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ū	0.5	1	1
11771	· III/ I CIIIOI I IIC	,5 51 4	0.5	9	0.5	-	-

^{*=}This limit was used in the evaluation of the final result



As Received

As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-54-55-170113 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787495 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/13/2017 09:15 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1515 SDG#: MMK15-15

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	m+p-Xylene		179601-23-1	0.5	U	0.5	1	1
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
Misc.	Organics	EPA 537 R	ev 1.1	ng/l		ng/l	ng/l	
10954	NETFOSAA		2991-50-6	1	U	1	3	1
	NEtFOSAA is the ac	conym for N-et		ctanesu	lfonamidoacet	ic Acid.		
10954	NMeFOSAA		2355-31-9	1	U	1	3	1
	NMeFOSAA is the acr				ulfonamidoace			
10954	Perfluorobutanes		375-73-5	6		0.7	2	1
10954	Perfluorobutanoi	c Acid	375-22-4	5	J	3	10	1
10954	Perfluorodecanoic a		335-76-2	0.5	U	0.5	2	1
10954	Perfluorododecanoio	c acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluoroheptano	ic acid	375-85-9	7		0.5	2	1
10954	Perfluorohexanes	ulfonate	355-46-4	2	J	1	3	1
10954	Perfluorohexanoi	c acid	307-24-4	9		0.5	2	1
10954	Perfluorononanoic a	acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluoro-octanesul	lfonate	1763-23-1	2	U	2	6	1
10954	Perfluorooctanoi	c acid	335-67-1	35		0.5	2	1
10954	Perfluoropentano	ic Acid	2706-90-3	8		0.5	2	1
10954	-		376-06-7	0.5	U	0.5	2	1
10954	Perfluorotridecano	ic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluoroundecanoio	c acid	2058-94-8	1	U	1	3	1
	stated QC limits are be obtained to calcu			ient dat	a points			
Metals	5	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	25.7		0.0382	0.400	1
01757	Magnesium		7439-95-4	6.22		0.0190	0.200	1
01762	Potassium		7440-09-7	4.08		0.160	1.00	1
01767	Sodium		7440-23-5	108		0.173	2.00	1
01/07	Socium		7440-23-3	108		0.173	2.00	1
Wet Ch	nemistry	EPA 300.0		mg/1		mg/l	mg/l	
00224	Chloride		16887-00-6	212		10.0	20.0	50
00228	Sulfate		14808-79-8	13.1		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Ni		n.a.	1.7		0.040	0.10	1
	Nitrogen	01400		_,,				
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity	to pH 4.5	n.a.	25.1		1.7	5.0	1
12149	Bicarbonate Alka	_	n.a.	25.1		1.7	5.0	1
12148	Carbonate Alkalinit	-	n.a.	1.7	U	1.7	5.0	1
		- 2			-	= • •		=

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-54-55-170113 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787495 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/13/2017 09:15 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1515 SDG#: MMK15-15

Sample Comments

	Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor			
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170231AA	01/23/2017	14:50	Angela D Sneeringer	1			
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170231AA	01/23/2017	14:50	Angela D Sneeringer	1			
10954	16 PFCs	EPA 537 Rev 1.1	1	17018004	02/02/2017	07:01	Jason W Knight	1			
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17018004	01/18/2017	19:50	Devon M Whooley	1			
01750	Calcium	SW-846 6010C	1	170180635002	01/22/2017	16:17	Elaine F Stoltzfus	1			
01757	Magnesium	SW-846 6010C	1	170180635002	01/22/2017	16:17	Elaine F Stoltzfus	1			
01762	Potassium	SW-846 6010C	1	170180635002	01/22/2017	16:17	Elaine F Stoltzfus	1			
01767	Sodium	SW-846 6010C	1	170180635002	01/22/2017	16:17	Elaine F Stoltzfus	1			
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170180635002	01/20/2017	07:30	Lisa J Cooke	1			
00224	Chloride	EPA 300.0	1	17018987131B	01/19/2017	06:32	Hallie A Burnett	50			
00228	Sulfate	EPA 300.0	1	17018987131B	01/19/2017	06:17	Hallie A Burnett	5			
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17019118102A	01/19/2017	04:24	Joseph E McKenzie	1			
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17017012202A	01/18/2017	01:05	Brandon P Costik	1			
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17017012202A	01/18/2017	01:05	Brandon P Costik	1			
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17017012202A	01/18/2017	01:05	Brandon P Costik	1			

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-64-65-170113 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787496 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/13/2017 12:44 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1516 SDG#: MMK15-16

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.7	J	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	Ū	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	Ū	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	Ū	0.5	1	1
11997	Chloroethane	75-00-3	0.5	Ū	0.5	1	1
11997	Chloroform	67-66-3	1		0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	IJ	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	IJ	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	IJ	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	Ū	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	Ū	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	Ū	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	Ū	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-64-65-170113 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787496 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/13/2017 12:44 by STJ C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/14/2017 10:10 Reported: 02/17/2017 14:33

M1516 SDG#: MMK15-16

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 82	60C	ug/l		ug/l	ug/l	
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1
11997	o-Xylene	95-47-6	0.5	U	0.5	1	1
Misc	Organics EPA 537 R	ev 1.1	ng/l		ng/l	ng/l	
10954	NETEOSAA	2991-50-6	1	τJ	1	3	1
10001	NEtFOSAA is the acronym for N-e		_	-	-	3	-
10954	-	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-m	ethyl perfluoro	octanes	ulfonamidoacet	cic Acid.		
10954	Perfluorobutanesulfonate	375-73-5	6		0.7	2	1
10954	Perfluorobutanoic Acid	375-22-4	5	J	3	10	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	6		0.5	2	1
10954	Perfluorohexanesulfonate	355-46-4	2	J	1	3	1
10954	Perfluorohexanoic acid	307-24-4	10	-	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	ŢŢ	0.6	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	IJ	2	6	1
10954	Perfluorooctanoic acid	335-67-1	37		0.5	2	1
10954	Perfluoropentanoic Acid	2706-90-3	7		0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	Ŭ	1	3	1
Metals	SW-846 60	100	mg/l		mg/l	mg/l	
01750	Calcium	7440-70-2	55.8		0.0382	0.400	1
01750		7439-95-4			0.0190	0.400	1
	Magnesium		22.1				-
01762	Potassium	7440-09-7	16.9		0.160	1.00	1
01767	Sodium	7440-23-5	108		0.173	2.00	1
Wet Ch	nemistry EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride	16887-00-6	281		10.0	20.0	50
00228	Sulfate	14808-79-8	13.9		1.5	5.0	5
	EPA 353.2		mg/1		mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	1.5		0.040	0.10	1
	SM 2320 E	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	26.8		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	26.8		1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7	U	1.7	5.0	1
12110	carsonace minarinie,		±.,	<u> </u>	±• /	3.0	-

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-64-65-170113 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787496 LL Group # 1754381

Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/13/2017 12:44 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1516 SDG#: MMK15-16

Sample Comments

	Laboratory Sample Analysis Record									
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor		
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170231AA	01/23/2017	15:12	Angela D Sneeringer	1		
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170231AA	01/23/2017	15:12	Angela D Sneeringer	1		
10954	16 PFCs	EPA 537 Rev 1.1	1	17018004	02/02/2017	07:22	Jason W Knight	1		
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17018004	01/18/2017	19:50	Devon M Whooley	1		
01750	Calcium	SW-846 6010C	1	170180635002	01/22/2017	16:20	Elaine F Stoltzfus	1		
01757	Magnesium	SW-846 6010C	1	170180635002	01/22/2017	16:20	Elaine F Stoltzfus	1		
01762	Potassium	SW-846 6010C	1	170180635002	01/22/2017	16:20	Elaine F Stoltzfus	1		
01767	Sodium	SW-846 6010C	1	170180635002	01/22/2017	16:20	Elaine F Stoltzfus	1		
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170180635002	01/20/2017	07:30	Lisa J Cooke	1		
00224	Chloride	EPA 300.0	1	17018987131B	01/19/2017	07:02	Hallie A Burnett	50		
00228	Sulfate	EPA 300.0	1	17018987131B	01/19/2017	06:47	Hallie A Burnett	5		
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17019118102B	01/19/2017	04:43	Joseph E McKenzie	1		
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17017012201A	01/17/2017	23:26	Brandon P Costik	1		
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17017012201A	01/17/2017	23:26	Brandon P Costik	1		
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17017012201A	01/17/2017	23:26	Brandon P Costik	1		

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-64-65-170113 Filtered Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8787497 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/13/2017 12:44 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1517 SDG#: MMK15-17

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	s Dissolved	SW-846 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	49.3	0.0382	0.400	1
01757	Magnesium	7439-95-4	12.7	0.0190	0.200	1
01762	Potassium	7440-09-7	6.36	0.160	1.00	1
01767	Sodium	7440-23-5	104	0.173	2.00	1

Sample Comments

This sample was filtered in the lab for dissolved metals.

	Laboratory Sample Analysis Record									
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor			
01750	Calcium	SW-846 6010C	1	170180635002	01/22/2017 16:23	Elaine F Stoltzfus	1			
01757	Magnesium	SW-846 6010C	1	170180635002	01/22/2017 16:23	Elaine F Stoltzfus	1			
01762	Potassium	SW-846 6010C	1	170180635002	01/22/2017 16:23	Elaine F Stoltzfus	1			
01767	Sodium	SW-846 6010C	1	170180635002	01/22/2017 16:23	Elaine F Stoltzfus	1			
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170180635002	01/20/2017 07:30	Lisa J Cooke	1			

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: TRIP BLANK PFCs Blank Water

SGPP - Merrimack

LL Sample # WW 8787498 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/10/2017

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/14/2017 10:10

Reported: 02/17/2017 14:33

M1518 SDG#: MMK15-18TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 R	ev 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	1	J	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.8	U	0.8	3	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroc	ctanesu	lfonamidoa	acetic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-m				pacetic Acid.		

The stated QC limits are advisory only until sufficient data points $\ensuremath{\mathsf{S}}$

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev 1.1	1	17018004	02/14/2017 14:31	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17018004	01/18/2017 19:50	Devon M Whooley	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-EBWP01-170113 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8787499 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/13/2017 14:24 by STJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1519 SDG#: MMK15-19EB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor	
Misc.	Organics EPA 537 H	Rev 1.1	ng/l		ng/l	ng/l		
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1	
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1	
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1	
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1	
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1	
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1	
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1	
10954	Perfluorohexanoic acid	307-24-4	1	J	0.5	2	1	
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1	
10954	Perfluorobutanesulfonate	375-73-5	0.8	U	0.8	3	1	
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1	
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1	
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1	
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1	
10954	NETFOSAA	2991-50-6	1	U	1	3	1	
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.							
10954	NMeFOSAA	2355-31-9	1	U	1	3	1	
	NMeFOSAA is the acronym for N-m	methyl perfluoro	octanes	ulfonamid	loacetic Acid.			

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev 1.1	1	17018004	02/14/2017 14:51	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17018004	01/18/2017 19:50	Devon M Whooley	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-EBPP01-170113 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8787500 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/13/2017 14:17 by STJ C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/14/2017 10:10 Reported: 02/17/2017 14:33

M1520 SDG#: MMK15-20EB

CAT No.	Analysis Name	CAS Number	Result	=	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 R	ev 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.6	J	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.8	U	0.8	3	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroo	ctanesul	lfonamidoacet	ic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me	ethyl perfluoro	octanesı	ulfonamidoace	tic Acid.		
_							

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev 1.1	1	17018004	02/14/2017 15:12	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17018004	01/18/2017 19:50	Devon M Whooley	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: Trip Blank VOCs Blank Water

SGPP - Merrimack

LL Group # 1754381 Account # 37191

LL Sample # WW 8787501

Project Name: SGPP - Merrimack

Collected: 01/10/2017

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/14/2017 10:10 Latham NY 12110

Reported: 02/17/2017 14:33

M1521 SDG#: MMK15-21TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U 	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U U	2 1	4 5	1 1
11997	Styrene	100-42-5	1 0.5	U	0.5	1	1
11997	1,1,2,2-Tetrachloroethane Tetrachloroethene	79-34-5	0.5	U		1	
11997 11997	Toluene	127-18-4 108-88-3	0.5	U	0.5 0.5	1	1 1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
	1,2,4-Trichlorobenzene		1	U	1	5	1
11997 11997	1,1,1-Trichloroethane	120-82-1 71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-00-5 79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-09-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1
11221	W. P WATCHE	1,7001-23-1	0.5	U	0.5	-	±

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

Sample Description: Trip Blank VOCs Blank Water

SGPP - Merrimack

LL Sample # WW 8787501 LL Group # 1754381 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/10/2017

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

Submitted: 01/14/2017 10:10

Reported: 02/17/2017 14:33

M1521 SDG#: MMK15-21TB

CAT Method Limit of Dilution No. Analysis Name CAS Number Result Detection Limit* Quantitation Factor

GC/MS Volatiles SW-846 8260C ug/1 ug/1 ug/1

11997 o-Xylene 95-47-6 0.5 U 0.5 1 1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170231AA	01/23/2017 15:34	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170231AA	01/23/2017 15:34	Angela D Sneeringer	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1754381

Reported: 02/17/2017 14:33

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	=	MDL**	LOQ
	ug/l		ug/l	ug/l
Batch number: Y170231AA		e numbe 31,8787		5,8787487,8787489,8787491-8787493,8787495-8787496,8787501
Acetone	6	U	6	20
Benzene	0.5	U	0.5	1
Bromochloromethane	1	U	1	5
Bromodichloromethane	0.5	U	0.5	1
Bromoform	0.5	U	0.5	4
Bromomethane	0.5	U	0.5	1
2-Butanone	3	U	3	10
Carbon Disulfide	1	U	1	5
Carbon Tetrachloride	0.5	U	0.5	1
Chlorobenzene	0.5	U	0.5	1
Chloroethane	0.5	U	0.5	1
Chloroform	0.5	U	0.5	1
Chloromethane	0.5	U	0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	U	2	5
Dibromochloromethane	0.5	U	0.5	1
1,2-Dibromoethane	0.5	U	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5
Dichlorodifluoromethane	0.5	U	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	U	0.5	1
trans-1,2-Dichloroethene	0.5	U	0.5	1
1,2-Dichloropropane	0.5	U	0.5	1
cis-1,3-Dichloropropene	0.5	U	0.5	1
trans-1,3-Dichloropropene	0.5	U	0.5	1
Ethylbenzene	0.5	U	0.5	1
Freon 113	2	U	2	10
2-Hexanone	3	Ū	3	10
Isopropylbenzene	1	U	1	5
Methyl Acetate	1	U	1	5
Methyl Tertiary Butyl Ether	0.5	Ū	0.5	1
4-Methyl-2-pentanone	3	Ū	3	10
Methylcyclohexane	1	Ū	1	5
Methylene Chloride	2	Ū	2	4
Styrene	1	Ū	1	5
	_	-	•	

^{*-} Outside of specification

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1754381

Reported: 02/17/2017 14:33

Method Blank (continued)

Analysis Name	Result	MDL**	LOQ
	ug/l	ug/l	ug/l
1,1,2,2-Tetrachloroethane	0.5 U	0.5	1
Tetrachloroethene	0.5 U	0.5	1
Toluene	0.5 U	0.5	1
1,2,3-Trichlorobenzene	1 U	1	5
1,2,4-Trichlorobenzene	1 U	1	5
1,1,1-Trichloroethane	0.5 U	0.5	1
1,1,2-Trichloroethane	0.5 U	0.5	1
Trichloroethene	0.5 U	0.5	1
Trichlorofluoromethane	0.5 U	0.5	1
Vinyl Chloride	0.5 U	0.5	1
m+p-Xylene	0.5 U	0.5	1
o-Xylene	0.5 U	0.5	1
o ny tene			-
	ng/l	ng/l	ng/l
Batch number: 17018004	Sample num		
			85,8787487,8787489,8787491-8787496,8787498-8787500
Perfluorooctanoic acid	0.5 U	0.5	2
Perfluorononanoic acid	0.6 U	0.6	2
Perfluorodecanoic acid	0.5 U	0.5	2
Perfluoroundecanoic acid	1 U	1	3
Perfluorododecanoic acid	0.5 U	0.5	2
Perfluorotridecanoic acid	0.5 U	0.5	2
Perfluorotetradecanoic acid	0.5 U	0.5	2
Perfluorohexanoic acid	0.5 U	0.5	2
Perfluoroheptanoic acid	0.5 U	0.5	2
Perfluorobutanesulfonate	0.7 U	0.7	2
Perfluorohexanesulfonate	1 U	1	3
Perfluoro-octanesulfonate	2 U	2	6
Perfluorobutanoic Acid	3 U	3	10
Perfluoropentanoic Acid	0.5 U	0.5	2
NETFOSAA	1 U	1	3
NMeFOSAA	1 U	1	3
	mg/l	mg/l	mg/l
Batch number: 170180635002	Sample nur	ber(s): 878	7481-8787493,8787495-8787497
Calcium	0.0448 J	0.0382	0.400
Magnesium	0.0190 U	0.0190	0.200
Potassium	0.160 U	0.160	1.00
Sodium	0.173 U	0.173	2.00
Batch number: 17018987131A	Sample num	nber(s): 878'	7481,8787483,8787485,8787487,8787489,8787491-8787493
Chloride	0.20 U	0.20	0.40
Sulfate	0.30 U	0.30	1.0
Batch number: 17018987131B	_		7495-8787496
Chloride	0.20 U	0.20	0.40
Sulfate	0.30 U	0.30	1.0
Batch number: 17019118101B	Sample nur	ber(s): 878	7481,8787483

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1754381

Reported: 02/17/2017 14:33

Method Blank (continued)

Analysis Name	Result mg/l	MDL** mg/l	LOQ mg/l
Total Nitrite/Nitrate Nitrogen	0.040 U	0.040	0.10
Batch number: 17019118102A	-		185,8787487,8787489,8787491-8787493,8787495
Total Nitrite/Nitrate Nitrogen	0.040 U	0.040	0.10
Batch number: 17019118102B	Sample number	r(s): 87874	196
Total Nitrite/Nitrate Nitrogen	0.040 U	0.040	0.10
	mg/l as CaCO	3 mg/l as CaCO3	mg/l as CaCO3
Batch number: 17017012201A	Sample number	r(s): 87874	181,8787489,8787493,8787496
Total Alkalinity to pH 4.5	1.7 U	1.7	5.0
Batch number: 17017012202A Total Alkalinity to pH 4.5	Sample number	r(s): 87874 1.7	183,8787485,8787487,8787491-8787492,8787495 5.0

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: Y170231AA	Sample number								
			5,8787487,8787					87501	
Acetone	150	171.7	150	169.92	114	113	50-168	1	30
Benzene	20	20.29	20	20.36	101	102	78-120	0	30
Bromochloromethane	20	20.4	20	20.08	102	100	80-125	2	30
Bromodichloromethane	20	19.22	20	19.07	96	95	80-120	1	30
Bromoform	20	17.29	20	17.17	86	86	59-120	1	30
Bromomethane	20	18	20	17.86	90	89	55-123	1	30
2-Butanone	150	152.66	150	152.27	102	102	57-145	0	30
Carbon Disulfide	20	17.84	20	17.69	89	88	58-120	1	30
Carbon Tetrachloride	20	19.5	20	19.34	98	97	74-130	1	30
Chlorobenzene	20	20.2	20	20.28	101	101	80-120	0	30
Chloroethane	20	17.31	20	17.31	87	87	56-120	0	30
Chloroform	20	20.27	20	20.2	101	101	80-120	0	30
Chloromethane	20	17.98	20	17.87	90	89	59-127	1	30
Cyclohexane	20	19.1	20	19.1	95	96	65-131	0	30
1,2-Dibromo-3-chloropropane	20	18.41	20	18.08	92	90	59-120	2	30
Dibromochloromethane	20	19.26	20	19.18	96	96	78-120	0	30
1,2-Dibromoethane	20	20.67	20	20.66	103	103	80-120	0	30
1,2-Dichlorobenzene	20	19.83	20	19.78	99	99	80-120	0	30
1,3-Dichlorobenzene	20	19.33	20	19.38	97	97	80-120	0	30
1,4-Dichlorobenzene	20	19.67	20	19.57	98	98	80-120	1	30
Dichlorodifluoromethane	20	17.67	20	17.3	88	86	49-134	2	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1754381

Reported: 02/17/2017 14:33

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
1,1-Dichloroethane	20	20.69	20	20.56	103	103	80-120	1	30
1,2-Dichloroethane	20	19.58	20	19.49	98	97	66-128	0	30
1,1-Dichloroethene	20	20.86	20	20.62	104	103	76-124	1	30
cis-1,2-Dichloroethene	20	20.4	20	20.17	102	101	80-120	1	30
trans-1,2-Dichloroethene	20	21.14	20	21.07	106	105	80-120	0	30
1,2-Dichloropropane	20	20.26	20	20.28	101	101	80-120	0	30
cis-1,3-Dichloropropene	20	19.78	20	19.76	99	99	80-120	0	30
trans-1,3-Dichloropropene	20	20.27	20	20.15	101	101	76-120	1	30
Ethylbenzene	20	20.54	20	20.41	103	102	78-120	1	30
Freon 113	20	19.07	20	18.82	95	94	64-136	1	30
2-Hexanone	100	107.27	100	107.11	107	107	49-146	0	3.0
Isopropylbenzene	20	20.23	20	20.35	101	102	80-120	1	30
Methyl Acetate	20	20.74	20	20.18	104	101	61-137	3	3.0
Methyl Tertiary Butyl Ether	20	19.7	20	19.65	98	98	75-120	0	30
4-Methyl-2-pentanone	100	106.7	100	105.02	107	105	55-141	2	30
Methylcyclohexane	20	18.96	20	18.77	95	94	66-126	1	30
Methylene Chloride	20	20.29	20	20.28	101	101	80-120	0	30
Styrene	20	19.84	20	19.77	99	99	80-120	0	30
1,1,2,2-Tetrachloroethane	20	20.24	20	20.24	101	101	72-120	0	30
Tetrachloroethene	20	20.39	20	20.21	102	101	80-129	0	30
Toluene	20	20.49	20	20.56	102	103	80-120	0	30
1,2,3-Trichlorobenzene	20	19.86	20	19.94	99	100	69-120	0	30
1,2,4-Trichlorobenzene	20	20.21	20	20.18	101	101	72-120	0	30
1,1,1-Trichloroethane	20	19.71	20	19.68	99	98	66-126	0	30
1,1,2-Trichloroethane	20	20.1	20	20.04	100	100	80-120	0	30
Trichloroethene	20	20.38	20	20.32	102	102	80-120	0	30
Trichlorofluoromethane	20	17.76	20	17.48	89	87	67-129	2	30
Vinyl Chloride	20	17.73	20	17.73	89	89	63-121	1	30
m+p-Xylene	40	40.64	40	41	102	102	80-120	1	30
o-Xylene	20	20.14	20	20.21	101	101	80-120	0	30
	ng/l	ng/l	ng/l	ng/l					
Batch number: 17018004	Sample numbe	er(s):							
	8787481,8787	7483,8787485	,8787487,878	7489,878749	1-878749	6,878749	8-8787500		
Perfluorooctanoic acid	200	172.03	200	192.01	86	96	70-130	11	30
Perfluorononanoic acid	200	186.94	200	178.02	93	89	70-130	5	30
Perfluorodecanoic acid	200	184	200	159.79	92	80	70-130	14	30
Perfluoroundecanoic acid	200	186.08	200	184.71	93	92	70-130	1	30
Perfluorododecanoic acid	200	196.08	200	198.78	98	99	70-130	1	30
Perfluorotridecanoic acid	200	216.61	200	224.28	108	112	70-130	3	30
Perfluorotetradecanoic acid	200	191.88	200	179.71	96	90	70-130	7	30
Perfluorohexanoic acid	200	175.85	200	153.64	88	77	70-130	13	30
Perfluoroheptanoic acid	200	192.57	200	181.83	96	91	70-130	6	30
Perfluorobutanesulfonate	176.8	190.83	176.8	167.55	108	95	70-130	13	30
Perfluorohexanesulfonate	189.2	169.89	189.2	141.81	90	75	70-130	18	30
Perfluoro-octanesulfonate	191.2	163.08	191.2	196.48	85	103	70-130	19	30
Perfluorobutanoic Acid	200	194.14	200	175.25	97	88	70-130	10	30
Perfluoropentanoic Acid	200	195.66	200	178.39	98	89	70-130	9	30
•									

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1754381

Reported: 02/17/2017 14:33

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ng/l	LCS Conc ng/l	LCSD Spike Added ng/l	LCSD Conc ng/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
NEtFOSAA NMeFOSAA	200 200	237.57 249.32	200 200	227.92 219.14	119 125	114 110	70-130 70-130	4 13	30 30
	mg/l	mg/l	mg/l	mg/l					
Batch number: 170180635002 Calcium Magnesium Potassium Sodium	Sample numbe 4.00 2.00 10 10	r(s): 87874 4.09 2.08 10.23 10.08	81-8787493,87	87495-8787	102 104 102 101		80-120 80-120 80-120 80-120		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17018987131A Chloride Sulfate	Sample numbe 3.00 7.50	r(s): 87874 2.86 7.34	81,8787483,87 3.00 7.50	87485,8787 2.85 7.28	487,8787 95 98	489,8787 95 97	491-8787493 90-110 90-110	0 1	20 20
Batch number: 17018987131B Chloride Sulfate	Sample numbe 3.00 7.50	r(s): 87874 2.86 7.34	3.00 7.50	2.85 7.28	95 98	95 97	90-110 90-110	0 1	20 20
Batch number: 17019118101B Total Nitrite/Nitrate Nitrogen	Sample numbe 2.50	r(s): 87874 2.65	81,8787483		106		90-110		
Batch number: 17019118102A Total Nitrite/Nitrate Nitrogen	Sample numbe 2.50	r(s): 87874 2.66	85,8787487,87	87489,8787	491-8787 107	493,8787	495 90-110		
Batch number: 17019118102B Total Nitrite/Nitrate Nitrogen	Sample numbe 2.50	r(s): 87874 2.66	196		107		90-110		
Batch number: 17017012201A	mg/l as CaCO3 Sample numbe	mg/l as CaCO3 r(s): 87874	mg/l as CaCO3	mg/l as CaCO3 87493.8787	496				
Total Alkalinity to pH 4.5	188	185.69	, , , , , , , , , , , , , , , , , , , ,	,,-	99		84-110		
Batch number: 17017012202A Total Alkalinity to pH 4.5	Sample numbe	r(s): 87874 189.22	83,8787485,87	87487,8787	491-8787 101	492,8787	495 84-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked	MS Spike	MS	MSD Spike	MSD	MS	MSD	MS/MSD	RPD	RPD
	Conc	Added	Conc	Added	Conc	%Rec	%Rec	Limits		Max
	ng/l	ng/l	ng/l	ng/l	ng/l					

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1754381

Reported: 02/17/2017 14:33

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ng/l	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS MS %Rec %Re	•	RPD	RPD Max
Batch number: 17018004	Sample numb 8787481,878		35,878748	7,8787489,87	87491-87	787496,8787498	-8787500 UNSP	K: 8787	485
Perfluorooctanoic acid	25.02	200.06	207.11			91	70-130		
Perfluorononanoic acid	0.6 U	200.06	190.88			95	70-130		
Perfluorodecanoic acid	0.5 U	200.06	198.08			99	70-130		
Perfluoroundecanoic acid	1 U	200.06	202.98			101	70-130		
Perfluorododecanoic acid	0.5 U	200.06	188.84			94	70-130		
Perfluorotridecanoic acid	0.5 U	200.06	218.34			109	70-130		
Perfluorotetradecanoic acid	0.5 U	200.06	184.62			92	70-130		
Perfluorohexanoic acid	4.53	200.06	202.6			99	70-130		
Perfluoroheptanoic acid	4.12	200.06	170.27			83	70-130		
Perfluorobutanesulfonate	2.88	176.85	175.55			98	70-130		
Perfluorohexanesulfonate	1.48	189.26	155.73			82	70-130		
Perfluoro-octanesulfonate	2 U	191.26	166.77			87	70-130		
Perfluorobutanoic Acid	3.40 4.70	200.06	193.06			95	70-130		
Perfluoropentanoic Acid		200.06	186.65			91	70-130		
NETFOSAA NMEFOSAA	1 U 1 U	200.06 200.06	231.87 264.5			116 132*	70-130 70-130		
NMEFOSAA	1 0	200.00	204.5			132	70-130		
	mg/l	mg/l	mg/l	mg/l	mg/l				
Batch number: 170180635002	Sample numb	er(s): 8787	7481-8787	493.8787495-	8787497	UNSPK: 878749	3		
Calcium	24.38	4.00	28.48	4.00	28.51	103 (2) 103		0	20
Magnesium	5.54	2.00	7.57	2.00	7.61	102 10		0	20
Potassium	3.33	10	13.81	10	13.81	105 10		0	20
Sodium	109.89	10	120.21	10	120.11	103 (2) 102		0	20
	mg/l	mg/l	mg/l	mg/l	mg/l				
Batch number: 17018987131A	Sample numb	er(s): 8787	7481,8787	483,8787485,	8787487,	8787489,87874	91-8787493 UN	SPK:	
Chloride	9.83	20	28.9			95	90-110		
Sulfate	34.43	50	86.24			104	90-110		
						101	50 110		
Batch number: 17018987131B	-			496 UNSPK: I	787998				
Chloride	6.24	20	25.29			95	90-110		
Sulfate	35.74	50	85.7			100	90-110		
Batch number: 17019118101B Total Nitrite/Nitrate Nitrogen	Sample numb 6.45	er(s): 8785 5.00	7481,8787 11.89	483 UNSPK: I	765484	109	90-110		
Batch number: 17019118102A Total Nitrite/Nitrate Nitrogen	Sample numb 0.966	er(s): 8787 1.00	7485,8787 2.04	487,8787489,	8787491-	-8787493,87874: 107	95 UNSPK: P79	0664	
Batch number: 17019118102B	Sample numb	er(s): 8787	7496 UNSP	K: P787996					

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1754381

Reported: 02/17/2017 14:33

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/l	MS Spike Added mg/l	MS Conc mg/l	MSD Spike Added mg/l	MSD Conc mg/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Total Nitrite/Nitrate Nitrogen	0.040 U	1.00	1.15	1.00	0.985	115*	99	90-110	15	20
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 17017012201A Total Alkalinity to pH 4.5	Sample number 418.92	er(s): 878 188	7481,8787 516.55	489,8787493	,8787496 ī	UNSPK: P7	787311	84-110		
Batch number: 17017012202A Total Alkalinity to pH 4.5	Sample number 17.85	er(s): 878 188	7483,8787 199.15	485,8787487	,8787491-8	8787492,8 96	8787 4 95 t	UNSPK: 878	7491	

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD	DUP RPD Max	
	mg/l	mg/l			
Batch number: 170180635002	Sample number(s):	8787481-8787493,	8787495-878749	7 BKG: 8787493	
Calcium	24.38	24.23	1	20	
Magnesium	5.54	5.51	0	20	
Potassium	3.33	3.28	1 (1)	20	
Sodium	109.89	109.03	1	20	
	mg/l	mg/l			
Batch number: 17018987131A	Sample number(s):	8787481,8787483,	8787485,878748	7,8787489,8787491-	8787493 BKG: P787996
Chloride	9.83	9.87	0 (1)	15	
Sulfate	34.43	34.79	1	15	
Batch number: 17018987131B	Sample number(s):	8787495-8787496	BKG: P787998		
Chloride	6.24	6.14	2 (1)	15	
Sulfate	35.74	35.81	0	15	
Batch number: 17019118101B	Sample number(s):	8787481,8787483	BKG: P765484		
Total Nitrite/Nitrate Nitrogen	6.45	6.48	1	2	
Batch number: 17019118102A	Sample number(s):	8787485 8787487	8787489 878749	1_8787493 8787495	BKG: D790664
Total Nitrite/Nitrate Nitrogen	0.966	0.948	2	2	BKG: F790004
Batch number: 17019118102B	Sample number(s):	8787496 BKG: P78	7996		
Total Nitrite/Nitrate Nitrogen	0.040 U	0.040 U	0 (1)	2	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1754381

Reported: 02/17/2017 14:33

Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name BKG Conc DUP Conc DUP RPD DUP RPD Max

mg/l mg/l

mg/l as CaCO3 mg/l as CaCO3

Batch number: 17017012201A Sample number(s): 8787481,8787489,8787493,8787496 BKG: P787311

Total Alkalinity to pH 4.5 418.92 417.19 0 5

Batch number: 17017012202A Sample number(s): 8787483,8787485,8787487,8787491-8787492,8787495 BKG: 8787491

Total Alkalinity to pH 4.5 17.85 17.77 0 (1) 5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: Y170231AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8787481	96	102	100	99
8787483	97	101	101	98
8787485	97	101	100	98
8787487	97	100	101	98
8787489	96	100	101	98
8787491	96	101	101	97
8787492	97	101	101	98
8787493	97	100	101	98
8787495	96	101	100	97
8787496	97	101	100	98
8787501	97	101	101	98
Blank	97	101	101	99
LCS	99	102	101	100
LCSD	99	100	101	100

Limits: 80-116 77-113 80-113 78-113

Analysis Name: 16 PFCs Batch number: 17018004

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA	
8787481	82	80	95	69*	71	78	
8787483	68*	69*	72	56*	61*	63*	
8787485	98	107	112	113	99	102	
8787487	62*	64*	67*	60*	59*	59*	
8787489	61*	65*	63*	67*	60*	74	
8787491	63*	64*	66*	64*	62*	74	
8787492	52*	58*	56*	60*	55*	57*	
8787493	77	76	79	76	82	83	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1754381

Reported: 02/17/2017 14:33

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 17018004

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8787494	74	64*	59*	82	70	71
8787495	68*	70	65*	77	72	77
8787496	80	88	90	86	93	97
8787498	78	73	68*	64*	63*	70
8787499	68*	70	68*	61*	52*	60*
8787500	124	145*	138*	125	113	121
Blank	77	73	78	84	85	92
LCS	64*	71	65*	62*	56*	62*
LCSD	79	81	83	79	75	75
MS	62*	70	66*	64*	76	77
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8787481	81	107	106	89	120	62*
8787483	64*	71	87	69*	88	68*
8787485	110	106	122	102	97	103
8787487	65*	60*	66*	76	77	71
8787489	61*	63*	71	60*	47*	58*
8787491	70	58*	63*	59*	50*	63*
8787492	57*	54*	53*	55*	50*	51*
8787493	81	71	92	74	76	77
8787494	77	68*	101	73	58*	64*
8787495	78	79	83	67*	69*	64*
8787496	86	72	82	86	84	85
8787498	81	72	100	86	59*	70
8787499	68*	64*	90	72	55*	60*
8787500	120	120	168*	123	94	102
Blank	81	69*	81	71	61*	62*
LCS	64*	72	77	60*	51*	58*
LCSD	73	63*	79	76	63*	67*
MS	69*	57*	70	61*	59*	60*
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA			

	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA
8787481	68*	48*	56*
8787483	89	51*	52*
8787485	153*	81	80
8787487	83	66*	62*
8787489	58*	47*	46*
8787491	69*	44*	48*
8787492	62*	42*	39*
8787493	84	68*	64*
8787494	60*	60*	51*

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1754381

Reported: 02/17/2017 14:33

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 17018004

	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
8787495	75	57*	58*	
8787496	115	74	73	
8787498	69*	63*	55*	
8787499	61*	53*	48*	
8787500	96	87	88	
Blank	79	56*	56*	
LCS	53*	55*	52*	
LCSD	59*	60*	63*	
MS	69*	57*	53*	
Limits:	70-130	70-130	70-130	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

Enviror	nmental Anal	lysis Requ	uest/Chain	of Custody
🗱 eurofins	l	For E	urofins Lancaster Laboratories E	Invironmental use only

COC #512676 Acct. # 37 | 9 Group # 175438 | Sample # 8787481-50 Lancaster Laboratories
Environmental

Client Information	n		Matrix						Spreage states	Analysis I					Requested			For Lab Use	Only			
Client:	Acct. #:		- Porto do Davido.				г	600-1XV-8		DO BANCON DATAMA					on C			ericon entrecise		FSC:		
CT Male Associates	l				G C		Ш						SO SON ES CETANAS.	MITTER SERVICES						SCR#:		
Project Name/#: SUPP- Minnimalk	PWSID #:		***************************************		Tissue	Ground 🗏	Surface	<i>y</i> ,							(c)	75				Preser	vation C	odes
-		NAME OF THE OWNER OWNER OF THE OWNER O	00000000000000000000000000000000000000		Ë	0.0	urfe			20	[3]	ग्यप		~	3	37mid				H =HCl		niosulfate
Project Manager: Yick Molinic		6126					∑ S	7	ers	(20003)	(20109)	-garettefite population		3000)	(SM 232.0)	M				N=HNO₃ S=H₂SO₄	MARKING AND AND A PARK TO SERVE THE	ther
Sampler: STS (Strahin Johnson) Quote #: 214135					Sediment	등 등	ES	Jd.	of Containers	A. >	£	77	6.5	· · · · · · · · · · · · · · · · · · ·	200	(L)				R	emarks	<u>;</u>
State where samples were collected: For Compliance: Yes	No 🗆			ite	Sedi	Potable	NPDES	45	of Co	2	~	Mitals	NO2	504	<u>C</u>	-1						
Sample Identification	Colle	ected	ap.	Composite			water	Other:	Total # (77	3	52,52	NO3.4	, ,		7 7 7						
	Date	Time	Grab	ပိ	Soil	18/	\ \ \	ð	ē	france	3	2	~	0	Coming	,,,,,,,						
SGZ-APOI-45-46-170110	410117	1103	X				×/		N	X	X	Х	χį	X	X	X				1:1/w]	or We	lals
342-APO1-55-56-170110	1/10/17	142	V			7	x/		11	ΧÌ	Ж	X	×	Ж	X	X)				FIAM	ome	14/5
Sh2-APOI-65-66-170111	1/11/17	0904	X			,	×		12	X	X	X	K	Ŋ	X	X				Filling	26/4	ĺ
Sh2-APO1-75-76-170111	1/11/17	1151	K				Ŕ		12	X	×	×	Xi	λį	XĮ	X				Filler	nelals	j
342-APOI-79-60-170111	1/11/17	1522			7	Q		12	X	X	X	X	X	X	\mathcal{N}				1	netale	,	
362-APOZ-24-25- 170112	1/12/17	1037	X				A)		A COLOR	X	X		X	Χ	Ί	X						
ShZ-4Pez - 34-35-170112	1)12/17	1212	X			`	X)		-	X	'×		W	У	X	X						
562-APOZ-44-45-170112	1/12/17	1348	X				χû		11	X	\times		X	Х	X	X						
Shz- FB02-170112	1/12/17	1548	X					×	2							X						
362-4902-54-55-170113	V13/17	0915	X				X)			У	×		X	X	Х	X						
Turnaround Time (TAT) Requested	(ptease circle	е)	Relingu	uished	by	1	\				Date	,	Time		Receiv	ed by				D	ate	Time
\	ush		Relinqu	upped!		<u> </u>	h_				V/I3		17	~	Receiv	od by					ate	Time
(Rush TAT is subject to laboratory approval and surcharge	9.)		r tem iqt	JISI IEU	by 、	· .J					Date		111116		Heceiv	eu by					A16	
Date results are needed:A>AP				uished	by						Date		Time		Receiv	ed by				D	ate	Time
E-mail address: K: moline @ ct male. com				uished	bv	<u> </u>		***************************************			Date		Time		Receiv	ed by				D	ate	Time
Data Package Options (circle if re	The second secon				•					_			o necessaries de la constante			,						
Type I (EDA Level 3	(Raw Data (Only)	Relinqu	uished	by		and the second second second	Constitution on the Section of the S			Date		Time		Received by				> 7		Time	
Type III (Reduced non-CLP) NJ DKQF	> TXT	TRRP-13			f yes,	EDI form	D Req	uirec	i? `	Yes	No				Relinquished by Commercial Carr				Λ	· #		
NYSDEC Category A or B MA MCP	CTF	ЗСР		Site	e-Sp	ecific	QC (I				Ye ate sam		No lume.)			Tei				receipt $\underline{ heta}$	3-16	<u>'</u> °C

7044 0216

Environmental Analysis Request/Chain of Custody

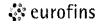
🗱 eurofins		eu	ro	fi	n	S
------------	--	----	----	----	---	---

For Eurofins Lancaster Laboratories Environmental use only

Lancaster Laboratories Acct. # 37191 Group # 1754381 Sample # 8787481-501

COC #512677

Client Information											sis I	Requested For Lab Use Only				Only						
Client:	Acct. #:				Conference of the						Preserva					odes	- menorable receive			FSC:		
CT Male Associates					e	Ø	ш													SCR#:		
Project Name/#:	PWSID #:				Tissue	Ground	Surface								30	1				Preser	ation (odes
Shpp-Marrimack					Ë	2	urfe	Ž.		7	3	75			25	3			1	H=HCI		iosulfate
Project Manager:	P.O. #:	6126			\Box	Q	ଊ	73	S	9	(2010)	3		0	53	53.7mud			Anna Carrier and Anna Carrier and Anna Carrier and Anna Carrier and Anna Carrier and Anna Carrier and Anna Car	N=HNO ₃	B=N	
Kirle Moline Sampler:	Quote #:	6 26		*************	1	Ш	\Box	2	힏	0973)	3	Filhard	~	(0:05)	3M2320B)					S =H ₂ SO ₄	0=0	orymanysourceasurymounts of the destination of
STS Stephen Johnson		14135			9	9	S	JH.	ţa.			تنا	as			(E/0.4)			ŀ	K	emarks	5
State where samples were collected: For Compliance:	1	***************************************			Ş	ap	H		é	45	1 2 1	~	3	1 .	7.				Variables			
NH Yes □	No 🗆			site	Sediment	Potable	NPDES	JU	of C	veas	2	Meduls	+1102	504	ے . حسیہ	2						
Sample Identification	Colle	ected	ام	Composite		ļ	į.	:. ::	Total # of Containers	TCL	S.M.S.	A	NO3	1	4)素を	7			are read between			
Sample Identification	Date	Time	Grab	S	Soil	M2*0*	2	Other:	Tota	7	િં		~)	4			ĺ				
Alsts										Control Control	**********		*************				CONTROL CONTROL CO	X CONTROL CONTROL CONTROL CONTROL CONTROL CONTROL CONTROL CONTROL CONTROL CONTROL CONTROL CONTROL CONTROL CONT				
Sh2-APOZ-64-65-170113	1/13/17	1244	X)	4		12	×	×	×	×	X	×	X				Filler	velo	14
TRIP Blank PFCS	. account	Miller States	ľ					×								X			ĺ	1 1 1 1 1	V 45 (-	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
SG2-EBWP01-170113	1/13/17	1424	×					×	2.							X			ĺ	****	C	
342-EBPPC1-176113	V/13/17	1417	×					'X	2							×						
Top Blank Vocs	1 months	man production of the last of						W	21	X				***************************************					Ì			
									SYS													
																			Ì			
												ĺ									•	
Turnaround Time (TAT) Requested	(please circl	e)	Relinquished by					Date Time			~ ft >	Received by					Da	te	Time			
Standard (Ri	ush)		l) 4¢		<u> 42°</u>	1	·				117		16					-			
(Rush TAT is subject to laboratory approval and surcharge	1.)		Relinq	ushed	J y	Y					Date		Time		Receiv	ed by				Da	te 	Time
Date results are needed:		·	Relinq	uished	ру						Date		Time		Receiv	ed by				Da	te	Time
				Tremitquistied by						11110												
E-mail address: Kimpline Octm	alerco	m	Relinq	uished	ру						Date		Time		Receiv	ed by				Da	te	Time
Data Package Options (circle if re	quired)								****			and the second second	AND THE RESERVE AND THE									
Type I (EPA Level 3 Type VI (Raw Data	Only)	Relinqı	uished	ру				- RABBERTON	SECTION AND ADDRESS OF THE PARTY OF THE PART	Date		Time		Receiv	ed by	Contraction of the last	<u> </u>	\supset	Da j	e //	Time
Equivalent/non-CLP)		3,	ACCORDANGE AND ADDRESS OF THE PARTY OF THE P		volue extreme		-	الموضوع والمعامر - موجوع			kasindiningsi	is Den Roberto Windowski		(<u> </u>	4	<u> </u>	کار			14/ (UUU
Type III (Reduced non-CLP) NJ DKQF	TX T	RRP-13				-EDD forma		uired	? `	Yes	No				Relinquished by Commercial Carrier: // / / / / UPS FedEx Other							
			 			ecific		MS/M	SD/Γ	Dup)?	' Y	es	No		UF						2/1	
NYSDEC Category A or B MA MCP	CT F	RCP					•			• •		nple vo				Ter	npera	ature (upon	receipt 🕭	31.C	<u> </u>



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

173092

Group Number(s): |75436|

Client: C.T Male

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

01/14/2017 10:10

Number of Packages:

<u>5</u>

Number of Projects:

2

State/Province of Origin:

<u>NY</u>

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

Yes

Custody Seal Present:

Yes

Sample Date/Times match COC:

Yes

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

Air Quality Samples Present:

No

No

Samples Chilled:

Yes

Total Trip Blank Qty:

2

Paperwork Enclosed:

Yes Yes Trip Blank Type:

HCI

Samples Intact: Missing Samples:

No.

Extra Samples:

No

Discrepancy in Container Qty on COC:

No

Unpacked by Karen Diem (3060) at 11:44 on 01/14/2017

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler#	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	1.4	DT	Wet	Υ	Bagged	N
2	DT121	0.6	DT	Wet	Υ Υ	Bagged	N
3	DT121	1.2	DT	Wet	Υ	Bagged	N
4	DT121	. 1.6	DT	Wet	Υ	Bagged	N
5	DT121	0.3	DT	Wet	Υ	Bagged	Ń



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RLReporting Limit kg **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: February 07, 2017

Project: SGPP - Merrimack

Submittal Date: 01/21/2017 Group Number: 1757183 SDG: MMK16 PO Number: 16.6126 State of Sample Origin: NH

	Lancaster Labs
Client Sample Description	<u>(LL) #</u>
SG2-AP08-57-58-170119 Grab Groundwater	8799385
SG2-AP08-57-58-170119 MS Grab Groundwater	8799386
SG2-AP08-57-58-170119 MSD Grab Groundwater	8799387
SG2-AP08-67-68-170119 Grab Groundwater	8799388
SG2-AP08-77-78-170119 Grab Groundwater	8799389
SG2-FD03-170119 Grab Groundwater	8799390
SG2-AP08-81-82-170120 Grab Groundwater	8799391
SG2-AP08-81-82-170120 Filtered Grab Groundwater	8799392
SG2-AP09-2.5-3-170120 Grab Soil	8799393
SG2-AP09-6-8-170120 Grab Soil	8799394
SG2-AP09-11-12-170120 Grab Groundwater	8799395
SG2-AP09-11-12-170120 Filtered Grab Groundwater	8799396
SG2-FB03-170120 Grab Blank Water	8799397
PFC Trip Blank Water	8799398
SG2-AP06-6-8-170118 Grab Soil	8799399
SG2-AP06-6-8-170118 MS Grab Soil	8799400
SG2-AP06-6-8-170118 MSD Grab Soil	8799401
VOC Trip Blank Water	8799402
PFC Trip Blank Water	8799403

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To Barr Engineering Company Attn: Jonathon Carter Electronic Copy To Barr Engineering Company Attn: Lauren Brady



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Electronic Copy To C. T. Male Associates Attn: Jeff Marx
Electronic Copy To C. T. Male Associates Attn: Dan Reilly
Electronic Copy To C. T. Male Associates Attn: Kirk Moline

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250



Project Name: SGPP - Merrimack LL Group #: 1757183

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260C, GC/MS Volatiles

Sample #s: 8799394

A Method Detection Limit (MDL) standard is analyzed to confirm sensitivity of the instrument for samples with non-detect analytes associated with a continuing calibration verification standard exhibiting low response (outside the 20%D criteria). The MDL standard shows adequate sensitivity at or below the reporting limit.

Batch #: A170272AA (Sample number(s): 8799393, 8799399-8799401 UNSPK: 8799399)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: 1,2-Dibromo-3-chloropropane, 2-Hexanone EPA 537 Rev 1.1, Misc. Organics

Sample #s: 8799385, 8799386, 8799387, 8799388, 8799389, 8799390, 8799395, 8799397,

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

<u>Batch #: 17031006 (Sample number(s): 8799385-8799391, 8799395, 8799397-8799398, </u> 8799403 UNSPK: 8799385)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Perfluorohexanoic acid

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8799385, 8799386, 8799388, 8799389, 8799395, 8799397, 8799398, 8799403, Blank, LCS, MS

EPA 537 Rev. 1.1 modified, Misc. Organics

Sample #s: 8799393, 8799394, 8799399, 8799400, 8799401

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Batch #: 17024006 (Sample number(s): 8799393-8799394, 8799399-8799401 UNSPK: 8799399)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: NEtFOSAA, NMeFOSAA

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8799393, 8799394, 8799399, 8799400, 8799401, LCS, MS, MSD

EPA 353.2, Wet Chemistry

Batch #: 17029118102A (Sample number(s): 8799385, 8799388-8799391, 8799395 UNSPK: 8799385 BKG: 8799385)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Nitrite/Nitrate Nitrogen SW-846 9060 modified, Wet Chemistry

Sample #s: 8799393, 8799394, 8799399

Due to the nature of this sample matrix, the sample cup was filled to capacity with less than 1000 mg of sample being used. The lowered sample weight has resulted in a raised reporting limit.

SM 2320 B-1997, Wet Chemistry

Batch #: 17025008103A (Sample number(s): 8799388, 8799391 UNSPK: P798607 BKG: P797952, P798607)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Total Alkalinity to pH 4.5

The relative percent difference(s) for the following analyte(s) in the MS/MSD were outside outside acceptance windows: Total Alkalinity to pH 4.5 Batch #: 17025008104A (Sample number(s): 8799385, 8799389, 8799395 UNSPK: P798933 BKG: P798933, P799390)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Alkalinity to pH 4.5 Batch #: 17025008104B (Sample number(s): 8799390 UNSPK: P798933 BKG: P798933, P8799390)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Alkalinity to pH 4.5

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Total Alkalinity to pH 4.5



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-57-58-170119 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799385 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/19/2017 10:04 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1601 SDG#: MMK16-01BKG

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-57-58-170119 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799385 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/19/2017 10:04 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1601 SDG#: MMK16-01BKG

CAT No.	No. Analysis Name		As CAS Number Re		ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	50C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sear	rch						
	The results from the FORM 1 - VOA-TIC. To on the back of this	The qualifier	-					
Misc.	Organics	EPA 537 Re	v 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic ad	cid	335-67-1	92		0.5	2	1
10954			375-95-1	0.8	J	0.6	2	1
	Perfluorodecanoic ad		335-76-2	0.5	IJ	0.5	2	1
10954			2058-94-8	1	IJ	1	3	1
10954			307-55-1	0.5	II	0.5	2	1
10954			72629-94-8	0.5	Ū	0.5	2	1
10954			376-06-7	0.5	II	0.5	2	1
10954			307-24-4	14	0	0.5	2	1
10954			375-85-9	11		0.5	2	1
10954	-		375-73-5	7		0.3	2	1
10954			355-46-4	3		1	3	1
10954			1763-23-1	6	J	2	6	1
10954			375-22-4	6	J	3	10	1
10954			2706-90-3	10	U	0.5	2	1
10954		ACIU	2991-50-6	1	IJ	1	3	1
10954				_	-	=	3	1
10954	NEtFOSAA is the acro	onym for N-et.	2355-31-9	octanesu 1	II onamidoace	1	3	1
10954		£ N			-	-	3	1
_,	NMeFOSAA is the acro					etic Acia.		
	stated QC limits are be obtained to calcul			ient da	ta points			
Metal		SW-846 601		mg/1		mg/l	mg/l	
01750	Calcium		7440-70-2	17.0		0.0382	0.400	1
01757	Magnesium		7439-95-4	3.55		0.0190	0.200	1
01762	Potassium		7440-09-7	3.79		0.160	1.00	1
01767	Sodium		7440-23-5	52.5		0.173	2.00	1
Wet C	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	94.6		20.0	40.0	100
00224	Sulfate		14808-79-8	12.7		1.5	5.0	5
00220	Bullace		14000 75 0	12.7		1.5	3.0	3
		EPA 353.2		mg/1		mg/l	mg/l	
07882	Total Nitrite/Nitrat	te Nitrogen	n.a.	4.7		0.080	0.20	2
		SM 2320 B-	1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	рн 4.5	n.a.	16.8		1.7	5.0	1
12149	Bicarbonate Alkalini	-	n.a.	16.8		1.7	5.0	1
12148	Carbonate Alkalinity	-	n.a.	1.7	U	1.7	5.0	1
					-	- ·	- · -	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-57-58-170119 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799385 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/19/2017 10:04 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1601 SDG#: MMK16-01BKG

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170271AA	01/27/2017	07:58	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170271AA	01/27/2017	07:58	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17031006	02/02/2017	14:54	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17031006	01/31/2017	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017	15:10	Katlin N Cataldi	1
01757	Magnesium	SW-846 6010C	1	170260635001	01/27/2017	15:10	Katlin N Cataldi	1
01762	Potassium	SW-846 6010C	1	170260635001	01/27/2017	15:10	Katlin N Cataldi	1
01767	Sodium	SW-846 6010C	1	170260635001	01/27/2017	15:10	Katlin N Cataldi	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170260635001	01/26/2017	22:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	17024120601A	01/24/2017	10:24	Hallie Burnett	100
00228	Sulfate	EPA 300.0	1	17024120601A	01/24/2017	10:10	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17029118102A	01/29/2017	17:34	Joseph E McKenzie	2
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17025008104A	01/26/2017	05:51	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	05:51	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	05:51	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO).
VOLATILE ORGANICS ANAL	YSIS DATA SHEET		
TENTATIVELY IDENTIFI	ED COMPOUNDS	!	!
		! K1601	!
Lab Name: Lancaster Laboratories	Contract:	!	!
Lab Code: LANCAS Case No.:	SAS No.:	SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 87993	85	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355	.i/17jan27a.b/y	j27s02.d
Level: (low/med) LOW	Date Received: 01/21	/17	

% Moisture: not dec.

Column: (pack/cap) CAP

Date Analyzed: 01/27/17

Dilution Factor: 1.0

CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) ug/L

	1			1
CAS NUMBER	: ! COMPOUND NAME ==!============		EST. CONC.	~
	: !Total VOC TICs	!	•	:
	_!	į	!	!
3.	1	i	!	i
		i	!	i
	· ·	· ·		!
6.	!		!	!
	1		!	
8.	!	· ·		!
9.	!	1	!	!
10.	!	i	!	i .
11.	!	· ·		!
	1	1	!	!
	1	i	!	i —
		i	!	i .
15.	!	1	!	!
	!	i	!	i .
17.	<u> </u>	· ·		!
		1	!	!
	1	i	!	i —
	!	i	!	i —
21		1	!	!
22.		i	!	i
		i	!	i —
24		i	!	
25		i	!	i
		i	!	i
	!	i	!	i
		i	i	i ———
29		i	·	i
30.		i	·	i
JU		i	·	i

page 1 of 1 FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-57-58-170119 MS Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799386 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/19/2017 10:04 by SJ C. T. Male Associates

50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1601 SDG#: MMK16-01MS

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l	ug/l	ug/l	
11997	Acetone	67-64-1	170	6	20	1
11997	Benzene	71-43-2	22	0.5	1	1
11997	Bromochloromethane	74-97-5	20	1	5	1
11997	Bromodichloromethane	75-27-4	19	0.5	1	1
11997	Bromoform	75-25-2	15	0.5	4	1
11997	Bromomethane	74-83-9	18	0.5	1	1
11997	2-Butanone	78-93-3	150	3	10	1
11997	Carbon Disulfide	75-15-0	21	1	5	1
11997	Carbon Tetrachloride	56-23-5	21	0.5	1	1
11997	Chlorobenzene	108-90-7	21	0.5	1	1
11997	Chloroethane	75-00-3	19	0.5	1	1
11997	Chloroform	67-66-3	21	0.5	1	1
11997	Chloromethane	74-87-3	20	0.5	1	1
11997	Cyclohexane	110-82-7	23	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	17	2	5	1
11997	Dibromochloromethane	124-48-1	18	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	21	0.5	1	1
	,		20		5	
11997	1,2-Dichlorobenzene	95-50-1	20	1 1	5	1
11997	1,3-Dichlorobenzene	541-73-1				1
11997	1,4-Dichlorobenzene	106-46-7	20	1	5	1
11997	Dichlorodifluoromethane	75-71-8	19	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	22	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	21	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	24	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	21	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	23	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	21	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	19	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	19	0.5	1	1
11997	Ethylbenzene	100-41-4	22	0.5	1	1
11997	Freon 113	76-13-1	23	2	10	1
11997	2-Hexanone	591-78-6	110	3	10	1
11997	Isopropylbenzene	98-82-8	22	1	5	1
11997	Methyl Acetate	79-20-9	20	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	20	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	110	3	10	1
11997	Methylcyclohexane	108-87-2	22	1	5	1
11997	Methylene Chloride	75-09-2	21	2	4	1
11997	Styrene	100-42-5	20	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	20	0.5	1	1
11997	Tetrachloroethene	127-18-4	22	0.5	1	1
11997	Toluene	108-88-3	22	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	20	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	21	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	21	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	20	0.5	1	1
11997	Trichloroethene	79-01-6	22	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	20	0.5	1	1
11997	Vinyl Chloride	75-01-4	20	0.5	1	1
11997	m+p-Xylene	179601-23-1	43	0.5	1	1
11//	P 21/1 CIIC	1//001 23-1	19	0.5	<u> </u>	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-57-58-170119 MS Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799386 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/19/2017 10:04 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1601 SDG#: MMK16-01MS

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	:60C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	21	0.5	1	1
Misc.	Organics	EPA 537 R	ev 1.1	ng/l	ng/l	ng/l	
10954	Perfluorooctanoio	c acid	335-67-1	250	0.5	2	1
10954	Perfluorononanoio	acid	375-95-1	170	0.6	2	1
10954	Perfluorodecanoio	c acid	335-76-2	170	0.5	2	1
10954	Perfluoroundecand	oic acid	2058-94-8	190	1	3	1
10954	Perfluorododecano	oic acid	307-55-1	190	0.5	2	1
10954	Perfluorotridecar	noic acid	72629-94-8	200	0.5	2	1
10954	Perfluorotetradeo	canoic acid	376-06-7	170	0.5	2	1
10954	Perfluorohexanoio	acid	307-24-4	150	0.5	2	1
10954	Perfluoroheptanoi	c acid	375-85-9	190	0.5	2	1
10954	Perfluorobutanesu	ılfonate	375-73-5	170	0.7	2	1
10954	Perfluorohexanesu	ılfonate	355-46-4	170	1	3	1
10954	Perfluoro-octanes	sulfonate	1763-23-1	180	2	6	1
10954	Perfluorobutanoio	c Acid	375-22-4	180	3	10	1
10954	Perfluoropentanoi	lc Acid	2706-90-3	190	0.5	2	1
10954	NEtFOSAA		2991-50-6	200	1	3	1
	NEtFOSAA is the a	acronym for N-e	thyl perfluoroo	ctanesulfonamidoac	etic Acid.		
10954	NMeFOSAA		2355-31-9	190	1	3	1
	NMeFOSAA is the a	acronym for N-m	ethyl perfluoro	octanesulfonamidoa	cetic Acid.		
The	stated QC limits a	re advisory onl	ly until suffic:	ient data points			

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170271AA	01/27/2017 08:21	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170271AA	01/27/2017 08:21	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17031006	02/02/2017 15:35	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17031006	01/31/2017 14:30	Devon M Whooley	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-57-58-170119 MSD Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799387 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/19/2017 10:04 by SJ

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1601 SDG#: MMK16-01MSD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l	ug/l	ug/l	
11997	Acetone	67-64-1	170	6	20	1
11997	Benzene	71-43-2	22	0.5	1	1
11997	Bromochloromethane	74-97-5	20	1	5	1
11997	Bromodichloromethane	75-27-4	19	0.5	1	1
11997	Bromoform	75-25-2	15	0.5	4	1
11997	Bromomethane	74-83-9	18	0.5	1	1
11997	2-Butanone	78-93-3	160	3	10	1
11997	Carbon Disulfide	75-15-0	21	1	5	1
11997	Carbon Tetrachloride	56-23-5	21	0.5	1	1
11997	Chlorobenzene	108-90-7	21	0.5	1	1
11997	Chloroethane	75-00-3	19	0.5	1	1
11997	Chloroform	67-66-3	22	0.5	1	1
11997	Chloromethane	74-87-3	20	0.5	1	1
11997	Cyclohexane	110-82-7	24	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	18	2	5	1
11997	Dibromochloromethane	124-48-1	18	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	21	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	20	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	20	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	20	1	5	1
11997	Dichlorodifluoromethane	75-71-8	20	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	23	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	21	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	24	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	22	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	23	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	22	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	20	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	20	0.5	1	1
11997	Ethylbenzene	100-41-4	22	0.5	1	1
11997	Freon 113	76-13-1	23	2	10	1
11997	2-Hexanone	591-78-6	110	3	10	1
11997	Isopropylbenzene	98-82-8	22	1	5	1
11997	Methyl Acetate	79-20-9	21	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	20	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	110	3	10	1
11997	Methylcyclohexane	108-87-2	22	1	5	1
11997	Methylene Chloride	75-09-2	22	2	4	1
11997	Styrene	100-42-5	20	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	21	0.5	1	1
11997	Tetrachloroethene	127-18-4	22	0.5	1	1
11997	Toluene	108-88-3	22	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	21	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	21	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	21	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	20	0.5	1	1
11997	Trichloroethene	79-01-6	22	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	20	0.5	1	1
11997	Vinyl Chloride	75-01-4	20	0.5	1	1
11997	m+p-Xylene	179601-23-1	43	0.5	1	1
	P 11/10110	1,,001 23 1	10	0.5	<u>+</u>	<u> </u>

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-57-58-170119 MSD Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799387 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/19/2017 10:04 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1601 SDG#: MMK16-01MSD

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	260C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	21	0.5	1	1
Misc.	Organics	EPA 537 F	Rev 1.1	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic	acid	335-67-1	280	0.5	2	1
10954	Perfluorononanoio	acid	375-95-1	160	0.6	2	1
10954	Perfluorodecanoic	acid	335-76-2	170	0.5	2	1
10954	Perfluoroundecano	ic acid	2058-94-8	190	1	3	1
10954	Perfluorododecano	ic acid	307-55-1	180	0.5	2	1
10954	Perfluorotridecan	oic acid	72629-94-8	190	0.5	2	1
10954	Perfluorotetradec	anoic acid	376-06-7	170	0.5	2	1
10954	Perfluorohexanoic	acid	307-24-4	180	0.5	2	1
10954	Perfluoroheptanoi	c acid	375-85-9	190	0.5	2	1
10954	Perfluorobutanesu	ılfonate	375-73-5	180	0.7	2	1
10954	Perfluorohexanesu	ılfonate	355-46-4	160	1	3	1
10954	Perfluoro-octanes	ulfonate	1763-23-1	160	2	6	1
10954	Perfluorobutanoio	: Acid	375-22-4	180	3	10	1
10954	Perfluoropentanoi	.c Acid	2706-90-3	190	0.5	2	1
10954	NEtFOSAA		2991-50-6	180	1	3	1
	NEtFOSAA is the a	cronym for N-e	thyl perfluoroc	ctanesulfonamidoa	cetic Acid.		
10954	NMeFOSAA	_	2355-31-9	200	1	3	1
Tho	NMeFOSAA is the a	-		octanesulfonamido	acetic Acid.		

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Time			Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170271AA	01/27/2017 08	3:43	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170271AA	01/27/2017 08	3:43	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17031006	02/02/2017 15	5:55	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17031006	01/31/2017 14	1:30	Devon M Whooley	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-67-68-170119 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799388 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/19/2017 12:08 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1602 SDG#: MMK16-02

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	Ū	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	IJ	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	IJ	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	Ū	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	Ū	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5	1
11997		124-48-1	0.5	II	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	IJ	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1	1
11997	,	75-35-4	0.5	IJ	0.5	1	1
11997	•	156-59-2	0.5	IJ	0.5	1	1
	cis-1,2-Dichloroethene			-		1	
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U U	0.5	1	1
11997		78-87-5	0.5		0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5		1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U 	0.5	1	1
11997	Freon 113	76-13-1	2	U 	2	10	1
11997	2-Hexanone	591-78-6	3	U 	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	-	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997		108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997		120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



As Received

As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-67-68-170119 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799388 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/19/2017 12:08 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1602 SDG#: MMK16-02

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea	ırch						
	The results from th	ne volatile li	brary search a	are list	ed on the at	tached		
	FORM 1 - VOA-TIC.							
	on the back of this	form.						
Misc.	Organics	EPA 537 R	ev 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic a	cid	335-67-1	130		0.5	2	1
10954	Perfluorononanoic a	ıcid	375-95-1	1	J	0.6	2	1
10954	Perfluorodecanoic a	ıcid	335-76-2	0.7	J	0.5	2	1
10954	Perfluoroundecanoio	acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoio	acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoi	c acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecar	oic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic a	icid	307-24-4	19		0.5	2	1
10954	Perfluoroheptanoic		375-85-9	16		0.5	2	1
10954	Perfluorobutanesulf	onate	375-73-5	9		0.7	2	1
10954	Perfluorohexanesulf	onate	355-46-4	3		1	3	1
10954	Perfluoro-octanesul	.fonate	1763-23-1	9		2	6	1
10954	Perfluorobutanoic A		375-22-4	8	J	3	10	1
	Perfluoropentanoic	Acid	2706-90-3	15		0.5	2	1
10954	NEtFOSAA		2991-50-6	1	U	1	3	1
10954	NEtFOSAA is the acr	conym for N-et	hyl perfluoroo 2355-31-9	octanesu 1	lfonamidoace	tic Acid. 1	3	1
	NMeFOSAA is the acr	onym for N-me	thyl perfluoro	octanes	ulfonamidoace	etic Acid.		
The	stated QC limits are	advisory only	y until suffic	ient da	ta points			
can	be obtained to calcu	late statisti	cal limits.					
Metal	5	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	18.2		0.0382	0.400	1
01757	Magnesium		7439-95-4	3.80		0.0190	0.200	1
01762	Potassium		7440-09-7	4.18		0.160	1.00	1
01767	Sodium		7440-23-5	67.3		0.173	2.00	1
Wet Cl	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	116		10.0	20.0	50
00228	Sulfate		14808-79-8	12.9		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitra		n.a.	5.5		0.080	0.20	2
0,002	10001 NICIICO/NICIO	ice Microgen		3.3		3.000	0.20	-
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	рн 4.5	n.a.	27.6		1.7	5.0	1
12149	Bicarbonate Alkalir	nity	n.a.	27.6		1.7	5.0	1
12148	Carbonate Alkalinit	.y	n.a.	1.7	U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-67-68-170119 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799388 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/19/2017 12:08 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1602 SDG#: MMK16-02

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170271AA	01/27/2017	09:05	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170271AA	01/27/2017	09:05	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17031006	02/02/2017	16:36	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17031006	01/31/2017	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017	14:44	Katlin N Cataldi	1
01757	Magnesium	SW-846 6010C	1	170260635001	01/27/2017	14:44	Katlin N Cataldi	1
01762	Potassium	SW-846 6010C	1	170260635001	01/27/2017	14:44	Katlin N Cataldi	1
01767	Sodium	SW-846 6010C	1	170260635001	01/27/2017	14:44	Katlin N Cataldi	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170260635001	01/26/2017	22:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	17024120601B	01/24/2017	23:14	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	17024120601B	01/24/2017	22:31	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17029118102A	01/29/2017	17:39	Joseph E McKenzie	2
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17025008103A	01/26/2017	03:35	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17025008103A	01/26/2017	03:35	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17025008103A	01/26/2017	03:35	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE NO.
VOLATILE ORGANICS ANALY	YSIS DATA SHEET		
TENTATIVELY IDENTIFI	ED COMPOUNDS	!	!
		!	K1602 !
Lab Name: Lancaster Laboratories	Contract:	!	!
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:
Matrix: (soil/water) WATER	Lab Sample ID: 8799388		
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355.i	/17ja	an27a.b/yj27s05.o
Level: (low/med) LOW	Date Received: 01/21/1	7	
% Moisture: not dec.	Date Analyzed: 01/27/1	7	
Column: (pack/cap) CAP	Dilution Factor: 1.0		

CONCENTRATION UNITS: Number TICs found: 0 (ug/L or ug/Kg) ug/L

	! COMPOUND NAME		! EST. CONC.	
	==!===================================	•	•	!===== ! U
		!	!	!
		!	!	!
	!		!	!
5	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	_!	!	!	!
	_!	!		!
	<u>!</u>	!	!	!
			!	
	<u>-</u> -		!	:
	! !	i	·	<u>;</u> ———
	<u>-</u>	i	!	:
		i	:	i
	!	i	· !	i ——
	i	i	!	!
		i	!	! !
	_!	!	!	!
	!		!	!
	!!	!	!	!
	!!	!	!	!
25		!	!	!
	!	!	!	!
	!	!	!	!
	_!	!		!
	_!	!	!	!
30	_!	!	!	!
	!	1	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-77-78-170119 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799389 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/19/2017 14:33 by SJ C. T. Male Associates

50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1603 SDG#: MMK16-03

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Lim	it*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l		ug/l	
11997	Acetone	67-64-1	6	U	6		20	1
11997	Benzene	71-43-2	0.5	IJ	0.5		1	1
11997	Bromochloromethane	74-97-5	1	IJ	1		5	1
11997	Bromodichloromethane	75-27-4	0.5	IJ	0.5		1	1
11997	Bromoform	75-25-2	0.5	U	0.5		4	1
11997	Bromomethane	74-83-9	0.5	U	0.5		1	1
11997	2-Butanone	78-93-3	3	IJ	3		10	1
11997	Carbon Disulfide	75-15-0	1	U	1		5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5		1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5		1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5		1	1
11997	Chloroform	67-66-3	0.5	U	0.5		1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5		1	1
11997	Cyclohexane	110-82-7	2	IJ	2		5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2		5	1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5		1	1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5		1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1		5	1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1		5	1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1		5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5		1	1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5		1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5		1	1
11997	1,1-Dichloroethene	75-35-4	0.5	Ū	0.5		1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	Ū	0.5		1	1
11997	trans-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5		1	1
11997	1,2-Dichloropropane	78-87-5	0.5	IJ	0.5		1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5		1	1
11997	trans-1,3-Dichloropropene	10061-01-5	0.5	IJ	0.5		1	1
11997	Ethylbenzene	10061-02-6	0.5	IJ	0.5		1	1
11997	Freon 113	76-13-1	2	IJ	2		10	1
			3	IJ			10	=
11997	2-Hexanone	591-78-6	3 1	Ū	3 1		5	1 1
11997	Isopropylbenzene	98-82-8	1	U	1		5	1
11997	Methyl Acetate	79-20-9	0.5	IJ	0.5			
11997	Methyl Tertiary Butyl Ether	1634-04-4		-			1	1
11997	4-Methyl-2-pentanone	108-10-1	3 1	U U	3 1		10 5	1 1
11997	Methylcyclohexane	108-87-2	2	IJ	2			
11997	Methylene Chloride	75-09-2		-			4	1
11997	Styrene	100-42-5	1	U	1		5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U 	0.5		1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5		1	1
11997	Toluene	108-88-3	0.5	U 	0.5		1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U 	1		5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U 	1		5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5		1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ū	0.5		1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5		1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5		1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5		1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5		1	1

^{*=}This limit was used in the evaluation of the final result



As Received

As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-77-78-170119 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799389 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/19/2017 14:33 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1603 SDG#: MMK16-03

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 82	260C	ug/l		ug/l	ug/l	
•	o-Xylene	95-47-6	0.5	U	0.5	1	1
00882	VOA Library Search						
	The results from the volatile l FORM 1 - VOA-TIC. The qualifie on the back of this form.	-					
Misc.	Organics EPA 537 F	Rev 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	140		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	1	J	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.6	J	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	Ū	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	IJ	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	IJ	0.5	2	1
10954		307-24-4	19		0.5	2	1
	Perfluoroheptanoic acid	375-85-9	16		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	1.0		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	4		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	9		2	6	1
10954		375-22-4	8	J	3	10	1
	Perfluoropentanoic Acid	2706-90-3	14	· ·	0.5	2	1
	NEtFOSAA	2991-50-6	1	U	1	3	1
10751	NEtFOSAA is the acronym for N-e				=	3	-
10954		2355-31-9	1	U	1	3	1
10001	NMeFOSAA is the acronym for N-m					3	±.
The	stated OC limits are advisory on				ere nera.		
	be obtained to calculate statist		Tenc da	ca points			
Metals	s SW-846 60)10C	mg/l		mg/l	mg/l	
			_		_	=	1
01750	Calcium	7440-70-2	16.4		0.0382	0.400	1
01757	Magnesium	7439-95-4	3.55		0.0190	0.200	1
01762	Potassium	7440-09-7	3.96		0.160	1.00	1
01767	Sodium	7440-23-5	72.4		0.173	2.00	1
Wet Cl	nemistry EPA 300.0)	mg/l		mg/l	mg/l	
00224	Chloride	16887-00-6	118		10.0	20.0	50
00228	Sulfate	14808-79-8	14.2		1.5	5.0	5
	EPA 353.2	.	mg/l		mg/l	mg/l	
0.000		=	_		<u>-</u> .		•
07882	Total Nitrite/Nitrate Nitrogen	n.a.	5.4		0.080	0.20	2
	SM 2320 E	3-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	23.9		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	23.9		1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7	U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-77-78-170119 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799389 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/19/2017 14:33 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1603 SDG#: MMK16-03

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170271AA	01/27/2017	09:27	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170271AA	01/27/2017	09:27	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17031006	02/02/2017	16:57	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17031006	01/31/2017	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017	14:46	Katlin N Cataldi	1
01757	Magnesium	SW-846 6010C	1	170260635001	01/27/2017	14:46	Katlin N Cataldi	1
01762	Potassium	SW-846 6010C	1	170260635001	01/27/2017	14:46	Katlin N Cataldi	1
01767	Sodium	SW-846 6010C	1	170260635001	01/27/2017	14:46	Katlin N Cataldi	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170260635001	01/26/2017	22:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	17024120601B	01/24/2017	21:20	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	17024120601B	01/24/2017	21:06	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17029118102A	01/29/2017	17:41	Joseph E McKenzie	2
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17025008104A	01/26/2017	05:44	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	05:44	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	05:44	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA	SAMPLE NO.
VOLATILE ORGANICS ANALYSIS DATA SHEET		
TENTATIVELY IDENTIFIED COMPOUNDS	!	!
	!	K1603 !
Lab Name: Lancaster Laboratories Contract:	!	!
Lab Code: LANCAS Case No.: SAS No.:	SDG	No.:
Matrix: (soil/water) WATER Lab Sample ID: 8799389		

Matrix: (soil/water) WATER
Lab Sample ID: 8799389
Sample wt/vol: 5.0 (g/mL)mL
Level: (low/med) LOW
Moisture: not dec.
Lab File ID: HP09355.i/17jan27a.b/yj27s06.d
Date Received: 01/21/17
Date Analyzed: 01/27/17

% Moisture: not dec. Date Analyzed: 01/27/17 Column: (pack/cap) CAP Dilution Factor: 1.0 CONCENTRATION UNITS: Number TICs found: 0 (ug/L or ug/Kg) ug/L

!	1	!	!	 !
! CAS NUMBER	! COMPOUND NAME		! EST. CONC.	
! 1. VOCTIC	!Total VOC TICs	!	•	! =====! ! U !
! 2	!! !	!	!	!!
	: !	i	! 	:i
		!	!	ii
! 6	.1	!	!	!!
! 7		!	!	!!
	!	!		!!
! 9 !10.	!	:	<u> </u>	¦
!11.		i ———	i	ii
!12	!	!	!	!!
!13	!	!	!	!!
!14		!	!	!!
!15! !16	<u> </u>	!	<u> </u>	!!
	! !	:	!	;;
!18		i	i	ii
!19	!	!		i i
!20	!	!	!	!!
! 21		!	!	!!
! 22. ! 23.		!	<u> </u>	!!
! 24		·	!	::
! 25.		i	i ————	ii
! 26		i	!	ii
!27	!	!	!	!!
! 28		!	<u> </u>	!!
! 29		!	!	!!
!30	<u> </u>	!	!	¦
·		•	·	؛ ــــــ ؛

page 1 of 1 FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-FD03-170119 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799390 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/19/2017 by SJ

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/21/2017 09:20

Latham NY 12110

Reported: 02/07/2017 10:47

K1604 SDG#: MMK16-04FD

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Lim	it*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l		ug/l	
11997	Acetone	67-64-1	6	U	6		20	1
11997	Benzene	71-43-2	0.5	IJ	0.5		1	1
11997	Bromochloromethane	74-97-5	1	IJ	1		5	1
11997	Bromodichloromethane	75-27-4	0.5	IJ	0.5		1	1
11997	Bromoform	75-25-2	0.5	U	0.5		4	1
11997	Bromomethane	74-83-9	0.5	U	0.5		1	1
11997	2-Butanone	78-93-3	3	IJ	3		10	1
11997	Carbon Disulfide	75-15-0	1	U	1		5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5		1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5		1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5		1	1
11997	Chloroform	67-66-3	0.5	U	0.5		1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5		1	1
11997	Cyclohexane	110-82-7	2	IJ	2		5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2		5	1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5		1	1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5		1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1		5	1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1		5	1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1		5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5		1	1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5		1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5		1	1
11997	1,1-Dichloroethene	75-35-4	0.5	Ū	0.5		1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	Ū	0.5		1	1
11997	trans-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5		1	1
11997	1,2-Dichloropropane	78-87-5	0.5	IJ	0.5		1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5		1	1
11997	trans-1,3-Dichloropropene	10061-01-5	0.5	IJ	0.5		1	1
11997	Ethylbenzene	10061-02-6	0.5	IJ	0.5		1	1
11997	Freon 113	76-13-1	2	IJ	2		10	1
			3	IJ			10	=
11997	2-Hexanone	591-78-6	3 1	Ū	3 1		5	1 1
11997	Isopropylbenzene	98-82-8	1	U	1		5	1
11997	Methyl Acetate	79-20-9	0.5	IJ	0.5			
11997	Methyl Tertiary Butyl Ether	1634-04-4		-			1	1
11997	4-Methyl-2-pentanone	108-10-1	3 1	U U	3 1		10 5	1 1
11997	Methylcyclohexane	108-87-2	2	IJ	2			
11997	Methylene Chloride	75-09-2		-			4	1
11997	Styrene	100-42-5	1	U	1		5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U 	0.5		1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5		1	1
11997	Toluene	108-88-3	0.5	U 	0.5		1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U 	1		5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U 	1		5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5		1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ū	0.5		1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5		1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5		1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5		1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5		1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-FD03-170119 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799390 LL Group # 1757183 Account # 37191

As Received

Limit of

Project Name: SGPP - Merrimack

Collected: 01/19/2017 by SJ

C. T. Male Associates
50 Century Hill Drive

As Received

Method

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 10:47

K1604 SDG#: MMK16-04FD

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Se	arch						
	The results from t FORM 1 - VOA-TIC. on the back of thi	The qualifier						
Misc.	Organics	EPA 537 R	ev 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic	acid	335-67-1	120		0.5	2	1
10954	Perfluorononanoic	acid	375-95-1	1	J	0.6	2	1
10954	Perfluorodecanoic	acid	335-76-2	0.6	J	0.5	2	1
10954	Perfluoroundecanoi	c acid	2058-94-8	1	Ū	1	3	1
10954			307-55-1	0.5	Ū	0.5	2	1
10954			72629-94-8	0.5	Ū	0.5	2	1
10954			376-06-7	0.5	IJ	0.5	2	1
10954			307-24-4	22	· ·	0.5	2	1
10954			375-85-9	16		0.5	2	1
10954			375-73-5	8		0.7	2	1
10954			355-46-4	3		1	3	1
10954			1763-23-1	11		2	6	1
10954			375-22-4	7	J	3	10	1
	Perfluoropentanoio		2706-90-3	14	Ü	0.5	2	1
10954	_		2991-50-6	1	U	1	3	1
	NEtFOSAA is the ac	ronym for N-et				tic Acid.	-	_
10954			2355-31-9	1	U	1	3	1
	NMeFOSAA is the ac	ronym for N-me	thyl perfluoro	octanes	ulfonamidoac	etic Acid.		
The	stated OC limits ar							
	be obtained to calc							
Metal	s	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	18.1		0.0382	0.400	1
01757	Magnesium		7439-95-4	3.80		0.0190	0.200	1
01762	Potassium		7440-09-7	4.17		0.160	1.00	1
01767	Sodium		7440-23-5	67.1		0.173	2.00	1
Wot C	hemistry	EPA 300.0		mg/l		mg/l	mg/l	
		EPA 300.0	16000 00 6	-				5.0
00224			16887-00-6	107		10.0	20.0	50
00228	Sulfate		14808-79-8	13.1		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitr	ate Nitrogen	n.a.	5.5		0.080	0.20	2
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity t		n.a.	30.0		1.7	5.0	1
12149	Bicarbonate Alkali	-	n.a.	30.0		1.7	5.0	1
12148	Carbonate Alkalini	-	n.a.	1.7	U	1.7	5.0	1
		-						

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-FD03-170119 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799390 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/19/2017 by SJ

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1604 SDG#: MMK16-04FD

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Tir	me		Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170271AA	01/27/2017	09:49	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170271AA	01/27/2017	09:49	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17031006	02/02/2017	18:19	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17031006	01/31/2017	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017	14:49	Katlin N Cataldi	1
01757	Magnesium	SW-846 6010C	1	170260635001	01/27/2017	14:49	Katlin N Cataldi	1
01762	Potassium	SW-846 6010C	1	170260635001	01/27/2017	14:49	Katlin N Cataldi	1
01767	Sodium	SW-846 6010C	1	170260635001	01/27/2017	14:49	Katlin N Cataldi	1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	170260635001	01/26/2017	22:00	Annamaria Kuhns	1
	U4							
00224	Chloride	EPA 300.0	1	17024120601B	01/24/2017	20:23	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	17024120601B	01/24/2017	19:40	Hallie Burnett	5
07882	Total Nitrite/Nitrate	EPA 353.2	1	17029118102A	01/29/2017	17:43	Joseph E McKenzie	2
	Nitrogen							
12150	Total Alkalinity to pH	SM 2320 B-1997	1	17025008104B	01/26/2017	04:43	Brandon P Costik	1
	4.5							
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17025008104B	01/26/2017	04:43	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17025008104B	01/26/2017	04:43	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA SAMPLE NO.		
VOLATILE ORGANICS ANA	LYSIS DATA SHEET		
TENTATIVELY IDENTIF	!	!	
		! K1604	!
Lab Name: Lancaster Laboratories	Contract:	!	!
Lab Code: LANCAS Case No.:	SAS No.:	SDG No.:	_
Matrix: (soil/water) WATER	Lab Sample ID: 8799	390	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0935	55.i/17jan27a.b/yj27	s07.
Level: (low/med) LOW	Date Received: 01/2	21/17	
% Moisture: not dec.	Date Analyzed: 01/2	27/17	
Column: (nack/can) CAD	Dilution Factor: 1	0	

Number TICs found: 0

Dilution Factor: 1.0

CONCENTRATION UNITS:

(ug/L or ug/Kg) ug/L

! ! CAS NUMBER	! ! COMPOUND NAME	! ! RT	! ! EST. CONC.	! ! ! 0
•	=!==========	==!======	!========	!======!
	!Total VOC TICs	!	! 0	! U !
! 2		!	! <u></u>	!!
	_!	!		!!
	_!	!	!	!!
	_!	!	! <u></u>	!!
! 6	_!	!		!!
	_!	!		!!
	_!	!		!!
! 9	!	!		!!
!10	_ !	!		!!
!11		!		!!
!12	_!	!		!!
!13	_!	!		!!
!14	_!	!		!!
!15	!	!	!	! !
!16	!	!	!	!!
	!			! !
!18	!	· ·		!
!19.		i		!
! 20.	!	i		!
!21.		· ·		!
! 22.		i		i ———
! 23.		i		i ———
!24			i	
! 25		i		
! 26	· · · · · · · · · · · · · · · · · · ·	i		i
! 27	!		i	;i
!28	_ ·	<u>i</u>		i ——— i
! 29 .		i		ii
130.			·	;i
	-;	i	·	i ——— i
•	_ •	·		• :

page 1 of 1

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-81-82-170120 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799391 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/20/2017 09:18 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1605 SDG#: MMK16-05

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1 11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1 1 11997 1,2-Dibromocthane 106-93-4 0.5 U 0.5 1 1 11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 11997 1,3-Dichlorobenzene 541-73-1 1 U 1 5 1 11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5 1 11997 1,4-Dichlorotenzene 106-46-7 1 U 1 5 1 11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 11997 1,1-Dichloroethane 107-06-2 0.5 U 0.5 1 1 11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1 1 11997 1,1-Dichloroethane 107-06-2 0.5 U 0.5 1 1 11997 1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 10061-01-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 10061-02-6 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 10061-02-6 0.5 U 0.5 1 1 11997 2-Hexanone 100-41-4 0.5 U 0.5 1 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 2-Hexanone 591-78-6 3 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl Cyclohexane 108-87-2 1 U 1 5 1 11997 Methyl-2-pentanone 108-10-1 3 U 2 2 4 1 11997 Methyl-2-pentanone 108-87-2 1 U 1 5 1 11997 Methyl-2-pentanone 108-87-2 1 U 1 5 1 11997 Methyl-2-pentanone 108-87-2 1 U 1 5 1 11997 Methyl-2-pentanone 108-87-2 1 U 1 5 1 11997 Methyl-2-pentanone 108-87-2 1 U 1 5 1 11997 Methyl-2-pentanone 108-87-2 1 U 1 5 1 11997 Methyl-2-pentanone 108-87-2 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1 11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1 1 11997 1,2-Dibromocthane 106-93-4 0.5 U 0.5 1 1 11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 11997 1,3-Dichlorobenzene 541-73-1 1 U 1 5 1 11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5 1 11997 1,4-Dichlorotenzene 106-46-7 1 U 1 5 1 11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 11997 1,1-Dichloroethane 107-06-2 0.5 U 0.5 1 1 11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1 1 11997 1,1-Dichloroethane 107-06-2 0.5 U 0.5 1 1 11997 1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 10061-01-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 10061-02-6 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 10061-02-6 0.5 U 0.5 1 1 11997 2-Hexanone 100-41-4 0.5 U 0.5 1 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 2-Hexanone 591-78-6 3 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl Cyclohexane 108-87-2 1 U 1 5 1 11997 Methyl-2-pentanone 108-10-1 3 U 2 2 4 1 11997 Methyl-2-pentanone 108-87-2 1 U 1 5 1 11997 Methyl-2-pentanone 108-87-2 1 U 1 5 1 11997 Methyl-2-pentanone 108-87-2 1 U 1 5 1 11997 Methyl-2-pentanone 108-87-2 1 U 1 5 1 11997 Methyl-2-pentanone 108-87-2 1 U 1 5 1 11997 Methyl-2-pentanone 108-87-2 1 U 1 5 1 11997 Methyl-2-pentanone 108-87-2 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-81-82-170120 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799391 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/20/2017 09:18 by SJ C. T. Male Associates

50 Century Hill Drive

As Received

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 10:47

K1605 SDG#: MMK16-05

12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	AS Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea	ırch						
	The results from the FORM 1 - VOA-TIC. on the back of this	The qualifie	-					
Misc.	Organics	EPA 537 R	ev 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic a	acid	335-67-1	120		0.5	2	1
10954	Perfluorononanoic a	acid	375-95-1	1	J	0.6	2	1
10954	Perfluorodecanoic a	acid	335-76-2	0.8	J	0.5	2	1
10954	Perfluoroundecanoio	acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoio	acid	307-55-1	0.5	Ū	0.5	2	1
10954	Perfluorotridecanoi	c acid	72629-94-8	0.5	IJ	0.5	2	1
	Perfluorotetradecar		376-06-7	0.5	II	0.5	2	1
10954			307-24-4	25	· ·	0.5	2	1
	Perfluoroheptanoic		375-85-9	17		0.5	2	1
10954			375-73-5	9		0.7	2	1
	Perfluorohexanesulf		355-46-4	3		1	3	1
	Perfluoro-octanesul		1763-23-1	12		2	6	1
	Perfluorobutanoic A		375-22-4	10		3	10	1
	Perfluoropentanoic		2706-90-3	17		0.5	2	1
	NEtFOSAA	ACIU	2991-50-6	1	U	1	3	1
10954	NEtFOSAA is the acr	£ N				_	3	Ţ
10054		ronym for N-e	2355-31-9	octanesu 1	III Onamidoace	tic Acia.	3	1
10954		5 27			-	=	3	Τ
	NMeFOSAA is the acr	ronym for N-m	etnyi periluoro	octanes	ulionamidoac	etic Acia.		
Metal	3	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	14.7		0.0382	0.400	1
01757			7439-95-4	2.72		0.0190	0.200	1
01762	_		7440-09-7	3.76		0.160	1.00	1
01767			7440-23-5	85.9		0.173	2.00	1
Wet Cl	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	133		10.0	20.0	50
00228	Sulfate		14808-79-8	14.4		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07000	m-1-1 min in (27):			_		=	=	2
07882	Total Nitrite/Nitra	ite Nitrogen	n.a.	5.5		0.080	0.20	2
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	орн 4.5	n.a.	37.1		1.7	5.0	1
12149	Bicarbonate Alkalir		n.a.	37.1		1.7	5.0	1
	Carbonate Alkalinit	-	n a	1 7	TT	1 7	5.0	1

1.7

n.a.

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-81-82-170120 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799391 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/20/2017 09:18 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1605 SDG#: MMK16-05

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Tir	me		Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170271AA	01/27/2017	10:11	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170271AA	01/27/2017	10:11	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17031006	02/02/2017	18:40	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17031006	01/31/2017	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017	14:52	Katlin N Cataldi	1
01757	Magnesium	SW-846 6010C	1	170260635001	01/27/2017	14:52	Katlin N Cataldi	1
01762	Potassium	SW-846 6010C	1	170260635001	01/27/2017	14:52	Katlin N Cataldi	1
01767	Sodium	SW-846 6010C	1	170260635001	01/27/2017	14:52	Katlin N Cataldi	1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	170260635001	01/26/2017	22:00	Annamaria Kuhns	1
	U4							
00224	Chloride	EPA 300.0	1	17024120601B	01/24/2017	19:26	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	17024120601B	01/24/2017	19:12	Hallie Burnett	5
07882	Total Nitrite/Nitrate	EPA 353.2	1	17029118102A	01/29/2017	17:45	Joseph E McKenzie	2
	Nitrogen							
12150	Total Alkalinity to pH	SM 2320 B-1997	1	17025008103A	01/26/2017	03:02	Brandon P Costik	1
	4.5							
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17025008103A	01/26/2017	03:02	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17025008103A	01/26/2017	03:02	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

	EPA	SAMPLE	NO.	
ANALYSIS DATA SHEET	_			
NTIFIED COMPOUNDS	!			!
	!	K1605		!
Contract:	!_			!
		No.:		_
Lab Sample ID: 879939	L			
Lab File ID:HP09355.:	i/17j	an27a.b/	yj27	s08.d
Date Received: 01/21/	L7			
Date Analyzed: 01/27/	L7			
Dilution Factor: 1.0				
CONCENTRATION UNITS	:			
(ug/L or ug/Kg) ug/I	_			
	Contract: SAS No.: Lab Sample ID: 879939 Lab File ID:HP09355. Date Received: 01/21/ Date Analyzed: 01/27/ Dilution Factor: 1.0 CONCENTRATION UNITS	ANALYSIS DATA SHEET TIFIED COMPOUNDS ! Contract: SAS No.: SDG Lab Sample ID: 8799391 Lab File ID:HP09355.i/17j Date Received: 01/21/17 Date Analyzed: 01/27/17	ANALYSIS DATA SHEET TIFIED COMPOUNDS Contract: SAS No.: SDG No.: Lab Sample ID: 8799391 Lab File ID:HP09355.i/17jan27a.b/ Date Received: 01/21/17 Date Analyzed: 01/27/17 Dilution Factor: 1.0 CONCENTRATION UNITS:	TIFIED COMPOUNDS Contract: SAS No.: SDG No.: Lab Sample ID: 8799391 Lab File ID:HP09355.i/17jan27a.b/yj27 Date Received: 01/21/17 Date Analyzed: 01/27/17 Dilution Factor: 1.0 CONCENTRATION UNITS:

CAS NUMBER	! COMPOUND NAME		EST. CONC.	~
	==!===================================	===!=====! !		!===== ! U
	_!	i		
	1			i
		i		i
	<u> </u>	i		!
6.	!	!		
	!	i		!
	1	!		!
9.	!	!		!
		!		!
	!	!		!
	!	!		!
3		!		!
	!	!		!
5	!	!!	!	!
6	!	!		!
7	!	!!		!
8	!	!!		!
9	!	!!		!
0	!	!!		!
1	!	!!		!
2	!	!!		!
3	!	!!		!
4	!	!!		!
	!	!!		!
	!	!!	l	!
7	!	!!		!
	!	!!		!
9	!	!!		!
0	!	!!		!
	!	!!!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP08-81-82-170120 Filtered Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799392 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/20/2017 09:18 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1606 SDG#: MMK16-06

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	Dissolved	SW-846	6010C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	14.1	0.0382	0.400	1
01757	Magnesium		7439-95-4	2.29	0.0190	0.200	1
01762	Potassium		7440-09-7	2.97	0.160	1.00	1
01767	Sodium		7440-23-5	84.4	0.173	2.00	1

Sample Comments

This sample was lab filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017	14:55	Katlin N Cataldi	1
01757	Magnesium	SW-846 6010C	1	170260635001	01/27/2017	14:55	Katlin N Cataldi	1
01762	Potassium	SW-846 6010C	1	170260635001	01/27/2017	14:55	Katlin N Cataldi	1
01767	Sodium	SW-846 6010C	1	170260635001	01/27/2017	14:55	Katlin N Cataldi	1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	170260635001	01/26/2017	22:00	Annamaria Kuhns	1
	U4							

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-2.5-3-170120 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799393 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/20/2017 11:18 by SJ C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 10:47

K1607 SDG#: MMK16-07

No. Nashysis Name SW-846 8260C SW-846 8260C SW-846 SW-846 8260C SW-846 SW-846 8260C SW-846					Dry Method	Dry Limit of	
Column C	CAT	Analysis Name	CAS Number	Dry			Dilution
11995	NO.			Result		-	Factor
11995 Renzene	GC/MS	Volatiles SW-846	8260C	mg/kg	mg/kg	mg/kg	
11995 Sromochloromethane		Acetone					
11995 Bromodichloromethane		Benzene		0.0004 U	0.0004	0.004	
11995 Rromoferm	11995	Bromochloromethane	74-97-5	0.0009 U	0.0009	0.004	0.82
11995 Stromomethane	11995	Bromodichloromethane	75-27-4	0.0009 U	0.0009	0.004	0.82
11995 Z-Butanome 78-93-3 0.004 U 0.0009 0.004 0.32 11995 Carbon Disulfide 75-15-0 0.0009 U 0.0009 0.004 0.32 11995 Carbon Terachloride 56-23-5 0.0009 U 0.0009 0.004 0.32 11995 Chloroethane 108-90-7 0.0009 U 0.0009 0.004 0.32 11995 Chloroethane 75-00-3 0.002 U 0.0009 0.004 0.32 11995 Chloroethane 74-87-3 0.002 U 0.0009 0.004 0.32 11995 Chloromethane 110-82-7 0.0009 U 0.0009 0.004 0.32 11995 Cyclohexane 110-82-7 0.0009 U 0.0009 0.004 0.32 11995 1,2-Dibromo-3-chloropropane 96-12-8 0.002 U 0.0009 0.004 0.32 11995 1,2-Dibromoethane 124-48-1 0.0009 U 0.0009 0.004 0.32 11995 1,2-Dibromoethane 106-93-4 0.0009 U 0.0009 0.004 0.82 11995 1,3-Dichloroethane 95-50-1 0.0009 U 0.0009 0.004 0.82 11995 1,3-Dichloroethane 106-46-7 0.0009 U 0.0009 0.004 0.82 11995 1,4-Dichloroethane 75-71-8 0.002 U 0.0009 0.004 0.82 11995 1,1-Dichloroethane 75-71-8 0.002 U 0.0009 0.004 0.82 11995 1,2-Dichloroethane 75-34-3 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichloroethane 75-34-3 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichloroethane 75-34-3 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichloroethane 75-34-3 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichloroethane 75-34-3 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichloroethane 156-59-2 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichloroethane 156-60-5 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichloroethane 156-60-5 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichloroethane 156-60-5 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichloroethane 156-00-5 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichloroethane 156-00-5 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichloroethane 108-81-81 0	11995	Bromoform	75-25-2	0.0009 U	0.0009	0.004	0.82
11995 Carbon Disulfide	11995	Bromomethane	74-83-9	0.002 U	0.002	0.004	0.82
11995 Carbon Tetrachloride 56-23-5 0.0009 U 0.0009 0.004 0.82 11995 Chlorochane 75-00-3 0.002 U 0.002 0.004 0.82 11995 Chlorochane 75-00-3 0.002 U 0.002 0.004 0.82 11995 Chlorochane 74-87-3 0.002 U 0.002 0.004 0.82 11995 Chloromethane 74-87-3 0.002 U 0.002 0.004 0.82 11995 Cyclohexane 10-82-7 0.009 U 0.0009 0.004 0.82 11995 1,2-Dithomo-alcomethane 124-88-1 0.002 U 0.002 0.004 0.82 11995 1,2-Dithomo-bane 106-93-4 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dithomo-bane 95-50-1 0.009 U 0.0009 0.004 0.82 11995 1,2-Dithomo-bane 95-50-1 0.0009 U 0.0009 0.004 0.82 11995 1,3-Dichlorochane 106-46-7 0.0009 U 0.0009 0.004 0.82 11995 1,4-Dichlorochane 75-71-8 0.002 U 0.0009 0.004 0.82 11995 1,1-Dichlorochane 75-34-3 0.009 U 0.0009 0.004 0.82 11995 1,1-Dichlorochane 75-34-3 0.009 U 0.0009 0.004 0.82 11995 1,1-Dichlorochane 107-06-2 0.009 U 0.0009 0.004 0.82 11995 1,1-Dichlorochane 107-06-2 0.009 U 0.0009 0.004 0.82 11995 1,2-Dichlorochane 107-06-2 0.009 U 0.0009 0.004 0.82 11995 1,2-Dichlorochane 107-06-2 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichlorochane 107-06-2 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichlorochane 106-01-01 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichlorochane 106-01-01 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichlorochane 106-01-01 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichlorochane 106-01-01 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichlorochane 106-01-01 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichlorochane 106-01-01 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichlorochane 106-01-01 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichlorochane 106-01-01 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichlorochane 106-01-	11995	2-Butanone	78-93-3	0.004 U	0.004	0.009	0.82
11995 Chlorobenzene	11995	Carbon Disulfide	75-15-0	0.0009 U	0.0009	0.004	0.82
11995 Chlorochane	11995	Carbon Tetrachloride	56-23-5	0.0009 U	0.0009	0.004	0.82
11995 Chloroform	11995	Chlorobenzene	108-90-7	0.0009 U	0.0009	0.004	0.82
11995 Chloromethane	11995	Chloroethane	75-00-3	0.002 U	0.002	0.004	0.82
11995 Cyclohexane	11995	Chloroform	67-66-3	0.0009 U	0.0009	0.004	0.82
11995 1,2-Dithromo-3-chloropropane	11995	Chloromethane	74-87-3	0.002 U	0.002	0.004	0.82
11995 Dibromochloromethane 124-48-1 0.0009 U 0.0009 0.004 0.82	11995	Cyclohexane	110-82-7	0.0009 U	0.0009	0.004	0.82
11995 Dibromochloromethane	11995	1,2-Dibromo-3-chloropropane	96-12-8	0.002 U	0.002	0.004	0.82
11995 1,2-Dichlorobenzene	11995		124-48-1	0.0009 U	0.0009	0.004	0.82
11995 1,2-Dichlorobenzene	11995	1,2-Dibromoethane	106-93-4	0.0009 U	0.0009	0.004	0.82
11995 1,4-Dichlorobenzene 106-46-7 0,0009 U 0,0002 0,004 0,82 11995 Dichlorodifluoromethane 75-71-8 0,002 U 0,0002 0,004 0,82 11995 1,1-Dichloroethane 107-06-2 0,0009 U 0,0009 0,004 0,82 11995 1,2-Dichloroethane 107-06-2 0,0009 U 0,0009 0,004 0,82 11995 1,1-Dichloroethene 156-59-2 0,0009 U 0,0009 0,004 0,82 11995 trans-1,2-Dichloroethene 156-59-2 0,0009 U 0,0009 0,004 0,82 11995 trans-1,2-Dichloroethene 156-60-5 0,0009 U 0,0009 0,004 0,82 11995 trans-1,3-Dichloropropane 78-87-5 0,0009 U 0,0009 0,004 0,82 11995 trans-1,3-Dichloropropane 10061-01-5 0,0009 U 0,0009 0,004 0,82 11995 trans-1,3-Dichloropropane 10061-02-6 0,0009 U 0,0009 0,004 0,82 11995 Ethylbenzene 10041-44 0,0009 U 0,0009 0,004 0,82 11995 Ethylbenzene 100-41-4 0,0009 U 0,0009 0,004 0,82 11995 Peon 113 76-13-1 0,002 U 0,002 0,009 0,004 0,82 11995 D,0009 0,004 0,82 11995 D,0009 0,004 0,82 11995 D,0009 0,004 0,82 11995 D,0009 0,004 0,82 11995 D,0009 0,004 0,82 11995 D,0009 0,004 0,82 11995 D,0009 0,004 0,82 11995 D,0009 0,004 0,82 11995 D,0009 0,004 0,82 11995 D,0009 0,004 0,82 11995 D,0009 0,004 0,82 11995 D,0009 0,004 0,82 11995 D,0009 0,004 0,82 11995 D,0009 D,004 0,82 11995 D,0009 D,004 0,82 11995 D,0009 D,004 0,82 11995 D,0009 D,004 0,82 11995 D,0009 D,004 0,82 11995 D,0009 D,004 0,82 11995 D,0009 D,004 0,82 11995 D,0009 D,004 D,0009	11995	1,2-Dichlorobenzene	95-50-1		0.0009		0.82
11995 1,4-Dichlorobenzene 106-46-7 0.0009 U 0.0002 0.004 0.82	11995	1.3-Dichlorobenzene	541-73-1	0.0009 U	0.0009	0.004	0.82
11995	11995	·	106-46-7	0.0009 U	0.0009		0.82
11995 1,1-Dichloroethane	11995	·	75-71-8				
11995 1,2-Dichloroethane	11995						
1.1-Dichloroethene	11995	•	107-06-2				
11995 cis-1,2-Dichloroethene 156-59-2 0.0009 U 0.0009 0.004 0.82 11995 trans-1,2-Dichloroethene 156-60-5 0.0009 U 0.0009 0.004 0.82 11995 cis-1,3-Dichloropropane 78-87-5 0.0009 U 0.0009 0.004 0.82 11995 cis-1,3-Dichloropropene 10061-01-5 0.0009 U 0.0009 0.004 0.82 11995 trans-1,3-Dichloropropene 10061-01-6 0.0009 U 0.0009 0.004 0.82 11995 Ethylbenzene 100-41-4 0.0009 U 0.0009 0.004 0.82 11995 Ethylbenzene 100-41-4 0.0009 U 0.0009 0.004 0.82 11995 Freon 13 76-13-1 0.002 U 0.002 0.009 0.82 11995 Isopropylbenzene 591-78-6 0.003 U 0.003 0.009 0.82 11995 Isopropylbenzene 98-82-8 0.0009 U 0.0009 0.004 0.82 11995 Methyl Acetate 79-20-9 0.002 U 0.002 0.004 0.82 11995 Methyl Tertiary Butyl Ether 1634-04-4 0.0004 U 0.0004 0.004 0.82 11995 Methyl-2-pentanone 108-10-1 0.003 U 0.003 0.009 0.82 11995 Methyl-2-pentanone 108-10-1 0.003 U 0.003 0.009 0.82 11995 Methyl-glockane 108-87-2 0.0009 U 0.0009 0.004 0.82 11995 Styrene 100-42-5 0.0009 U 0.0009 0.004 0.82 11995 Tetrachloroethene 127-18-4 0.0009 U 0.0009 0.004 0.82 11995 Toluene 108-88-3 0.0009 U 0.0009 0.004 0.82 11995 Toluene 108-88-3 0.0009 U 0.0009 0.004 0.82 11995 1,2,3-Trichloroethane 79-34-5 0.0009 U 0.0009 0.004 0.82 11995 1,2,4-Trichloroethane 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 75-69-4 0.002 U 0.0009 0.004 0.82 11995 Trichloroethane 75-69-4 0.002 U 0.0009 0.004 0.82 11995 Trichloroethane 75-69-4 0.002 U 0.0009 0.004 0.82 11995 Trichlorofluoromethane 75-69-4 0.000 U 0.0009 0.004 0.82 11995 Trichloroflu	11995	1,1-Dichloroethene	75-35-4		0.0009	0.004	0.82
11995 trans-1,2-Dichloroethene 156-60-5 0.0009 U 0.0009 0.004 0.82 11995 1,2-Dichloropropane 78-87-5 0.0009 U 0.0009 0.004 0.82 11995 trans-1,3-Dichloropropene 10061-01-5 0.0009 U 0.0009 0.004 0.82 11995 trans-1,3-Dichloropropene 10061-02-6 0.0009 U 0.0009 0.004 0.82 11995 trans-1,3-Dichloropropene 100-41-4 0.0009 U 0.0009 0.004 0.82 11995 Ethylbenzene 100-41-4 0.0009 U 0.0009 0.004 0.82 11995 Preon 113 76-13-1 0.002 U 0.002 0.009 0.82 11995 2-Hexanone 591-78-6 0.003 U 0.003 0.009 0.82 11995 Isopropylbenzene 98-82-8 0.0009 U 0.0009 0.004 0.82 11995 Methyl Acetate 79-20-9 0.002 U 0.002 0.004 0.82 11995 Methyl Tertiary Butyl Ether 1634-04-4 0.0004 U 0.0004 0.004 0.82 11995 4-Methyl-2-pentanone 108-10-1 0.003 U 0.003 0.009 0.82 11995 Methylene Chloride 75-09-2 0.002 U 0.0009 0.004 0.82 11995 Styrene 100-42-5 0.0009 U 0.0009 0.004 0.82 11995 Tetrachloroethane 79-34-5 0.0009 U 0.0009 0.004 0.82 11995 Tetrachloroethene 127-18-4 0.0009 U 0.0009 0.004 0.82 11995 1,2,3-Trichlorobenzene 120-82-1 0.0009 U 0.0009 0.004 0.82 11995 1,2,4-Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 79-00-5 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 79-00-5 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 75-69-4 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 75-69-4 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 75-69-4 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 75-69-4 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 75-60-4 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 75-60-4 0.0009 U 0.0009 0.004 0.82 11995	11995						
11995 1,2-Dichloropropane 78-87-5 0.0009 U 0.0009 0.004 0.82 11995 cis-1,3-Dichloropropene 10061-01-5 0.0009 U 0.0009 0.004 0.82 11995 trans-1,3-Dichloropropene 10061-02-6 0.0009 U 0.0009 0.004 0.82 11995 Ethylbenzene 100-41-4 0.0009 U 0.0009 0.004 0.82 11995 Ethylbenzene 100-41-4 0.0009 U 0.0009 0.004 0.82 11995 Freon 113 76-13-1 0.002 U 0.002 0.009 0.82 11995 Z-Hexanone 591-78-6 0.003 U 0.003 0.009 0.82 11995 Isopropylbenzene 98-82-8 0.0009 U 0.0009 0.004 0.82 11995 Methyl Acetate 79-20-9 0.002 U 0.002 0.004 0.82 11995 Methyl Acetate 79-20-9 0.002 U 0.002 0.004 0.82 11995 Methyl-2-pentanone 108-10-1 0.003 U 0.003 0.009 0.82 11995 Methyl-2-pentanone 108-87-2 0.0009 U 0.0009 0.004 0.82 11995 Methylene Chloride 75-09-2 0.002 U 0.002 0.004 0.82 11995 Styrene 100-42-5 0.0009 U 0.0009 0.004 0.82 11995 Tetrachloroethane 79-34-5 0.0009 U 0.0009 0.004 0.82 11995 Tetrachloroethane 127-18-4 0.0009 U 0.0009 0.004 0.82 11995 Toluene 108-88-3 0.0009 U 0.0009 0.004 0.82 11995 1,2,3-Trichlorobenzene 120-82-1 0.0009 U 0.0009 0.004 0.82 11995 1,2,1-Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 79-00-5 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 75-69-4 0.002 U 0.0009 0.004 0.82 11995 Trichloroethane 75-69-4 0.002 U 0.0009 0.004 0.82 11995 Trichloroethane 75-69-4 0.002 U 0.0009 0.004 0.82 11995 Trichloroethane 75-01-4 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 75-69-4 0.002 U 0.0009 0.004 0.82 11995 Trichloroethane 75-01-4 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 75-01-4 0.0009 U 0.0009 0.	11995	trans-1,2-Dichloroethene	156-60-5	0.0009 U	0.0009	0.004	0.82
11995 cis-1,3-Dichloropropene 10061-01-5 0.0009 U 0.0009 0.004 0.82 11995 trans-1,3-Dichloropropene 10061-02-6 0.0009 U 0.0009 0.004 0.82 11995 Ethylbenzene 100-41-4 0.0009 U 0.0009 0.004 0.82 11995 Freon 113 76-13-1 0.002 U 0.002 0.009 0.82 11995 2-Hexanone 591-78-6 0.003 U 0.003 0.009 0.82 11995 Isopropylbenzene 98-82-8 0.0009 U 0.0009 0.004 0.82 11995 Methyl Acetate 79-20-9 0.002 U 0.002 0.004 0.82 11995 Methyl Tertiary Butyl Ether 1634-04-4 0.0004 U 0.0004 0.004 0.82 11995 Methyl-2-pentanone 108-10-1 0.003 U 0.003 0.009 0.82 11995 Methylecolohexane 108-87-2 0.0009 U 0.0009 0.004 0.82 11995 Methylene Chloride 75-09-2 0.002 U 0.002 0.004 0.82 11995 Styrene 100-42-5 0.0009 U 0.0009 0.004 0.82 11995 Tetrachloroethane 79-34-5 0.0009 U 0.0009 0.004 0.82 11995 Toluene 108-83-3 0.0009 U 0.0009 0.004 0.82 11995 1,2,3-Trichlorobenzene 120-82-1 0.0009 U 0.0009 0.004 0.82 11995 1,2,1-Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 1,1,1-Trichloroethane 79-00-5 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 75-01-4 0.0009 U 0.0009 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 0.0009 0.0004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 0.0009 0.0009 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 0.0009 0.0009 0.0004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 0.0009 0.0009 0.0004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 0.000	11995	1,2-Dichloropropane	78-87-5	0.0009 U	0.0009	0.004	0.82
11995 trans-1,3-Dichloropropene 10061-02-6 0.0009 U 0.0009 0.004 0.82 11995 Ethylbenzene 100-41-4 0.0009 U 0.0009 0.004 0.82 11995 Freon 13 76-13-1 0.002 U 0.002 0.009 0.82 11995 2-Hexanone 591-78-6 0.003 U 0.003 0.009 0.82 11995 Isopropylbenzene 98-82-8 0.0009 U 0.0009 0.004 0.82 11995 Methyl Acetate 79-20-9 0.002 U 0.002 0.004 0.82 11995 Methyl Tertiary Butyl Ether 1634-04-4 0.0004 U 0.0004 0.004 0.82 11995 4-Methyl-2-pentanone 108-10-1 0.003 U 0.003 0.009 0.82 11995 Methylcyclohexane 108-87-2 0.0009 U 0.0009 0.004 0.82 11995 Methyl-lene Chloride 75-09-2 0.002 U 0.0002 0.004 0.82 11995 Styrene 100-42-5 0.0009 U 0.0009 0.004 0.82 11995 Tetrachloroethane 79-34-5 0.0009 U 0.0009 0.004 0.82 11995 Tetrachloroethene 127-18-4 0.0009 U 0.0009 0.004 0.82 11995 1,2,3-Trichlorobenzene 87-61-6 0.0009 U 0.0009 0.004 0.82 11995 1,2,3-Trichlorobenzene 87-61-6 0.0009 U 0.0009 0.004 0.82 11995 1,1,1-Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 77-50-6 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 75-69-4 0.000 U 0.0009 0.004 0.82 11995 Trichlorofluoromethane 75-01-4 0.0009 U 0.0009 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.0004 0.0009 0.004 1080 1080 1080 1							
11995 Ethylbenzene	11995		10061-02-6	0.0009 U	0.0009	0.004	0.82
11995 2-Hexanone 591-78-6 0.003 U 0.003 0.009 0.82	11995	Ethylbenzene	100-41-4	0.0009 U	0.0009	0.004	0.82
11995 Isopropylbenzene 98-82-8 0.0009 U 0.0009 0.004 0.82	11995	Freon 113	76-13-1	0.002 U	0.002	0.009	0.82
11995 Methyl Acetate 79-20-9 0.002 U 0.002 0.004 0.82 11995 Methyl Tertiary Butyl Ether 1634-04-4 0.0004 U 0.0004 0.0004 0.0004 0.82 11995 4-Methyl-2-pentanone 108-10-1 0.003 U 0.003 0.009 0.82 11995 Methylcyclohexane 108-87-2 0.0009 U 0.0009 0.004 0.82 11995 Methylene Chloride 75-09-2 0.002 U 0.002 0.004 0.82 11995 Styrene 100-42-5 0.0009 U 0.0009 0.004 0.82 11995 1,1,2,2-Tetrachloroethane 79-34-5 0.0009 U 0.0009 0.004 0.82 11995 Tetrachloroethene 127-18-4 0.0009 U 0.0009 0.004 0.82 11995 Toluene 108-88-3 0.0009 U 0.0009 0.004 0.82 11995 1,2,3-Trichlorobenzene 87-61-6 0.0009 U 0.0009 0.004 0.82 11995 1,2,4-Trichlorobenzene 120-82-1 0.0009 U 0.0009 0.004 0.82 11995 1,1,1-Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 1,1,2-Trichloroethane 79-00-5 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethane 75-69-4 0.0009 U 0.0009 0.004 0.82 11995 Trichlorofluoromethane 75-69-4 0.0009 U 0.0009 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82	11995	2-Hexanone	591-78-6	0.003 U	0.003	0.009	0.82
11995 Methyl Tertiary Butyl Ether 1634-04-4 0.0004 U 0.0004 0.0004 0.82 11995 4-Methyl-2-pentanone 108-10-1 0.003 U 0.003 0.009 0.82 11995 Methylcyclohexane 108-87-2 0.0009 U 0.0009 0.004 0.82 11995 Methylene Chloride 75-09-2 0.002 U 0.002 0.004 0.82 11995 Styrene 100-42-5 0.0009 U 0.0009 0.004 0.82 11995 1,1,2,2-Tetrachloroethane 79-34-5 0.0009 U 0.0009 0.004 0.82 11995 Tetrachloroethene 127-18-4 0.0009 U 0.0009 0.004 0.82 11995 Toluene 108-88-3 0.0009 U 0.0009 0.004 0.82 11995 1,2,3-Trichlorobenzene 87-61-6 0.0009 U 0.0009 0.004 0.82 11995 1,2,4-Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 1,1,1-Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 1,1,2-Trichloroethane 79-00-5 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethene 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichlorofluoromethane 75-69-4 0.002 U 0.0009 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82	11995	Isopropylbenzene	98-82-8	0.0009 U	0.0009	0.004	0.82
11995 4-Methyl-2-pentanone 108-10-1 0.003 U 0.003 0.009 0.82 11995 Methylcyclohexane 108-87-2 0.0009 U 0.0009 0.004 0.82 11995 Methylene Chloride 75-09-2 0.002 U 0.002 0.004 0.82 11995 Styrene 100-42-5 0.0009 U 0.0009 0.004 0.82 11995 1,1,2,2-Tetrachloroethane 79-34-5 0.0009 U 0.0009 0.004 0.82 11995 Tetrachloroethene 127-18-4 0.0009 U 0.0009 0.004 0.82 11995 Toluene 108-88-3 0.0009 U 0.0009 0.004 0.82 11995 1,2,3-Trichlorobenzene 87-61-6 0.0009 U 0.0009 0.004 0.82 11995 1,2,4-Trichlorobenzene 120-82-1 0.0009 U 0.0009 0.004 0.82 11995 1,1,1-Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 1,1,1-Trichloroethane 79-00-5 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethene 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethene 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichlorofluoromethane 75-69-4 0.002 U 0.0009 0.0004 0.82 11995 Trichlorofluoromethane 75-69-4 0.002 U 0.0009 0.0004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.0004 0.82	11995	Methyl Acetate	79-20-9	0.002 U	0.002	0.004	0.82
11995 4-Methyl-2-pentanone 108-10-1 0.003 0.003 0.009 0.82 11995 Methylcyclohexane 108-87-2 0.0009 U 0.0009 0.004 0.82 11995 Methylene Chloride 75-09-2 0.002 U 0.002 0.004 0.82 11995 Styrene 100-42-5 0.0009 U 0.0009 0.004 0.82 11995 1,1,2,2-Tetrachloroethane 79-34-5 0.0009 U 0.0009 0.004 0.82 11995 Tetrachloroethane 127-18-4 0.0009 U 0.0009 0.004 0.82 11995 Toluene 108-88-3 0.0009 U 0.0009 0.004 0.82 11995 1,2,3-Trichlorobenzene 87-61-6 0.0009 U 0.0009 0.004 0.82 11995 1,2,4-Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 1,1,2-Trichloroethane 79-00-5 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethene	11995	Methyl Tertiary Butyl Ether	1634-04-4	0.0004 U	0.0004	0.004	0.82
11995 Methylcyclohexane 108-87-2 0.0009 U 0.0009 0.004 0.82 11995 Methylene Chloride 75-09-2 0.002 U 0.002 0.004 0.82 11995 Styrene 100-42-5 0.0009 U 0.0009 0.004 0.82 11995 1,1,2,2-Tetrachloroethane 79-34-5 0.0009 U 0.0009 0.004 0.82 11995 Tetrachloroethene 127-18-4 0.0009 U 0.0009 0.004 0.82 11995 Toluene 108-88-3 0.0009 U 0.0009 0.004 0.82 11995 1,2,3-Trichlorobenzene 87-61-6 0.0009 U 0.0009 0.004 0.82 11995 1,2,4-Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 1,1,2-Trichloroethane 79-00-5 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethene 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichlorofluoromethane 75-69-4 0.002 U 0.002 0.004 0.82 <	11995		108-10-1	0.003 U	0.003	0.009	0.82
11995 Styrene 100-42-5 0.0009 U 0.0009 0.004 0.82 11995 1,1,2,2-Tetrachloroethane 79-34-5 0.0009 U 0.0009 0.004 0.82 11995 Tetrachloroethane 127-18-4 0.0009 U 0.0009 0.004 0.82 11995 Toluene 108-88-3 0.0009 U 0.0009 0.004 0.82 11995 1,2,3-Trichlorobenzene 87-61-6 0.0009 U 0.0009 0.004 0.82 11995 1,2,4-Trichlorobenzene 120-82-1 0.0009 U 0.0009 0.004 0.82 11995 1,1,1-Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 1,1,2-Trichloroethane 79-00-5 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethene 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichlorofluoromethane 75-69-4 0.002 U 0.002 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82 </td <td>11995</td> <td>Methylcyclohexane</td> <td>108-87-2</td> <td>0.0009 U</td> <td>0.0009</td> <td>0.004</td> <td>0.82</td>	11995	Methylcyclohexane	108-87-2	0.0009 U	0.0009	0.004	0.82
11995 1,1,2,2-Tetrachloroethane 79-34-5 0.0009 U 0.0009 0.0004 0.82 11995 Tetrachloroethane 127-18-4 0.0009 U 0.0009 0.004 0.82 11995 Toluene 108-88-3 0.0009 U 0.0009 0.004 0.82 11995 1,2,3-Trichlorobenzene 87-61-6 0.0009 U 0.0009 0.004 0.82 11995 1,2,4-Trichlorobenzene 120-82-1 0.0009 U 0.0009 0.004 0.82 11995 1,1,1-Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 1,1,2-Trichloroethane 79-00-5 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethene 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichlorofluoromethane 75-69-4 0.002 U 0.002 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82	11995	Methylene Chloride	75-09-2	0.002 U	0.002	0.004	0.82
11995 Tetrachloroethene 127-18-4 0.0009 U 0.0009 0.004 0.82 11995 Toluene 108-88-3 0.0009 U 0.0009 0.004 0.82 11995 1,2,3-Trichlorobenzene 87-61-6 0.0009 U 0.0009 0.004 0.82 11995 1,2,4-Trichlorobenzene 120-82-1 0.0009 U 0.0009 0.004 0.82 11995 1,1,1-Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 1,1,2-Trichloroethane 79-00-5 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethene 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichlorofluoromethane 75-69-4 0.002 U 0.002 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82	11995	Styrene	100-42-5	0.0009 U	0.0009	0.004	0.82
11995 Toluene 108-88-3 0.0009 U 0.0009 0.0004 0.82 11995 1,2,3-Trichlorobenzene 87-61-6 0.0009 U 0.0009 0.004 0.82 11995 1,2,4-Trichlorobenzene 120-82-1 0.0009 U 0.0009 0.004 0.82 11995 1,1,1-Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 1,1,2-Trichloroethane 79-00-5 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethene 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichlorofluoromethane 75-69-4 0.002 U 0.002 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82		_	79-34-5	0.0009 U	0.0009		0.82
11995 Toluene 108-88-3 0.0009 U 0.0009 0.0004 0.82 11995 1,2,3-Trichlorobenzene 87-61-6 0.0009 U 0.0009 0.004 0.82 11995 1,2,4-Trichlorobenzene 120-82-1 0.0009 U 0.0009 0.004 0.82 11995 1,1,1-Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 1,1,2-Trichloroethane 79-00-5 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethene 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichlorofluoromethane 75-69-4 0.002 U 0.002 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82	11995	Tetrachloroethene	127-18-4	0.0009 U	0.0009	0.004	0.82
11995 1,2,4-Trichlorobenzene 120-82-1 0.0009 U 0.0009 0.0004 0.82 11995 1,1,1-Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 1,1,2-Trichloroethane 79-00-5 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethene 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichlorofluoromethane 75-69-4 0.002 U 0.002 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82	11995	Toluene	108-88-3	0.0009 U		0.004	0.82
11995 1,2,4-Trichlorobenzene 120-82-1 0.0009 U 0.0009 0.0004 0.82 11995 1,1,1-Trichloroethane 71-55-6 0.0009 U 0.0009 0.004 0.82 11995 1,1,2-Trichloroethane 79-00-5 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethene 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichlorofluoromethane 75-69-4 0.002 U 0.002 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82		1,2,3-Trichlorobenzene					
11995 1,1,1-Trichloroethane 71-55-6 0.0009 U 0.0009 0.0004 0.82 11995 1,1,2-Trichloroethane 79-00-5 0.0009 U 0.0009 0.004 0.82 11995 Trichloroethene 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichlorofluoromethane 75-69-4 0.002 U 0.002 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82							
11995 1,1,2-Trichloroethane 79-00-5 0.0009 U 0.0009 0.0004 0.82 11995 Trichloroethene 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichlorofluoromethane 75-69-4 0.002 U 0.002 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82							
11995 Trichloroethene 79-01-6 0.0009 U 0.0009 0.004 0.82 11995 Trichlorofluoromethane 75-69-4 0.002 U 0.002 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82							
11995 Trichlorofluoromethane 75-69-4 0.002 U 0.002 0.004 0.82 11995 Vinyl Chloride 75-01-4 0.0009 U 0.0009 0.004 0.82		• •					
		Trichlorofluoromethane					
11995 m+p-Xylene 179601-23-1 0.0009 U 0.0009 0.004 0.82	11995	Vinyl Chloride	75-01-4	0.0009 U	0.0009	0.004	0.82
	11995	m+p-Xylene	179601-23-1	0.0009 U	0.0009	0.004	0.82

^{*=}This limit was used in the evaluation of the final result



Drv

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-2.5-3-170120 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799393 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/20/2017 11:18 by SJ

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Drv

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 10:47

K1607 SDG#: MMK16-07

CAT No.	Analysis Name		CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	50C	mg/kg		mg/kg	mg/kg	
11995	o-Xylene		95-47-6	0.0009	U	0.0009	0.004	0.82
00882	VOA Library Sea	rch						
	The results from the FORM 1 - VOA-TIC. on the back of this	The qualifier						
Misc.	Organics	EPA 537 Re	ev. 1.1	ng/g		ng/g	ng/g	
		modified						
14027	NETFOSAA		2991-50-6	0.30	U	0.30	0.90	1
	NEtFOSAA is the acr	onym for N-et						
14027	NMeFOSAA		2355-31-9	0.30	U	0.30	0.90	1
	NMeFOSAA is the acr							
14027	Perfluorobutanesulf		375-73-5	0.20	U	0.20	0.60	1
	Perfluorodecanoic a		335-76-2	0.20	U	0.20	0.60	1
	Perfluorododecanoic		307-55-1	0.20	U 	0.20	0.60	1
	Perfluoroheptanoic		375-85-9	0.20	U 	0.20	0.60	1
14027			355-46-4	0.20	U 	0.20	0.60	1
14027			307-24-4	0.10	U	0.10	0.40	1 1
14027			375-95-1	0.10	U	0.10	0.40	1
14027			1763-23-1	0.30	U	0.30	0.90	
14027	Perfluorooctanoic a Perfluorotetradecan		335-67-1	0.20	U	0.20	0.60	1 1
			376-06-7	0.20	U	0.20	0.60	1
14027 14027			72629-94-8	0.20	U U	0.20	0.60	1
			2058-94-8	0.20	-	0.20	0.60	1
	stated QC limits are be obtained to calcu			ent data	a points			
Wet Ch	nemistry	SW-846 906	0 modified	mg/kg		mg/kg	mg/kg	
02079	TOC		n.a.	213	J	122	367	1
	Due to the nature of	f this sample	matrix, the sa	ample cu	p was filled			
	to capacity with le sample weight has r		_	_				
Wet Ch	nemistry	SM 2540 G-	-1997	%		%	%	
00111			n.a.	6.9		0.50	0.50	1
	Moisture represents 103 - 105 degrees C as-received basis.					ng at		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-2.5-3-170120 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799393 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/20/2017 11:18 by SJ C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 10:47

K1607 SDG#: MMK16-07

	Laboratory Sample Analysis Record											
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor				
11995	SOM02.2 Volatiles	SW-846 8260C	1	A170272AA	01/27/2017	22:25	Stephen C Nolte	0.82				
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	1	201702344141	01/20/2017	11:18	Client Supplied	1				
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	2	201702344141	01/20/2017	11:18	Client Supplied	1				
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201702344141	01/20/2017	11:18	Client Supplied	1				
14027	14 PFCs	EPA 537 Rev. 1.1 modified	1	17024006	01/26/2017	15:41	Marissa C Drexinger	1				
14090	PFC Solid Prep	EPA 537 Rev. 1.1 modified	1	17024006	01/24/2017	14:10	Devon M Whooley	1				
02079	TOC	SW-846 9060 modified	1	17024667631A	01/24/2017	16:52	Drew M Gerhart	1				
00111	Moisture	SM 2540 G-1997	1	17026820004B	01/26/2017	12:53	Larry E Bevins	1				

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE NO	
VOLATILE ORGANICS ANAL TENTATIVELY IDENTIFI		,		_,
	EB COM COMES	į	K1607	į
Lab Name: Lancaster Laboratories	Contract:	!		!
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	
Matrix: (soil/water) SOIL	Lab Sample ID: 8799393			
Sample wt/vol: 6.12 (g/mL) g	Lab File ID: HP09685.i	/17 ja	an27b.b/aj	27s25.d
Level: (low/med) LOW	Date Received: 01/21/1	7		
% Moisture: not dec. 6.9	Date Analyzed: 01/27/1	7		
Column: (pack/cap) CAP	Dilution Factor: 1.0			
	CONCENTRATION UNITS:			
Number TICs found: 1	(mg/L or mg/Kg) mg/Kg	3		

CAS NUMBER			! EST. CONC.	
	!Cyclotetrasiloxane, octameth	•	•	•
	! !Total VOC TICs	: ! !	: ! 0.006	: ! J !
5	!	!	!	!
	_!	!	!	!
	_!	!	!	!
	_!	!	!	!
	_!	!	!	
	_!	!		-
	_!	• ———	<u> </u>	-
	_!		·	
4		i	i	;
	·	!	!	!
		!	!	!
.7	_!	!	! <u></u>	!
.8	_!	!	!	!
	_!	!	!	!
	_!	!	!	!
	_!	!	!	!
22		!	!	!
	- 	!	<u> </u>	•
		·	<u> </u>	<u>;</u>
	_ !	i	:	i
		·	·	;
		i ———	I	i
29.		!	!	!
30	!	!	!	!
		!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-6-8-170120 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799394 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/20/2017 11:29 by SJ

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1608 SDG#: MMK16-08

				Dry	Dry	
CAT	Amalanda Wana	CAS Number	Dry	Method Detection Limit*	Limit of Quantitation	Dilution
No.	Analysis Name	CAS Number	Result	Detection Limit.	Quantitation	Factor
GC/MS	Volatiles SW-846	8260C	mg/kg	mg/kg	mg/kg	
11995	Acetone	67-64-1	0.024	0.006	0.018	0.85
11995	Benzene	71-43-2	0.0004 U	0.0004	0.004	0.85
11995	Bromochloromethane	74-97-5	0.0009 U	0.0009	0.004	0.85
11995	Bromodichloromethane	75-27-4	0.0009 U	0.0009	0.004	0.85
11995	Bromoform	75-25-2	0.0009 U	0.0009	0.004	0.85
11995	Bromomethane	74-83-9	0.002 U	0.002	0.004	0.85
11995	2-Butanone	78-93-3	0.004 U	0.004	0.009	0.85
11995	Carbon Disulfide	75-15-0	0.0009 U	0.0009	0.004	0.85
11995	Carbon Tetrachloride	56-23-5	0.0009 U	0.0009	0.004	0.85
11995	Chlorobenzene	108-90-7	0.0009 U	0.0009	0.004	0.85
11995	Chloroethane	75-00-3	0.002 U	0.002	0.004	0.85
11995	Chloroform	67-66-3	0.0009 U	0.0009	0.004	0.85
11995	Chloromethane	74-87-3	0.002 U	0.002	0.004	0.85
11995	Cyclohexane	110-82-7	0.0009 U	0.0009	0.004	0.85
11995	1,2-Dibromo-3-chloropropane	96-12-8	0.002 U	0.002	0.004	0.85
11995	Dibromochloromethane	124-48-1	0.0009 U	0.0009	0.004	0.85
11995	1,2-Dibromoethane	106-93-4	0.0009 U	0.0009	0.004	0.85
11995	1,2-Dichlorobenzene	95-50-1	0.0009 U	0.0009	0.004	0.85
11995	1,3-Dichlorobenzene	541-73-1	0.0009 U	0.0009	0.004	0.85
11995	1,4-Dichlorobenzene	106-46-7	0.0009 U	0.0009	0.004	0.85
11995	Dichlorodifluoromethane	75-71-8	0.002 U	0.002	0.004	0.85
11995	1,1-Dichloroethane	75-34-3	0.0009 U	0.0009	0.004	0.85
11995	1,2-Dichloroethane	107-06-2	0.0009 U	0.0009	0.004	0.85
11995	1,1-Dichloroethene	75-35-4	0.0009 U	0.0009	0.004	0.85
11995	cis-1,2-Dichloroethene	156-59-2	0.0009 U	0.0009	0.004	0.85
11995	trans-1,2-Dichloroethene	156-60-5	0.0009 U	0.0009	0.004	0.85
11995	1,2-Dichloropropane	78-87-5	0.0009 U	0.0009	0.004	0.85
11995	cis-1,3-Dichloropropene	10061-01-5	0.0009 U	0.0009	0.004	0.85
11995	trans-1,3-Dichloropropene	10061-02-6	0.0009 U	0.0009	0.004	0.85
11995	Ethylbenzene	100-41-4	0.0009 U	0.0009	0.004	0.85
11995	Freon 113	76-13-1	0.002 U	0.002	0.009	0.85
11995	2-Hexanone	591-78-6	0.003 U	0.003	0.009	0.85
11995	Isopropylbenzene	98-82-8	0.0009 U	0.0009	0.004	0.85
11995	Methyl Acetate	79-20-9	0.060	0.002	0.004	0.85
11995	Methyl Tertiary Butyl Ether	1634-04-4	0.0004 U	0.0004	0.004	0.85
11995	4-Methyl-2-pentanone	108-10-1	0.003 U	0.003	0.009	0.85
11995	Methylcyclohexane	108-87-2	0.0009 U	0.0009	0.004	0.85
11995	Methylene Chloride	75-09-2	0.002 U	0.002	0.004	0.85
11995	Styrene	100-42-5	0.0002 U	0.0009	0.004	0.85
11995	1,1,2,2-Tetrachloroethane	79-34-5	0.0009 U	0.0009	0.004	0.85
11995	Tetrachloroethene	127-18-4	0.0009 U	0.0009	0.004	0.85
11995	Toluene	108-88-3	0.0009 U	0.0009	0.004	0.85
11995	1,2,3-Trichlorobenzene	87-61-6	0.0009 U	0.0009	0.004	0.85
11995	1,2,4-Trichlorobenzene	120-82-1	0.0009 U	0.0009	0.004	0.85
11995	1,1,1-Trichloroethane	71-55-6	0.0009 U	0.0009	0.004	0.85
11995	1,1,2-Trichloroethane	79-00-5	0.0009 U	0.0009	0.004	0.85
11995	Trichloroethene	79-00-5	0.0009 U	0.0009	0.004	0.85
11995	Trichlorofluoromethane	75-69-4	0.0009 U	0.0009	0.004	0.85
11995	Vinyl Chloride	75-09-4	0.002 U	0.002	0.004	0.85
11995	-	179601-23-1		0.0009	0.004	0.85
11995	m+p-Xylene	1/9001-23-1	0.001 J	0.0009	0.004	0.05

^{*=}This limit was used in the evaluation of the final result



Dry

Detection Limit* Quantitation

Limit of

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

CAS Number

Sample Description: SG2-AP09-6-8-170120 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799394 LL Group # 1757183 Account # 37191

Dilution

Factor

Project Name: SGPP - Merrimack

Collected: 01/20/2017 11:29 by SJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Dry

Method

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 10:47

K1608 SDG#: MMK16-08

Analysis Name

CAT

No.

11995 A Me the cont the	Volatiles o-Xylene thod Detection Limit instrument for sample inuing calibration ve 20%D criteria). The reporting limit.	es with non-de erification st	95-47-6 rd is analyzed etect analytes candard exhibit	associa ing low	irm sensitivity ted with a response (outs	side	mg/kg 0.004	0.85
00882	VOA Library Sea The results from th FORM 1 - VOA-TIC. on the back of this	e volatile lil The qualifier:	-					
Misc.	Organics	EPA 537 Remodified	ev. 1.1	ng/g		ng/g	ng/g	
14027	NETFOSAA		2991-50-6	0.30	U	0.30	0.91	1
	NEtFOSAA is the acr	onym for N-et	hyl perfluorood	ctanesu:	lfonamidoacetic	Acid.		
14027	NMeFOSAA		2355-31-9	0.30	U	0.30	0.91	1
	NMeFOSAA is the acr	onym for N-me	thyl perfluorod	octanesi	ılfonamidoaceti	c Acid.		
14027	Perfluorobutanesulf		375-73-5	0.20	U	0.20	0.61	1
14027			335-76-2	0.20	U	0.20	0.61	1
14027			307-55-1	0.20	U	0.20	0.61	1
14027	-		375-85-9	0.20	U	0.20	0.61	1
14027			355-46-4	0.20	U	0.20	0.61	1
14027			307-24-4	0.10	U	0.10	0.41	1
14027			375-95-1	0.10	U	0.10	0.41	1
14027			1763-23-1	0.30	Ū	0.30	0.91	1
14027			335-67-1	0.20	U	0.20	0.61	1
14027			376-06-7	0.20	U	0.20	0.61	1
14027			72629-94-8	0.20	U	0.20	0.61	1
14027			2058-94-8	0.20	U .	0.20	0.61	1
	stated QC limits are be obtained to calcul			ent dat	a points			
Wet Ch	nemistry	SW-846 906	0 modified	mg/kg		mg/kg	mg/kg	
02079	TOC		n.a.	162	U	162	486	1
	Due to the nature o to capacity with le sample weight has r	ss than 1000 i	mg of sample be	eing use	ed. The lowered			
Wet Cl	nemistry	SM 2540 G-	-1997	%		%	%	
00111	Moisture		n.a.	2.5		0.50	0.50	1
	Moisture represents 103 - 105 degrees C as-received basis.					ng at		

Dry

Result

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-6-8-170120 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799394 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/20/2017 11:29 by SJ C. T. Male Associates

50 Century Hill Drive Submitted: 01/21/2017 09:20

Reported: 02/07/2017 10:47

Latham NY 12110

SDG#: MMK16-08 K1608

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

		Laborat	cory Sa	umple Analysı	s Record			
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11995	SOM02.2 Volatiles	SW-846 8260C	1	A170301AA	01/30/2017	11:21	Linda C Pape	0.85
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	1	201702344141	01/20/2017	11:29	Client Supplied	1
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	2	201702344141	01/20/2017	11:29	Client Supplied	1
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201702344141	01/20/2017	11:29	Client Supplied	1
14027	14 PFCs	EPA 537 Rev. 1.1 modified	1	17024006	01/26/2017	16:01	Marissa C Drexinger	1
14090	PFC Solid Prep	EPA 537 Rev. 1.1 modified	1	17024006	01/24/2017	14:10	Devon M Whooley	1
02079	TOC	SW-846 9060 modified	1	17024667631A	01/24/2017	12:56	Drew M Gerhart	1
00111	Moisture	SM 2540 G-1997	1	17026820004B	01/26/2017	12:53	Larry E Bevins	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E VOLATILE ORGANICS ANAL	עכוכ האדא פטדדי	EPA	SAMPLE	NO.	
TENTATIVELY IDENTIFIE		!!!	K1608	! !	
Lab Name: Lancaster Laboratories	Contract:	!		į	
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:		
Matrix: (soil/water) SOIL	Lab Sample ID: 8799394				
Sample wt/vol: 5.85 (g/mL) g	Lab File ID: HP09685.i,	/17 ja	an30a.b/	aj30s03.d	£
Level: (low/med) LOW	Date Received: 01/21/17	7			
Moisture: not dec. 2.5	Date Analyzed: 01/30/17	7			
Column: (pack/cap) CAP	Dilution Factor: 1.0				
	CONCENTRATION UNITS:				
Number TICs found: 1	(mg/L or mg/Kg) mg/Kg	3			

CAS NUMBER	! COMPOUND NAME	RT!	EST. CONC.	
1. 556-67-2	!Cyclotetrasiloxane, octameth			•
2. 3. VOCTIC 4	! !Total VOC TICs !	! !	0.006	! ! J !
	_!	!!		!
		!!		!
	_!	!!		!
	<u>!</u>			!
	<u>-</u> -!			!
	!	!		!
	!			:
	_ <u>!</u>	·		!
	_ <u>;</u>	:		
	_ <u> </u>			
	i			
	- <u>i</u>			
	i	i ——— i		!
	!			!
	!			!
1	!	!!		!
2	!	!!		!
3	_!	!!		!
	_!	!!		!
	!	l!		!
	_!	!!		!
	<u> </u>			
		!!		!
0	_	!!		!
ge 1 of 1	_!	!!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-11-12-170120 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799395 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/20/2017 12:24 by SJ

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1609 SDG#: MMK16-09

GC/MS Volatiles SW-846 8260C	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit	As Received Limit of * Quantitation	Dilution Factor
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997 Bromochloromethane	11997	Acetone	67-64-1	6	U	6	20	1
11997 Bromofethane	11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997 Bromochame					Ū	1		
11997 Promomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997 Promomethane	11997	Bromoform	75-25-2	0.5	IJ	0.5	4	1
11997 Carbon Disulfide		Bromomethane			Ū			
11997 Carbon Disulfide	11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997 Chloroethane	11997	Carbon Disulfide		1	Ū	1	5	
11997 Chlorosthane	11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997 Chlorosthane	11997	Chlorobenzene		0.5	Ū	0.5		1
11997 Chloroform	11997	Chloroethane		0.5	IJ	0.5	1	1
11997 Cyclohexane								
11997 Cyclohexane	11997	Chloromethane	74-87-3	0.5	Ū	0.5	1	1
11997 1,2-Dithromo-3-chloropropane								
11997 Dibromochloromethane					Ū			
11997 1,2-Dichlorobenzene	11997			0.5	IJ		1	1
11997 1,2-Dichlorobenzene					Ū			
11997 1,3-Dichlorobenzene		·						
11997 1,4-Dichlorobenzene		•			Ū			
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1								
11997 1,1-Dichloroethane		,			-			
11997 1,2-Dichloroethane								
11997 1,1-Dichloroethene		•			-			
11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 1 1 1 1 1 1 1		·						
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 1 1 1 1 1 1 1		•						
11997								
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 1 1 1 1 1 1 1		•			-			
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1								
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1								
11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methyl-2-pentanone 108-87-2 1 U 1 5 1 11997 Methyl-2-pentanone 108-87-2 1 U 1 5 1 11997 Methyl-2-pentanone 108-87-2 1 U 1 5 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,1-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethane 79-01-6 0.5 U 0.5 1 1 11997 Trichloroethane 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 0.5 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 0.5 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 U 0.5 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 U 0.5 U 0.5 U 0.5 U 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 U 0.5 U 0.5 U 0.5 U 0.5 U 0.5 U U 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 U 0.5 U 0.5 U U U U U U U U U					Ü			
11997 2-Hexanone 591-78-6 3 U 3 10 1 1 1997 Isopropylbenzene 98-82-8 1 U 1 5 1 1 1 1 1 1 1 1		-						
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 1 1 1 1 1 1 1					-			
11997 Methyl Acetate 79-20-9 1 U 1 5 1 1 1 1 1 1 1 1					-			
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 Trichloroethane 79-00-5 0.5 U 0.5 1 1				_	-			
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1		-						
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichloroethane 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1					-	* * *		
11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 <tr< td=""><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td></tr<>					-			
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethane 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1					-			
11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1 11997 Tetrachloroethane 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1		-						
11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1 1 11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1		1		_	-			
11997 Toluene 108-88-3 0.5 U 0.5 1 1 11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1					-			
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1 11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1					-			
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1								
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1 11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethane 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1				_	-			=
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1 11997 Trichloroethane 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1		• •						
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1 11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1								
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		• •						
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1					-			
	11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



As Received

5.0

As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-11-12-170120 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799395 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/20/2017 12:24 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1609 SDG#: MMK16-09

12148 Carbonate Alkalinity

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea The results from th		brary search a	ıre list	ed on the at	tached		
	FORM 1 - VOA-TIC. on the back of this		s appearing ir	the "Q	" column are	defined		
Misc.	Organics	EPA 537 R	ev 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic a	.cid	335-67-1	25		0.5	2	1
10954	Perfluorononanoic a	.cid	375-95-1	2	J	0.6	2	1
10954	Perfluorodecanoic a	.cid	335-76-2	2		0.5	2	1
10954	Perfluoroundecanoic	acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic	acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoi	c acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecan	oic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic a	.cid	307-24-4	7		0.5	2	1
10954	Perfluoroheptanoic	acid	375-85-9	5		0.5	2	1
10954	Perfluorobutanesulf	onate	375-73-5	6		0.7	2	1
10954	Perfluorohexanesulf	onate	355-46-4	1	J	1	3	1
10954	Perfluoro-octanesul	fonate	1763-23-1	6		2	6	1
10954	Perfluorobutanoic A	cid	375-22-4	5	J	3	10	1
10954	Perfluoropentanoic	Acid	2706-90-3	5		0.5	2	1
10954			2991-50-6	3		1	3	1
	NEtFOSAA is the acr	onym for N-et	hyl perfluorod	ctanesu	lfonamidoace	tic Acid.		
10954			2355-31-9	1	U	1	3	1
	NMeFOSAA is the acr	onvm for N-me		octanes	ulfonamidoac	etic Acid.		
The	stated QC limits are	-						
	be obtained to calcu							
Metals	5	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	16.9		0.0382	0.400	1
01757	Magnesium		7439-95-4	5.80		0.0190	0.200	1
01762	Potassium		7440-09-7	6.47		0.160	1.00	1
01767	Sodium		7440-23-5	52.1		0.173	2.00	1
Wet Cl	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	80.5		10.0	20.0	50
00228	Sulfate		14808-79-8	13.3		1.5	5.0	5
		EPA 353.2		mg/1		mg/l	mg/l	
07882	Total Nitrite/Nitra	te Nitrogen	n.a.	2.4		0.040	0.10	1
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	рн 4.5	n.a.	20.9		1.7	5.0	1
12149	Bicarbonate Alkalin	-	n.a.	20.9		1.7	5.0	1
10140	a l			1 7		- • •	E 0	_

^{*=}This limit was used in the evaluation of the final result

1.7

n.a.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-11-12-170120 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799395 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/20/2017 12:24 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1609 SDG#: MMK16-09

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170271AA	01/27/2017	10:33	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170271AA	01/27/2017	10:33	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17031006	02/02/2017	19:00	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17031006	01/31/2017	14:30	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017	15:04	Katlin N Cataldi	1
01757	Magnesium	SW-846 6010C	1	170260635001	01/27/2017	15:04	Katlin N Cataldi	1
01762	Potassium	SW-846 6010C	1	170260635001	01/27/2017	15:04	Katlin N Cataldi	1
01767	Sodium	SW-846 6010C	1	170260635001	01/27/2017	15:04	Katlin N Cataldi	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170260635001	01/26/2017	22:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	17024120601B	01/24/2017	20:51	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	17024120601B	01/24/2017	20:37	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17029118102A	01/29/2017	17:46	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17025008104A	01/26/2017	05:26	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	05:26	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	05:26	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.
VOLATILE ORGANICS AND	ALYSIS DATA SHEET	
TENTATIVELY IDENTIA	FIED COMPOUNDS	!!!
		! K1609 !
Lab Name: Lancaster Laboratories	Contract:	!
Lab Code: LANCAS Case No.:	SAS No.:	SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID: 8799	9395
Sample wt/vol: 5.0 $(\alpha/mT.)mT$.	Tah File ID: HD093	55 i/17ian27a h/wi27g0

Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17jan27a.b/yj27s09.d Level: (low/med) LOW Date Received: 01/21/17 % Moisture: not dec. Date Analyzed: 01/27/17 Date Analyzed: 01/27/17 Dilution Factor: 1.0 COMMENTED TOOL UNITS:

Number TICs found: 0 (ug/L or ug/Kg) ug/L

! ! CAS NUMBER	! ! COMPOUND NAME		EST. CONC.	
•	==!===================================	! =====!====: !		!===== ! U
	_!	!!		!
! 3	!	!!		!
! 4	!	!!		!
	!	!!		!
! 6	!	!!		!
! 7	!	!!		!
! 8	!	!!		!
. 9		!!		!
	!	!!		!
	!	!!		!
!12	!	!!		!
!13		!!		!
!14		!!		!
!15		!!		!
	!	!!		!
	!	!!		!
!18	!	!!		!
	!	!!		!
	!	!!		!
!21		!!		!
	_!	!!		!
	!	!!		!
! 24		!!		!
!25		!!		!
!26		!!		!
! 27		!!		!
! 28	!	!!		!
! 29		!!		!
!30	!	!!		!
!	!	!!		!

page 1 of 1 FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-11-12-170120 Filtered Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799396 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/20/2017 12:24 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1610 SDG#: MMK16-10

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	Dissolved	SW-846	6010C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	12.3	0.0382	0.400	1
01757	Magnesium		7439-95-4	1.87	0.0190	0.200	1
01762	Potassium		7440-09-7	2.61	0.160	1.00	1
01767	Sodium		7440-23-5	49.4	0.173	2.00	1

Sample Comments

This sample was lab filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017 15:07	Katlin N Cataldi	1
01757	Magnesium	SW-846 6010C	1	170260635001	01/27/2017 15:07	Katlin N Cataldi	1
01762	Potassium	SW-846 6010C	1	170260635001	01/27/2017 15:07	Katlin N Cataldi	1
01767	Sodium	SW-846 6010C	1	170260635001	01/27/2017 15:07	Katlin N Cataldi	1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	170260635001	01/26/2017 22:00	Annamaria Kuhns	1
	U4						



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

Sample Description: SG2-FB03-170120 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8799397 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/20/2017 14:20 by SJ C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 10:47

K1611 SDG#: MMK16-11FB

CAT No.	Analysis Name	CAS Number	Result	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 F	Rev 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-e	thyl perfluoroc	ctanesu:	lfonamidoaceti	c Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-m	ethyl perfluoro	octanes	ulfonamidoacet	ic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
	16 PFCs PFAA Water Prep	EPA 537 Rev 1.1 EPA 537 Rev 1.1	1 2	17031006 17031006	02/02/2017 19 01/31/2017 14	Jason W Knight Devon M Whooley	1 1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

Sample Description: PFC Trip Blank Water

SGPP - Merrimack

LL Sample # WW 8799398 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/19/2017

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 10:47

K1612 SDG#: MMK16-12TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 H	Rev 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-6	ethyl perfluoroc	ctanesu	lfonamidoace	tic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-m	methyl perfluoro	octanes	ulfonamidoac	etic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	me	Analyst	Dilution Factor
	16 PFCs PFAA Water Prep	EPA 537 Rev 1.1 EPA 537 Rev 1.1	1 2	17031006 17031006	02/02/2017 01/31/2017		Jason W Knight Devon M Whooley	1 1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP06-6-8-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799399 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 15:48 by SJ

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/21/2017 09:20

Latham NY 12110

Reported: 02/07/2017 10:47

K1613 SDG#: MMK16-13BKG

				Dry Method	Dry Limit of	
CAT	Analysis Name	CAS Number	Dry	Detection Limit*	Quantitation	Dilution
No.	Analysis Name	CAS Number	Result	Deceetion Himre	gaanereacron	Factor
GC/MS	Volatiles SW-846	8260C	mg/kg	mg/kg	mg/kg	
11995	Acetone	67-64-1	0.008 U	0.008	0.022	1
11995	Benzene	71-43-2	0.0005 U	0.0005	0.005	1
11995	Bromochloromethane	74-97-5	0.001 U	0.001	0.005	1
11995	Bromodichloromethane	75-27-4	0.001 U	0.001	0.005	1
11995	Bromoform	75-25-2	0.001 U	0.001	0.005	1
11995	Bromomethane	74-83-9	0.002 U	0.002	0.005	1
11995	2-Butanone	78-93-3	0.004 U	0.004	0.011	1
11995	Carbon Disulfide	75-15-0	0.001 U	0.001	0.005	1
11995	Carbon Tetrachloride	56-23-5	0.001 U	0.001	0.005	1
11995	Chlorobenzene	108-90-7	0.001 U	0.001	0.005	1
11995	Chloroethane	75-00-3	0.002 U	0.002	0.005	1
11995	Chloroform	67-66-3	0.001 U	0.001	0.005	1
11995	Chloromethane	74-87-3	0.002 U	0.002	0.005	1
11995	Cyclohexane	110-82-7	0.001 U	0.001	0.005	1
11995	1,2-Dibromo-3-chloropropane	96-12-8	0.002 U	0.002	0.005	1
11995	Dibromochloromethane	124-48-1	0.001 U	0.001	0.005	1
11995	1,2-Dibromoethane	106-93-4	0.001 U	0.001	0.005	1
11995	1,2-Dichlorobenzene	95-50-1	0.001 U	0.001	0.005	1
11995	1,3-Dichlorobenzene	541-73-1	0.001 U	0.001	0.005	1
11995	1,4-Dichlorobenzene	106-46-7	0.001 U	0.001	0.005	1
11995	Dichlorodifluoromethane	75-71-8	0.002 U	0.002	0.005	1
11995	1,1-Dichloroethane	75-34-3	0.001 U	0.001	0.005	1
11995	1,2-Dichloroethane	107-06-2	0.001 U	0.001	0.005	1
11995	1,1-Dichloroethene	75-35-4	0.001 U	0.001	0.005	1
11995	cis-1,2-Dichloroethene	156-59-2	0.001 U	0.001	0.005	1
11995	trans-1,2-Dichloroethene	156-60-5	0.001 U	0.001	0.005	1
11995	1,2-Dichloropropane	78-87-5	0.001 U	0.001	0.005	1
11995	cis-1,3-Dichloropropene	10061-01-5	0.001 U	0.001	0.005	1
11995	trans-1,3-Dichloropropene	10061-02-6	0.001 U	0.001	0.005	1
11995	Ethylbenzene	100-41-4	0.001 U	0.001	0.005	1
11995	Freon 113	76-13-1	0.002 U	0.002	0.011	1
11995	2-Hexanone	591-78-6	0.003 U	0.003	0.011	1
11995	Isopropylbenzene	98-82-8	0.001 U	0.001	0.005	1
11995	Methyl Acetate	79-20-9	0.002 U	0.002	0.005	1
11995	Methyl Tertiary Butyl Ether	1634-04-4	0.0005 U	0.0005	0.005	1
11995	4-Methyl-2-pentanone	108-10-1	0.003 U	0.003	0.011	1
11995	Methylcyclohexane	108-87-2	0.001 U	0.001	0.005	1
11995	Methylene Chloride	75-09-2	0.002 U	0.002	0.005	1
11995	Styrene	100-42-5	0.001 U	0.001	0.005	1
11995	1,1,2,2-Tetrachloroethane	79-34-5	0.001 U	0.001	0.005	1
11995	Tetrachloroethene	127-18-4	0.001 U	0.001	0.005	1
11995	Toluene	108-88-3	0.001 U	0.001	0.005	1
11995	1,2,3-Trichlorobenzene	87-61-6	0.001 U	0.001	0.005	1
11995	1,2,4-Trichlorobenzene	120-82-1	0.001 U	0.001	0.005	1
11995	1,1,1-Trichloroethane	71-55-6	0.001 U	0.001	0.005	1
11995	1,1,2-Trichloroethane	79-00-5	0.001 U	0.001	0.005	1
11995	Trichloroethene	79-01-6	0.001 U	0.001	0.005	1
11995	Trichlorofluoromethane	75-69-4	0.002 U	0.002	0.005	1
11995	Vinyl Chloride	75-01-4	0.001 U	0.001	0.005	1
11995	m+p-Xylene	179601-23-1	0.001 U	0.001	0.005	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP06-6-8-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799399 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 15:48 by SJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 10:47

K1613 SDG#: MMK16-13BKG

CAT No.	Analysis Name		CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	50C	mg/kg		mg/kg	mg/kg	
11995	o-Xylene		95-47-6	0.001	IJ	0.001	0.005	1
00882	VOA Library Se The results from t FORM 1 - VOA-TIC.	he volatile li						
	on the back of thi		s appearing in	ciic Q	cordinar are ac	Lilled		
Misc.	Organics	EPA 537 Remodified	ev. 1.1	ng/g		ng/g	ng/g	
14027	NETFOSAA	modified	2991-50-6	0.31	IJ	0.31	0.92	1
14027	NETFOSAA is the ac	ronvm for N-et			~		0.72	_
14027	NMeFOSAA	. ,	2355-31-9		U	0.31	0.92	1
	NMeFOSAA is the ac	ronym for N-me	thyl perfluoro	ctanesul	fonamidoaceti	c Acid.		
14027	Perfluorobutanesul	-	375-73-5		U	0.20	0.61	1
14027	Perfluorodecanoic	acid	335-76-2	0.20	IJ	0.20	0.61	1
14027	Perfluorododecanoi	c acid	307-55-1	0.20	IJ	0.20	0.61	1
14027	Perfluoroheptanoio	acid	375-85-9	0.20	IJ	0.20	0.61	1
14027	Perfluorohexanesul	fonate	355-46-4	0.20	IJ	0.20	0.61	1
14027	Perfluorohexanoic	acid	307-24-4	0.10	IJ	0.10	0.41	1
14027	Perfluorononanoic	acid	375-95-1	0.10	U	0.10	0.41	1
14027	Perfluoro-octanesu	lfonate	1763-23-1	0.31	U	0.31	0.92	1
14027	Perfluorooctanoic	acid	335-67-1	0.20	U	0.20	0.61	1
14027	Perfluorotetradeca	noic acid	376-06-7	0.20	IJ	0.20	0.61	1
14027	Perfluorotridecano	ic acid	72629-94-8	0.20	IJ	0.20	0.61	1
14027	Perfluoroundecanoi	c acid	2058-94-8	0.20	IJ	0.20	0.61	1
	stated QC limits ar oe obtained to calc		•	ent data	points			
Wet Ch	nemistry	SW-846 90	0 modified	mg/kg		mg/kg	mg/kg	
02079	TOC		n.a.	242	U	242	727	1
	Due to the nature							
	to capacity with l sample weight has				. The lowered			
Wet Ch	nemistry	SM 2540 G	-1997	%		%	%	
00111	Moisture		n.a.	8.0		0.50	0.50	1
	Moisture represent 103 - 105 degrees as-received basis.	Celsius. The m				ng at		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP06-6-8-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799399 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 15:48 by SJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 10:47

K1613 SDG#: MMK16-13BKG

	Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor			
11995	SOM02.2 Volatiles	SW-846 8260C	1	A170272AA	01/27/2017	23:11	Stephen C Nolte	1			
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	1	201702344141	01/18/2017	15:48	Client Supplied	1			
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	2	201702344141	01/18/2017	15:48	Client Supplied	1			
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201702344141	01/18/2017	15:48	Client Supplied	1			
14027	14 PFCs	EPA 537 Rev. 1.1 modified	1	17024006	01/30/2017	16:54	Marissa C Drexinger	1			
14090	PFC Solid Prep	EPA 537 Rev. 1.1 modified	1	17024006	01/24/2017	14:10	Devon M Whooley	1			
02079	TOC	SW-846 9060 modified	1	17024667631A	01/24/2017	13:03	Drew M Gerhart	1			
00111	Moisture	SM 2540 G-1997	1	17026820004B	01/26/2017	12:53	Larry E Bevins	1			

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA SAMPLE NO.			
VOLATILE ORGANICS AN TENTATIVELY IDENTI	!	<u>!</u>		
		! K1613	!	
ab Name: Lancaster Laboratories	Contract:	!	!	
ab Code: LANCAS Case No.:	SAS No.:	SDG No.:		
Matrix: (soil/water) SOIL	Lab Sample ID: 8799	9399		
Sample wt/vol: 4.99 (g/mL) g	Lab File ID: HP096	85.i/17jan27b.b/a	j27s27.d	
evel: (low/med) LOW	Date Received: 01/2	21/17		
Moisture: not dec. 8	Date Analyzed: 01/2	27/17		
clumn: (pack/cap) CAP	Dilution Factor: 1	.0		
12	CONCENTRATION UNI	ITS:		
Number TICs found: 1	(ma/L or ma/Ka) r	ma/Ka		

CAS NUMBER	! COMPOUND NAME	! RT !	EST. CONC.	
l.	==!========= !Unknown	! 12.00 !		•
2.	!	!!!	0.000	!
	!Total VOC TICs !	!!!	0.008	! J
·		ii		i
5.		ii		i
7.	<u>;</u>	ii		i — —
		ii		<u> </u>
9	!	!!		!
	!	!!		!
	!	!!		!
	!	!!		!
	!	<u>-</u> !!		!
	!			
	!	::		:
	<u>;</u>	ii		i
	<u>-</u>	ii		i
	<u> </u>	i		!
				!
L	!	!!		!
	!	!!		!
	_!	!!		!
	!	!!		!
	!	<u>-</u> !!		!
	!			!
		<u>-</u> ;		:
	!	:		i
·		i		i — —
··	·	ii		i — —

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP06-6-8-170118 MS Grab Soil

SGPP - Merrimack

LL Sample # SW 8799400 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 15:48 by SJ

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 10:47

K1613 SDG#: MMK16-13MS

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 820	60C	mg/kg	mg/kg	mg/kg	
11995	Acetone	67-64-1	0.14	0.008	0.022	1
11995	Benzene	71-43-2	0.022	0.0005	0.005	1
11995	Bromochloromethane	74-97-5	0.023	0.001	0.005	1
11995	Bromodichloromethane	75-27-4	0.022	0.001	0.005	1
11995	Bromoform	75-25-2	0.024	0.001	0.005	1
11995	Bromomethane	74-83-9	0.020	0.002	0.005	1
11995	2-Butanone	78-93-3	0.15	0.004	0.011	1
11995	Carbon Disulfide	75-15-0	0.021	0.001	0.005	1
11995	Carbon Tetrachloride	56-23-5	0.024	0.001	0.005	1
11995	Chlorobenzene	108-90-7	0.022	0.001	0.005	1
11995	Chloroethane	75-00-3	0.018	0.002	0.005	1
11995	Chloroform	67-66-3	0.023	0.001	0.005	1
11995	Chloromethane	74-87-3	0.020	0.002	0.005	1
11995	Cyclohexane	110-82-7	0.024	0.001	0.005	1
11995	1,2-Dibromo-3-chloropropane	96-12-8	0.027	0.002	0.005	1
11995	Dibromochloromethane	124-48-1	0.024	0.001	0.005	1
11995	1,2-Dibromoethane	106-93-4	0.026	0.001	0.005	1
11995	1,2-Dichlorobenzene	95-50-1	0.021	0.001	0.005	1
11995	1,3-Dichlorobenzene	541-73-1	0.021	0.001	0.005	1
11995	1,4-Dichlorobenzene	106-46-7	0.021	0.001	0.005	1
11995	Dichlorodifluoromethane	75-71-8	0.023	0.002	0.005	1
11995	1,1-Dichloroethane	75-34-3	0.022	0.001	0.005	1
11995	1,2-Dichloroethane	107-06-2	0.024	0.001	0.005	1
11995	1,1-Dichloroethene	75-35-4	0.024	0.001	0.005	1
11995	cis-1,2-Dichloroethene	156-59-2	0.024	0.001	0.005	1
11995	trans-1,2-Dichloroethene	156-60-5	0.023	0.001	0.005	1
11995	1,2-Dichloropropane	78-87-5	0.023	0.001	0.005	1
11995	cis-1,3-Dichloropropene	10061-01-5	0.023	0.001	0.005	1
11995	trans-1,3-Dichloropropene	10061-01-5	0.023	0.001	0.005	1
11995	Ethylbenzene	10001-02-0	0.023	0.001	0.005	1
11995	Freon 113	76-13-1	0.024	0.001	0.003	1
11995	2-Hexanone	591-78-6	0.024	0.002	0.011	1
11995	Isopropylbenzene	98-82-8	0.024	0.003	0.005	1
11995	Methyl Acetate	79-20-9	0.024	0.001	0.005	1
11995	Methyl Tertiary Butyl Ether	1634-04-4	0.024	0.002	0.005	1
11995	4-Methyl-2-pentanone	1034-04-4	0.14	0.0003	0.003	1
11995	Methylcyclohexane	108-10-1	0.025	0.003	0.005	1
11995	Methylene Chloride	75-09-2	0.023	0.001	0.005	1
11995	Styrene	100-42-5	0.022	0.002	0.005	1
11995	1,1,2,2-Tetrachloroethane	79-34-5	0.026	0.001	0.005	1
11995	Tetrachloroethene	127-18-4	0.020	0.001	0.005	1
11995	Toluene	108-88-3	0.022	0.001	0.005	1
11995		87-61-6	0.019	0.001	0.005	1
11995	1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene	120-82-1	0.019	0.001	0.005	1
11995						1
11995	1,1,1-Trichloroethane 1,1,2-Trichloroethane	71-55-6	0.021	0.001	0.005	1
		79-00-5	0.023	0.001	0.005	
11995	Trichloroethene	79-01-6	0.023	0.001	0.005	1 1
11995	Trichlorofluoromethane	75-69-4	0.025	0.002	0.005	1
11995	Vinyl Chloride	75-01-4	0.021	0.001	0.005	
11995	m+p-Xylene	179601-23-1	0.045	0.001	0.005	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP06-6-8-170118 MS Grab Soil

SGPP - Merrimack

LL Sample # SW 8799400 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 15:48 by SJ

C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 10:47

K1613 SDG#: MMK16-13MS

CAT No.	Analysis Name		CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8	260C	mg/kg	mg/kg	mg/kg	
11995	o-Xylene		95-47-6	0.022	0.001	0.005	1
Misc.	Organics	EPA 537	Rev. 1.1	ng/g	ng/g	ng/g	
		modified					
14027	NEtFOSAA		2991-50-6	29	0.32	0.95	1
	NEtFOSAA is the acr	onym for N-	ethyl perfluorood	ctanesulfonamidoacetic	: Acid.		
14027	NMeFOSAA		2355-31-9	29	0.32	0.95	1
	NMeFOSAA is the acr	onym for N-	methyl perfluoro	octanesulfonamidoaceti	c Acid.		
14027	Perfluorobutanesulf	onate	375-73-5	18	0.21	0.64	1
14027	Perfluorodecanoic a	cid	335-76-2	21	0.21	0.64	1
14027	Perfluorododecanoic	acid	307-55-1	23	0.21	0.64	1
14027	Perfluoroheptanoic		375-85-9	25	0.21	0.64	1
14027	Perfluorohexanesulf		355-46-4	23	0.21	0.64	1
14027	Perfluorohexanoic a	cid	307-24-4	22	0.11	0.42	1
14027	Perfluorononanoic a		375-95-1	22	0.11	0.42	1
14027	Perfluoro-octanesul		1763-23-1	20	0.32	0.95	1
14027	Perfluorooctanoic a	cid	335-67-1	21	0.21	0.64	1
14027	Perfluorotetradecan		376-06-7	23	0.21	0.64	1
14027	Perfluorotridecanoi	c acid	72629-94-8	22	0.21	0.64	1
14027	Perfluoroundecanoic	acid	2058-94-8	22	0.21	0.64	1
	stated QC limits are be obtained to calcul			ent data points			
Wet Ch	nemistry	SM 2540	C-1997	%	%	%	
00118	Moisture	511 2540		8.0	0.50	0.50	1
00118	MOISLUIE		n.a.	0.0	0.50	0.50	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Trial# Batch# Analysis

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	SOM02.2 Volatiles	SW-846 8260C	1	A170272AA	01/27/2017 23:33	Stephen C Nolte	1
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	1	201702344141	01/18/2017 15:48	Client Supplied	1
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	2	201702344141	01/18/2017 15:48	Client Supplied	1
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201702344141	01/18/2017 15:48	Client Supplied	1
14027	14 PFCs	EPA 537 Rev. 1.1 modified	1	17024006	01/26/2017 13:58	Marissa C Drexinger	1
14090	PFC Solid Prep	EPA 537 Rev. 1.1 modified	1	17024006	01/24/2017 14:10	Devon M Whooley	1
00118	Moisture	SM 2540 G-1997	1	17026820004B	01/26/2017 12:53	Larry E Bevins	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP06-6-8-170118 MSD Grab Soil

SGPP - Merrimack

LL Sample # SW 8799401 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 15:48 by SJ

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1613 SDG#: MMK16-13MSD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	mg/kg	mg/kg	mg/kg	
11995	Acetone	67-64-1	0.14	0.007	0.021	0.98
11995	Benzene	71-43-2	0.021	0.0005	0.005	0.98
11995	Bromochloromethane	74-97-5	0.023	0.001	0.005	0.98
11995	Bromodichloromethane	75-27-4	0.022	0.001	0.005	0.98
11995	Bromoform	75-25-2	0.023	0.001	0.005	0.98
11995	Bromomethane	74-83-9	0.019	0.002	0.005	0.98
11995	2-Butanone	78-93-3	0.14	0.004	0.011	0.98
11995	Carbon Disulfide	75-15-0	0.021	0.001	0.005	0.98
11995	Carbon Tetrachloride	56-23-5	0.023	0.001	0.005	0.98
11995	Chlorobenzene	108-90-7	0.021	0.001	0.005	0.98
11995	Chloroethane	75-00-3	0.017	0.002	0.005	0.98
11995	Chloroform	67-66-3	0.022	0.001	0.005	0.98
11995	Chloromethane	74-87-3	0.020	0.002	0.005	0.98
11995	Cyclohexane	110-82-7	0.023	0.001	0.005	0.98
11995	1,2-Dibromo-3-chloropropane	96-12-8	0.026	0.002	0.005	0.98
11995	Dibromochloromethane	124-48-1	0.023	0.001	0.005	0.98
11995	1,2-Dibromoethane	106-93-4	0.024	0.001	0.005	0.98
11995	1,2-Dichlorobenzene	95-50-1	0.020	0.001	0.005	0.98
11995	1,3-Dichlorobenzene	541-73-1	0.019	0.001	0.005	0.98
11995	1,4-Dichlorobenzene	106-46-7	0.019	0.001	0.005	0.98
11995	Dichlorodifluoromethane	75-71-8	0.021	0.002	0.005	0.98
11995	1,1-Dichloroethane	75-34-3	0.022	0.001	0.005	0.98
11995	1,2-Dichloroethane	107-06-2	0.022	0.001	0.005	0.98
11995	1,1-Dichloroethene	75-35-4	0.023	0.001	0.005	0.98
11995	cis-1,2-Dichloroethene	156-59-2	0.021	0.001	0.005	0.98
11995	trans-1,2-Dichloroethene	156-60-5	0.023	0.001	0.005	0.98
11995	1,2-Dichloropropane	78-87-5	0.021	0.001	0.005	0.98
11995	cis-1,3-Dichloropropene	10061-01-5	0.022	0.001	0.005	0.98
11995	trans-1,3-Dichloropropene	10061-02-6	0.023	0.001	0.005	0.98
11995	Ethylbenzene	100-41-4	0.021	0.001	0.005	0.98
11995	Freon 113	76-13-1	0.024	0.002	0.011	0.98
11995	2-Hexanone	591-78-6	0.15	0.003	0.011	0.98
11995	Isopropylbenzene	98-82-8	0.022	0.001	0.005	0.98
11995	Methyl Acetate	79-20-9	0.025	0.002	0.005	0.98
11995	Methyl Tertiary Butyl Ether	1634-04-4	0.023	0.0005	0.005	0.98
11995	4-Methyl-2-pentanone	108-10-1	0.14	0.003	0.011	0.98
11995	Methylcyclohexane	108-87-2	0.024	0.001	0.005	0.98
11995	Methylene Chloride	75-09-2	0.022	0.002	0.005	0.98
11995 11995	Styrene 1,1,2,2-Tetrachloroethane	100-42-5 79-34-5	0.021 0.025	0.001 0.001	0.005 0.005	0.98 0.98
11995	Tetrachloroethene	127-18-4	0.025	0.001	0.005	0.98
11995	Toluene	108-88-3	0.021	0.001	0.005	0.98
11995	1,2,3-Trichlorobenzene	87-61-6	0.022	0.001	0.005	0.98
11995	1,2,4-Trichlorobenzene	120-82-1	0.018	0.001	0.005	0.98
11995	1,1,1-Trichloroethane	71-55-6	0.017	0.001	0.005	0.98
11995	1,1,2-Trichloroethane	79-00-5	0.020	0.001	0.005	0.98
11995	Trichloroethene	79-00-5	0.023	0.001	0.005	0.98
11995	Trichlorofluoromethane	75-69-4	0.022	0.001	0.005	0.98
11995	Vinyl Chloride	75-01-4	0.023	0.002	0.005	0.98
11995	m+p-Xylene	179601-23-1	0.042	0.001	0.005	0.98
11223	W. P WATCHC	1,7001-23-1	0.012	0.001	0.003	0.70

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax; 717-656-2681 • www,LancasterLabs.com

Sample Description: SG2-AP06-6-8-170118 MSD Grab Soil

SGPP - Merrimack

LL Sample # SW 8799401 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 15:48 by SJ C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 10:47

K1613 SDG#: MMK16-13MSD

CAT No.	Analysis Name		CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor			
GC/MS	Volatiles	SW-846	8260C	mg/kg	mg/kg	mg/kg				
11995	o-Xylene		95-47-6	0.021	0.001	0.005	0.98			
Misc.	Organics	EPA 537	Rev. 1.1	ng/g	ng/g	ng/g				
	modified									
14027	NETFOSAA		2991-50-6	24	0.30	0.91	1			
	NEtFOSAA is the acr	onym for N	N-ethyl perfluoroo	ctanesulfonami	doacetic Acid.					
14027	NMeFOSAA	_	2355-31-9	25	0.30	0.91	1			
	NMeFOSAA is the acr	conym for N	N-methyl perfluoro	octanesulfonam	idoacetic Acid.					
14027	Perfluorobutanesulf	onate	375-73-5	19	0.20	0.61	1			
14027	Perfluorodecanoic a	acid	335-76-2	23	0.20	0.61	1			
14027	Perfluorododecanoio	c acid	307-55-1	24	0.20	0.61	1			
14027	Perfluoroheptanoic	acid	375-85-9	22	0.20	0.61	1			
14027	Perfluorohexanesulf	onate	355-46-4	22	0.20	0.61	1			
14027	Perfluorohexanoic a	acid	307-24-4	23	0.10	0.41	1			
14027	Perfluorononanoic a	acid	375-95-1	18	0.10	0.41	1			
14027	Perfluoro-octanesul	fonate	1763-23-1	21	0.30	0.91	1			
14027	Perfluorooctanoic a	acid	335-67-1	20	0.20	0.61	1			
14027	Perfluorotetradecar	noic acid	376-06-7	22	0.20	0.61	1			
14027	Perfluorotridecanoi	c acid	72629-94-8	20	0.20	0.61	1			
14027	Perfluoroundecanoio		2058-94-8	22	0.20	0.61	1			
	stated QC limits are be obtained to calcu			ient data point	cs					
Wet Ch	nemistry	SM 2540	G-1997	%	%	%				
00118	Moisture		n.a.	8.0	0.50	0.50	1			
00121	Moisture Duplicate		n.a.	8.4	0.50	0.50	1			
	The duplicate moist moisture test. For determination is th	comparabi	llity purposes, th	ne initial mois	ture					

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Dilution Analysis Analyst Date and Time Factor No. 01/27/2017 23:56 01/18/2017 15:48 Stephen C Nolte 11995 SOM02.2 Volatiles SW-846 8260C A170272AA 0.98 02392 GC/MS - Field Preserved SW-846 5035A 1 201702344141 Client Supplied 1 NaHS04 02392 GC/MS - Field Preserved SW-846 5035A 201702344141 01/18/2017 15:48 Client Supplied 1 NaHS04 SW-846 5035A 201702344141 Client Supplied GC/MS-5g Field 01/18/2017 15:48 Preserv.MeOH-NC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP06-6-8-170118 MSD Grab Soil

SGPP - Merrimack

LL Sample # SW 8799401 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 15:48 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1613 SDG#: MMK16-13MSD

			_	_				
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	e	Analyst	Dilution Factor
14027	14 PFCs	EPA 537 Rev. 1.1 modified	1	17024006	01/30/2017	17:15	Marissa C Drexinger	1
14090	PFC Solid Prep	EPA 537 Rev. 1.1 modified	1	17024006	01/24/2017	14:10	Devon M Whooley	1
00118	Moisture	SM 2540 G-1997	1	17026820004B	01/26/2017	12:53	Larry E Bevins	1
00121	Moisture Duplicate	SM 2540 G-1997	1	17026820004B	01/26/2017	12:53	Larry E Bevins	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: VOC Trip Blank Water

SGPP - Merrimack

LL Group # 1757183 Account # 37191

LL Sample # WW 8799402

Project Name: SGPP - Merrimack

Collected: 01/18/2017

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 10:47

K1614 SDG#: MMK16-14TB

CAT No.	Analysis Name	CAS Number	Resul	Ė	Method Detection L	imit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l		ug/l	
11997	Acetone	67-64-1	6	U	6		20	1
11997	Benzene	71-43-2	0.5	U	0.5		1	1
11997	Bromochloromethane	74-97-5	1	Ū	1		5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5		1	1
11997	Bromoform	75-25-2	0.5	U	0.5		4	1
11997	Bromomethane	74-83-9	0.5	U	0.5		1	1
11997	2-Butanone	78-93-3	3	U	3		10	1
11997	Carbon Disulfide	75-15-0	1	U	1		5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5		1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5		1	1
11997	Chloroethane	75-00-3	0.5	U	0.5		1	1
11997	Chloroform	67-66-3	0.5	U	0.5		1	1
11997	Chloromethane	74-87-3	0.5	U	0.5		1	1
11997	Cyclohexane	110-82-7	2	U	2		5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2		5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5		1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5		1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1		5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1		5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1		5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5		1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5		1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5		1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5		1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5		1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5		1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5		1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5		1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5		1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5		1	1
11997	Freon 113	76-13-1	2	U	2		10	1
11997	2-Hexanone	591-78-6	3 1	U U	3 1		10 5	1 1
11997 11997	Isopropylbenzene	98-82-8 79-20-9	1	U	1		5	1
11997	Methyl Tontions Butsl Ethon	1634-04-4	0.5	U	0.5		1	1
11997	Methyl Tertiary Butyl Ether 4-Methyl-2-pentanone	108-10-1	3	IJ	3		10	1
11997	Methylcyclohexane	108-10-1	1	IJ	1		5	1
11997	Methylene Chloride	75-09-2	2	IJ	2		4	1
11997	Styrene	100-42-5	1	IJ	1		5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	IJ	0.5		1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5		1	1
11997	Toluene	108-88-3	0.5	IJ	0.5		1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	IJ	1		5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	IJ	1		5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5		1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5		1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5		1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5		1	1
11997	Vinyl Chloride	75-01-4	0.5	Ū	0.5		1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5		1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: VOC Trip Blank Water

SGPP - Merrimack

LL Sample # WW 8799402 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 10:47

K1614 SDG#: MMK16-14TB

CAT No.	Analysis Name		CAS Number	Result	:	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS 11997	Volatiles o-Xylene	SW-846	8260C 95-47-6	ug/l 0.5	U	ug/l 0.5	ug/l 1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170271AA	01/27/2017 07:36	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170271AA	01/27/2017 07:36	Anita M Dale	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA	SAMPLE NO		
VOLATILE ORGANICS ANA				
TENTATIVELY IDENTIF	!		!	
		!	K1614	!
Lab Name: Lancaster Laboratories	Contract:	!		!
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8799402	2		
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355.:	i/17ja	an27a.b/yj	27s01.d
Level: (low/med) LOW	Date Received: 01/21/2	L7		
% Moisture: not dec.	Date Analyzed: 01/27/2	L7		
Column: (pack/cap) CAP	Dilution Factor: 1.0			

Column: (pack/cap) CAP Dilution Factor: 1.0 CONCENTRATION UNITS: Number TICs found: 0 (ug/L or ug/Kg) ug/L

CAS NUMBER	! COMPOUND NAME ==!============		EST. CONC.	
	==!===================================	! ====!====! !		!====== ! U
	_!	!!		!
3	!	!		!
4		!!		!
	!	!!		!
	!	!!		!
	_!	!!		!
	_!	!!		!
	_!	!!		!
	<u>!</u>	<u></u> !		<u> </u>
	 	<u>-</u>		!
	 -			
	!	:		:
14 15.		:		<u>;</u>
	<u> </u>	:i		:
	i	ii		·
	!	:		;
	<u>;</u>	ii		i
		i		!
21.		i		!
22.				!
23.	!	!!		!
	!	!		!
25		!!		!
26	!!	!!		!
27		!!		!
	!	!!		!
	_!	!!		!
30	!	!!		!
	!	!!!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

Sample Description: PFC Trip Blank Water

SGPP - Merrimack

LL Sample # WW 8799403 LL Group # 1757183 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017

C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 10:47

K1615 SDG#: MMK16-15TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 1	Rev 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-6	ethyl perfluoroo	ctanesu	lfonamidoaceti	c Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-m	methyl perfluoro	octanes	ulfonamidoacet	ic Acid.		

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ıe	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev 1.1	1	17031006	02/02/2017		Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17031006	01/31/2017		Devon M Whooley	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	mg/kg		mg/kg	mg/kg
Batch number: A170272AA	Sample	number	(s): 87993	93,8799399-8799401
Acetone	0.007	U	0.007	0.020
Benzene	0.0005	U	0.0005	0.005
Bromochloromethane	0.001	U	0.001	0.005
Bromodichloromethane	0.001	U	0.001	0.005
Bromoform	0.001	U	0.001	0.005
Bromomethane	0.002	U	0.002	0.005
2-Butanone	0.004	U	0.004	0.010
Carbon Disulfide	0.001	U	0.001	0.005
Carbon Tetrachloride	0.001	U	0.001	0.005
Chlorobenzene	0.001	U	0.001	0.005
Chloroethane	0.002	U	0.002	0.005
Chloroform	0.001	U	0.001	0.005
Chloromethane	0.002	U	0.002	0.005
Cyclohexane	0.001	U	0.001	0.005
1,2-Dibromo-3-chloropropane	0.002	U	0.002	0.005
Dibromochloromethane	0.001	U	0.001	0.005
1,2-Dibromoethane	0.001	U	0.001	0.005
1,2-Dichlorobenzene	0.001	U	0.001	0.005
1,3-Dichlorobenzene	0.001	U	0.001	0.005
1,4-Dichlorobenzene	0.001	U	0.001	0.005
Dichlorodifluoromethane	0.002	U	0.002	0.005
1,1-Dichloroethane	0.001	U	0.001	0.005
1,2-Dichloroethane	0.001	U	0.001	0.005
1,1-Dichloroethene	0.001	U	0.001	0.005
cis-1,2-Dichloroethene	0.001	U	0.001	0.005
trans-1,2-Dichloroethene	0.001	U	0.001	0.005
1,2-Dichloropropane	0.001	U	0.001	0.005
cis-1,3-Dichloropropene	0.001	U	0.001	0.005
trans-1,3-Dichloropropene	0.001	U	0.001	0.005
Ethylbenzene	0.001	U	0.001	0.005
Freon 113	0.002	U	0.002	0.010
2-Hexanone	0.003	U	0.003	0.010
Isopropylbenzene	0.001	U	0.001	0.005
Methyl Acetate	0.002	U	0.002	0.005
Methyl Tertiary Butyl Ether	0.0005	U	0.0005	0.005
4-Methyl-2-pentanone	0.003	U	0.003	0.010
Methylcyclohexane	0.001	U	0.001	0.005
Methylene Chloride	0.002	Ū	0.002	0.005
Styrene	0.001	Ū	0.001	0.005
1,1,2,2-Tetrachloroethane	0.001	U	0.001	0.005

^{*-} Outside of specification

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

Method Blank (continued)

Tetrachloroethene	Analysis Name	Result	MDL**	LOQ
Toluene		mg/kg	mg/kg	mg/kg
Trichlorofluoromethane	Toluene 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene 1,1,1-Trichloroethane	0.001 U 0.001 U 0.001 U 0.001 U	0.001 0.001 0.001 0.001	0.005 0.005 0.005 0.005
Acetone 0.007 U 0.007 0.020	Trichlorofluoromethane Vinyl Chloride m+p-Xylene o-Xylene	0.002 U 0.001 U 0.001 U 0.001 U	0.002 0.001 0.001 0.001	0.005 0.005 0.005 0.005
Methyl Tertiary Butyl Ether 0.0005 U 0.0005 0.005	Acetone Benzene Bromochloromethane Bromodichloromethane Bromoform Bromomethane 2-Butanone Carbon Disulfide Carbon Tetrachloride Chlorobenzene Chlorobenzene Chlorothane Chloromethane Cyclohexane 1,2-Dibromo-3-chloropropane Dibromochloromethane 1,2-Dibromoethane 1,2-Dichlorobenzene 1,4-Dichlorobenzene 1,4-Dichlorobenzene 1,4-Dichlorobenzene 1,1-Dichlorothane 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethene cis-1,2-Dichloroethene trans-1,2-Dichloropropane cis-1,3-Dichloropropane cis-1,3-Dichloropropene trans-1,3-Dichloropropene Ethylbenzene Freon 113 2-Hexanone Isopropylbenzene	0.007 U 0.0005 U 0.001 U 0.001 U 0.001 U 0.001 U 0.001 U 0.001 U 0.001 U 0.001 U 0.002 U 0.001 U 0.002 U 0.001 U 0.002 U 0.001 U 0.002 U 0.001 U	0.007 0.0005 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.002 0.001 0.002 0.001 0.002 0.001 0.002 0.001	0.020 0.005
	Methyl Tertiary Butyl Ether	0.0005 U	0.0005	0.005

^{*-} Outside of specification

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ
	mg/kg		mg/kg	mg/kg
Methylcyclohexane	0.001	U	0.001	0.005
Methylene Chloride	0.002	U	0.002	0.005
Styrene	0.001	U	0.001	0.005
1,1,2,2-Tetrachloroethane	0.001	U	0.001	0.005
Tetrachloroethene	0.001	U	0.001	0.005
Toluene	0.001	U	0.001	0.005
1,2,3-Trichlorobenzene	0.001	U	0.001	0.005
1,2,4-Trichlorobenzene	0.001	U	0.001	0.005
1,1,1-Trichloroethane	0.001	U	0.001	0.005
1,1,2-Trichloroethane	0.001	U	0.001	0.005
Trichloroethene	0.001	U	0.001	0.005
Trichlorofluoromethane	0.002	U	0.002	0.005
Vinyl Chloride		U	0.001	0.005
m+p-Xylene	0.001	U	0.001	0.005
o-Xylene	0.001	U	0.001	0.005
	ug/l		ug/l	ug/l
Batch number: Y170271AA	_			385-8799391,8799395,8799402
Acetone	6	U	6	20
Benzene	0.5	U	0.5	1
Bromochloromethane	1	U	1	5
Bromodichloromethane	0.5	U	0.5	1
Bromoform	0.5	U	0.5	4
Bromomethane	0.5	U	0.5	1
2-Butanone	3	U	3	10
Carbon Disulfide	1	U	1	5
Carbon Tetrachloride	0.5	U	0.5	1
Chlorobenzene	0.5	U	0.5	1
Chloroethane	0.5	U	0.5	1
Chloroform	0.5	U	0.5	1
Chloromethane	0.5	U	0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	U	2	5
Dibromochloromethane	0.5	U	0.5	1
1,2-Dibromoethane	0.5	U	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5
Dichlorodifluoromethane	0.5	U	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	Ū	0.5	1
cis-1,2-Dichloroethene	0.5	U	0.5	1
trans-1,2-Dichloroethene	0.5	U	0.5	1
1,2-Dichloropropane	0.5	U 	0.5	1
cis-1,3-Dichloropropene	0.5	U	0.5	1
trans-1,3-Dichloropropene	0.5	U	0.5	1
Ethylbenzene	0.5	U	0.5	1
Freon 113	2	U	2	10

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

Method Blank (continued)

Analysis Name	Result	.	MDL**	LOQ
	ug/l		ug/l	ug/l
2-Hexanone	3	U	3	10
Isopropylbenzene	1	Ū	1	5
Methyl Acetate	1	U	1	5
Methyl Tertiary Butyl Ether	0.5	U	0.5	1
4-Methyl-2-pentanone	3	U	3	10
Methylcyclohexane	1	U	1	5
Methylene Chloride	2	U	2	4
Styrene	1	U	1	5
1,1,2,2-Tetrachloroethane	0.5	U	0.5	1
Tetrachloroethene	0.5	U	0.5	1
Toluene	0.5	U	0.5	1
1,2,3-Trichlorobenzene	1	U	1	5
1,2,4-Trichlorobenzene	1	U	1	5
1,1,1-Trichloroethane	0.5	U	0.5	1
1,1,2-Trichloroethane	0.5	U	0.5	1
Trichloroethene	0.5	U	0.5	1
Trichlorofluoromethane	0.5	U	0.5	1
Vinyl Chloride	0.5	U	0.5	1
m+p-Xylene	0.5	U	0.5	1
o-Xylene	0.5	U	0.5	1
	ng/g		ng/g	ng/g
Batch number: 17024006	Sample	number	r(s): 879	9393-8799394,8799399-8799401
NEtFOSAA	0.30	U	0.30	0.90
NMeFOSAA	0.30	U	0.30	0.90
Perfluorobutanesulfonate	0.20	U	0.20	0.60
Perfluorodecanoic acid	0.20	U	0.20	0.60
Perfluorododecanoic acid	0.20	U	0.20	0.60
Perfluoroheptanoic acid	0.20	U	0.20	0.60
Perfluorohexanesulfonate	0.20	U	0.20	0.60
Perfluorohexanoic acid	0.10	U	0.10	0.40
Perfluorononanoic acid	0.10	U	0.10	0.40
Perfluoro-octanesulfonate	0.30	U	0.30	0.90
Perfluorooctanoic acid	0.20	U	0.20	0.60
Perfluorotetradecanoic acid	0.20	U	0.20	0.60
Perfluorotridecanoic acid	0.20	U	0.20	0.60
Perfluoroundecanoic acid	0.20	U	0.20	0.60
	ng/l		ng/l	ng/l
Batch number: 17031006	Sample	number	r(s): 879	9385-8799391,8799395,8799397-8799398,8799403
Perfluorooctanoic acid	0.5	U	0.5	2
Perfluorononanoic acid	0.6	U	0.6	2
Perfluorodecanoic acid	0.5	U	0.5	2
Perfluoroundecanoic acid	1	U	1	3
Perfluorododecanoic acid	0.5	U	0.5	2
Perfluorotridecanoic acid	0.5	U	0.5	2
Perfluorotetradecanoic acid	0.5	U	0.5	2
Perfluorohexanoic acid	0.5	U	0.5	2
Perfluoroheptanoic acid	0.5	U	0.5	2

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

Method Blank (continued)

Analysis Name	Result	MDL**	LOQ
	ng/l	ng/l	ng/l
Perfluorobutanesulfonate Perfluorohexanesulfonate Perfluoro-octanesulfonate Perfluorobutanoic Acid Perfluoropentanoic Acid NEtFOSAA NMeFOSAA	0.7 U 1 U 2 U 3 U 0.5 U 1 U	0.7 1 2 3 0.5 1	2 3 6 10 2 3 3
	mg/l	mg/l	mg/l
Batch number: 170260635001 Calcium Magnesium Potassium Sodium	Sample number 0.0495 J 0.0460 J 0.160 U 0.173 U	r(s): 87993 0.0382 0.0190 0.160 0.173	885,8799388-8799392,8799395-8799396 0.400 0.200 1.00 2.00
	mg/kg	mg/kg	mg/kg
Batch number: 17024667631A	Sample number	r(s): 87993 100	893-8799394,8799399 300
	mg/l	mg/l	mg/l
Batch number: 17024120601A Chloride Sulfate	Sample number 0.20 U 0.30 U	r(s): 87993 0.20 0.30	0.40 1.0
Batch number: 17024120601B Chloride Sulfate	Sample number 0.20 U 0.30 U	r(s): 87993 0.20 0.30	888-8799391,8799395 0.40 1.0
Batch number: 17029118102A Total Nitrite/Nitrate Nitrogen	Sample number	r(s): 87993 0.040	885,8799388-8799391,8799395 0.10
	mg/l as CaCO	3 mg/l as CaCO3	mg/l as CaCO3
Batch number: 17025008103A Total Alkalinity to pH 4.5	Sample number 3.5 J	r(s): 87993 1.7	888,8799391 5.0
Batch number: 17025008104A Total Alkalinity to pH 4.5	Sample number 3.3 J	r(s): 87993 1.7	885,8799389,8799395 5.0
Batch number: 17025008104B Total Alkalinity to pH 4.5	Sample number 3.3 J	r(s): 87993 1.7	5.0

LCS/LCSD

Analysis Name	LCS Spike	LCS	LCSD Spike	LCSD	LCS	LCSD	LCS/LCSD	RPD	RPD
	Added	Conc	Added	Conc	%REC	%REC	Limits		Max

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

LCS/LCSD

Analysis Name	LCS Spike	LCS	LCSD Spike	LCSD	LCS	LCSD	LCS/LCSD	RPD	RPD
	Added	Conc	Added	Conc	%REC	%REC	Limits		Max
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: A170272AA		r(s): 87993	393,8799399-87	99401					
Acetone	0.150	0.138	0.150	0.133	92	89	39-150	4	30
Benzene	0.0200	0.0195	0.0200	0.0194	98	97	80-120	1	30
Bromochloromethane	0.0200	0.0200	0.0200	0.0191	100	96	80-126	4	30
Bromodichloromethane	0.0200	0.0193	0.0200	0.0188	97	94	75-120	3	30
Bromoform	0.0200	0.0189	0.0200	0.0187	95	93	57-127	1	30
Bromomethane	0.0200	0.0187	0.0200	0.0168	93	84	21-165	11	30
2-Butanone	0.150	0.148	0.150	0.138	99	92	54-129	8	30
Carbon Disulfide	0.0200	0.0184	0.0200	0.0182	92	91	60-120	1	30
Carbon Tetrachloride	0.0200	0.0201	0.0200	0.0192	100	96	69-130	4	30
Chlorobenzene	0.0200	0.0196	0.0200	0.0194	98	97	80-120	1	30
Chloroethane	0.0200	0.0165	0.0200	0.0158	82	79	10-187	4	30
Chloroform	0.0200	0.0199	0.0200	0.0191	99	95	80-120	4	30
Chloromethane	0.0200	0.0183	0.0200	0.0173	92	86	56-120	6	30
Cyclohexane	0.0200	0.0197	0.0200	0.0195	99	98	58-120	1	30
1,2-Dibromo-3-chloropropane	0.0200	0.0192	0.0200	0.0181	96	91	54-120	6	30
Dibromochloromethane	0.0200	0.0195	0.0200	0.0190	98	95	77-120	3	30
1,2-Dibromoethane	0.0200	0.0197	0.0200	0.0198	99	99	80-120	0	30
1,2-Dichlorobenzene	0.0200	0.0194	0.0200	0.0193	97	96	80-120	1	30
1,3-Dichlorobenzene	0.0200	0.0199	0.0200	0.0191	99	96	80-120	4	30
1,4-Dichlorobenzene	0.0200	0.0194	0.0200	0.0189	97	94	80-120	2	30
Dichlorodifluoromethane	0.0200	0.0173	0.0200	0.0163	87	82	37-126	6	30
1,1-Dichloroethane	0.0200	0.0198	0.0200	0.0198	99	99	77-120	0	30
1,2-Dichloroethane	0.0200	0.0195	0.0200	0.0192	98	96	70-133	1	30
1,1-Dichloroethene	0.0200	0.0205	0.0200	0.0199	102	100	73-129	3	30
cis-1,2-Dichloroethene	0.0200	0.0199	0.0200	0.0194	99	97	80-120	3	30
trans-1,2-Dichloroethene	0.0200	0.0202	0.0200	0.0201	101	100	80-125	1	30
1,2-Dichloropropane	0.0200	0.0193	0.0200	0.0191	96	95	76-120	1	30
cis-1,3-Dichloropropene	0.0200	0.0195	0.0200	0.0190	97	95	74-120	3	30
trans-1,3-Dichloropropene	0.0200	0.0200	0.0200	0.0197	100	98	76-120	2	30
Ethylbenzene	0.0200	0.0199	0.0200	0.0196	100	98	80-120	2	30
Freon 113	0.0200	0.0202	0.0200	0.0195	101	98	64-133	3	30
2-Hexanone	0.100	0.0974	0.100	0.0946	97	95	48-126	3	30
Isopropylbenzene	0.0200	0.0206	0.0200	0.0203	103	102	76-120	1	30
Methyl Acetate	0.0200	0.0196	0.0200	0.0200	98	100	52-146	2	30
Methyl Tertiary Butyl Ether	0.0200	0.0193	0.0200	0.0193	97	97	72-120	0	30
4-Methyl-2-pentanone	0.100	0.0966	0.100	0.0925	97	93	48-136	4	30
Methylcyclohexane	0.0200	0.0192	0.0200	0.0185	96	93	62-132	4	30
Methylene Chloride	0.0200	0.0191	0.0200	0.0189	96	94	76-122	2	30
Styrene	0.0200	0.0218	0.0200	0.0209	109	104	76-120	4	30
1,1,2,2-Tetrachloroethane	0.0200	0.0195	0.0200	0.0195	98	97	67-121	0	30
Tetrachloroethene	0.0200	0.0198	0.0200	0.0189	99	94	78-120	5	30
Toluene	0.0200	0.0202	0.0200	0.0194	101	97	80-120	4	30
1,2,3-Trichlorobenzene	0.0200	0.0188	0.0200	0.0178	94	89	63-122	6	30
1,2,4-Trichlorobenzene	0.0200	0.0192	0.0200	0.0182	96	91	63-121	6	30
1,1,1-Trichloroethane	0.0200	0.0174	0.0200	0.0169	87	85	66-128	3	30
1,1,2-Trichloroethane	0.0200	0.0193	0.0200	0.0197	97	98	80-120	2	30
Trichloroethene	0.0200	0.0201	0.0200	0.0193	100	97	80-120	4	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/kg	LCS Conc mg/kg	LCSD Spike Added mg/kg	LCSD Conc mg/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Trichlorofluoromethane	0.0200	0.0188	0.0200	0.0180	94	90	47-146	4	30
Vinyl Chloride	0.0200	0.0184	0.0200	0.0177	92	89	59-120	4	30
m+p-Xylene	0.0400	0.0402	0.0400	0.0392	100	98	80-120	3	30
o-Xylene	0.0200	0.0205	0.0200	0.0194	102	97	80-120	5	30
Batch number: A170301AA	Sample numbe	r(s): 87993	94						
Acetone	0.150	0.140	0.150	0.131	93	87	39-150	6	30
Benzene	0.0200	0.0202	0.0200	0.0205	101	102	80-120	1	30
Bromochloromethane	0.0200	0.0201	0.0200	0.0208	100	104	80-126	3	30
Bromodichloromethane	0.0200	0.0202	0.0200	0.0206	101	103	75-120	2	30
Bromoform	0.0200	0.0185	0.0200	0.0184	92	92	57-127	0	30
Bromomethane	0.0200	0.0188	0.0200	0.0189	94	95	21-165	1	30
2-Butanone	0.150	0.148	0.150	0.139	99	93	54-129	6	30
Carbon Disulfide	0.0200	0.0172	0.0200	0.0177	86	88	60-120	2	30
Carbon Tetrachloride	0.0200	0.0221	0.0200	0.0223	110	111	69-130	1	30
Chlorobenzene	0.0200	0.0193	0.0200	0.0194	96	97	80-120	1	30
Chloroethane	0.0200	0.0161	0.0200	0.0172	80	86	10-187	7	30
Chloroform	0.0200	0.0206	0.0200	0.0208	103	104	80-120	1	30
Chloromethane	0.0200	0.0180	0.0200	0.0191	90	96	56-120	6	30
Cyclohexane	0.0200	0.0205	0.0200	0.0211	102	106	58-120	3	30
1,2-Dibromo-3-chloropropane	0.0200	0.0183	0.0200	0.0181	92	90	54-120	1	30
Dibromochloromethane	0.0200	0.0198	0.0200	0.0193	99	96	77-120	3	30
1,2-Dibromoethane	0.0200	0.0201	0.0200	0.0194	100	97	80-120	3	30
1,2-Dichlorobenzene	0.0200	0.0194	0.0200	0.0193	97	97	80-120	0	30
1,3-Dichlorobenzene	0.0200	0.0193	0.0200	0.0189	96	95	80-120	2	30
1,4-Dichlorobenzene	0.0200	0.0192	0.0200	0.0188	96	94	80-120	2	30
Dichlorodifluoromethane	0.0200	0.0210	0.0200	0.0215	105	108	37-126	3	30
1,1-Dichloroethane	0.0200	0.0199	0.0200	0.0201	100	101	77-120	1	30
1,2-Dichloroethane	0.0200	0.0211	0.0200	0.0208	105	104	70-133	1	30
1,1-Dichloroethene	0.0200	0.0204	0.0200	0.0207	102	104	73-129	2	30
cis-1,2-Dichloroethene	0.0200	0.0203	0.0200	0.0206	102	103	80-120	1	30
trans-1,2-Dichloroethene	0.0200	0.0213	0.0200	0.0216	107	108	80-125	1	30
1,2-Dichloropropane	0.0200	0.0193	0.0200	0.0196	97	98	76-120	2	30
cis-1,3-Dichloropropene	0.0200	0.0195	0.0200	0.0197	97	99	74-120	1	30
trans-1,3-Dichloropropene	0.0200	0.0206	0.0200	0.0195	103	97	76-120	5	30
Ethylbenzene	0.0200	0.0206	0.0200	0.0206	103	103	80-120	0	30
Freon 113	0.0200	0.0213	0.0200	0.0215	106	107	64-133	1	30
2-Hexanone	0.100	0.0959	0.100	0.0914	96	91	48-126	5	30
Isopropylbenzene	0.0200	0.0206	0.0200	0.0207	103	104	76-120	0	30
Methyl Acetate	0.0200	0.0194	0.0200	0.0189	97	94	52-146	3	30
Methyl Tertiary Butyl Ether	0.0200	0.0199	0.0200	0.0197	99	99	72-120	1	30
4-Methyl-2-pentanone	0.100	0.0993	0.100	0.0963	99	96	48-136	3	30
Methylcyclohexane	0.0200	0.0208	0.0200	0.0212	104	106	62-132	2	30
Methylene Chloride	0.0200	0.0195	0.0200	0.0195	98	98	76-122	0	30
Styrene	0.0200	0.0200	0.0200	0.0192	100	96	76-120	4	30
1,1,2,2-Tetrachloroethane	0.0200	0.0193	0.0200	0.0187	97	94	67-121	3	30
Tetrachloroethene	0.0200	0.0210	0.0200	0.0207	105	103	78-120	1	30
Toluene	0.0200	0.0207	0.0200	0.0196	103	98	80-120	5	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/kg	LCS Conc mg/kg	LCSD Spike Added mg/kg	LCSD Conc mg/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
1,2,3-Trichlorobenzene	0.0200	0.0189	0.0200	0.0183	94	92	63-122	3	30
1,2,4-Trichlorobenzene	0.0200	0.0191	0.0200	0.0185	96	93	63-121	3	30
1,1,1-Trichloroethane	0.0200	0.0209	0.0200	0.0214	104	107	66-128	2	30
1,1,2-Trichloroethane	0.0200	0.0198	0.0200	0.0195	99	97	80-120	2	30
Trichloroethene	0.0200	0.0213	0.0200	0.0210	107	105	80-120	2	30
Trichlorofluoromethane	0.0200	0.0213	0.0200	0.0215	106	108	47-146	1	30
Vinyl Chloride	0.0200	0.0187	0.0200	0.0198	93	99	59-120	6	30
m+p-Xylene	0.0400	0.0421	0.0400	0.0425	105	106	80-120	1	30
o-Xylene	0.0200	0.0197	0.0200	0.0197	99	99	80-120	0	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: Y170271AA		r(s): 87993	85-8799391,87	99395,8799	402				
Acetone	150	174.51			116		50-168		
Benzene	20	22.02			110		78-120		
Bromochloromethane	20	21.27			106		80-125		
Bromodichloromethane	20	19.91			100		80-120		
Bromoform	20	16.44			82		59-120		
Bromomethane	20	18.36			92		55-123		
2-Butanone	150	162.74			108		57-145		
Carbon Disulfide	20	20.82			104		58-120		
Carbon Tetrachloride	20	20.41			102		74-130		
Chlorobenzene	20	21.58			108		80-120		
Chloroethane	20	18.85			94		56-120		
Chloroform	20	21.71			109		80-120		
Chloromethane	20	19.75			99		59-127		
Cyclohexane	20	19.77			99		65-131		
1,2-Dibromo-3-chloropropane	20	18.31			92		59-120		
Dibromochloromethane	20	19.51			98		78-120		
1,2-Dibromoethane	20	22.11			111		80-120		
1,2-Dichlorobenzene	20	20.99			105		80-120		
1,3-Dichlorobenzene	20	20.71			104		80-120		
1,4-Dichlorobenzene	20	20.88			104		80-120		
Dichlorodifluoromethane	20	16.51			83		49-134		
1,1-Dichloroethane	20	22.8			114		80-120		
1,2-Dichloroethane 1,1-Dichloroethene	20 20	21.49 22.74			107 114		66-128 76-124		
cis-1,2-Dichloroethene	20	21.78			109		80-120		
trans-1,2-Dichloroethene	20	22.44			112		80-120		
1,2-Dichloropropane	20	22.18			111		80-120		
cis-1,3-Dichloropropene	20	20.74			104		80-120		
trans-1,3-Dichloropropene	20	20.85			104		76-120		
Ethylbenzene	20	22.04			110		78-120		
Freon 113	20	18.8			94		64-136		
2-Hexanone	100	115.5			115		49-146		
Isopropylbenzene	20	21.59			108		80-120		
Methyl Acetate	20	22.21			111		61-137		
Methyl Tertiary Butyl Ether	20	21.51			108		75-120		
4-Methyl-2-pentanone	100	115.76			116		55-141		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Methylcyclohexane	20	18.51			93		66-126		
Methylene Chloride	20	22.34			112		80-120		
Styrene	20	21.1			105		80-120		
1,1,2,2-Tetrachloroethane	20	21.21			106		72-120		
Tetrachloroethene	20	21.67			108		80-129		
Toluene	20	22.04			110		80-120		
1,2,3-Trichlorobenzene	20	21.7			108		69-120		
1,2,4-Trichlorobenzene	20	22.01			110		72-120		
1,1,1-Trichloroethane	20	20.87			104		66-126		
1,1,2-Trichloroethane	20	21.35			107		80-120		
Trichloroethene	20	22.11			111		80-120		
Trichlorofluoromethane	20	18.21			91		67-129		
Vinyl Chloride	20	19.07			95		63-121		
m+p-Xylene	40	43.82			110		80-120		
o-Xylene	20	21.71			109		80-120		
	ng/g	ng/g	ng/g	ng/g					
Batch number: 17024006	Sample numbe	er(s): 87993	393-8799394,87	99399-8799	401				
NEtFOSAA	20	23.48	,		117		70-130		
NMeFOSAA	20	24.25			121		70-130		
Perfluorobutanesulfonate	17.68	16.44			93		70-130		
Perfluorodecanoic acid	20	20.5			102		70-130		
Perfluorododecanoic acid	20	21.76			109		70-130		
Perfluoroheptanoic acid	20	23.67			118		70-130		
Perfluorohexanesulfonate	18.92	20.22			107		70-130		
Perfluorohexanoic acid	20	20.75			104		70-130		
Perfluorononanoic acid	20	22.02			110		70-130		
Perfluoro-octanesulfonate	19.12	20.53			107		70-130		
Perfluorooctanoic acid	20	20.44			102		70-130		
Perfluorotetradecanoic acid	20	21.66			108		70-130		
Perfluorotridecanoic acid	20	21.38			107		70-130		
Perfluoroundecanoic acid	20	21.51			108		70-130		
	ng/l	ng/l	ng/l	ng/l					
Batch number: 17031006	Sample numbe	er(s): 87993	885-8799391,87	99395,8799	397-8799	398,8799	403		
Perfluorooctanoic acid	200	168.48			84		70-130		
Perfluorononanoic acid	200	171.62			86		70-130		
Perfluorodecanoic acid	200	162.46			81		70-130		
Perfluoroundecanoic acid	200	172.03			86		70-130		
Perfluorododecanoic acid	200	166.31			83		70-130		
Perfluorotridecanoic acid	200	216.56			108		70-130		
Perfluorotetradecanoic acid	200	169.28			85		70-130		
Perfluorohexanoic acid	200	156.12			78		70-130		
Perfluoroheptanoic acid	200	158.98			79		70-130		
Perfluorobutanesulfonate	176.8	155.23			88		70-130		
Perfluorohexanesulfonate	189.2	140.96			75		70-130		
Perfluoro-octanesulfonate	191.2	157.33			82		70-130		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ng/l	LCS Conc ng/l	LCSD Spike Added ng/l	LCSD Conc ng/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Perfluorobutanoic Acid Perfluoropentanoic Acid NEtFOSAA NMeFOSAA	200 200 200 200	173.56 164.1 191.24 194.59			87 82 96 97		70-130 70-130 70-130 70-130		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 170260635001 Calcium Magnesium Potassium Sodium	4.00 2.00 10 10	4.32 2.19 10.79 10.68	85,8799388-87		9395-8799 108 110 108 107	396	80-120 80-120 80-120 80-120		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 17024667631A TOC	Sample numbe	er(s): 87993 5441.01	93-8799394,87	99399	90		47-143		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17024120601A Chloride Sulfate	Sample number 3.00 7.50	er(s): 87993 2.97 7.56	85		99 101		90-110 90-110		
Batch number: 17024120601B Chloride Sulfate	3.00 7.50	er(s): 87993 2.97 7.56	88-8799391,87	99395	99 101		90-110 90-110		
Batch number: 17029118102A Total Nitrite/Nitrate Nitrogen	-	er(s): 87993 2.70	85,8799388-87	99391,8799	9395 108		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 17025008103A Total Alkalinity to pH 4.5	Sample number 188	er(s): 87993 182.44	88,8799391		97		84-110		
Batch number: 17025008104A Total Alkalinity to pH 4.5	Sample number 188	er(s): 87993 182.26	85,8799389,87	99395	97		84-110		
Batch number: 17025008104B Total Alkalinity to pH 4.5	Sample number 188	er(s): 87993 182.26	90		97		84-110		
	%	%	%	%					
Batch number: 17026820004B Moisture Moisture Moisture Duplicate	Sample numbe 89.5 89.5 89.5	er(s): 87993 89.36 89.36 89.36	93-8799394,87	99399-8799	100 100 100 100		99-101 99-101 99-101		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/kg	MS Spike Added mg/kg	MS Conc mg/kg	MSD Spike Added mg/kg	MSD Conc mg/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: A170272AA	Sample numb	er(s): 8799	393,8799	399-8799401	UNSPK: 87	99399				
Acetone	0.007 U	0.150	0.133	0.148	0.128	88	87	39-150	4	30
Benzene	0.0005 U	0.0200	0.0202	0.0197	0.0194	101	99	80-120	4	30
Bromochloromethane	0.001 U	0.0200	0.0211	0.0197	0.0207	105	105	80-126	2	30
Bromodichloromethane	0.001 U	0.0200	0.0205	0.0197	0.0198	102	101	75-120	4	30
Bromoform	0.001 U	0.0200	0.0222	0.0197	0.0215	111	109	57-127	3	30
Bromomethane	0.002 U	0.0200	0.0186	0.0197	0.0179	93	91	21-165	4	30
2-Butanone	0.004 U	0.150	0.141	0.148	0.133	94	90	54-129	5	30
Carbon Disulfide	0.001 U	0.0200	0.0190	0.0197	0.0190	95	96	60-120	0	30
Carbon Tetrachloride	0.001 U	0.0200	0.0224	0.0197	0.0214	112	109	69-130	4	30
Chlorobenzene	0.001 U	0.0200	0.0206	0.0197	0.0192	103	98	80-120	7	30
Chloroethane	0.002 U	0.0200	0.0170	0.0197	0.0160	85	81	10-187	6	30
Chloroform	0.001 U	0.0200	0.0210	0.0197	0.0201	105	102	80-120	4	30
Chloromethane	0.002 U	0.0200	0.0188	0.0197	0.0183	94	93	56-120	3	30
Cyclohexane	0.001 U	0.0200	0.0218	0.0197	0.0211	109	107	58-120	3	30
1,2-Dibromo-3-chloropropane	0.002 U	0.0200	0.0250	0.0197	0.0243	125*	124*	54-120	3	30
Dibromochloromethane	0.001 U	0.0200	0.0224	0.0197	0.0211	112	107	77-120	6	30
1,2-Dibromoethane	0.001 U	0.0200	0.0236	0.0197	0.0223	118	114	80-120	5	30
1,2-Dichlorobenzene	0.001 U	0.0200	0.0195	0.0197	0.0180	97	92	80-120	8	30
1,3-Dichlorobenzene	0.001 U	0.0200	0.0194	0.0197	0.0179	97	91	80-120	8	30
1,4-Dichlorobenzene	0.001 U	0.0200	0.0189	0.0197	0.0176	94	90	80-120	7	30
Dichlorodifluoromethane	0.002 U	0.0200	0.0208	0.0197	0.0194	104	99	37-126	7	30
1,1-Dichloroethane	0.001 U	0.0200	0.0203	0.0197	0.0203	101	103	77-120	0	30
1,2-Dichloroethane	0.001 U	0.0200	0.0217	0.0197	0.0207	108	105	70-133	5	30
1,1-Dichloroethene	0.001 U	0.0200	0.0217	0.0197	0.0216	108	110	73-129	1	30
cis-1,2-Dichloroethene	0.001 U	0.0200	0.0207	0.0197	0.0198	103	100	80-120	5	30
trans-1,2-Dichloroethene	0.001 U	0.0200	0.0212	0.0197	0.0213	106	108	80-125	1	30
1,2-Dichloropropane	0.001 U	0.0200	0.0203	0.0197	0.0197	101	100	76-120	3	30
cis-1,3-Dichloropropene	0.001 U	0.0200	0.0212	0.0197	0.0198	106	101	74-120	7	30
trans-1,3-Dichloropropene	0.001 U	0.0200	0.0213	0.0197	0.0208	106	106	76-120	2	30
Ethylbenzene	0.001 U	0.0200	0.0205	0.0197	0.0197	102	100	80-120	4	30
Freon 113	0.002 U	0.0200	0.0225	0.0197	0.0223	112	113	64-133	1	30
2-Hexanone	0.003 U	0.100	0.126	0.0984	0.134	126	136*	48-126	6	30
Isopropylbenzene	0.001 U	0.0200	0.0219	0.0197	0.0202	109	103	76-120	8	30
Methyl Acetate	0.002 U	0.0200	0.0224	0.0197	0.0229	112	116	52-146	2	30
Methyl Tertiary Butyl Ether	0.0005 U	0.0200	0.0213	0.0197	0.0212	106	108	72-120	0	30
4-Methyl-2-pentanone	0.003 U	0.100	0.133	0.0984	0.131	133	133	48-136	2	30
Methylcyclohexane	0.001 U	0.0200	0.0227	0.0197	0.0220	113	112	62-132	3	30
Methylene Chloride	0.002 U	0.0200	0.0201	0.0197	0.0201	100	102	76-122	0	30
Styrene	0.001 U	0.0200	0.0205	0.0197	0.0194	102	99	76-120	5	30
1,1,2,2-Tetrachloroethane	0.001 U	0.0200	0.0239	0.0197	0.0233	119	118	67-121	3	30
Tetrachloroethene	0.001 U	0.0200	0.0206	0.0197	0.0197	103	100	78-120	4	30
Toluene	0.001 U	0.0200	0.0206	0.0197	0.0198	103	101	80-120	4	30
1,2,3-Trichlorobenzene	0.001 U	0.0200	0.0176	0.0197	0.0164	88	83	63-122	7	30
1,2,4-Trichlorobenzene	0.001 U	0.0200	0.0175	0.0197	0.0159	87	81	63-121	10	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene
Trichlorofluoromethane 0.002 U 0.0200 0.0226 0.0197 0.0214 113 109 47-146 6 30 Vinyl Chloride
Vinyl Chloride 0.001 U 0.0200 0.0198 0.0197 0.0192 99 98 59-120 3 30 m+p-Xylene 59-120 5 30 0.001 U 0.0401 0.0410 0.0394 0.0391 102 99 80-120 5 30 0.002 0.000 0.000 0.000 0.000 0.00097 0.0194 101 98 80-120 5 30 0.000 0.000 0.000 0.000 0.000 0.00097 0.0194 101 98 80-120 5 30 0.0000 0.0000 0.0000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.0000 0.0000 0.000 0.000 0.000
m+p-Xylene 0.001 U 0.0401 0.0401 0.0410 0.0394 0.0391 102 99 80-120 5 30 o-Xylene 0.001 U 0.0200 0.0203 0.0197 0.0194 101 98 80-120 5 30 ug/l ug/l ug/l ug/l ug/l ug/l Batch number: Y170271AA Sample number(s): 8799385-8799391,8799395,8799402 UNSPK: 8799385 Acetone 6 U 150 165.8 111 111 111 50-168 1 30 Benzene 0.5 U 20 21.72 20 21.97 109 110 78-120 1 30 Bromochloromethane 1 U 20 19.84 20 20.25 99 101 80-125 2 30 Bromodichloromethane 0.5 U 20 18.9 20 19.21 95 96 80-120 2 30 Bromoform 0.5 U 20 15.21 70 15.21 76 76 59-120 0 30 Bromomethane 0.5 U 20 17.99 20 18.32 90 92 55-123 2 30 2-Butanone 3 U 150 153.79 150 157.73 103 105 57-145 3 30 Carbon Disulfide 1 U 20 20.73 20 21.37 104 107 58-120 3 30 Carbon Tetrachloride 0.5 U 20 21.16 20 21.37 106 107 74-130 1 30 Chlorobenzene 0.5 U 20 18.78 20 18.73 94 94 56-120 0 30 Chloroform 0.5 U 20 18.78 20 18.73 94 94 56-120 0 30 Chloroform 0.5 U 20 21.24 20 21.56 106 108 80-120 2 30
verylene 0.001 U 0.0200 0.0203 0.0197 0.0194 101 98 80-120 5 30 ug/l ug/l ug/l ug/l ug/l ug/l ug/l Batch number: Y170271AA Sample number(s): 8799385-8799391, 8799395, 8799402 UNSPK: 8799385 8799385
ug/l ug/l ug/l ug/l ug/l ug/l Batch number: Y170271AA Sample number(s): 8799385-8799391,8799395,8799402 UNSPK: 8799385 8799385 Acetone 6 U 150 167.15 150 165.8 111 111 50-168 1 30 Benzene 0.5 U 20 21.72 20 21.97 109 110 78-120 1 30 Bromochloromethane 1 U 20 19.84 20 20.25 99 101 80-125 2 30 Bromodichloromethane 0.5 U 20 18.9 20 19.21 95 96 80-120 2 30 Bromoform 0.5 U 20 15.21 20 15.21 76 76 76 59-120 0 30 Bromomethane 0.5 U 20 17.99 20 18.32 90 92 55-123 2 30 Bromomethane<
Batch number: Y170271AA
Acetone 6 U 150 167.15 150 165.8 111 111 50-168 1 30 Benzene 0.5 U 20 21.72 20 21.97 109 110 78-120 1 30 Bromochloromethane 1 U 20 19.84 20 20.25 99 101 80-125 2 30 Bromodichloromethane 0.5 U 20 18.9 20 19.21 95 96 80-120 2 30 Bromoform 0.5 U 20 15.21 20 15.21 76 76 59-120 0 30 Bromomethane 0.5 U 20 17.99 20 18.32 90 92 55-123 2 30 2-Butanone 3 U 150 153.79 150 157.73 103 105 57-145 3 30 Carbon Disulfide 1 U 20 20.73 20 21.37 104 107 58-120 3 30 Carbon Tetrachloride 0.5 U 20 21.16 20 21.37 104 107 58-120 3 30 Chlorobenzene 0.5 U 20 21.16 20 20.93 105 105 80-120 0 30 Chloroform 0.5 U 20 21.24 20 18.78 94 94 56-120 0 30 Chloroform 0.5 U 20 21.24 20 21.56 106 108 80-120 2 30
Benzene 0.5 U 20 21.72 20 21.97 109 110 78-120 1 30 Bromochloromethane 1 U 20 19.84 20 20.25 99 101 80-125 2 30 Bromodichloromethane 0.5 U 20 18.9 20 19.21 95 96 80-120 2 30 Bromoform 0.5 U 20 15.21 20 15.21 76 76 59-120 0 30 Bromomethane 0.5 U 20 17.99 20 18.32 90 92 55-123 2 30 2-Butanone 3 U 150 153.79 150 157.73 103 105 57-145 3 30 Carbon Disulfide 1 U 20 20.73 20 21.37 104 107 58-120 3 30 Carbon Tetrachloride 0.5 U
Bromochloromethane 1 U 20 19.84 20 20.25 99 101 80-125 2 30 Bromodichloromethane 0.5 U 20 18.9 20 19.21 95 96 80-120 2 30 Bromoform 0.5 U 20 15.21 20 15.21 76 76 59-120 0 30 Bromomethane 0.5 U 20 17.99 20 18.32 90 92 55-123 2 30 2-Butanone 3 U 150 153.79 150 157.73 103 105 57-145 3 30 Carbon Disulfide 1 U 20 20.73 20 21.37 104 107 58-120 3 30 Carbon Tetrachloride 0.5 U 20 21.01 20 21.37 106 107 74-130 1 30 Chlorobenzene 0.5
Bromodichloromethane 0.5 U 20 18.9 20 19.21 95 96 80-120 2 30 Bromoform 0.5 U 20 15.21 20 15.21 76 76 59-120 0 30 Bromomethane 0.5 U 20 17.99 20 18.32 90 92 55-123 2 30 2-Butanone 3 U 150 153.79 150 157.73 103 105 57-145 3 30 Carbon Disulfide 1 U 20 20.73 20 21.37 104 107 58-120 3 30 Carbon Tetrachloride 0.5 U 20 21.16 20 21.37 106 107 74-130 1 30 Chlorobenzene 0.5 U 20 21.01 20 20.93 105 105 80-120 0 30 Chloroform 0.5 U
Bromoform 0.5 U 20 15.21 20 15.21 76 76 59-120 0 30 Bromomethane 0.5 U 20 17.99 20 18.32 90 92 55-123 2 30 2-Butanone 3 U 150 153.79 150 157.73 103 105 57-145 3 30 Carbon Disulfide 1 U 20 20.73 20 21.37 104 107 58-120 3 30 Carbon Tetrachloride 0.5 U 20 21.16 20 21.37 106 107 74-130 1 30 Chlorobenzene 0.5 U 20 21.01 20 20.93 105 105 80-120 0 30 Chloroform 0.5 U 20 18.78 20 18.73 94 94 56-120 0 30 Chloroform 0.5 U
Bromomethane 0.5 U 20 17.99 20 18.32 90 92 55-123 2 30 2-Butanone 3 U 150 153.79 150 157.73 103 105 57-145 3 30 Carbon Disulfide 1 U 20 20.73 20 21.37 104 107 58-120 3 30 Carbon Tetrachloride 0.5 U 20 21.16 20 21.37 106 107 74-130 1 30 Chlorobenzene 0.5 U 20 21.01 20 20.93 105 105 80-120 0 30 Chlorobethane 0.5 U 20 18.78 20 18.73 94 94 56-120 0 30 Chloroform 0.5 U 20 21.24 20 21.56 106 108 80-120 2 30
2-Butanone 3 U 150 153.79 150 157.73 103 105 57-145 3 30 Carbon Disulfide 1 U 20 20.73 20 21.37 104 107 58-120 3 30 Carbon Tetrachloride 0.5 U 20 21.16 20 21.37 106 107 74-130 1 30 Chlorobenzene 0.5 U 20 21.01 20 20.93 105 105 80-120 0 30 Chloroethane 0.5 U 20 18.78 20 18.73 94 94 56-120 0 30 Chloroform 0.5 U 20 21.24 20 21.56 106 108 80-120 2 30
Carbon Disulfide 1 U 20 20.73 20 21.37 104 107 58-120 3 30 Carbon Tetrachloride 0.5 U 20 21.16 20 21.37 106 107 74-130 1 30 Chlorobenzene 0.5 U 20 21.01 20 20.93 105 105 80-120 0 30 Chloroethane 0.5 U 20 18.78 20 18.73 94 94 56-120 0 30 Chloroform 0.5 U 20 21.24 20 21.56 106 108 80-120 2 30
Carbon Tetrachloride 0.5 U 20 21.16 20 21.37 106 107 74-130 1 30 Chlorobenzene 0.5 U 20 21.01 20 20.93 105 105 80-120 0 30 Chloroethane 0.5 U 20 18.78 20 18.73 94 94 56-120 0 30 Chloroform 0.5 U 20 21.24 20 21.56 106 108 80-120 2 30
Chlorobenzene 0.5 U 20 21.01 20 20.93 105 105 80-120 0 30 Chloroethane 0.5 U 20 18.78 20 18.73 94 94 56-120 0 30 Chloroform 0.5 U 20 21.24 20 21.56 106 108 80-120 2 30
Chloroethane 0.5 U 20 18.78 20 18.73 94 94 56-120 0 30 Chloroform 0.5 U 20 21.24 20 21.56 106 108 80-120 2 30
Chloroform 0.5 U 20 21.24 20 21.56 106 108 80-120 2 30
Chloromethane 0.5 II 20 19.61 20 19.54 99 99 59.127 0 20
0.3 0.3
Cyclohexane 2 U 20 23.45 20 23.53 117 118 65-131 0 30
1,2-Dibromo-3-chloropropane 2 U 20 16.73 20 17.67 84 88 59-120 5 30
Dibromochloromethane 0.5 U 20 18.08 20 18.37 90 92 78-120 2 30
1,2-Dibromoethane 0.5 U 20 20.52 20 20.9 103 104 80-120 2 30
1,2-Dichlorobenzene 1 U 20 20.07 20 20.39 100 102 80-120 2 30
1,3-Dichlorobenzene 1 U 20 19.89 20 20.36 99 102 80-120 2 30
1,4-Dichlorobenzene 1 U 20 20.01 20 20.4 100 102 80-120 2 30
Dichlorodifluoromethane 0.5 U 20 19.26 20 19.68 96 98 49-134 2 30
1,1-Dichloroethane 0.5 U 20 22.3 20 22.82 111 114 80-120 2 30
1,2-Dichloroethane 0.5 U 20 20.63 20 20.56 103 103 66-128 0 30
1,1-Dichloroethene 0.5 U 20 23.67 20 24.07 118 120 76-124 2 30
cis-1,2-Dichloroethene 0.5 U 20 21.23 20 21.67 106 108 80-120 2 30
trans-1,2-Dichloroethene 0.5 U 20 22.77 20 23.11 114 116 80-120 1 30
1,2-Dichloropropane 0.5 U 20 21.46 20 21.89 107 109 80-120 2 30
cis-1,3-Dichloropropene 0.5 U 20 19.21 20 19.68 96 98 80-120 2 30
trans-1,3-Dichloropropene 0.5 U 20 19.27 20 19.57 96 98 76-120 2 30
Ethylbenzene 0.5 U 20 21.75 20 21.81 109 109 78-120 0 30
Freon 113 2 U 20 22.95 20 23.45 115 117 64-136 2 30
2-Hexanone 3 U 100 109.02 100 111.59 109 112 49-146 2 30
Isopropylbenzene 1 U 20 21.55 20 21.69 108 108 80-120 1 30
Methyl Acetate 1 U 20 20.11 20 21.03 100 100 100 100 100 100 100 100 100 1
Methyl Tertiary Butyl Ether 0.5 U 20 20.04 20 20.47 100 102 75-120 2 30
4-Methyl-2-pentanone 3 U 100 108.16 100 110.37 108 110 55-141 2 30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Methylcyclohexane	1 U	20	21.92	20	22.28	110	111	66-126	2	30
Methylene Chloride	2 U	20	21.34	20	21.66	107	108	80-120	2	30
Styrene	1 U	20	20.3	20	20.42	102	102	80-120	1	30
1,1,2,2-Tetrachloroethane	0.5 U	20	20.07	20	20.58	100	103	72-120	3	30
Tetrachloroethene	0.5 U	20	22.1	20	22.23	111	111	80-129	1	30
Toluene	0.5 U	20	21.73	20	21.81	109	109	80-120	0	30
1,2,3-Trichlorobenzene	1 U	20	20.3	20	20.58	102	103	69-120	1	30
1,2,4-Trichlorobenzene	1 U	20	20.54	20	21.05	103	105	72-120	2	30
1,1,1-Trichloroethane	0.5 U	20	21.03	20	21.5	105	107	66-126	2	30
1,1,2-Trichloroethane	0.5 U	20	20.1	20	20.38	100	102	80-120	1	30
Trichloroethene	0.5 U	20	21.74	20	22.15	109	111	80-120	2	30
Trichlorofluoromethane	0.5 U	20	20.03	20	20.18	100	101	67-129	1	30
Vinyl Chloride	0.5 U	20	19.62	20	19.84	98	99	63-121	1	30
m+p-Xylene	0.5 U	40	43.22	40	43.39	108	108	80-120	0	30
o-Xylene	0.5 U	20	20.87	20	21.18	104	106	80-120	1	30
	ng/g	ng/g	ng/g	ng/g	ng/g					
Batch number: 17024006	Sample num	ber(s): 8799	9393-8799	394,8799399-	-8799401	UNSPK: 87	799399			
NEtFOSAA	0.28 U	19.49	26.35	18.69	21.99	135*	118	70-130	18	30
NMeFOSAA	0.28 U	19.49	27.07	18.69	22.63	139*	121	70-130	18	30
Perfluorobutanesulfonate	0.19 U	17.23	16.35	16.52	17.35	95	105	70-130	6	30
Perfluorodecanoic acid	0.19 U	19.49	18.97	18.69	21.57	97	115	70-130	13	30
Perfluorododecanoic acid	0.19 U	19.49	21	18.69	21.82	108	117	70-130	4	30
Perfluoroheptanoic acid	0.19 U	19.49	22.56	18.69	20.35	116	109	70-130	10	30
Perfluorohexanesulfonate	0.19 U	18.44	21.38	17.68	19.89	116	112	70-130	7	30
Perfluorohexanoic acid	0.094 U	19.49	19.95	18.69	21.45	102	115	70-130	7	30
Perfluorononanoic acid	0.094 U	19.49	20.43	18.69	16.45	105	88	70-130	22	30
Perfluoro-octanesulfonate	0.28 U	18.64	18.64	17.87	19.24	100	108	70-130	3	30
Perfluorooctanoic acid	0.19 U	19.49	19.71	18.69	18.54	101	99	70-130	6	30
Perfluorotetradecanoic acid	0.19 U	19.49	20.8	18.69	19.83	107	106	70-130	5	30
Perfluorotridecanoic acid	0.19 U	19.49	19.95	18.69	18.41	102	98	70-130	8	30
Perfluoroundecanoic acid	0.19 U	19.49	20.52	18.69	20.29	105	109	70-130	1	30
	ng/l	ng/l	ng/l	ng/l	ng/l					
Batch number: 17031006	Sample num	ber(s): 8799	9385-8799	391,8799395	,8799397-	8799398,8	3799403	UNSPK: 879	9385	
Perfluorooctanoic acid	92.07	199.12	246.75	199.64	277.89	78	93	70-130	12	30
Perfluorononanoic acid	0.766	199.12	169.34	199.64	161.11	85	80	70-130	5	30
Perfluorodecanoic acid	0.5 U	199.12	166.93	199.64	166.88	84	84	70-130	0	30
Perfluoroundecanoic acid	1 U	199.12	194	199.64	187.04	97	94	70-130	4	30
Perfluorododecanoic acid	0.5 U	199.12	187.34	199.64	175.63	94	88	70-130	6	30
Perfluorotridecanoic acid	0.5 U	199.12	198.26	199.64	194.25	100	97	70-130	2	30
Perfluorotetradecanoic acid	0.5 U	199.12	169.04	199.64	171.5	85	86	70-130	1	30
Perfluorohexanoic acid	13.89	199.12	151.85	199.64	184.09	69*	85	70-130	19	30
Perfluoroheptanoic acid	11.17	199.12	185.75	199.64	187.89	88	89	70-130	1	30
Perfluorobutanesulfonate	6.91	176.03	165.64	176.48	177.55	90	97	70-130	7	30
Perfluorohexanesulfonate	3.06	188.37	167.7	188.86	164.04	87	85	70-130	2	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ng/l	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/1	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max			
Perfluoro-octanesulfonate	5.82	190.36	183.49	190.86	157.7	93	80	70-130	15	30			
Perfluorobutanoic Acid	6.05	199.12	178.42	199.64	183.34	87	89	70-130	3	30			
Perfluoropentanoic Acid	9.88	199.12	187.55	199.64	187.9	89	89	70-130	0	30			
NETFOSAA	1 U	199.12	196.69	199.64	175.79	99	88	70-130	11	30			
NMeFOSAA	1 U	199.12	192.17	199.64	196.85	97	99	70-130	2	30			
	mg/l	mg/l	mg/l	mg/l	mg/l								
Batch number: 170260635001	0260635001 Sample number(s): 8799385,8799388-8799392,8799395-8799396 UNSPK: P799414												
Calcium	30.51	4.00	34.79	4.00	34.86	107 (2)	109 (2)	75-125	0	20			
Magnesium	7.06	2.00	9.11	2.00	9.11	102	102	75-125	0	20			
Potassium	4.94	10	15.46	10	15.46	105	105	75-125	0	20			
Sodium	70.16	10	80.69	10	81.01	105 (2)	108 (2)	75-125	0	20			
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg								
Batch number: 17024667631A	Sample numb	er(s): 8799	9393-8799	394,8799399	IINSPK: 8	799399							
TOC	223 U	20220	16365.48	331,0733333	ONDIE: 0	81		47-143					
	mg/l	mg/l	mg/l	mg/l	mg/l								
Batch number: 17024120601A	Sample numb	er(s): 8799	9385 UNSP	K: 8799385									
Chloride	94.61	400	482.85	. 0,,,,,,,		97		90-110					
Sulfate	12.72	50	59.83			94		90-110					
Batch number: 17024120601B	Sample numb	er(s): 8799	9388-8799	391,8799395	UNSPK: P	799414							
Chloride	149.4	200	358.21			104		90-110					
Sulfate	19.77	50	67.98			96		90-110					
Batch number: 17029118102A	Sample numb	er(s): 8799	9385,8799	388-8799391,	,8799395	UNSPK: 8	799385						
Total Nitrite/Nitrate Nitrogen	4.75	2.00	7.00			113*		90-110					
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3								
Batch number: 17025008103A	-			391 UNSPK: I									
Total Alkalinity to pH 4.5	132.51	188	221.3	188	258.71	47*	67*	84-110	16*	5			
Batch number: 17025008104A Total Alkalinity to pH 4.5	Sample numb 98.28	er(s): 8799 188	9385,8799 230.89	389,8799395	UNSPK: P	798933 71*		84-110					
Batch number: 17025008104B	Sample numb	er(s): 8799	9390 UNSP	K: P798933									
Total Alkalinity to pH 4.5	98.28							84-110					

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD DUP	RPD Max			
	mg/l	mg/l					
Batch number: 170260635001 Calcium Magnesium Potassium Sodium	Sample number(s): 30.51 7.06 4.94 70.16	8799385,8799388-879 30.66 7.05 4.94 70.42	9392,8799395-8799 0 0 0 (1) 0	396 BKG: P799414 20 20 20 20 20			
	mg/kg	mg/kg					
Batch number: 17024667631A	Sample number(s): 223 U	8799393-8799394,879 223 U	9399 BKG: 8799399 0 (1)	7			
	mg/l	mg/l					
Batch number: 17024120601A Chloride Sulfate	Sample number(s): 94.61 12.72	8799385 BKG: 879938 96.85 12.69	2 (1) 0 (1)	15 15			
Batch number: 17024120601B Chloride Sulfate	Sample number(s): 149.4 19.77	8799388-8799391,879 149.87 19.91	9395 BKG: P799414 0 1 (1)	15 15			
Batch number: 17029118102A Total Nitrite/Nitrate Nitrogen	Sample number(s): 4.75	8799385,8799388-879 4.73	9391,8799395 BKG: 0	8799385 2			
	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 17025008103A Total Alkalinity to pH 4.5	Sample number(s): 132.51	8799388,8799391 BKG 133.62	:: P798607 1	5			
Batch number: 17025008104A Total Alkalinity to pH 4.5	Sample number(s): 98.28	8799385,8799389,879 96.1	9395 BKG: P798933 2	5			
Batch number: 17025008104B Total Alkalinity to pH 4.5	Sample number(s): 29.95	8799390 BKG: 879939 25.3	17*	5			
	%	%					
Batch number: 17026820004B Moisture Moisture Moisture Duplicate	Sample number(s): 8.05 8.05 8.05	8799393-8799394,879 8.43 8.43 8.43	9399-8799401 BKG: 5 5 5	8799399, p799399 5 5 5			

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: A170272AA

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: A170272AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8799393	100	103	100	98
8799399	101	102	95	93
8799400	99	100	99	97
8799401	98	101	100	103
Blank	101	101	97	96
LCS	101	100	100	99
LCSD	99	101	98	98
MS	99	100	99	97
MSD	98	101	100	103
Limits:	50-141	54-135	52-141	50-131

Analysis Name: SOM02.2 Volatiles

Batch number: A170301AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8799394	104	109	91	98
Blank	112	121	86	96
LCS	102	106	99	100
LCSD	104	107	96	102
Limits:	50-141	54-135	52-141	50-131

Analysis Name: SOM02.2 Volatiles

Batch number: Y170271AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene			
8799385	96	101	100	99			
8799386	97	99	100	101			
8799387	97	100	100	100			
8799388	95	99	100	99			
8799389	95	100	99	98			
8799390	95	99	100	99			
8799391	95	100	100	98			
8799395	95	100	100	99			
8799402	94	100	100	99			
Blank	95	100	100	98			
LCS	98	98	101	101			
MS	97	99	100	101			
MSD	97	100	100	100			
Limits:	80-116	77-113	80-113	78-113			

Analysis Name: 14 PFCs Batch number: 17024006

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 14 PFCs Batch number: 17024006

	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA	13C8-PFOA	13C8-PFOS	
8799393	71	76	70	72	76	76	
8799394	63*	77	66*	76	76	61*	
8799399	76	83	72	76	93	72	
8799400	73	77	71	77	79	85	
8799401	58*	52*	52*	53*	69*	57*	
Blank	81	96	89	94	106	96	
LCS	80	75	73	78	82	71	
MS	73	77	71	77	79	85	
MSD	58*	52*	52*	53*	69*	57*	
Limits:	70-130	70-130	70-130	70-130	70-130	70-130	

	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA	d5-NEtFOSAA	13C2-PFDoDA
8799393	93	78	64*	73	72	66*
8799394	77	79	60*	65*	61*	63*

8799399 62* 74 75 8799400 81 71 57* 69* 65* 65* 52* 62* 47* 59* 8799401 71 60* Blank 109 90 78 85 99 78 79 69* 78 80 78 LCS 83 57* 69* 65* 65* MS 81 71 59* 52* 47* MSD 71 60* 62*

Limits: 70-130 70-130 70-130 70-130 70-130

13C2-PFTeDA 8799393 8799394 60* 8799399 66* 64* 8799400 8799401 56* Blank 75 LCS 75 MS 64* MSD 56*

Limits: 70-130

Analysis Name: 16 PFCs Batch number: 17031006

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8799385	75	85	92	77	80	80
8799386	75	80	94	80	77	78
8799387	88	104	102	86	86	92
8799388	89	99	108	84	88	97

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 17031006

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8799389	78	89	103	89	90	102
8799390	70	84	97	77	81	94
8799391	81	98	109	81	82	94
3799395	84	108	120	86	72	83
8799397	74	74	72	83	73	82
8799398	78	81	78	69*	81	81
3799403	78	76	70	81	75	84
3lank	71	67*	65*	70	63*	71
LCS	78	78	82	101	97	96
MS	75	80	94	80	77	78
MSD	88	104	102	86	86	92
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
3799385	75	79	83	79	67*	73
3799386	78	75	89	69*	58*	57*
8799387	85	98	98	96	98	90
8799388	79	89	89	78	73	72
8799389	77	92	87	81	68*	76
3799390	83	79	94	73	72	68*
3799391	90	94	100	86	89	80
3799395	82	96	99	87	86	73
3799397	80	79	74	72	75	67*
3799398	74	83	94	82	82	71
3799403	76	79	78	67*	66*	60*
3lank	73	73	79	72	73	67*
LCS	95	80	91	81	80	73
MS	78	75	89	69*	58*	57*
MSD	85	98	98	96	98	90
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	-IF NIELEOCAA	1202 DED-DA	1202 DET-DA			

	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA
8799385	90	60*	63*
8799386	62*	60*	62*
8799387	98	89	84
8799388	89	69*	68*
8799389	96	71	74
8799390	82	68*	61*
8799391	103	75	71
8799395	81	65*	67*
8799397	77	62*	62*
8799398	88	71	70
8799403	76	67*	59*

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757183

Reported: 02/07/2017 10:47

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 17031006

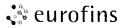
	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
Blank	72	58*	54*	
LCS	78	64*	71	
MS	62*	60*	62*	
MSD	98	89	84	
Limits:	70-130	70-130	70-130	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



Lancaster Environmental Services Analysis Request/Chain of Custody

Acct. #:	1757183					Sample #: 8799385-1									-403			COC#: 16303					
Client: C.T. Male Associates					Matrix								Ar	alys	es F	Requ	quested				For Lab Use Only		
Project Name/#: SGPP - Merrimack	Site ID:								Preservation						on (Codes				SF#: <u>286377</u>			
Project Manager: Kirk Moline	P.O. #:				=	PE :	မ္တ	٤		Н	N	S									SCR#: <u>200</u> 2	<u> 80</u>	
Sampler: Stephen Johnson STJ					Sediment	Ground	Surface	Water		S				0 B)							Preser	vation Codes	
Phone #: 715-529-1670	Quote #:	Quote #: 214135							ers	TICs	<u></u>	(353.2)	3.2)	4 2320	mod.)	·A					H = HCI	T = Thiosulfa	ıte
State where sample(s) were collected: NH						9 (- 1	Tree	Containers	(၁၀	(6010C)		<u></u>	P (SN	537 1	VOC.5					N = HNO ₃	B = NaOH	
		4.5		je,	Ą	Potable				(8260C)	, K	SON.	(300.0)	Carb/Bicarb (SM	ΡĀ			لح			S = H ₂ SO ₄	P = H ₃ PO ₄	
	Colle	ection		osit	/ `		Ć	:	# of	VOAs	Mg, Na, K	102 /	SO4- (Carb/	S)	2.7	FCS	Moistur	20		O = Other		
Sample Identification	Date	Time	Grab	Composite	Soil	Water	1	Other	Total	TCL V	Ca, Mc	Total NO2 / NO3	Cl-, SC	ALK +	16 PFCs (EPA 537	72	<u>a</u>	M	F		Re	marks	
Shz-4108-57-58-170119	44/17	1004	X			X			21	×	×	×	X	X	X						MIMSE	<u> </u>	
Shz-AP08-67-68-170119	419/17	1208	X			y				×	×	ý	\ \{\gamma}	X	X							i din	
Shz-4108-77-78-170119	419/17	1433	У			X			1	X	×	×	×	\(\sigma\)	×								
542- FA03-170119	419/17	C STATE OF THE STA	X			×			-	X	X	×	×	X	×								
SAZ-APOR-81-82-170120	1/20/17	0918	Х			X			12	X	'X)	X	X	\bowtie	×						F: Han	chale	
Sh2-APO9-25-3-170120	42017	1118	\rtimes		X			6	5							X	X	X	X				
Sh2-APO9-6-8-170120	1/20/17	1129	×		×.				5						>	X	X	×	X				
Sh2-APO9-11-12-170120	120/17	1224	Х			\times		Ì	12	X	X	X	\bowtie	×	X						F: Itin Metals		
S42-FB03-170120	Y 20/17	1420	X					X							X								
PFC Topblank	· · · · · · · · · · · · · · · · · · ·	relative to the second	$\langle \rangle$					X							\mathcal{A}								
Turnaround Time Requested (TAT) (please of	check): Stan	dard 🗌	RUSH	4 🕅		nquish				-		Date			Time フィ		Rece	eived	l by:		Date	Time	Į.
(RUSH TAT is subject to Eurofins Lancaster Laboratori	es approval	and surchar	rges.)			nquishe			Nomeno		- /	2.0/17 Date			Time	0	Rece	aivod	l bye		Date	Time	
Date results are needed: E-mail address to send RUSH results:					Keili	riquisiie	eu by	<i>,</i> .				Date			IIIIE		Kec	SIVEO	ιυy.		Date	Tillie	
Data Package Options (please check if require	red)				Reli	nquish	ed by	/ :				Date		and a second	Time		Rece	eivec	l by:		Date	Time	
Type I (Validation/non-CLP) ✓ MA MC	·	TX TRRP	· - 13									San San San San San San San San San San											
Type III (Reduced non-CLP) CT RC					Reli	nquish	ed by	<u>/:</u>	Market Market			Date			Time		Rece	eivec	Нбу:		Date	Time	;
	ype A 🗌						AND THE PROPERTY OF		***,														
ype VI (Raw Data Only) ASP Type B				Reli	nquish	ed by	y :				Date			Time		Ŕec		a —		Date	Time		
EDD Format: EQuIS					Airhi	ll No.:											$-\ell$	<u>/,}-</u>	h11		12/17	912	
If site-specific QC (MS/MSD/Dup) required, i	ndicate Q	C sample	s and		Relin	quished	-										'					A 8	
submit triplicate volume.					UPS		_ Fe	edEx			Othe	r					Tem	pera	ture u	pon rec	eipt <u>OO -</u>	<u>0.∂</u> °C	

Environmental Analysis Request/Chain of Custody

CT RCP

MA MCP

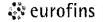
NYSDEC Category A or B

Cancaster Laboratories Environmental	Acct. #	37191				caster Lab							5-	40	3			C	OC #	* 512	2678
Client Informatio	n					Matrix	MARKE LOYE	Section of the second		ekenne Englishe (nestike	Ļ	naly	/sis l	Requ	este	d	open (in the second second		For Lab U	se Only	
Client:	Acct. #:	Mills of the Constitution and Advantage and the			П			1				Pres	ervat	ion C	odes				FSC:		
CT Make Associates	514615				စ္ခ) }	~~~~	~						K-motosopoversis	AND THE PROPERTY OF THE PARTY O	SCR#:		
Project Name/#: SWPP - Merrimack	PWSID #:				Tissue	ace)cst		1.63		553		-	(los					Preson	ervation (Codes hiosulfate
Project Manager: Kink Moline	P.O. #:] Ground] Surface		ırs	(8260C)+T	(00100)	25 M	(300.0)	Sm 2320 B)	527 mad					N=HNO S=H ₂ SO	3 B =N	laOH
Sampler: Shiphin Johnson 55	Quote #:				ent		T.	aine	260	- ×	NO3.	(30	, RJ	EPA	VOCS				Nation of the Contract of the	Remark	S
State where samples were collected: For Compliance:			1	T.	Sediment	able	(L)	a til		7	1	, _		U	Š						
Yes	No □			# E	Sec	Potable NPDES	Pre	5	V CAS	My	340,	504	100	况 3	22	ķ	in C	ري			
Sample Identification	Colle	ected	Grab	Composite	Soil	Water	Other:	Total # of Containers	727	Ca, M	- C - C	CI'.	A K	9	77	P P.C.S	Moislanc	T0			
•	Date	Time	نَّ [ပိ	So	M.	ð	-0.000 CONTRACTOR OF THE PARTY	<i>}</i>		1,000			*****	1000						
SGZ-AP06-6-8-17011B	V18/17	1548	X		X		ļ.,	13	<u> </u>	ļ					X	X	X	M	MSMSI	<u>)</u>	
VOCTAID Blank PFC Trys Blank			K				X	2	X	ļ											<u> </u>
PFC Trp Blank		,	×	<u> </u>			<u> </u>		<u> </u>					X							
			<u> </u>			S.		<u> </u>									annowe better 1990				
			<u> </u>					ļ													
		V.Comp. O.C.	<u> </u>	<u> </u>				ļ													
			<u> </u>							ļ											
						, carpent,, co	ļ														
								<u> </u>		ļ											
															***************************************		Koakedoni/turki//				
Turnaround Time (TAT) Requested) /	le)	Relind	uished	- 1	// /				Date	1-17	Time	U2	Receiv	ed by					Date	Time
	ush)		Beling	uished	Ohr.	# 1	·			Date	1-11	Time	76	Receiv	ed by					Date	Time
(Rush TAT is subject to laboratory approval and surcharg	e.)			,u.o.,ou	~,	*									,						
Date results are needed:		_	Relind	uished	by			, ,		Date		Time		Receiv	red by				and the second s	Date	Time
E mail addraga			Relina	uished	hv	A STATE OF THE STA				Date		Time		Receiv	red by	- Andrews				Date	Time
E-mail address:	aquirod\		Leilik	quioi ieu	UY					Date		111111111111111111111111111111111111111		110001	, ou by					Dute	1,1110
Type I (EPA Level 3			Relina	uished	by					Date		Time		Receiv	red by	1	^			Date	Time
Equivalent/non-CLP) Type VI	(Raw Data	Only)													P	ih	11			1/4/12	9.20
Type III (Reduced non-CLP) NJ DKQI	ר צד כ	TRRP-13	ingristlenike	Sul/Admontol statica	Soller VISA soudretti de	EDD Re	quire	d?	(es)	No	HANNAN PAR EST	randytva-gramini							cial Carrie	r:	
Type in (Headood Holl-OL) / No Dice	17		1		If yes	format: _		F21	115			_		UI	PS _		Fedl	Ex 🏒	Other		

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Temperature upon receipt <u>60 55</u>°C



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

173642

Group Number(s): 1757183

Client: C.T. Male

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

01/20/2017 9:45

Number of Packages:

2

Number of Projects:

1

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

N/A

Custody Seal Present:

Yes

Sample Date/Times match COC:

N/A

Custody Seal Intact: Yes VOA Vial Headspace ≥ 6mm:

No

Samples Chilled:

Yes

Total Trip Blank Qty:

3

Paperwork Enclosed:

No Trip Blank Type: N/A

Samples Intact: Missing Samples: Yes

No

Extra Samples:

Discrepancy in Container Qty on COC:

No N/A Air Quality Samples Present:

No

Unpacked by Karen Diem (3060) at 19:50 on 01/20/2017

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler#	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	0.9	DT	Wet	Υ	Bagged	N
2	DT121	0.6	DT	Wet	Υ	Bagged	N
3	DT121	0.5	DT	Wet	Υ	Bagged	N

Paperwork Not Enclosed Details

Sample ID on Label see att paper

No. of Containers 1

Date on Label 1/20/2017 20:06

Comments

General Comments:

SEE ATT PAPER

1757183 1-16-17 - 1553 - 4 Bottle's Tuicel's APO4-27-28-170116 - 5 Bothes - 7 vials 1-17-17 FADI- 170117 8 BoHles - 13 vals - 1 aB/mg ADOU-44-45 - 170117 1-17-17 1046 APO3-68-69-170116 1422 - 7Battles - 70018. 1-16-17 0915 - 5 Battles - 70, 10/5 APOU - 34-36-170117 1-17-17 14za - 4BOHLES-7-VICITS APOU- 64-65- 17017 1-17-17 1706 - 5BHHES- M-VICUS 1-17-17 AZU-54-55-17017 1057 - 5BitHes-7 wals APOU - 83.6-845 170118 - 1-18-17 0843 - 2 Bittles - Mucals - 1-18-17 APO4-74-75-170118 1117 - 1BOHLE - 15011 Jan-APOUL \$20-21.5 - 170116 1-16-17 1120 - a Bottles 1-18-17 FB03 - 170118 988 - 1 Bettle - 1 soil Jan 1-16-17 APOZ - 7-8 - 170116 1033 - 180 Hle - 15017 Ret 1-12e-17 A-POZ - 12-13-170116 1546-1BONHE 1-18-17 Apole - 11-8 170118 1522 - 1 BOHHE -1-5011 DEV Aprile - 25-45170118 1-18-17 1320 - 1BOHHE-1501 Jan APOS - 11.5-145170118 1-18-17 1300 - 1-BOHHE- 1501 Ju APOS - 7-8-170118 1-18+17 1848 - a Botthes - 1501 Jun 1-18-17 Atole - 6-8 170118 1145 - 1 Bottle-1-501 Jun 1-16-17 3-5 14011le -SORA 1381 - 1Bottle 1-50/Ter 1-18-17 APOZ- 2-3-170/18 1057 - 1 Bottle 1-18-17 APOXI - 83.5-84.5170118 1087 - 1501 Jar 1-16-17 - 17-18-17014 SOGA. of 1 Bothe - 1 soil Tow 1-18-17 FDOZ. 170118

2TB Hei

178-Bottle



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

173687

Group Number(s): [757183

Client: C.T Male Associates

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

01/21/2017 9:20

Number of Packages:

Number of Projects:

1

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

No

Custody Seal Present:

Yes

Sample Date/Times match COC:

No

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

Air Quality Samples Present:

No

Samples Chilled:

Yes

Total Trip Blank Qty:

6

Paperwork Enclosed:

Yes

Trip Blank Type:

See Below No

Samples Intact: Missing Samples: Yes No

Extra Samples:

No

Discrepancy in Container Qty on COC:

Yes

Trip Blank Type(s): (2UNP.) (4HCL)

Unpacked by Porsha Hill (12046) at 11:54 on 01/21/2017

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler#	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	0.0	DT	Wet	Υ	Bagged	N
2	DT121	0.5	DT	Wet	Υ	Bagged	N
3	DT121	0.3	DT	Wet	Υ	Bagged	N
4	DT121	0.5	DT	Wet	Υ	Bagged	N

Container Quantity Discrepancy Details

Sample ID on COC

Container Qty. Received

Container Qty. on COC

Comments

AP04-44-45-170117

22

21

Sample ID Discrepancy Details

Sample ID on COC

Sample ID on Label

Comments

FD03-170119

FD01-170119

only HCI vials

AP08-57-58-170119

AP08-58-59-070119

Sample Date/Time Discrepancy Details

Sample ID on COC

Date/Time on Label

Comments

AP04-34-35-170117

1/17/2017 09:15

T : 717-656-2300 F 717-656-2681 www.LancasterLabs.cor



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RLkg Reporting Limit **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: February 07, 2017

Project: SGPP - Merrimack

Submittal Date: 01/21/2017 Group Number: 1757184 SDG: MMK17 PO Number: 16.6126 State of Sample Origin: NH

	Lancaster Labs
Client Sample Description	<u>(LL) #</u>
SG2-AP02-3-5-170116 Grab Soil	8799404
SG2-AP02-7-8-170116 Grab Soil	8799405
SG2-AP02-12-13-170116 Grab Soil	8799406
SG2-AP02-17-18-170116 Grab Soil	8799407
SG2-AP02-20-21.5-170116 Grab Soil	8799408
SG2-AP03-68-69-170116 Grab Groundwater	8799409
SG2-AP03-68-69-170116 Filtered Grab Groundwater	8799410
SG2-AP04-27-28-170116 Grab Groundwater	8799411
SG2-AP04-34-35-170117 Grab Groundwater	8799412
SG2-AP04-34-35-170117 Filtered Grab Groundwater	8799413
SG2-AP04-44-45-170117 Grab Groundwater	8799414
SG2-AP04-44-45-170117MS Grab Groundwater	8799415
SG2-AP04-44-45-170117MSD Grab Groundwater	8799416
SG2-FD01-170117 Grab Groundwater	8799417
SG2-FD01-170117 Filtered Grab Groundwater	8799418

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	Barr Engineering Company	Attn: Jonathon Carter
Electronic Copy To	Barr Engineering Company	Attn: Lauren Brady
Electronic Copy To	C. T. Male Associates	Attn: Jeff Marx
Electronic Copy To	C. T. Male Associates	Attn: Dan Reilly
Electronic Copy To	C. T. Male Associates	Attn: Kirk Moline



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

Nancy Jean Bornhow

(717) 556-7250



Project Name: SGPP - Merrimack LL Group #: 1757184

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260C, GC/MS Volatiles

Batch #: A170272AA (Sample number(s): 8799404-8799408 UNSPK: P799399)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: 1,2-Dibromo-3-chloropropane, 2-Hexanone EPA 537 Rev 1.1, Misc. Organics

Sample #s: 8799415, 8799417

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample #s: 8799409, 8799411, 8799412, 8799414

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits. The recovery of the extraction standard E13C3-PFHxS was outside QC acceptance criteria at 132% in the opening CCV associated with this sample. Since the recovery of the E13C3-PFHxS was within acceptance criteria in the sample, the data is reported.

<u>Batch #: 17030004 (Sample number(s): 8799409, 8799411-8799412, 8799414-8799417 UNSPK: 8799414)</u>

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8799409, 8799411, 8799412, 8799414, 8799415, 8799417, Blank, LCS, MS EPA 537 Rev. 1.1 modified, Misc. Organics

Sample #s: 8799404, 8799405, 8799406, 8799407, 8799408

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Batch #: 17024006 (Sample number(s): 8799404-8799408 UNSPK: P799399)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: NEtFOSAA, NMeFOSAA

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8799404, 8799405, 8799406, 8799407, 8799408, LCS, MS, MSD

EPA 353.2, Wet Chemistry

<u>Batch #: 17029118102A (sample number(s): 8799409, 8799411-8799412, 8799417 UNSPK: P799385 BKG: P799385)</u>

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Nitrite/Nitrate Nitrogen

SW-846 9060 modified, Wet Chemistry

<u>Sample #s: 8799405, 8799406, 8799407, 8799408</u>

Due to the nature of this sample matrix, the sample cup was filled to capacity with less than 1000 mg of sample being used. The lowered sample weight has resulted in a raised reporting limit.

Batch #: 17024667631B (Sample number(s): 8799408 UNSPK: P799432 BKG: P799432)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: TOC Solids/Sludges Combustion

SM 2320 B-1997, Wet Chemistry

<u>Batch #: 17025008103A (Sample number(s): 8799411 UNSPK: P798607 BKG: P797952, P798607)</u>

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Total Alkalinity to pH 4.5

The relative percent difference(s) for the following analyte(s) in the MS/MSD were outside outside acceptance windows: Total Alkalinity to pH 4.5

<u>Batch #: 17025008104A (Sample number(s): 8799412, 8799414, 8799417 UNSPK: P798933</u>

<u>BKG: P798933, P799390)</u>

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Alkalinity to pH 4.5

<u>Batch #: 17026002103A (Sample number(s): 8799409 UNSPK: P804238 BKG: P804217, P804238)</u>

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Alkalinity to pH $4.5\,$



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-3-5-170116 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799404 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 11:45 by SJ

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

01K17 SDG#: MMK17-01

				Dry Method	Dry Limit of	
CAT No.	Analysis Name	CAS Number	Dry Result	Detection Limit*	Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	mg/kg	mg/kg	mg/kg	
11995	Acetone	67-64-1	0.021 J	0.008	0.022	1.01
11995	Benzene	71-43-2	0.0006 U	0.0006	0.006	1.01
11995	Bromochloromethane	74-97-5	0.001 U	0.001	0.006	1.01
11995	Bromodichloromethane	75-27-4	0.001 U	0.001	0.006	1.01
11995	Bromoform	75-25-2	0.001 U	0.001	0.006	1.01
11995	Bromomethane	74-83-9	0.002 U	0.002	0.006	1.01
11995	2-Butanone	78-93-3	0.004 U	0.004	0.011	1.01
11995	Carbon Disulfide	75-15-0	0.001 U	0.001	0.006	1.01
11995	Carbon Tetrachloride	56-23-5	0.001 U	0.001	0.006	1.01
11995	Chlorobenzene	108-90-7	0.001 U	0.001	0.006	1.01
11995	Chloroethane	75-00-3	0.002 U	0.002	0.006	1.01
11995	Chloroform	67-66-3	0.001 U	0.001	0.006	1.01
11995	Chloromethane	74-87-3	0.002 U	0.002	0.006	1.01
11995	Cyclohexane	110-82-7	0.001 U	0.001	0.006	1.01
11995	1,2-Dibromo-3-chloropropane	96-12-8	0.002 U	0.002	0.006	1.01
11995	Dibromochloromethane	124-48-1	0.001 U	0.001	0.006	1.01
11995	1,2-Dibromoethane	106-93-4	0.001 U	0.001	0.006	1.01
11995	1,2-Dichlorobenzene	95-50-1	0.001 U	0.001	0.006	1.01
11995	1,3-Dichlorobenzene	541-73-1	0.001 U	0.001	0.006	1.01
11995	1,4-Dichlorobenzene	106-46-7	0.001 U	0.001	0.006	1.01
11995	Dichlorodifluoromethane	75-71-8	0.002 U	0.002	0.006	1.01
11995	1,1-Dichloroethane	75-34-3	0.001 U	0.001	0.006	1.01
11995	1,2-Dichloroethane	107-06-2	0.001 U	0.001	0.006	1.01
11995	1,1-Dichloroethene	75-35-4	0.001 U	0.001	0.006	1.01
11995	cis-1,2-Dichloroethene	156-59-2	0.001 U	0.001	0.006	1.01
11995	trans-1,2-Dichloroethene	156-60-5	0.001 U	0.001	0.006	1.01
11995	1,2-Dichloropropane	78-87-5	0.001 U	0.001	0.006	1.01
11995	cis-1,3-Dichloropropene	10061-01-5	0.001 U	0.001	0.006	1.01
11995	trans-1,3-Dichloropropene	10061-02-6	0.001 U	0.001	0.006	1.01
11995	Ethylbenzene	100-41-4	0.001 U	0.001	0.006	1.01
11995	Freon 113	76-13-1	0.002 U	0.002	0.011	1.01
11995	2-Hexanone	591-78-6	0.003 U	0.003	0.011	1.01
11995	Isopropylbenzene	98-82-8	0.001 U	0.001	0.006	1.01
11995	Methyl Acetate	79-20-9	0.002 U	0.002	0.006	1.01
11995	Methyl Tertiary Butyl Ether	1634-04-4	0.0006 U	0.0006	0.006	1.01
11995	4-Methyl-2-pentanone	108-10-1	0.003 U	0.003	0.011	1.01
11995	Methylcyclohexane	108-87-2	0.001 U	0.001	0.006	1.01
11995	Methylene Chloride	75-09-2	0.002 U	0.002	0.006	1.01
11995	Styrene	100-42-5	0.001 U	0.001	0.006	1.01
11995	1,1,2,2-Tetrachloroethane	79-34-5	0.001 U	0.001	0.006	1.01
11995	Tetrachloroethene	127-18-4	0.001 U	0.001	0.006	1.01
11995	Toluene	108-88-3	0.001 U	0.001	0.006	1.01
11995	1,2,3-Trichlorobenzene	87-61-6	0.001 U	0.001	0.006	1.01
11995	1,2,4-Trichlorobenzene	120-82-1	0.001 U	0.001	0.006	1.01
11995	1,1,1-Trichloroethane	71-55-6	0.001 U	0.001	0.006	1.01
11995	1,1,2-Trichloroethane	79-00-5	0.001 U	0.001	0.006	1.01
11995	Trichloroethene	79-01-6	0.001 U	0.001	0.006	1.01
11995	Trichlorofluoromethane	75-69-4	0.002 U	0.002	0.006	1.01
11995	Vinyl Chloride	75-01-4	0.001 U	0.001	0.006	1.01
11995	m+p-Xylene	179601-23-1	0.001 U	0.001	0.006	1.01

^{*=}This limit was used in the evaluation of the final result



0.50

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-3-5-170116 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799404 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 11:45 by SJ C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 12:57

01K17 SDG#: MMK17-01

00111 Moisture

as-received basis.

CAT No.	Analysis Name		CAS Number	Dry Result	:	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	mg/kg		mg/kg	mg/kg	
11995	o-Xylene		95-47-6	0.001	U	0.001	0.006	1.01
00882	VOA Library Sea The results from th FORM 1 - VOA-TIC. on the back of this	e volatile li The qualifier	-					
Misc.	Organics	EPA 537 R	ev. 1.1	ng/g		ng/g	ng/g	
		modified						
14027	NETFOSAA		2991-50-6	0.32	U	0.32	0.96	1
	NEtFOSAA is the acr	onym for N-et			fonamidoacetic			
14027	NMeFOSAA		2355-31-9	0.32	U	0.32	0.96	1
	NMeFOSAA is the acr							
14027	Perfluorobutanesulf		375-73-5	0.21	U	0.21	0.64	1
14027	Perfluorodecanoic a		335-76-2	0.21	Ŭ	0.21	0.64	1
14027	Perfluorododecanoic		307-55-1	0.21	U	0.21	0.64	1
14027	Perfluoroheptanoic		375-85-9	0.21	Ŭ	0.21	0.64	1
14027	Perfluorohexanesulf		355-46-4	0.21	Ŭ	0.21	0.64	1
14027	Perfluorohexanoic a		307-24-4	0.11	J	0.11	0.43	1
14027	Perfluorononanoic a		375-95-1	0.11	U	0.11	0.43	1
14027	Perfluoro-octanesul		1763-23-1	0.32	U	0.32	0.96	1
14027	Perfluorooctanoic a		335-67-1	0.35	J	0.21	0.64	1
14027			376-06-7	0.21	Ŭ	0.21	0.64	1
14027			72629-94-8	0.21	U	0.21	0.64	1
14027	Perfluoroundecanoic		2058-94-8	0.21	Ŭ .	0.21	0.64	1
	stated QC limits are be obtained to calcu			ent dat	a points			
Wet Cl	nemistry	SW-846 90	60 modified	mg/kg		mg/kg	mg/kg	
02079	TOC		n.a.	1,350		184	551	1
Wet Cl	nemistry	SM 2540 G	-1997	%		%	%	

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

n.a. Moisture represents the loss in weight of the sample after oven drying at

 $103\,$ - $\,105\,$ degrees Celsius. The moisture result reported is on an

Laboratory Sample Analysis Record

CAT	Analysis Name	Method	Trial#	Batch#	Analysis	Analyst	Dilution
No.					Date and Time		Factor
11995	SOM02.2 Volatiles	SW-846 8260C	1	A170272AA	01/28/2017 00:40	Stephen C Nolte	1.01



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-3-5-170116 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799404 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 11:45 by SJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 12:57

01K17 SDG#: MMK17-01

	Laboratory Sample Analysis Record											
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor				
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	1	201702344142	01/16/2017	11:45	Client Supplied	1				
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	2	201702344142	01/16/2017	11:45	Client Supplied	1				
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201702344142	01/16/2017	11:45	Client Supplied	1				
14027	14 PFCs	EPA 537 Rev. 1.1 modified	1	17024006	01/26/2017	16:22	Marissa C Drexinger	1				
14090	PFC Solid Prep	EPA 537 Rev. 1.1 modified	1	17024006	01/24/2017	14:10	Devon M Whooley	1				
02079	TOC	SW-846 9060 modified	1	17024667631A	01/24/2017	14:01	Drew M Gerhart	1				
00111	Moisture	SM 2540 G-1997	1	17026820004B	01/26/2017	12:53	Larry E Bevins	1				

^{*=}This limit was used in the evaluation of the final result



Number TICs found: 2

page 1 of 1

Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA	SAMPLE NO.	
VOLATILE ORGANICS ANALYSIS DATA SHEET	_		_
TENTATIVELY IDENTIFIED COMPOUNDS	!		!
	!	01K17	!
Lab Name: Lancaster Laboratories Contract:	!		_!
Lab Code: LANCAS Case No.: SAS No.:	SDG	No.:	
Matrix: (soil/water) SOIL Lab Sample ID: 8799404			

(mg/L or mg/Kg) mg/Kg

Matrix: (soil/water) SOIL

Sample wt/vol: 4.96 (g/mL) g
Level: (low/med) LOW

Moisture: not dec. 8.5

Lab Sample ID: 8799404

Lab File ID: HP09685.i/17jan27b.b/aj27s30.d

Date Received: 01/21/17

Date Analyzed: 01/28/17

% Moisture: not dec. 8.5

Column: (pack/cap) CAP

CONCENTRATION UNITS:

! ! CAS NUMBER			EST. CONC.	
! 1. ! 2. 556-67-2		10.34	0.008	! J !
! 3. ! 4. VOCTIC ! 5.	! !Total VOC TICs _!	! ! !	0.02	
! 6	!	!!		!!
! 8		!!		!!
!10! !11		!! !!		!! !!
!12! !13	_!	!! !!		!! !!
		!! !!	!	!! !!
!17	_	!!		!! !!
!19	-!	!!		!!
! 21		!!		!!
! 23 ! 24 .	_!	!!		!!
! 25 . ! 26 .		!! !		!! !
! 27.		!! !!		!!
! 29. ! 30.	_!	!! !!		!! !!
!	.!	!!		!!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-7-8-170116 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799405 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 09:55 by SJ

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

02K17 SDG#: MMK17-02

				Dry	Dry	
CAT			Dry	Method Detection Limit*	Limit of Quantitation	Dilution
No.	Analysis Name	CAS Number	Result	Detection Limit*	Quantitation	Factor
GC/MS	Volatiles SW-846	8260C	mg/kg	mg/kg	mg/kg	
11995	Acetone	67-64-1	0.010 J	0.008	0.023	1.03
11995	Benzene	71-43-2	0.0006 U	0.0006	0.006	1.03
11995	Bromochloromethane	74-97-5	0.001 U	0.001	0.006	1.03
11995	Bromodichloromethane	75-27-4	0.001 U	0.001	0.006	1.03
11995	Bromoform	75-25-2	0.001 U	0.001	0.006	1.03
11995	Bromomethane	74-83-9	0.002 U	0.002	0.006	1.03
11995	2-Butanone	78-93-3	0.005 U	0.005	0.012	1.03
11995	Carbon Disulfide	75-15-0	0.001 U	0.001	0.006	1.03
11995	Carbon Tetrachloride	56-23-5	0.001 U	0.001	0.006	1.03
11995	Chlorobenzene	108-90-7	0.001 U	0.001	0.006	1.03
11995	Chloroethane	75-00-3	0.002 U	0.002	0.006	1.03
11995	Chloroform	67-66-3	0.001 U	0.001	0.006	1.03
11995	Chloromethane	74-87-3	0.002 U	0.002	0.006	1.03
11995	Cyclohexane	110-82-7	0.001 U	0.001	0.006	1.03
11995	1,2-Dibromo-3-chloropropane	96-12-8	0.002 U	0.002	0.006	1.03
11995	Dibromochloromethane	124-48-1	0.001 U	0.001	0.006	1.03
11995	1,2-Dibromoethane	106-93-4	0.001 U	0.001	0.006	1.03
11995	1,2-Dichlorobenzene	95-50-1	0.001 U	0.001	0.006	1.03
11995	1,3-Dichlorobenzene	541-73-1	0.001 U	0.001	0.006	1.03
11995	1,4-Dichlorobenzene	106-46-7	0.001 U	0.001	0.006	1.03
11995	Dichlorodifluoromethane	75-71-8	0.002 U	0.002	0.006	1.03
11995	1,1-Dichloroethane	75-34-3	0.001 U	0.001	0.006	1.03
11995	1,2-Dichloroethane	107-06-2	0.001 U	0.001	0.006	1.03
11995	1,1-Dichloroethene	75-35-4	0.001 U	0.001	0.006	1.03
11995	cis-1,2-Dichloroethene	156-59-2	0.001 U	0.001	0.006	1.03
11995	trans-1,2-Dichloroethene	156-60-5	0.001 U	0.001	0.006	1.03
11995	1,2-Dichloropropane	78-87-5	0.001 U	0.001	0.006	1.03
11995	cis-1,3-Dichloropropene	10061-01-5	0.001 U	0.001	0.006	1.03
11995	trans-1,3-Dichloropropene	10061-02-6	0.001 U	0.001	0.006	1.03
11995	Ethylbenzene	100-41-4	0.001 U	0.001	0.006	1.03
11995	Freon 113	76-13-1	0.002 U	0.002	0.012	1.03
11995	2-Hexanone	591-78-6	0.003 U	0.003	0.012	1.03
11995	Isopropylbenzene	98-82-8	0.001 U	0.001	0.006	1.03
11995	Methyl Acetate	79-20-9	0.002 U	0.002	0.006	1.03
11995	Methyl Tertiary Butyl Ether	1634-04-4	0.0006 U	0.0006	0.006	1.03
11995	4-Methyl-2-pentanone	108-10-1	0.003 U	0.003	0.012	1.03
11995	Methylcyclohexane	108-87-2	0.001 U	0.001	0.006	1.03
11995	Methylene Chloride	75-09-2	0.002 U	0.002	0.006	1.03
11995	Styrene	100-42-5	0.001 U	0.001	0.006	1.03
11995	1,1,2,2-Tetrachloroethane	79-34-5	0.001 U	0.001	0.006	1.03
11995	Tetrachloroethene	127-18-4	0.001 U	0.001	0.006	1.03
11995	Toluene	108-88-3	0.001 U	0.001	0.006	1.03
11995	1,2,3-Trichlorobenzene	87-61-6	0.001 U	0.001	0.006	1.03
11995	1,2,4-Trichlorobenzene	120-82-1	0.001 U	0.001	0.006	1.03
11995	1,1,1-Trichloroethane	71-55-6	0.001 U	0.001	0.006	1.03
11995	1,1,2-Trichloroethane	79-00-5	0.001 U	0.001	0.006	1.03
11995	Trichloroethene	79-01-6	0.001 U	0.001	0.006	1.03
11995	Trichlorofluoromethane	75-69-4	0.002 U	0.002	0.006	1.03
11995	Vinyl Chloride	75-01-4	0.001 U	0.001	0.006	1.03
11995	m+p-Xylene	179601-23-1	0.001 U	0.001	0.006	1.03

^{*=}This limit was used in the evaluation of the final result



Drv

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-7-8-170116 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799405 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 09:55 by SJ

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Drv

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 12:57

02K17 SDG#: MMK17-02

CAT No.	Analysis Name		CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	50C	mg/kg		mg/kg	mg/kg	
-	o-Xylene		95-47-6	0.001	U	0.001	0.006	1.03
00882	VOA Library Sea	rch						
	The results from the FORM 1 - VOA-TIC. on the back of this	The qualifier						
Misc.	Organics	EPA 537 Re	ev. 1.1	ng/g		ng/g	ng/g	
		modified						
14027	NETFOSAA		2991-50-6	0.33	U	0.33	0.98	1
	NEtFOSAA is the acr	onym for N-et						
14027	NMeFOSAA		2355-31-9	0.33	U	0.33	0.98	1
	NMeFOSAA is the acr							
14027	Perfluorobutanesulf		375-73-5	0.22	U	0.22	0.66	1
	Perfluorodecanoic a		335-76-2	0.22	U	0.22	0.66	1
	Perfluorododecanoio		307-55-1	0.22	U	0.22	0.66	1
	Perfluoroheptanoic		375-85-9	0.22	U	0.22	0.66	1
14027			355-46-4	0.22	U	0.22	0.66	1
14027			307-24-4	0.11	U	0.11	0.44	1
14027			375-95-1	0.11	U	0.11	0.44	1
14027			1763-23-1	0.33	U	0.33	0.98	1
14027			335-67-1	0.27	J	0.22	0.66	1
	Perfluorotetradecan		376-06-7	0.22	U	0.22	0.66	1
14027			72629-94-8	0.22	U	0.22	0.66	1
	Perfluoroundecanoic		2058-94-8	0.22	Ŭ .	0.22	0.66	1
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.								
Wet Ch	nemistry	SW-846 906	0 modified	mg/kg		mg/kg	mg/kg	
02079	TOC		n.a.	195	U	195	584	1
	Due to the nature of	f this sample	matrix, the sa	ample cu	p was filled			
	to capacity with le sample weight has r		_	_				
Wet Ch	nemistry	SM 2540 G-	-1997	%		%	%	
00111	Moisture		n.a.	11.1		0.50	0.50	1
	Moisture represents 103 - 105 degrees C as-received basis.					ng at		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-7-8-170116 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799405 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 09:55 by SJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 12:57

02K17 SDG#: MMK17-02

Laboratory Sample Analysis Record								
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11995	SOM02.2 Volatiles	SW-846 8260C	1	A170272AA	01/28/2017	01:03	Stephen C Nolte	1.03
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	1	201702344142	01/16/2017	09:55	Client Supplied	1
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	2	201702344142	01/16/2017	09:55	Client Supplied	1
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201702344142	01/16/2017	09:55	Client Supplied	1
14027	14 PFCs	EPA 537 Rev. 1.1 modified	1	17024006	01/26/2017	16:42	Marissa C Drexinger	1
14090	PFC Solid Prep	EPA 537 Rev. 1.1 modified	1	17024006	01/24/2017	14:10	Devon M Whooley	1
02079	TOC	SW-846 9060 modified	1	17024667631A	01/24/2017	14:08	Drew M Gerhart	1
00111	Moisture	SM 2540 G-1997	1	17026820004B	01/26/2017	12:53	Larry E Bevins	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E VOLATILE ORGANICS ANAI	EPA SAMPLE NO.			
TENTATIVELY IDENTIF		!	02K17	!
ab Name: Lancaster Laboratories	Contract:	: !	UZKI/	!
ab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	
atrix: (soil/water) SOIL	Lab Sample ID: 87994	0.5		
ample wt/vol: 4.84 (g/mL) g	Lab File ID: HP09685	.i/17ja	an27b.b/a	j27s31.d
evel: (low/med) LOW	Date Received: 01/21	/17		
Moisture: not dec. 11.1	Date Analyzed: 01/28	/17		
olumn: (pack/cap) CAP	Dilution Factor: 1.0	1		
	CONCENTRATION UNIT	'S:		
Number TICs found: 1	(mg/L or mg/Kg) mg	/Kg		

CAS NUMBER	! COMPOUND NAME	! RT !	EST. CONC.	
	!Cyclotetrasiloxane, octameth			•
	!Total VOC TICs	! !	0.007	! J !
		!!		!
		!!		!
7	!	!!		!
8	!!	!!		!
	!!	!!		!
	!!	!!		!
	_!!	!!		!
	! !	!!		!
	_!!	!!		!
	_!!	!!		!
	_!!			
	_!	!!		!
	<u> </u>			!
	_ ! !			!
	_	!		!
	_!	!		!
	!			!
	_!!	·		:
	!:	·		:
	!	·		:
	_ <u>;</u>	ii		:
	_ <u>;</u>	ii		·
	_ !	;;		i ———
		ii		i
0		;i		·
~ ·		ii		i

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-12-13-170116 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799406 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 10:33 by SJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 12:57

SDG#: MMK17-03

03K17

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	mg/kg	mg/kg	mg/kg	
11995	Acetone	67-64-1	0.007 U	0.007	0.021	0.99
11995	Benzene	71-43-2	0.0005 U	0.0005	0.005	0.99
11995	Bromochloromethane	74-97-5	0.001 U	0.001	0.005	0.99
11995	Bromodichloromethane	75-27-4	0.001 U	0.001	0.005	0.99
11995	Bromoform	75-25-2	0.001 U	0.001	0.005	0.99
11995	Bromomethane	74-83-9	0.002 U	0.002	0.005	0.99
11995	2-Butanone	78-93-3	0.004 U	0.004	0.010	0.99
11995	Carbon Disulfide	75-15-0	0.001 U	0.001	0.005	0.99
11995	Carbon Tetrachloride	56-23-5	0.001 U	0.001	0.005	0.99
11995	Chlorobenzene	108-90-7	0.001 U	0.001	0.005	0.99
11995	Chloroethane	75-00-3	0.002 U	0.002	0.005	0.99
11995	Chloroform	67-66-3	0.001 U	0.001	0.005	0.99
11995	Chloromethane	74-87-3	0.002 U	0.002	0.005	0.99
11995	Cyclohexane	110-82-7	0.001 U	0.001	0.005	0.99
11995	1,2-Dibromo-3-chloropropane	96-12-8	0.002 U	0.002	0.005	0.99
11995	Dibromochloromethane	124-48-1	0.001 U	0.001	0.005	0.99
11995	1,2-Dibromoethane	106-93-4	0.001 U	0.001	0.005	0.99
11995	1,2-Dichlorobenzene	95-50-1	0.001 U	0.001	0.005	0.99
11995	1,3-Dichlorobenzene	541-73-1	0.001 U	0.001	0.005	0.99
11995	1,4-Dichlorobenzene	106-46-7	0.001 U	0.001	0.005	0.99
11995	Dichlorodifluoromethane	75-71-8	0.002 U	0.002	0.005	0.99
11995	1,1-Dichloroethane	75-34-3	0.001 U	0.001	0.005	0.99
11995	1,2-Dichloroethane	107-06-2	0.001 U	0.001	0.005	0.99
11995	1,1-Dichloroethene	75-35-4	0.001 U	0.001	0.005	0.99
11995	cis-1,2-Dichloroethene	156-59-2	0.001 U	0.001	0.005	0.99
11995	trans-1,2-Dichloroethene	156-60-5	0.001 U	0.001	0.005	0.99
11995	1,2-Dichloropropane	78-87-5	0.001 U	0.001	0.005	0.99
11995	cis-1,3-Dichloropropene	10061-01-5	0.001 U	0.001	0.005	0.99
11995	trans-1,3-Dichloropropene	10061-02-6	0.001 U	0.001	0.005	0.99
11995	Ethylbenzene	10001 02 0	0.001 U	0.001	0.005	0.99
11995	Freon 113	76-13-1	0.002 U	0.002	0.010	0.99
11995	2-Hexanone	591-78-6	0.003 U	0.002	0.010	0.99
11995	Isopropylbenzene	98-82-8	0.001 U	0.003	0.005	0.99
11995	Methyl Acetate	79-20-9	0.002 U	0.002	0.005	0.99
11995	Methyl Tertiary Butyl Ether	1634-04-4	0.0005 U	0.0005	0.005	0.99
11995	4-Methyl-2-pentanone	108-10-1	0.003 U	0.003	0.010	0.99
11995	Methylcyclohexane	108-87-2	0.001 U	0.001	0.005	0.99
11995	Methylene Chloride	75-09-2	0.002 U	0.002	0.005	0.99
11995	Styrene	100-42-5	0.001 U	0.001	0.005	0.99
11995	1,1,2,2-Tetrachloroethane	79-34-5	0.001 U	0.001	0.005	0.99
11995	Tetrachloroethene	127-18-4	0.001 U	0.001	0.005	0.99
11995	Toluene	108-88-3	0.001 U	0.001	0.005	0.99
11995	1,2,3-Trichlorobenzene	87-61-6	0.001 U	0.001	0.005	0.99
11995	1,2,4-Trichlorobenzene	120-82-1	0.001 U	0.001	0.005	0.99
11995	1,1,1-Trichloroethane	71-55-6	0.001 U	0.001	0.005	0.99
11995	1,1,2-Trichloroethane	79-00-5	0.001 U	0.001	0.005	0.99
11995	Trichloroethene	79-00-5	0.001 U	0.001	0.005	0.99
11995	Trichlorofluoromethane	75-69-4	0.001 U	0.001	0.005	0.99
11995	Vinyl Chloride	75-09-4	0.002 U	0.002	0.005	0.99
11995	m+p-Xylene	179601-23-1	0.001 U	0.001	0.005	0.99
11333	m+b-vàteme	1/2001-23-1	0.001 0	0.001	0.003	U.77

^{*=}This limit was used in the evaluation of the final result



Drv

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-12-13-170116 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799406 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 10:33 by SJ

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Drv

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 12:57

03K17 SDG#: MMK17-03

CAT No.	Analysis Name		CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	mg/kg		mg/kg	mg/kg	
11995	o-Xylene		95-47-6	0.001 t	J	0.001	0.005	0.99
00882	VOA Library Se	earch						
	The results from FORM 1 - VOA-TIC. on the back of the	The qualifier						
Misc.	Organics	EPA 537 R	ev. 1.1	ng/g		ng/g	ng/g	
		${ t modified}$						
14027	NEtFOSAA		2991-50-6	0.29 t	•	0.29	0.88	1
	NEtFOSAA is the a	cronym for N-et	hyl perfluorood		onamidoacetic	Acid.		
14027	NMeFOSAA		2355-31-9	0.29 t	-	0.29	0.88	1
	NMeFOSAA is the a	cronym for N-me	thyl perfluorod	octanesulf	fonamidoaceti	c Acid.		
14027	Perfluorobutanesu	lfonate	375-73-5	0.19 t	J	0.19	0.58	1
14027	Perfluorodecanoic	acid	335-76-2	0.19 t	J	0.19	0.58	1
14027	Perfluorododecano	ic acid	307-55-1	0.19 t	J	0.19	0.58	1
14027	Perfluoroheptanoi	c acid	375-85-9	0.19 t	J	0.19	0.58	1
14027	Perfluorohexanesu	lfonate	355-46-4	0.19 t	J	0.19	0.58	1
14027	Perfluorohexanoic	acid	307-24-4	0.097 t	J	0.097	0.39	1
14027	Perfluorononanoic	acid	375-95-1	0.097 t	J	0.097	0.39	1
14027	Perfluoro-octanes	ulfonate	1763-23-1	0.29 t	J	0.29	0.88	1
14027	Perfluorooctanoic	acid	335-67-1	0.29	J	0.19	0.58	1
14027	Perfluorotetradeca	anoic acid	376-06-7	0.19 t	J	0.19	0.58	1
14027	Perfluorotridecan	oic acid	72629-94-8	0.19 t	J	0.19	0.58	1
14027	Perfluoroundecano	ic acid	2058-94-8	0.19 t	J	0.19	0.58	1
The s	stated OC limits ar	re advisory onl	v until suffici	ent data	points			
	pe obtained to calc	-	-		F			
Wet Ch	nemistry	SW-846 90	60 modified	mg/kg		mg/kg	mg/kg	
02079	TOC		n.a.	217	U	217	651	1
	Due to the nature	of this sample	matrix, the sa	ample cup	was filled			
	to capacity with sample weight has				. The lowered			
Wet Ch	nemistry	SM 2540 G	-1997	%		%	%	
00111	Moisture		n.a.	4.6		0.50	0.50	1
	Moisture represen 103 - 105 degrees as-received basis	Celsius. The r				ng at		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-12-13-170116 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799406 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 10:33 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

	Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor			
11995	SOM02.2 Volatiles	SW-846 8260C	1	A170272AA	01/28/2017	01:26	Stephen C Nolte	0.99			
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	1	201702344142	01/16/2017	10:33	Client Supplied	1			
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	2	201702344142	01/16/2017	10:33	Client Supplied	1			
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201702344142	01/16/2017	10:33	Client Supplied	1			
14027	14 PFCs	EPA 537 Rev. 1.1 modified	1	17024006	01/26/2017	17:03	Marissa C Drexinger	1			
14090	PFC Solid Prep	EPA 537 Rev. 1.1 modified	1	17024006	01/24/2017	14:10	Devon M Whooley	1			
02079	TOC	SW-846 9060 modified	1	17024667631A	01/24/2017	14:17	Drew M Gerhart	1			
00111	Moisture	SM 2540 G-1997	1	17026820004B	01/26/2017	12:53	Larry E Bevins	1			

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E VOLATILE ORGANICS ANA	ALVOTO DATA CHEET	EPA SAMPLE NO.	
VOLATILE ORGANICS AND TENTATIVELY IDENTIF	! ! ! ! 03K17 !		
ab Name: Lancaster Laboratories	Contract:	ii	
	Lab Sample ID: 8799	9406	
dample wt/vol: 5.05 (g/mL) g devel: (low/med) LOW	Lab File ID: HP0968 Date Received: 01/2	35.i/17jan27b.b/aj27s32. 21/17	. d
Moisture: not dec. 4.6	Date Analyzed: 01/2		
olumn: (pack/cap) CAP	Dilution Factor: 1. CONCENTRATION UNI		
Number TICs found: 1	(mg/L or mg/Kg) m	ng/Kg	

! COMPOUND NAME !		EST. CONC.	
•			•
! !Total VOC TICs !	: !	0.007	: ! J
_!!	!		!
_!!	!		!
_!!	!		!
	!		!
	!		!
	!		!
	!		!
	!		!
	!		!
			!
			!
			!
			!
	:		<u> </u>
	:		:
	:		:
	i		:
	i		:
	i		i
	i		i ———
	i		;
	i		;
	i		;——
	i		· ——
- <u>i</u> i	i		
		Cyclotetrasiloxane, octameth 12.00 Total VOC TICS	Cyclotetrasiloxane, octameth 12.00 0.007 Total VOC TICs 0.007 Total voc Tics 0.007

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-17-18-170116 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799407 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 10:57 by SJ

C. T. Male Associates

50 Century Hill Drive Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 8	260C	mg/kg	mg/kg	mg/kg	
11995	Acetone	67-64-1	0.007 U	0.007	0.021	0.99
11995	Benzene	71-43-2	0.0005 U	0.0005	0.005	0.99
11995	Bromochloromethane	74-97-5	0.001 U	0.001	0.005	0.99
11995	Bromodichloromethane	75-27-4	0.001 U	0.001	0.005	0.99
11995	Bromoform	75-25-2	0.001 U	0.001	0.005	0.99
11995	Bromomethane	74-83-9	0.002 U	0.002	0.005	0.99
11995	2-Butanone	78-93-3	0.004 U	0.004	0.011	0.99
11995	Carbon Disulfide	75-15-0	0.001 U	0.001	0.005	0.99
11995	Carbon Tetrachloride	56-23-5	0.001 U	0.001	0.005	0.99
11995	Chlorobenzene	108-90-7	0.001 U	0.001	0.005	0.99
11995	Chloroethane	75-00-3	0.002 U	0.002	0.005	0.99
11995	Chloroform	67-66-3	0.001 U	0.001	0.005	0.99
11995	Chloromethane	74-87-3	0.002 U	0.002	0.005	0.99
11995	Cyclohexane	110-82-7	0.001 U	0.001	0.005	0.99
11995	1,2-Dibromo-3-chloropropane	96-12-8	0.002 U	0.002	0.005	0.99
11995	Dibromochloromethane	124-48-1	0.001 U	0.001	0.005	0.99
11995	1,2-Dibromoethane	106-93-4	0.001 U	0.001	0.005	0.99
11995	1,2-Dichlorobenzene	95-50-1	0.001 U	0.001	0.005	0.99
11995	1,3-Dichlorobenzene	541-73-1	0.001 U	0.001	0.005	0.99
11995	1,4-Dichlorobenzene	106-46-7	0.001 U	0.001	0.005	0.99
11995	Dichlorodifluoromethane	75-71-8	0.002 U	0.002	0.005	0.99
11995	1,1-Dichloroethane	75-34-3	0.001 U	0.001	0.005	0.99
11995	1,2-Dichloroethane	107-06-2	0.001 U	0.001	0.005	0.99
11995	1,1-Dichloroethene	75-35-4	0.001 U	0.001	0.005	0.99
11995	cis-1,2-Dichloroethene	156-59-2	0.001 U	0.001	0.005	0.99
11995	trans-1,2-Dichloroethene	156-60-5	0.001 U	0.001	0.005	0.99
11995	1,2-Dichloropropane	78-87-5	0.001 U	0.001	0.005	0.99
11995	cis-1,3-Dichloropropene	10061-01-5	0.001 U	0.001	0.005	0.99
11995	trans-1,3-Dichloropropene	10061-01-5	0.001 U	0.001	0.005	0.99
11995	Ethylbenzene	10001-02-0	0.001 U	0.001	0.005	0.99
11995	Freon 113	76-13-1	0.001 U	0.002	0.003	0.99
11995	2-Hexanone	591-78-6	0.002 U	0.002	0.011	0.99
11995	Isopropylbenzene	98-82-8	0.003 U	0.003	0.005	0.99
11995	Methyl Acetate	79-20-9	0.001 U	0.001	0.005	0.99
11995	Methyl Tertiary Butyl Ether	1634-04-4	0.002 U	0.002	0.005	0.99
11995	4-Methyl-2-pentanone	108-10-1	0.0005 U	0.0003	0.005	0.99
11995	Methylcyclohexane	108-10-1	0.003 U	0.003	0.005	0.99
11995	Methylene Chloride	75-09-2	0.001 U	0.001	0.005	0.99
11995	Styrene Chioride	100-42-5	0.002 U	0.002	0.005	0.99
11995	-	79-34-5	0.001 U		0.005	0.99
11995	1,1,2,2-Tetrachloroethane Tetrachloroethene		0.001 U	0.001		0.99
11995	Toluene Toluene	127-18-4 108-88-3	0.001 U 0.001 U	0.001	0.005	
				0.001	0.005	0.99
11995	1,2,3-Trichlorobenzene	87-61-6	0.001 U	0.001	0.005	0.99
11995	1,2,4-Trichlorobenzene	120-82-1	0.001 U	0.001	0.005	0.99
11995	1,1,1-Trichloroethane	71-55-6	0.001 U	0.001	0.005	0.99
11995	1,1,2-Trichloroethane	79-00-5	0.001 U	0.001	0.005	0.99
11995	Trichloroethene	79-01-6	0.001 U	0.001	0.005	0.99
11995	Trichlorofluoromethane	75-69-4	0.002 U	0.002	0.005	0.99
11995	Vinyl Chloride	75-01-4	0.001 U	0.001	0.005	0.99
11995	m+p-Xylene	179601-23-1	0.001 U	0.001	0.005	0.99

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-17-18-170116 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799407 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 10:57 by SJ

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 12:57

04K17 SDG#: MMK17-04

CAT No.	Analysis Name		CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	0C	mg/kg		mg/kg	mg/kg	
•	o-Xylene		95-47-6	0.001	U	0.001	0.005	0.99
00882	VOA Library Sea	rch						
	The results from th FORM 1 - VOA-TIC. on the back of this	The qualifier:						
Misc.	Organics	EPA 537 Re	v. 1.1	ng/g		ng/g	ng/g	
		modified						
14027	NETFOSAA		2991-50-6	0.30	U	0.30	0.90	1
	NEtFOSAA is the acr	onym for N-etl	hyl perfluorood	tanesul	fonamidoacetic	Acid.		
14027	NMeFOSAA	_	2355-31-9	0.30	U	0.30	0.90	1
	NMeFOSAA is the acr	onym for N-met	thyl perfluoroc	ctanesu	lfonamidoaceti	c Acid.		
14027	Perfluorobutanesulf		375-73-5	0.20	U	0.20	0.60	1
14027	Perfluorodecanoic a	cid	335-76-2	0.20	U	0.20	0.60	1
14027	Perfluorododecanoic	acid	307-55-1	0.20	U	0.20	0.60	1
14027	Perfluoroheptanoic	acid	375-85-9	0.20	U	0.20	0.60	1
14027	Perfluorohexanesulf	onate	355-46-4	0.20	U	0.20	0.60	1
14027	Perfluorohexanoic a	cid	307-24-4	0.10	Ū	0.10	0.40	1
14027	Perfluorononanoic a	cid	375-95-1	0.10	Ū	0.10	0.40	1
14027	Perfluoro-octanesul	fonate	1763-23-1	0.30	Ū	0.30	0.90	1
14027	Perfluorooctanoic a	cid	335-67-1	0.20	IJ	0.20	0.60	1
14027	Perfluorotetradecan	oic acid	376-06-7	0.20	Ū	0.20	0.60	1
14027			72629-94-8	0.20	Ū	0.20	0.60	1
14027	Perfluoroundecanoic		2058-94-8	0.20	IJ	0.20	0.60	1
	stated OC limits are				-	0.20	0.00	-
	pe obtained to calcul			ciic dace	i poines			
Wet Ch	nemistry	SW-846 906	0 modified	mg/kg		mg/kg	mg/kg	
02079	TOC		n.a.	197	IJ	197	592	1
02075	Due to the nature o	f thic cample			•	137	3,72	_
	to capacity with le	_		-	-			
	sample weight has r							
Wet Ch	nemistry	SM 2540 G-	1997	%		%	%	
00111	-		n.a.	7.3		0.50	0.50	1
00111	Moisture represents	the loss in t			fter oven dryi		0.50	-
	103 - 105 degrees C		-	-	-	ily ac		
	as-received basis.	CIBIUB. IIIE III	DIBCUIC ICBUIL	reporte	a 15 OII aII			
	as received basis.							

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-17-18-170116 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799407 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 10:57 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

	Laboratory Sample Analysis Record									
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor		
11995	SOM02.2 Volatiles	SW-846 8260C	1	A170272AA	01/28/2017	01:48	Stephen C Nolte	0.99		
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	1	201702344142	01/16/2017	10:57	Client Supplied	1		
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	2	201702344142	01/16/2017	10:57	Client Supplied	1		
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201702344142	01/16/2017	10:57	Client Supplied	1		
14027	14 PFCs	EPA 537 Rev. 1.1 modified	1	17024006	01/26/2017	17:23	Marissa C Drexinger	1		
14090	PFC Solid Prep	EPA 537 Rev. 1.1 modified	1	17024006	01/24/2017	14:10	Devon M Whooley	1		
02079	TOC	SW-846 9060 modified	1	17024667631A	01/24/2017	14:25	Drew M Gerhart	1		
00111	Moisture	SM 2540 G-1997	1	17026820004B	01/26/2017	12:53	Larry E Bevins	1		

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E VOLATILE ORGANICS ANAL	VOIC DATA CUEET	EPA SAMPLE NO.			
TENTATIVELY IDENTIFI		! !	04K17	! !	
Lab Name: Lancaster Laboratories Lab Code: LANCAS Case No.:	Contract: SAS No.:	!_ SDG	No.:	!	
Matrix: (soil/water) SOIL	Lab Sample ID: 8799407		0=1 1		
Sample wt/vol: 5.05 (g/mL) g Level: (low/med) LOW	Lab File ID: HP09685.i Date Received: 01/21/1		an27b.b/	aj27s	:33.d
Moisture: not dec. 7.3	Date Analyzed: 01/28/1	7			
Column: (pack/cap) CAP	Dilution Factor: 1.0 CONCENTRATION UNITS:				
Number TICs found: 1	(mg/L or mg/Kg) mg/Kg	Э			

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
1. 556-67-2 2.	!Cyclotetrasiloxane, octameth			•
3. VOCTIC 4	! !Total VOC TICs	: ! !	0.008	: ! J !
5.	!	i ——— i		: !
	_!	!!		!
7		!!		!
	_!	!!		!
	_!	!!		!
		!!		!
	_!	!		!
		!		!
	_ ! !			<u>;</u>
	<u>-</u>	ii		;———
	- <u>;</u>	ii		·
				;
18.	!	i ——— i		!
19.	!			! !
20	!	!!		!
	!	!!		!
	!	!!		!
	_!	!!	l	!
	_!	!!		!
	_!	!!		!
	_!	!!	·	!
	_!	!!		!
28		!!		!
	_!	!		!
30		!!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-20-21.5-170116 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799408 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 11:17 by SJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 12:57

				Dry Method	Dry Limit of	
CAT No.	Analysis Name	CAS Number	Dry Result	Detection Limit*	Quantitation	Dilution Factor
	-					Factor
-	Volatiles SW-846		mg/kg	mg/kg	mg/kg	
11995	Acetone	67-64-1	0.009 J	0.008	0.023	1.01
11995	Benzene	71-43-2	0.0006 U	0.0006	0.006	1.01
11995	Bromochloromethane	74-97-5	0.001 U	0.001	0.006	1.01
11995	Bromodichloromethane	75-27-4	0.001 U	0.001	0.006	1.01
11995	Bromoform	75-25-2	0.001 U	0.001	0.006	1.01
11995	Bromomethane	74-83-9	0.002 U	0.002	0.006	1.01
11995	2-Butanone	78-93-3	0.005 U	0.005	0.012	1.01
11995	Carbon Disulfide	75-15-0	0.001 U	0.001	0.006	1.01
11995	Carbon Tetrachloride	56-23-5	0.001 U	0.001	0.006	1.01
11995	Chlorobenzene	108-90-7	0.001 U	0.001	0.006	1.01
11995	Chloroethane	75-00-3	0.002 U	0.002	0.006	1.01
11995	Chloroform	67-66-3	0.001 U	0.001	0.006	1.01
11995	Chloromethane	74-87-3	0.002 U	0.002	0.006	1.01
11995	Cyclohexane	110-82-7	0.001 U	0.001	0.006	1.01
11995	1,2-Dibromo-3-chloropropane	96-12-8	0.002 U	0.002	0.006	1.01
11995	Dibromochloromethane	124-48-1	0.001 U	0.001	0.006	1.01
11995	1,2-Dibromoethane	106-93-4	0.001 U	0.001	0.006	1.01
11995	1,2-Dichlorobenzene	95-50-1	0.001 U	0.001	0.006	1.01
11995	1,3-Dichlorobenzene	541-73-1	0.001 U	0.001	0.006	1.01
11995	1,4-Dichlorobenzene	106-46-7	0.001 U	0.001	0.006	1.01
11995	Dichlorodifluoromethane	75-71-8	0.002 U	0.002	0.006	1.01
11995	1,1-Dichloroethane	75-34-3	0.001 U	0.001	0.006	1.01
11995	1,2-Dichloroethane	107-06-2	0.001 U	0.001	0.006	1.01
11995	1,1-Dichloroethene	75-35-4	0.001 U	0.001	0.006	1.01
11995	cis-1,2-Dichloroethene	156-59-2	0.001 U	0.001	0.006	1.01
11995	trans-1,2-Dichloroethene	156-60-5	0.001 U	0.001	0.006	1.01
11995	1,2-Dichloropropane	78-87-5	0.001 U	0.001	0.006	1.01
11995	cis-1,3-Dichloropropene	10061-01-5	0.001 U	0.001	0.006	1.01
11995	trans-1,3-Dichloropropene	10061-02-6	0.001 U	0.001	0.006	1.01
11995	Ethylbenzene	100-41-4	0.001 U	0.001	0.006	1.01
11995	Freon 113	76-13-1	0.002 U	0.002	0.012	1.01
11995	2-Hexanone	591-78-6	0.003 U	0.003	0.012	1.01
11995	Isopropylbenzene	98-82-8 79-20-9	0.001 U	0.001	0.006	1.01
11995 11995	Methyl Acetate	1634-04-4	0.002 U 0.0006 U	0.002 0.0006	0.006 0.006	1.01 1.01
11995	Methyl Tertiary Butyl Ether		0.0006 U		0.006	1.01
11995	4-Methyl-2-pentanone Methylcyclohexane	108-10-1 108-87-2	0.003 U	0.003 0.001	0.012	1.01
11995	Methylene Chloride	75-09-2	0.001 U	0.001	0.006	1.01
11995	Styrene Chioride	100-42-5	0.002 U 0.001 U		0.006	1.01
11995	1,1,2,2-Tetrachloroethane	79-34-5	0.001 U	0.001 0.001	0.006	1.01
11995	Tetrachloroethene	127-18-4	0.001 U	0.001	0.006	1.01
11995	Toluene	108-88-3	0.001 U	0.001	0.006	1.01
11995		87-61-6	0.001 U	0.001	0.006	1.01
11995	1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene	120-82-1	0.001 U	0.001	0.006	1.01
11995	1,1,1-Trichloroethane	71-55-6	0.001 U	0.001	0.006	1.01
11995	1,1,2-Trichloroethane	79-00-5	0.001 U	0.001	0.006	1.01
11995	Trichloroethene	79-00-5 79-01-6	0.001 U	0.001	0.006	1.01
11995	Trichlorofluoromethane	75-69-4	0.001 U	0.001	0.006	1.01
11995	Vinyl Chloride	75-69-4 75-01-4	0.002 U	0.002	0.006	1.01
11995	m+p-Xylene	179601-23-1	0.001 U	0.001	0.006	1.01
11223	m±b-vì telle	1/9001-23-1	0.001 0	0.001	0.000	1.01

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-20-21.5-170116 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799408 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 11:17 by SJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 12:57

05K17 SDG#: MMK17-05

CAT No.	Analysis Name		CAS Number	Dry Result		Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	mg/kg		mg/kg	mg/kg	
11995	o-Xylene		95-47-6	0.001	U	0.001	0.006	1.01
00882	VOA Library Se	arch						
	The results from t FORM 1 - VOA-TIC. on the back of thi	The qualifier	-					
Misc.	Organics	EPA 537 R	ev. 1.1	ng/g		ng/g	ng/g	
		modified						
14027	NETFOSAA		2991-50-6	0.55	U	0.33	1.0	1
	NEtFOSAA is the ac	ronym for N-et						_
14027	NMeFOSAA	c	2355-31-9		U	0.33	1.0	1
1 4000	NMeFOSAA is the ac	-					0 68	1
14027	Perfluorobutanesul		375-73-5		U 	0.22	0.67	1
	Perfluorodecanoic		335-76-2		U 	0.22	0.67	1
	Perfluorododecanoi		307-55-1		U	0.22	0.67	1
	Perfluoroheptanoio		375-85-9		U	0.22	0.67	1
14027	Perfluorohexanesul		355-46-4		U	0.22	0.67	1
14027 14027	Perfluorohexanoic Perfluorononanoic		307-24-4 375-95-1		U U	0.11 0.11	0.45 0.45	1
	Perfluoronomamore		1763-23-1		IJ	0.33	1.0	1
	Perfluorooctanoic		335-67-1		τJ	0.22	0.67	1
	Perfluorotetradeca		376-06-7		U	0.22	0.67	1
14027	Perfluorotridecano		72629-94-8		TT	0.22	0.67	1
14027			2058-94-8		TJ	0.22	0.67	1
The s	stated QC limits ar be obtained to calc	e advisory onl	y until suffici		-	0.22	0.07	1
Wet Ch	nemistry	SW-846 90	60 modified	mg/kg		mg/kg	mg/kg	
02079	TOC		n.a.	220	U	220	659	1
	Due to the nature to capacity with l sample weight has	ess than 1000	mg of sample be	eing used	. The lowered	ı		
Wet Ch	nemistry	SM 2540 G	-1997	%		8	%	
00111	Moisture		n.a.	13.1		0.50	0.50	1
	Moisture represent 103 - 105 degrees as-received basis.	Celsius. The r				ng at		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-20-21.5-170116 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799408 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 11:17 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

	Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor			
11995	SOM02.2 Volatiles	SW-846 8260C	1	A170272AA	01/28/2017	02:11	Stephen C Nolte	1.01			
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	1	201702344142	01/16/2017	11:17	Client Supplied	1			
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	2	201702344142	01/16/2017	11:17	Client Supplied	1			
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201702344142	01/16/2017	11:17	Client Supplied	1			
14027	14 PFCs	EPA 537 Rev. 1.1 modified	1	17024006	01/26/2017	17:44	Marissa C Drexinger	1			
14090	PFC Solid Prep	EPA 537 Rev. 1.1 modified	1	17024006	01/24/2017	14:10	Devon M Whooley	1			
02079	TOC	SW-846 9060 modified	1	17024667631B	01/24/2017	14:33	Drew M Gerhart	1			
00111	Moisture	SM 2540 G-1997	1	17026820004B	01/26/2017	12:53	Larry E Bevins	1			

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.	
		!	_ _!
	ORGANICS ANALYSIS DATA SHEET IVELY IDENTIFIED COMPOUNDS ! Oratories	!	
ab Name: Lancaster Laboratories	Contract:	!	!
ab Code: LANCAS Case No.:	SAS No.:	SDG No.:	
Matrix: (soil/water) SOIL	Lab Sample ID: 8799	9408	
Sample wt/vol: 4.94 (g/mL) g	Lab File ID: HP096	85.i/17jan27b.b/aj2	27s34.d
evel: (low/med) LOW	Date Received: 01/2	21/17	
Moisture: not dec. 13.1	Date Analyzed: 01/2	28/17	
column: (pack/cap) CAP	Dilution Factor: 1	. 0	
	CONCENTRATION UNI	ITS:	
Number TICs found: 1	(mg/L or mg/Kg) m	mg/Kg	

CAS NUMBER	! COMPOUND NAME :=!===========	RT!	EST. CONC.	~
1. 556-67-2	!Cyclotetrasiloxane, octameth			•
2. VOCTIC	! !Total VOC TICs	!!!!	0.008	! ! .T
	_!!	i	0.000	. 0
		i		!
6.	<u> </u>			!
	!!			
8	_!!	!		!
9	_!!	!!		!
0	_!!	!!		!
	_!!	!!		!
	!!	!!		!
	!!	!!		!
	!!	!!		!
	!			
	!	·		<u>!</u>
	!			!
				<u> </u>
	!! !			<u> </u>
				:
		·i		i
		i		:
	<u> </u>	i		;
	· ·			;
				!
8.	!	·		!
9				!
	!	!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP03-68-69-170116 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799409 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 14:22 by SJ C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 12:57

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP03-68-69-170116 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799409 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 14:22 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

06K17 SDG#: MMK17-06

CAT No.	Analysis Name		CAS Number	As Re Resul	eceived Lt	As Received Method Detection Lim	As Received Limit of it* Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea	arch						
	The results from t FORM 1 - VOA-TIC. on the back of thi	The qualifie:						
Misc.	Organics	EPA 537 R	ev 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic	acid	335-67-1	95		0.5	2	1
10954			375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic	acid	335-76-2	0.5	Ū	0.5	2	1
10954	Perfluoroundecanoi	c acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoi	c acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecano	ic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradeca	noic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic	acid	307-24-4	11		0.5	2	1
10954	-		375-85-9	10		0.5	2	1
10954			375-73-5	3		0.7	2	1
10954			355-46-4	5		1	3	1
10954			1763-23-1	2	U	2	6	1
	Perfluorobutanoic		375-22-4	4	J	3	10	1
10954		Acid	2706-90-3	7		0.5	2	1
10954			2991-50-6	1	U	1	3	1
	NETFOSAA is the ac NMeFOSAA NMeFOSAA is the ac stated QC limits are be obtained to calcu	ronym for N-me advisory onl	2355-31-9 ethyl perfluoro Ly until suffic	1 ooctanes	U sulfonamido	1	3	1
QC a this acce	recovery of the extraceptance criteria as sample. Since the eptance criteria in t	at 132% in the recovery of t the sample, th	e opening CCV a the E13C3-PFHxS ne data is repo	ssociat was wi orted.	ed with			
Metal	-	SW-846 60		mg/l		mg/l	mg/l	
01750			7440-70-2	35.3		0.0382	0.400	1
01757	Magnesium		7439-95-4	9.88		0.0190	0.200	1
01762	Potassium		7440-09-7	8.09		0.160	1.00	1
01767	Sodium		7440-23-5	49.5		0.173	2.00	1
Wet C	hemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	109		10.0	20.0	50
00228	Sulfate		14808-79-8	14.3		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitr		n.a.	4.4		0.20	0.50	5
		-						

^{*=}This limit was used in the evaluation of the final result

mg/l as CaCO3

mg/l as CaCO3

mg/l as CaCO3

SM 2320 B-1997



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP03-68-69-170116 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799409 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 14:22 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

06K17 SDG#: MMK17-06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Ch	nemistry SM 2320	B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	32.8	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	32.8	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170272AA	01/27/2017	10:55	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170272AA	01/27/2017	10:55	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17030004	02/01/2017	17:40	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17030004	01/30/2017	15:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017	14:17	Katlin N Cataldi	1
01757	Magnesium	SW-846 6010C	1	170260635001	01/27/2017	14:17	Katlin N Cataldi	1
01762	Potassium	SW-846 6010C	1	170260635001	01/27/2017	14:17	Katlin N Cataldi	1
01767	Sodium	SW-846 6010C	1	170260635001	01/27/2017	14:17	Katlin N Cataldi	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170260635001	01/26/2017	22:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	17024120601A	01/24/2017	14:55	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	17024120601A	01/24/2017	14:41	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17029118102A	01/29/2017	18:53	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	2	17026002103A	01/27/2017	04:25	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	2	17026002103A	01/27/2017	04:25	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	2	17026002103A	01/27/2017	04:25	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	NDS !	EPA SAMPLE NO.			
	VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS				
		! 06K17	!		
ab Name: Lancaster Laboratories	Contract:	!	!		
ab Code: LANCAS Case No.:	SAS No.:	SDG No.:			
Matrix: (soil/water) WATER	Lab Sample ID: 879	9409			
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP093	55.i/17jan27a.b/y	j27s21.d		
evel: (low/med) LOW	Date Received: 01/	21/17			
Moisture: not dec.	Date Analyzed: 01/	27/17			
clumn: (pack/cap) CAP	Dilution Factor: 1	.0			
12	CONCENTRATION UN	ITS:			
Number TICs found: 0	(ua/L or ua/Ka)	11α / L			

! ! CAS NUMBER	! ! COMPOUND NAME ==!==================================		! ! EST. CONC.	
! 1. VOCTIC	!Total VOC TICs	: !	•	: ! U !
	!!	!	!	!!
	!	!	!	!!
		!	!	!!
	!	_!	!	!!
	!	!	!	!!
	!!	<u>:</u>	!	!
	'	-	·	::
	-	:	: !	;;
		;	i	;;
	<u>;</u>		!	i — i
	!		!	· ·
!14			!	!!
	!	!	!	!!
!16	!!	!	!	!!
	!	!	!	!!
	!	!	!	!!
	_!	!	!	!!
	<u>!</u>	_!	!	!!
	!	!	!	!!
	 		!	!
! 24.	_ <u> </u>		!	::
	-	:	i	::
	-	:	·	;
	!	_;	·	;;
! 28 .		<u>i</u>	· !	:i
! 29			!	i ——— i
!30		!	!	!!
!1	!	!	!	!!

page 1 of 1

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP03-68-69-170116 Filtered Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799410 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 14:22 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

07K17 SDG#: MMK17-07

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	s Dissolved	SW-846	6010C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	30.1	0.0382	0.400	1
01757	Magnesium		7439-95-4	6.67	0.0190	0.200	1
01762	Potassium		7440-09-7	4.21	0.160	1.00	1
01767	Sodium		7440-23-5	48.9	0.173	2.00	1

Sample Comments

This sample was lab filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017 14:35	Katlin N Cataldi	1
01757	Magnesium	SW-846 6010C	1	170260635001	01/27/2017 14:35	Katlin N Cataldi	1
01762	Potassium	SW-846 6010C	1	170260635001	01/27/2017 14:35	Katlin N Cataldi	1
01767	Sodium	SW-846 6010C	1	170260635001	01/27/2017 14:35	Katlin N Cataldi	1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	170260635001	01/26/2017 22:00	Annamaria Kuhns	1
	U4						



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-27-28-170116 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799411 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 15:53 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	Ū	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	ττ	0.5	1	1
11997	1,2-Dibromoethane 1,2-Dichlorobenzene	95-50-1	0.5 1	U	1	5	1
11997	•		1	ττ	1	5 5	1
	1,3-Dichlorobenzene	541-73-1		-			
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U 	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ū	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	Ū	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ū	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	IJ	0.5	1	1
		1,,001 20 1	٠.٥		<u> </u>		

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-27-28-170116 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799411 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 15:53 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

07882 Total Nitrite/Nitrate Nitrogen n.a.

SM 2320 B-1997

08K17 SDG#: MMK17-08

CAT No.	Analysis Name		CAS Number	As Re Resul	eceived .t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8	260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library	Search						
	The results from FORM 1 - VOA-TION on the back of the	C. The qualific						
Misc.	Organics	EPA 537	Rev 1.1	ng/l		ng/l	ng/l	
	Perfluorooctanoi		335-67-1	0.5	J	0.5	2	1
10954			375-95-1	0.6	Ū	0.6	2	1
	Perfluorodecano		335-76-2	0.5	Ū	0.5	2	1
10954			2058-94-8	1	Ū	1	3	1
	Perfluorododecar		307-55-1	0.5	Ū	0.5	2	1
10954	Perfluorotrideca	anoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetrade	ecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexano	ic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluoroheptano	oic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorobutanes	sulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorohexanes	sulfonate	355-46-4	1	U	1	3	1
10954	Perfluoro-octane	esulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutano	ic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentano	oic Acid	2706-90-3	0.5	U	0.5	2	1
10954	NETFOSAA		2991-50-6	1	U	1	3	1
	NEtFOSAA is the	acronym for N-	ethyl perfluoro	octanesu	lfonamidoa	cetic Acid.		
10954	NMeFOSAA		2355-31-9	1	U	1	3	1
	NMeFOSAA is the	-				acetic Acid.		
	stated QC limits			cient da	ta points			
can	be obtained to ca	lculate statist	cical limits.					
Tho	recovery of the e	utraction stand	land Elaca DEUro	' "'''' " " " " " " " " " " " " " " " "	+ a i d o			
	cceptance criteri							
	sample. Since t							
	ptance criteria i				CIIIII			
	_		_					
Metal	S	SW-846 6	010C	mg/1		mg/l	mg/l	
01750			7440-70-2	5.95		0.0382	0.400	1
01757			7439-95-4	0.939		0.0190	0.200	1
01762	Potassium		7440-09-7	0.850) J	0.160	1.00	1
01767	Sodium		7440-23-5	2.51		0.173	2.00	1
Wet C	hemistry	EPA 300.	0	mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	3.3		1.0	2.0	5
00224	Sulfate		14808-79-8	9.9		1.5	5.0	5
30220	Sallace		11000 /5 0	,,,		1.5	5.0	J
		EPA 353.	2	mg/1		mg/l	mg/l	

^{*=}This limit was used in the evaluation of the final result

mg/l as CaCO3

mg/l as CaCO3

mg/l as CaCO3



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-27-28-170116 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799411 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 15:53 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

08K17 SDG#: MMK17-08

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Cl	nemistry SM 2320	B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	10.7	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	10.7	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170272AA	01/27/2017	11:17	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170272AA	01/27/2017	11:17	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17030004	02/01/2017	18:01	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17030004	01/30/2017	15:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017	14:20	Katlin N Cataldi	1
01757	Magnesium	SW-846 6010C	1	170260635001	01/27/2017	14:20	Katlin N Cataldi	1
01762	Potassium	SW-846 6010C	1	170260635001	01/27/2017	14:20	Katlin N Cataldi	1
01767	Sodium	SW-846 6010C	1	170260635001	01/27/2017	14:20	Katlin N Cataldi	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170260635001	01/26/2017	22:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	17024120601A	01/24/2017	15:09	Hallie Burnett	5
00228	Sulfate	EPA 300.0	1	17024120601A	01/24/2017	15:09	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17029118102A	01/29/2017	17:50	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17025008103A	01/26/2017	03:21	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17025008103A	01/26/2017	03:21	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17025008103A	01/26/2017	03:21	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E VOLATILE ORGANICS A	EPA SAMPLE NO.			
TENTATIVELY IDENT	!	— _!		
ab Name: Lancaster Laboratories	Contract:		: :	
ab Code: LANCAS	Lab Sample ID: 8799	411 ———		
<pre>sample wt/vol: 5.0 (g/mL)mL sevel: (low/med) LOW</pre>	Lab File ID:HP0935 Date Received: 01/2		27s22.d	
Moisture: not dec.	Date Analyzed: 01/2	7/17		
olumn: (pack/cap) CAP	Dilution Factor: 1. CONCENTRATION UNI			
Number TICs found: 0	(ua/L or ua/Ka) u	a/L		

CAS NUMBER	! COMPOUND NAME ==!==================================		EST. CONC.	
	:!Total VOC TICs			: =====: ! U
2.	!	1 1		!
	!			!
	1			!
	į			!
6.	!			!
	!			! !
	į			!
	!			!
0.	<u> </u>			!
	<u> </u>			!
	!			!
	<u> </u>			!
	į			!
5.	!			!
6.	!	!!		!
7.	!	!!		!
8.	!	! !		!
9.	!	!!		!
	!	!!		!
1.	!			!
	!	!!		!
	!	!!		!
4.	!	! !		!
5.	!	!!		!
6	!	!!		!
7	!	!!		!
8	!	!		!
9	!	!!		!
0	!	!!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-34-35-170117 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799412 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 09:17 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-34-35-170117 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799412 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 09:17 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

07882 Total Nitrite/Nitrate Nitrogen n.a.

SM 2320 B-1997

09K17 SDG#: MMK17-09

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	50C	ug/l		ug/l	ug/l	
11997			95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea The results from th FORM 1 - VOA-TIC. on the back of this	e volatile li The qualifier	-					
Misc.	Organics	EPA 537 Re	v 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic a	.cid	335-67-1	29		0.5	2	1
10954	Perfluorononanoic a	.cid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic a	.cid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic	acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoio	acid	307-55-1	0.5	U	0.5	2	1
10954			72629-94-8	0.5	U	0.5	2	1
10954			376-06-7	0.5	U	0.5	2	1
10954			307-24-4	4		0.5	2	1
10954	-		375-85-9	5		0.5	2	1
10954			375-73-5	1	J	0.7	2	1
10954			355-46-4	1	J	1	3	1
10954			1763-23-1	3	J	2	6	1
10954			375-22-4	3	U	3	10	1
10954		Acid	2706-90-3	3		0.5	2	1
10954	NETFOSAA	<u> </u>	2991-50-6	. 1	U	1	3	1
10054	NEtFOSAA is the acr	onym for N-et.					2	1
10954	NMeFOSAA NMeFOSAA is the acr	£ N	2355-31-9	1	U] £ ; -]	1	3	1
can The QC a	stated QC limits are be obtained to calcu recovery of the extraceptance criteria a sample. Since the ptance criteria in the sample of the samp	advisory only late statistic action standar t 132% in the recovery of the	y until suffice the cal limits. Ed E13C3-PFHxS opening CCV and the E13C3-PFHxS	ient da was ou ssociat was wi	ta points tside ed with	Accele nera.		
Metals	=	SW-846 601	0C	mg/l		mg/l	mg/l	
01750	-	2.7 010 001	7440-70-2	20.8		0.0382	0.400	1
01757	Magnesium		7439-95-4	4.87		0.0190	0.200	1
01762	Potassium		7440-09-7	3.07		0.160	1.00	1
01767	Sodium		7440-23-5	38.7		0.173	2.00	1
Wet Cl	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	65.6		10.0	20.0	50
00228	Sulfate		14808-79-8	25.3		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	

mg/l as CaCO3

mg/l as CaCO3

mg/l as CaCO3

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-34-35-170117 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799412 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 09:17 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

09K17 SDG#: MMK17-09

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Ch	nemistry SM 2320	B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	43.6	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	43.6	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170272AA	01/27/2017	11:39	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170272AA	01/27/2017	11:39	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17030004	02/01/2017	18:21	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17030004	01/30/2017	15:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017	14:29	Katlin N Cataldi	1
01757	Magnesium	SW-846 6010C	1	170260635001	01/27/2017	14:29	Katlin N Cataldi	1
01762	Potassium	SW-846 6010C	1	170260635001	01/27/2017	14:29	Katlin N Cataldi	1
01767	Sodium	SW-846 6010C	1	170260635001	01/27/2017	14:29	Katlin N Cataldi	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170260635001	01/26/2017	22:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	17024120601B	01/25/2017	13:19	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	17024120601B	01/24/2017	21:34	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17029118102A	01/29/2017	17:55	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17025008104A	01/26/2017	07:14	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	07:14	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	07:14	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E VOLATILE ORGANICS AN	EPA SAMPLE NO.			
TENTATIVELY IDENTI	!		_!	
		!	09K17	!
Lab Name: Lancaster Laboratories	Contract:	!!		!
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8799	9412		
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0935	55.i/17ja	an27a.b/y	j27s23.d
Level: (low/med) LOW	Date Received: 01/2	21/17	_	
Moisture: not dec.	Date Analyzed: 01/2	27/17		
Column: (pack/cap) CAP	Dilution Factor: 1.	. 0		
	CONCENTRATION UNI	TS:		
Number TICs found: 0	(ua/L or ua/Ka) ı	ıa/L		

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
	==!===================================	:======: !		!===== ! []
	_!	i		
				i
		ii		i
	<u> </u>			i
				!
	<u>;</u>	ii		•
	<u>;</u>			
	!			i
0.		ii		i
	<u> </u>			i
	<u>.</u>			i
		ii		i
	<u> </u>			i
	<u> </u>			i
	<u>;</u>	ii		i
	<u> </u>			•
	<u>.</u>			
	<u> </u>			i
	<u> </u>			i
				i
	<u> </u>			i
	<u> </u>			i
	1			i
	<u> </u>			i
	!			!
	<u> </u>	· · · · · · · · · · · · · · · · · · ·		•
		i		1
	<u> </u>			i
	i			i
· · .		ii		i — —
ge 1 of 1				

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-34-35-170117 Filtered Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799413 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 09:17 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

10K17 SDG#: MMK17-10

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	s Dissolved	SW-846	6010C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	20.0	0.0382	0.400	1
01757	Magnesium		7439-95-4	4.17	0.0190	0.200	1
01762	Potassium		7440-09-7	1.94	0.160	1.00	1
01767	Sodium		7440-23-5	37.9	0.173	2.00	1

Sample Comments

This sample was lab filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017 14:38	Katlin N Cataldi	1
01757	Magnesium	SW-846 6010C	1	170260635001	01/27/2017 14:38	Katlin N Cataldi	1
01762	Potassium	SW-846 6010C	1	170260635001	01/27/2017 14:38	Katlin N Cataldi	1
01767	Sodium	SW-846 6010C	1	170260635001	01/27/2017 14:38	Katlin N Cataldi	1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	170260635001	01/26/2017 22:00	Annamaria Kuhns	1
	U4						



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-44-45-170117 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799414 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 10:46 by SJ C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 12:57

11K17 SDG#: MMK17-11BKG

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	Ū	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	Ū	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	IJ	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	IJ	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	Ū	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	Ū	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	Ū	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	Ū	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	Ū	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	Ū	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.7	J	0.5	1	1
11997	Toluene	108-88-3	0.5	Ū	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	IJ	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	Ū	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ū	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	IJ	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	IJ	0.5	1	1
		1,3001 23 1				_	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-44-45-170117 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799414 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 10:46 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

11K17 SDG#: MMK17-11BKG

CAT No.	Analysis Name		CAS Number	As Re Resul	eceived Lt	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8	260C	ug/l		ug/l	ug/l	
L1997	o-Xylene		95-47-6	0.5	U	0.5	1	1
0882	VOA Library	Search						
	The results from FORM 1 - VOA-TION on the back of the	n the volatile :						
isc.	Organics	EPA 537	Rev 1.1	ng/l		ng/l	ng/l	
	Perfluorooctanoi	ic acid	335-67-1	44		0.5	2	1
10954			375-95-1	0.6	U	0.6	2	1
.0954			335-76-2	0.5	U	0.5	2	1
	Perfluoroundecar		2058-94-8	1	IJ	1	3	1
0954			307-55-1	0.5	IJ	0.5	2	1
0954			72629-94-8	0.5	IJ	0.5	2	1
.0954			376-06-7	0.5	II.	0.5	2	1
	Perfluorohexano		307-24-4	9	Ü	0.5	2	1
	Perfluoroheptano		375-85-9	7		0.5	2	1
0954	-		375-73-5	4		0.7	2	1
	Perfluorohexanes		355-46-4	2	J	1	3	1
	Perfluoro-octane		1763-23-1	3	J	2	6	1
.0954			375-22-4	5	J	3	10	1
				8	J	0.5	2	1
	Perfluoropentano	ole Acid	2706-90-3	0	U	1	3	1
.0954	NETFOSAA	C 37	2991-50-6			-	3	Ţ
10954	NEtFOSAA is the NMeFOSAA	acronym for N-	2355-31-9	octanesi 1	uronamidoac U	etic Acid. 1	3	1
.0954	NMeFOSAA is the	agranum for N				-	3	Τ.
	stated QC limits be obtained to ca	are advisory or	nly until suffic			detic Acid.		
QC a	recovery of the e cceptance criteri sample. Since t ptance criteria i	a at 132% in th he recovery of	ne opening CCV a the E13C3-PFHxS	associat 3 was wi	ed with			
etal	3	SW-846 6	010C	mg/l		mg/l	mg/l	
1750	Calcium		7440-70-2	30.5		0.0382	0.400	1
01757	Magnesium		7439-95-4	7.06		0.0190	0.200	1
01762	Potassium		7440-09-7	4.94		0.160	1.00	1
1767	Sodium		7440-23-5	70.2		0.173	2.00	1
et Cl	nemistry	EPA 300.	0	mg/l		mg/l	mg/l	
0224	Chloride		16887-00-6	149		10.0	20.0	50
00224	Sulfate		14808-79-8	19.8		1.5	5.0	5
		EPA 353.	2	mg/l		mg/l	mg/l	
7000	m-4-1 mit-1/2 /27		_	_		=	<u>-</u>	1
7882	Total Nitrite/Ni	ıtrate Nitrogen	n.a.	1.5		0.040	0.10	1

^{*=}This limit was used in the evaluation of the final result

mg/l as CaCO3

mg/l as CaCO3

mg/l as CaCO3

SM 2320 B-1997



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-44-45-170117 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799414 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 10:46 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

11K17 SDG#: MMK17-11BKG

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet C	nemistry SM 2320	B-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	36.6	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	36.6	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tin	me.	Analyst	Dilution Factor
	GOMOO 0 17-1-+-11	GH 046 0260G	1	**170070**			7 M D-1-	Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170272AA	,,	12:01	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170272AA	01/27/2017	12:01	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17030004	02/01/2017	19:02	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17030004	01/30/2017	15:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017	13:59	Katlin N Cataldi	1
01757	Magnesium	SW-846 6010C	1	170260635001	01/27/2017	13:59	Katlin N Cataldi	1
01762	Potassium	SW-846 6010C	1	170260635001	01/27/2017	13:59	Katlin N Cataldi	1
01767	Sodium	SW-846 6010C	1	170260635001	01/27/2017	13:59	Katlin N Cataldi	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170260635001	01/26/2017	22:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	2	17024120601B	01/26/2017	21:10	Alexandria M Lanager	50
00228	Sulfate	EPA 300.0	1	17024120601B	01/24/2017	16:21	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17029118102B	01/29/2017	17:59	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17025008104A	01/26/2017	06:13	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	06:13	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	06:13	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.	
VOLATILE ORGANICS A			
TENTATIVELY IDENT	TFIED COMPOUNDS	! ! 11K17	!
ab Name: Lancaster Laboratories	Contract:	!	_!
ab Code: LANCAS Case No.:	SAS No.:	SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8799	9414	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP093!	55.i/17jan27a.b/yj27	7s24.d
evel: (low/med) LOW	Date Received: 01/2	21/17	
Moisture: not dec.	Date Analyzed: 01/2	27/17	
column: (pack/cap) CAP	Dilution Factor: 1	. 0	
	CONCENTRATION UNI	ITS:	
Number TICs found: 0	(11a/L or 11a/Ka) 1	ıa/T.	

CAS NUMBER	! COMPOUND NAME ==!==================================	! RT	EST. CONC.	
	!Total VOC TICs	!		!===== ! U
	!!	! !		!
	!	!		!
4.	!	!		!
5	!	!!		!
6	!	!		!
7	!	!!		!
8	!	!		!
9	!	!!	!	!
.0.	!	!		!
1	!	!!		!
2	!!	!!		!
.3	!	!!		!
4	!	!!		!
.5	!	!!		!
.6	!	!!		!
.7	!	!!		!
.8	!	!!		!
.9	!	!!		!
0	!	!!		!
1	!	!!		!
	!	!!		!
3	!	!!		!
4	!	!!		!
5	!	!!		!
6	!	!!		!
.7	!	!!		!
8		!!		!
9		!!		!
0	!	!!		!
	!	! !		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-44-45-170117MS Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799415 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 10:46 by SJ

C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 12:57

SDG#: MMK17-11MS

11K17

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l	ug/l	ug/l	
11997	Acetone	67-64-1	170	6	20	1
11997	Benzene	71-43-2	21	0.5	1	1
11997	Bromochloromethane	74-97-5	20	1	5	1
11997	Bromodichloromethane	75-27-4	19	0.5	1	1
11997	Bromoform	75-25-2	15	0.5	4	1
11997	Bromomethane	74-83-9	18	0.5	1	1
11997	2-Butanone	78-93-3	150	3	10	1
11997	Carbon Disulfide	75-15-0	20	1	5	1
11997	Carbon Tetrachloride	56-23-5	21	0.5	1	1
11997	Chlorobenzene	108-90-7	21	0.5	1	1
11997	Chloroethane	75-00-3	18	0.5	1	1
11997	Chloroform	67-66-3	21	0.5	1	1
11997	Chloromethane	74-87-3	19	0.5	1	1
11997	Cyclohexane	110-82-7	23	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	16	2	5	1
11997	Dibromochloromethane	124-48-1	18	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	20	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	20	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	20	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	20	1	5	1
11997	Dichlorodifluoromethane	75-71-8	19	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	22	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	20	0.5	1	1
11997	,	75-35-4	23	0.5	1	1
	1,1-Dichloroethene		23	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	22	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	22		1	1
11997	1,2-Dichloropropane	78-87-5	19	0.5		
11997	cis-1,3-Dichloropropene	10061-01-5	19	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	21	0.5 0.5	1 1	1 1
11997	Ethylbenzene	100-41-4		2		
11997	Freon 113	76-13-1	22		10	1
11997	2-Hexanone	591-78-6	110	3	10	1
11997	Isopropylbenzene	98-82-8	21	1	5	1
11997	Methyl Acetate	79-20-9	20	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	20	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	110	3	10	1
11997	Methylcyclohexane	108-87-2	21	1	5	1
11997	Methylene Chloride	75-09-2	21	2	4	1
11997	Styrene	100-42-5	20	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	19	0.5	1	1
11997	Tetrachloroethene	127-18-4	22	0.5	1	1
11997	Toluene	108-88-3	21	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	20	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	20	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	21	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	20	0.5	1	1
11997	Trichloroethene	79-01-6	22	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	21	0.5	1	1
11997	Vinyl Chloride	75-01-4	19	0.5	1	1
11997	m+p-Xylene	179601-23-1	42	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-44-45-170117MS Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799415 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 10:46 by SJ C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 12:57

11K17 SDG#: MMK17-11MS

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	21	0.5	1	1
Misc.	Organics	EPA 537 R	ev 1.1	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic ac	cid	335-67-1	240	0.5	2	1
10954	Perfluorononanoic ad	cid	375-95-1	160	0.6	2	1
10954	Perfluorodecanoic ad	cid	335-76-2	170	0.5	2	1
10954	Perfluoroundecanoic	acid	2058-94-8	180	1	3	1
10954	Perfluorododecanoic	acid	307-55-1	190	0.5	2	1
10954	Perfluorotridecanoio	c acid	72629-94-8	210	0.5	2	1
10954	Perfluorotetradecand	oic acid	376-06-7	170	0.5	2	1
10954	Perfluorohexanoic ac	cid	307-24-4	180	0.5	2	1
10954	Perfluoroheptanoic a	acid	375-85-9	180	0.5	2	1
10954	Perfluorobutanesulfo	onate	375-73-5	180	0.7	2	1
10954	Perfluorohexanesulfo	onate	355-46-4	180	1	3	1
10954	Perfluoro-octanesulf	Eonate	1763-23-1	140	2	6	1
10954	Perfluorobutanoic Ac	cid	375-22-4	190	3	10	1
10954	Perfluoropentanoic A	Acid	2706-90-3	190	0.5	2	1
10954	NETFOSAA		2991-50-6	180	1	3	1
	NEtFOSAA is the acro	onym for N-et	thyl perfluoroo	ctanesulfonamidoac	etic Acid.		
10954	NMeFOSAA		2355-31-9	220	1	3	1
	NMeFOSAA is the acro	onym for N-me	ethyl perfluoro	octanesulfonamidoa	cetic Acid.		
The	stated OC limits are	advisory onl	y until suffic	ient data points			

The stated QC limits are advisory only until suf-can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170272AA	01/27/2017 12:23	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170272AA	01/27/2017 12:23	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17030004	02/01/2017 20:04	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17030004	01/30/2017 15:00	Devon M Whooley	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-44-45-170117MSD Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799416 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 10:46 by SJ C. T. Male Associates

50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

11K17 SDG#: MMK17-11MSD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l	ug/l	ug/l	
11997	Acetone	67-64-1	170	6	20	1
11997	Benzene	71-43-2	22	0.5	1	1
11997	Bromochloromethane	74-97-5	20	1	5	1
11997	Bromodichloromethane	75-27-4	19	0.5	1	1
11997	Bromoform	75-25-2	15	0.5	4	1
11997	Bromomethane	74-83-9	18	0.5	1	1
11997	2-Butanone	78-93-3	150	3	10	1
11997	Carbon Disulfide	75-15-0	20	1	5	1
11997	Carbon Tetrachloride	56-23-5	21	0.5	1	1
11997	Chlorobenzene	108-90-7	21	0.5	1	1
11997	Chloroethane	75-00-3	19	0.5	1	1
11997	Chloroform	67-66-3	22	0.5	1	1
11997	Chloromethane	74-87-3	19	0.5	1	1
11997	Cyclohexane	110-82-7	23	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	16	2	5	1
11997	Dibromochloromethane	124-48-1	18	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	21	0.5	1	1
11997	1,2-Dibromoethane 1,2-Dichlorobenzene	95-50-1	20	1	5	1
11997	•		20	1	5	1
	1,3-Dichlorobenzene	541-73-1				
11997	1,4-Dichlorobenzene	106-46-7	20	1	5	1
11997	Dichlorodifluoromethane	75-71-8	19	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	22	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	20	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	24	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	21	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	23	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	22	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	19	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	19	0.5	1	1
11997	Ethylbenzene	100-41-4	22	0.5	1	1
11997	Freon 113	76-13-1	23	2	10	1
11997	2-Hexanone	591-78-6	110	3	10	1
11997	Isopropylbenzene	98-82-8	21	1	5	1
11997	Methyl Acetate	79-20-9	20	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	20	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	110	3	10	1
11997	Methylcyclohexane	108-87-2	22	1	5	1
11997	Methylene Chloride	75-09-2	21	2	4	1
11997	Styrene	100-42-5	20	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	20	0.5	1	1
11997	Tetrachloroethene	127-18-4	23	0.5	1	1
11997	Toluene	108-88-3	22	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	20	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	21	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	21	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	20	0.5	1	1
11997	Trichloroethene	79-01-6	22	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	21	0.5	1	1
11997	Vinyl Chloride	75-01-4	20	0.5	1	1
11997	m+p-Xylene	179601-23-1	43	0.5	1	1
11//	P 21/10110	1//001 23-1	13	0.5	<u> </u>	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-44-45-170117MSD Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799416 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 10:46 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

11K17 SDG#: MMK17-11MSD

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	50C	ug/l	ug/l	ug/l	
11997	o-Xylene		95-47-6	21	0.5	1	1
Misc.	Organics	EPA 537 R	ev 1.1	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic ac	id	335-67-1	220	0.5	2	1
10954	Perfluorononanoic ac	id	375-95-1	160	0.6	2	1
10954	Perfluorodecanoic ac	id	335-76-2	160	0.5	2	1
10954	Perfluoroundecanoic	acid	2058-94-8	190	1	3	1
10954	Perfluorododecanoic	acid	307-55-1	190	0.5	2	1
10954	Perfluorotridecanoic	acid	72629-94-8	210	0.5	2	1
10954	Perfluorotetradecano	ic acid	376-06-7	180	0.5	2	1
10954	Perfluorohexanoic ac	id	307-24-4	170	0.5	2	1
10954	Perfluoroheptanoic a	cid	375-85-9	170	0.5	2	1
10954	Perfluorobutanesulfo	nate	375-73-5	180	0.7	2	1
10954	Perfluorohexanesulfo	nate	355-46-4	170	1	3	1
10954	Perfluoro-octanesulf	onate	1763-23-1	180	2	6	1
10954	Perfluorobutanoic Ac	id	375-22-4	190	3	10	1
10954	Perfluoropentanoic A	cid	2706-90-3	180	0.5	2	1
10954	NETFOSAA		2991-50-6	200	1	3	1
	NEtFOSAA is the acro	nym for N-et	hyl perfluorood	ctanesulfonamidoacetic	: Acid.		
10954	NMeFOSAA		2355-31-9	200	1	3	1
	NMeFOSAA is the acro	nym for N-me	thyl perfluorod	octanesulfonamidoaceti	.c Acid.		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170272AA	01/27/2017 12:45	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170272AA	01/27/2017 12:45	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17030004	02/01/2017 20:24	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17030004	01/30/2017 15:00	Devon M Whooley	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-FD01-170117 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799417 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 by SJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 12:57

12K17 SDG#: MMK17-12FD

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 82	60C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	Ū	0.5	1	1
11997	Bromochloromethane	74-97-5	1	Ū	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	Ū	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	Ū	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	Ū	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	Ū	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	Ū	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	Ū	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	Ū	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	Ū	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	Ū	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	Ū	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	Ū	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
11997	2-Hexanone	591-78-6	3	IJ	3	10	1
11997	Isopropylbenzene	98-82-8	1	Ū	1	5	1
11997	Methyl Acetate	79-20-9	1	Ū	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	Ū	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	Ū	3	10	1
11997	Methylcyclohexane	108-87-2	1	Ū	1	5	1
11997	Methylene Chloride	75-09-2	2	Ū	2	4	1
11997	Styrene	100-42-5	1	Ū	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	IJ	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	Ū	0.5	1	1
11997	Toluene	108-88-3	0.5	IJ	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	IJ	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	IJ	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	Ū	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	IJ	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1
	1/1-0110	_,,,,,,	٠.٥	-		_	_

^{*=}This limit was used in the evaluation of the final result



5.0

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-FD01-170117 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799417 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 by SJ C. T. Male Associates 50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 12:57

12K17 SDG#: MMK17-12FD

12148 Carbonate Alkalinity

CAT No.	Analysis Name		As Received CAS Number Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor		
GC/MS	Volatiles	SW-846 82	260C	ug/l		ug/l	ug/l		
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1	
00882	VOA Library Se	earch							
	The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.								
Misc.	Organics	EPA 537 F	Pev 1.1	ng/l		ng/l	ng/l		
10954	•		335-67-1	28		0.5	2	1	
10954			375-95-1	0.6	U	0.6	2	1	
10954			335-76-2	0.5	n n	0.5	2	1	
10954			2058-94-8	1	n n	1	3	1	
10954			307-55-1	0.5	Ū	0.5	2	1	
10954			72629-94-8	0.5	n n	0.5	2	1	
10954			376-06-7	0.5	Ū	0.5	2	1	
10954			307-24-4	4	U	0.5	2	1	
10954			375-85-9	5		0.5	2	1	
10954	Perfluorobutanesu		375-73-5	1	J	0.7	2	1	
10954			355-46-4	2	J	1	3	1	
10954			1763-23-1	2	J	2	6	1	
				3	Ū	3	10	1	
10954 10954			375-22-4	3 4	U	0.5	2	1	
	-	C ACIO	2706-90-3	1		1	3	1	
10954	NETFOSAA	£ N	2991-50-6		U	=	3	1	
10054	NEtFOSAA is the a	cronym for N-e					3	1	
10954		£ N	2355-31-9	1	U] f ; -]	1	3	1	
_,	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid. The stated QC limits are advisory only until sufficient data points								
				cient da	ta points				
can	be obtained to cal	culate statist	ical limits.						
Metal	S	SW-846 60	10C	mg/l		mg/l	mg/l		
01750	Calcium		7440-70-2	21.0		0.0382	0.400	1	
01757	Magnesium		7439-95-4	4.98		0.0190	0.200	1	
01762	Potassium		7440-09-7	3.32		0.160	1.00	1	
01767	Sodium		7440-23-5	38.8		0.173	2.00	1	
Wet Cl	hemistry	EPA 300.0)	mg/l		mg/l	mg/l		
00224	Chloride		16887-00-6	62.4		10.0	20.0	50	
00224	Sulfate		14808-79-8	23.8		1.5	5.0	5	
00220	Sullace		14000-79-0	23.0		1.3	5.0	5	
		EPA 353.2	2	mg/l		mg/l	mg/l		
07882	Total Nitrite/Nit	rate Nitrogen	n.a.	0.99		0.040	0.10	1	
	SM 2320 B-		3-1997	mg/l as CaCO3		mg/l as CaCO3	mg/l as CaCO3 mg/l as CaCO3		
12150	Total Alkalinity		n.a.	47.5		1.7	5.0	1	
12149	Bicarbonate Alkal	-	n.a.	47.5		1.7	5.0	1	
12149	Garbonate Alkai		11.a.	1 7	TT	1.7	5.0	1	

^{*=}This limit was used in the evaluation of the final result

1.7

n.a.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-FD01-170117 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799417 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 by SJ

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

12K17 SDG#: MMK17-12FD

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170272AA	01/27/2017	13:08	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170272AA	01/27/2017	13:08	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17030004	02/01/2017	20:45	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17030004	01/30/2017	15:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017	14:32	Katlin N Cataldi	1
01757	Magnesium	SW-846 6010C	1	170260635001	01/27/2017	14:32	Katlin N Cataldi	1
01762	Potassium	SW-846 6010C	1	170260635001	01/27/2017	14:32	Katlin N Cataldi	1
01767	Sodium	SW-846 6010C	1	170260635001	01/27/2017	14:32	Katlin N Cataldi	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170260635001	01/26/2017	22:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	17024120601B	01/24/2017	18:57	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	17024120601B	01/24/2017	18:43	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17029118102A	01/29/2017	17:57	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17025008104A	01/26/2017	06:06	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	06:06	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	06:06	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.
VOLATILE ORGANICS ANA		
TENTATIVELY IDENTIF	'IED COMPOUNDS	!!!
		! 12K17 !
Lab Name: Lancaster Laboratories	Contract:	!!
Lab Code: LANCAS Case No.:	SAS No.:	_ SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID: 8799	417
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0935	5.i/17jan27a.b/yj27s27.d
Level: (low/med) LOW	Date Received: 01/2	1/17
Moisture: not dec.	Date Analyzed: 01/2	7/17
Column: (pack/cap) CAP	Dilution Factor: 1.	0
	CONCENTRATION UNI	TS:
Number TICs found: 0	(ug/L or ug/Kg) u	g/L

CAS NUMBER	! COMPOUND NAME		EST. CONC.	~
	!Total VOC TICs	!: !		!===== ! U
2	_!	!!	!	!
	_!	!		!
	!		!	!
	!		!	!
6	!	!	!	!
7	!		!	!
8	!!	!!	<u> </u>	!
9	!	!!	!	!
.0	!	!!		!
1	!!	!!	<u> </u>	!
2	!	!!	!	!
.3	!!	!!	<u> </u>	!
4	!	!!	!	!
.5	!	!!		!
	!	!!	!	!
7	!	!!	!	!
.8	!	!!	!	!
9	!	!!	!	!
0	!	!!	!	!
1	!	!!		!
2	!!	!!	<u> </u>	!
3	!	!!	!	!
4	!!	!!		!
	!	!!	!	!
6	!!	!!	!	!
.7	!	!!		!
	!	!!		!
9	!	!!		!
0	!	!!		!
	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-FD01-170117 Filtered Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799418 LL Group # 1757184 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 12:57

13K17 SDG#: MMK17-13FD

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	s Dissolved	SW-846	6010C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	20.1	0.0382	0.400	1
01757	Magnesium		7439-95-4	4.20	0.0190	0.200	1
01762	Potassium		7440-09-7	1.97	0.160	1.00	1
01767	Sodium		7440-23-5	38.3	0.173	2.00	1

Sample Comments

This sample was lab filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	rial# Batch# Analysis Date and Time		Analyst	Dilution Factor
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017 14	4:41 Katlin N Cataldi	1
01757	Magnesium	SW-846 6010C	1	170260635001	01/27/2017 14	4:41 Katlin N Cataldi	1
01762	Potassium	SW-846 6010C	1	170260635001	01/27/2017 14	4:41 Katlin N Cataldi	1
01767	Sodium	SW-846 6010C	1	170260635001	01/27/2017 14	4:41 Katlin N Cataldi	1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	170260635001	01/26/2017 22	2:00 Annamaria Kuhns	1
	U4						



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757184

Reported: 02/07/2017 12:57

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ	
	mg/kg		mg/kg	mg/kg	
Batch number: A170272AA	Sample	number	(s): 879940	04-8799408	
Acetone	0.007	U	0.007	0.020	
Benzene	0.0005	U	0.0005	0.005	
Bromochloromethane	0.001	U	0.001	0.005	
Bromodichloromethane	0.001	U	0.001	0.005	
Bromoform	0.001	U	0.001	0.005	
Bromomethane	0.002	U	0.002	0.005	
2-Butanone	0.004	U	0.004	0.010	
Carbon Disulfide	0.001	U	0.001	0.005	
Carbon Tetrachloride	0.001	U	0.001	0.005	
Chlorobenzene	0.001	U	0.001	0.005	
Chloroethane	0.002	U	0.002	0.005	
Chloroform	0.001	U	0.001	0.005	
Chloromethane	0.002	U	0.002	0.005	
Cyclohexane	0.001	U	0.001	0.005	
1,2-Dibromo-3-chloropropane	0.002	U	0.002	0.005	
Dibromochloromethane	0.001	U	0.001	0.005	
1,2-Dibromoethane	0.001	U	0.001	0.005	
1,2-Dichlorobenzene	0.001	U	0.001	0.005	
1,3-Dichlorobenzene	0.001	U	0.001	0.005	
1,4-Dichlorobenzene	0.001	U	0.001	0.005	
Dichlorodifluoromethane	0.002	U	0.002	0.005	
1,1-Dichloroethane	0.001	U	0.001	0.005	
1,2-Dichloroethane	0.001	U	0.001	0.005	
1,1-Dichloroethene	0.001	U	0.001	0.005	
cis-1,2-Dichloroethene	0.001	U	0.001	0.005	
trans-1,2-Dichloroethene	0.001	U	0.001	0.005	
1,2-Dichloropropane	0.001	U	0.001	0.005	
cis-1,3-Dichloropropene	0.001	U	0.001	0.005	
trans-1,3-Dichloropropene	0.001	U	0.001	0.005	
Ethylbenzene		U	0.001	0.005	
Freon 113	0.002	U	0.002	0.010	
2-Hexanone		U	0.003	0.010	
Isopropylbenzene	0.001	U	0.001	0.005	
Methyl Acetate	0.002	U	0.002	0.005	
Methyl Tertiary Butyl Ether	0.0005	U	0.0005	0.005	
4-Methyl-2-pentanone	0.003	U	0.003	0.010	
Methylcyclohexane		U	0.001	0.005	
Methylene Chloride		U	0.002	0.005	
Styrene		U	0.001	0.005	
1,1,2,2-Tetrachloroethane	0.001	U	0.001	0.005	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757184

Reported: 02/07/2017 12:57

Method Blank (continued)

Analysis Name	Result	:	MDL**	LOQ
	mg/kg		mg/kg	mg/kg
Tetrachloroethene	0.001	U	0.001	0.005
Toluene	0.001		0.001	0.005
1,2,3-Trichlorobenzene	0.001		0.001	0.005
1,2,4-Trichlorobenzene	0.001		0.001	0.005
1,1,1-Trichloroethane	0.001		0.001	0.005
1,1,2-Trichloroethane Trichloroethene	0.001		0.001	0.005
Trichlorofluoromethane	0.001		0.001 0.002	0.005 0.005
Vinyl Chloride	0.001		0.001	0.005
m+p-Xylene	0.001		0.001	0.005
o-Xylene	0.001	U	0.001	0.005
	ug/l		ug/l	ug/l
Batch number: Y170272AA	_			109,8799411-8799412,8799414-8799417
Acetone	6	U	6	20
Benzene	0.5	U	0.5	1
Bromochloromethane	1	U	1	5
Bromodichloromethane	0.5	U	0.5	1
Bromoform	0.5	U	0.5	4
Bromomethane	0.5	U	0.5	1
2-Butanone	3	U	3	10
Carbon Disulfide	1	U	1	5
Carbon Tetrachloride	0.5	U	0.5	1
Chlorobenzene	0.5	U	0.5	1
Chloroethane	0.5	U	0.5	1
Chloroform	0.5	U	0.5	1
Chloromethane	0.5	U	0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	U	2	5
Dibromochloromethane	0.5	U	0.5	1
1,2-Dibromoethane	0.5	U	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5
Dichlorodifluoromethane	0.5	U	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	U	0.5	1
trans-1,2-Dichloroethene	0.5	U	0.5	1
1,2-Dichloropropane	0.5	U	0.5	1
cis-1,3-Dichloropropene	0.5	U	0.5	1
trans-1,3-Dichloropropene	0.5	U	0.5	1
Ethylbenzene	0.5	U	0.5	1
Freon 113	2	Ū	2	10
2-Hexanone	3	Ū	3	10
Isopropylbenzene	1	Ū	1	5
Methyl Acetate	1	Ū	1	5
Methyl Tertiary Butyl Ether	0.5	Ū	0.5	1
rererary bacy r bener	0.5	0		=

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757184

Reported: 02/07/2017 12:57

Method Blank (continued)

Analysis Name	Result	:	MDL**	LOQ
	ug/l		ug/l	ug/l
4-Methyl-2-pentanone	3	U	3	10
Methylcyclohexane	1	U	1	5
Methylene Chloride	2	U	2	4
Styrene	1	U	1	5
1,1,2,2-Tetrachloroethane	0.5	U	0.5	1
Tetrachloroethene	0.5	U	0.5	1
Toluene	0.5	U	0.5	1
1,2,3-Trichlorobenzene	1	U	1	5
1,2,4-Trichlorobenzene	1	U	1	5
1,1,1-Trichloroethane	0.5	U	0.5	1
1,1,2-Trichloroethane	0.5	U	0.5	1
Trichloroethene	0.5	U	0.5	1
Trichlorofluoromethane	0.5	U	0.5	1
Vinyl Chloride	0.5	U	0.5	1
m+p-Xylene	0.5	U	0.5	1
o-Xylene	0.5	U	0.5	1
	ng/g		ng/g	ng/g
Batch number: 17024006	Sample	numbe:	r(s): 8799	404-8799408
NETFOSAA	0.30	U	0.30	0.90
NMeFOSAA	0.30	U	0.30	0.90
Perfluorobutanesulfonate	0.20	U	0.20	0.60
Perfluorodecanoic acid	0.20	U	0.20	0.60
Perfluorododecanoic acid	0.20	U	0.20	0.60
Perfluoroheptanoic acid	0.20	U	0.20	0.60
Perfluorohexanesulfonate	0.20	U	0.20	0.60
Perfluorohexanoic acid	0.10	U	0.10	0.40
Perfluorononanoic acid	0.10	U	0.10	0.40
Perfluoro-octanesulfonate	0.30	U	0.30	0.90
Perfluorooctanoic acid	0.20	U	0.20	0.60
Perfluorotetradecanoic acid	0.20	U	0.20	0.60
Perfluorotridecanoic acid	0.20	U	0.20	0.60
Perfluoroundecanoic acid	0.20	U	0.20	0.60
	ng/l		ng/l	ng/l
Batch number: 17030004	_	number		409,8799411-8799412,8799414-8799417
Perfluorooctanoic acid	0.5	U	0.5	2
Perfluorononanoic acid	0.6	U	0.6	2
Perfluorodecanoic acid	0.5	U	0.5	2
Perfluoroundecanoic acid	1	U	1	3
Perfluorododecanoic acid	0.5	U	0.5	2
Perfluorotridecanoic acid	0.5	U	0.5	2
Perfluorotetradecanoic acid	0.5	U	0.5	2
Perfluorohexanoic acid	0.5	U	0.5	2
Perfluoroheptanoic acid	0.5	U	0.5	2
Perfluorobutanesulfonate	0.7	U	0.7	2
Perfluorohexanesulfonate	1	U	1	3
Perfluoro-octanesulfonate	2	U	2	6
Perfluorobutanoic Acid	3	U	3	10

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757184

Reported: 02/07/2017 12:57

Method Blank (continued)

Analysis Name	Result ng/l	MDL**	LOQ ng/l
Perfluoropentanoic Acid NEtFOSAA NMeFOSAA	0.5 U 1 U 1 U	0.5 1 1	2 3 3
Batch number: 170260635001 Calcium Magnesium Potassium Sodium	mg/l Sample number 0.0495 J 0.0460 J 0.160 U 0.173 U	mg/l (s): 87994 0.0382 0.0190 0.160 0.173	mg/1 09-8799414,8799417-8799418 0.400 0.200 1.00 2.00
D. J. J. 150046655212	mg/kg	mg/kg	mg/kg
Batch number: 17024667631A TOC	Sample number	100	300
Batch number: 17024667631B	Sample number	r(s): 87994 100	300
	mg/l	mg/l	mg/l
Batch number: 17024120601A Chloride Sulfate	Sample number 0.20 U 0.30 U	(s): 87994 0.20 0.30	09,8799411 0.40 1.0
Batch number: 17024120601B Chloride Sulfate	Sample number 0.20 U 0.30 U	0.20 0.30	12,8799414,8799417 0.40 1.0
Batch number: 17029118102A Total Nitrite/Nitrate Nitrogen	Sample number 0.040 U	(s): 87994 0.040	09,8799411-8799412,8799417 0.10
Batch number: 17029118102B Total Nitrite/Nitrate Nitrogen	Sample number 0.040 U	(s): 87994 0.040	0.10
	mg/l as CaCO3	mg/l as	mg/l as CaCO3
Batch number: 17025008103A Total Alkalinity to pH 4.5	Sample number		
Batch number: 17025008104A Total Alkalinity to pH 4.5	Sample number 3.3 J	1.7 (s): 87994	12,8799414,8799417 5.0
Batch number: 17026002103A Total Alkalinity to pH 4.5	Sample number 2.6 J	1.7	5.0

LCS/LCSD

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757184

Reported: 02/07/2017 12:57

LCS/LCSD

Analysis Name	LCS Spike	LCS	LCSD Spike	LCSD	LCS	LCSD	LCS/LCSD	RPD	RPD
	Added mg/kg	Conc mg/kg	Added mg/kg	Conc mg/kg	%REC	%REC	Limits		Max
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: A170272AA	Sample numbe	r(s): 87994	04-8799408						
Acetone	0.150	0.138	0.150	0.133	92	89	39-150	4	30
Benzene	0.0200	0.0195	0.0200	0.0194	98	97	80-120	1	30
Bromochloromethane	0.0200	0.0200	0.0200	0.0191	100	96	80-126	4	30
Bromodichloromethane	0.0200	0.0193	0.0200	0.0188	97	94	75-120	3	30
Bromoform	0.0200	0.0189	0.0200	0.0187	95	93	57-127	1	30
Bromomethane	0.0200	0.0187	0.0200	0.0168	93	84	21-165	11	30
2-Butanone	0.150	0.148	0.150	0.138	99	92	54-129	8	30
Carbon Disulfide	0.0200	0.0184	0.0200	0.0182	92	91	60-120	1	30
Carbon Tetrachloride	0.0200	0.0201	0.0200	0.0192	100	96	69-130	4	30
Chlorobenzene	0.0200	0.0196	0.0200	0.0194	98	97	80-120	1	30
Chloroethane	0.0200	0.0165	0.0200	0.0158	82	79	10-187	4	30
Chloroform	0.0200	0.0199	0.0200	0.0191	99	95	80-120	4	30
Chloromethane	0.0200	0.0183	0.0200	0.0173	92	86	56-120	6	30
Cyclohexane	0.0200	0.0197	0.0200	0.0195	99	98	58-120	1	30
1,2-Dibromo-3-chloropropane	0.0200	0.0192	0.0200	0.0181	96	91	54-120	6	30
Dibromochloromethane	0.0200	0.0195	0.0200	0.0190	98	95	77-120	3	30
1,2-Dibromoethane	0.0200	0.0197	0.0200	0.0198	99	99	80-120	0	30
1,2-Dichlorobenzene	0.0200	0.0194	0.0200	0.0193	97	96	80-120	1	30
1,3-Dichlorobenzene	0.0200	0.0199	0.0200	0.0191	99	96	80-120	4	30
1,4-Dichlorobenzene	0.0200	0.0194	0.0200	0.0189	97	94	80-120	2	30
Dichlorodifluoromethane	0.0200	0.0173	0.0200	0.0163	87	82	37-126	6	30
1,1-Dichloroethane	0.0200	0.0198	0.0200	0.0198	99	99	77-120	0	30
1,2-Dichloroethane	0.0200	0.0195	0.0200	0.0192	98	96	70-133	1	30
1,1-Dichloroethene	0.0200	0.0205	0.0200	0.0199	102	100	73-129	3	30
cis-1,2-Dichloroethene	0.0200	0.0199	0.0200	0.0194	99	97	80-120	3	30
trans-1,2-Dichloroethene	0.0200	0.0202	0.0200	0.0201	101	100	80-125	1	30
1,2-Dichloropropane	0.0200	0.0193	0.0200	0.0191	96	95	76-120	1	30
cis-1,3-Dichloropropene	0.0200	0.0195	0.0200	0.0190	97	95	74-120	3	30
trans-1,3-Dichloropropene	0.0200	0.0200	0.0200	0.0197	100	98	76-120	2	30
Ethylbenzene	0.0200	0.0199	0.0200	0.0196	100	98	80-120	2	30
Freon 113	0.0200	0.0202	0.0200	0.0195	101	98	64-133	3	30
2-Hexanone	0.100	0.0974	0.100	0.0946	97	95	48-126	3	30
Isopropylbenzene	0.0200	0.0206	0.0200	0.0203	103	102	76-120	1	30
Methyl Acetate	0.0200	0.0196	0.0200	0.0200	98	100	52-146	2	30
Methyl Tertiary Butyl Ether	0.0200	0.0193	0.0200	0.0193	97	97	72-120	0	30
4-Methyl-2-pentanone	0.100	0.0966	0.100	0.0925	97	93	48-136	4	30
Methylcyclohexane	0.0200	0.0192	0.0200	0.0185	96	93	62-132	4	30
Methylene Chloride	0.0200	0.0191	0.0200	0.0189	96	94	76-122	2	30
Styrene	0.0200	0.0218	0.0200	0.0209	109	104	76-120	4	30
1,1,2,2-Tetrachloroethane	0.0200	0.0195	0.0200	0.0195	98	97	67-121	0	30
Tetrachloroethene	0.0200	0.0198	0.0200	0.0189	99	94	78-120	5	30
Toluene	0.0200	0.0202	0.0200	0.0194	101	97	80-120	4	30
1,2,3-Trichlorobenzene	0.0200	0.0188	0.0200	0.0178	94	89	63-122	6	30
1,2,4-Trichlorobenzene	0.0200	0.0192	0.0200	0.0182	96	91	63-121	6	30
1,1,1-Trichloroethane	0.0200	0.0174	0.0200	0.0169	87	85	66-128	3	30
1,1,2-Trichloroethane	0.0200	0.0193	0.0200	0.0197	97	98	80-120	2	30
Trichloroethene	0.0200	0.0201	0.0200	0.0193	100	97	80-120	4	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757184

Reported: 02/07/2017 12:57

LCS/LCSD (continued)

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	mg/kg	mg/kg	mg/kg	mg/kg					
Trichlorofluoromethane	0.0200	0.0188	0.0200	0.0180	94	90	47-146	4	30
Vinyl Chloride	0.0200	0.0184	0.0200	0.0177	92	89	59-120	4	30
m+p-Xylene	0.0400	0.0402	0.0400	0.0392	100	98	80-120	3	30
o-Xylene	0.0200	0.0205	0.0200	0.0194	102	97	80-120	5	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: Y170272AA	Sample numbe	r(s): 87994	09,8799411-87	99412,8799	414-8799	417			
Acetone	150	174.51			116		50-168		
Benzene	20	22.02			110		78-120		
Bromochloromethane	20	21.27			106		80-125		
Bromodichloromethane	20	19.91			100		80-120		
Bromoform	20	16.44			82		59-120		
Bromomethane	20	18.36			92		55-123		
2-Butanone	150	162.74			108		57-145		
Carbon Disulfide	20	20.82			104		58-120		
Carbon Tetrachloride	20	20.41			102		74-130		
Chlorobenzene	20	21.58			108		80-120		
Chloroethane	20	18.85			94		56-120		
Chloroform	20	21.71			109		80-120		
Chloromethane	20	19.75			99		59-127		
Cyclohexane	20	19.77			99		65-131		
1,2-Dibromo-3-chloropropane	20	18.31			92		59-120		
Dibromochloromethane	20	19.51			98		78-120		
1,2-Dibromoethane	20	22.11			111		80-120		
1,2-Dichlorobenzene	20	20.99			105		80-120		
1,3-Dichlorobenzene	20	20.71			104		80-120		
1,4-Dichlorobenzene	20	20.88			104		80-120		
Dichlorodifluoromethane	20	16.51			83		49-134		
1,1-Dichloroethane	20	22.8			114		80-120		
1,2-Dichloroethane	20	21.49			107		66-128		
1,1-Dichloroethene	20	22.74			114		76-124		
cis-1,2-Dichloroethene	20	21.78			109		80-120		
trans-1,2-Dichloroethene	20	22.44			112		80-120		
1,2-Dichloropropane	20	22.18			111		80-120		
cis-1,3-Dichloropropene	20	20.74			104		80-120		
trans-1,3-Dichloropropene	20	20.85			104		76-120		
Ethylbenzene	20	22.04			110		78-120		
Freon 113	20	18.8			94		64-136		
2-Hexanone	100	115.5			115		49-146		
Isopropylbenzene	20 20	21.59			108		80-120		
Methyl Acetate	20	22.21			111 108		61-137		
Methyl Tertiary Butyl Ether	100	21.51 115.76			116		75-120 55-141		
4-Methyl-2-pentanone									
Methylcyclohexane	20 20	18.51			93		66-126		
Methylene Chloride Styrene	20	22.34 21.1			112 105		80-120 80-120		
1,1,2,2-Tetrachloroethane	20	21.1			105		72-120		
Tetrachloroethene	20	21.21			108		80-129		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757184

Reported: 02/07/2017 12:57

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Toluene	20	22.04			110		80-120		
1,2,3-Trichlorobenzene	20	21.7			108		69-120		
1,2,4-Trichlorobenzene	20	22.01			110		72-120		
1,1,1-Trichloroethane	20	20.87			104		66-126		
1,1,2-Trichloroethane	20	21.35			107		80-120		
Trichloroethene	20	22.11			111		80-120		
Trichlorofluoromethane	20	18.21			91		67-129		
Vinyl Chloride	20	19.07			95		63-121		
m+p-Xylene	40	43.82			110		80-120		
o-Xylene	20	21.71			109		80-120		
	ng/g	ng/g	ng/g	ng/g					
Batch number: 17024006	Sample numbe	r(s): 87994	104-8799408						
NETFOSAA	20	23.48			117		70-130		
NMeFOSAA	20	24.25			121		70-130		
Perfluorobutanesulfonate	17.68	16.44			93		70-130		
Perfluorodecanoic acid	20	20.5			102		70-130		
Perfluorododecanoic acid	20	21.76			109		70-130		
Perfluoroheptanoic acid	20	23.67			118		70-130		
Perfluorohexanesulfonate	18.92	20.22			107		70-130		
Perfluorohexanoic acid	20	20.75			104		70-130		
Perfluorononanoic acid	20	22.02			110		70-130		
Perfluoro-octanesulfonate	19.12	20.53			107		70-130		
Perfluorooctanoic acid	20	20.44			102		70-130		
Perfluorotetradecanoic acid	20	21.66			108		70-130		
Perfluorotridecanoic acid	20	21.38			107		70-130		
Perfluoroundecanoic acid	20	21.51			108		70-130		
	ng/l	ng/l	ng/l	ng/l					
Batch number: 17030004			109,8799411-87	99412,8799		417			
Perfluorooctanoic acid	200	184.09			92		70-130		
Perfluorononanoic acid	200	156.4			78		70-130		
Perfluorodecanoic acid	200	162.11			81		70-130		
Perfluoroundecanoic acid	200	209.77			105		70-130		
Perfluorododecanoic acid	200	179.17			90		70-130		
Perfluorotridecanoic acid	200	203.02			102		70-130		
Perfluorotetradecanoic acid	200	180.69			90		70-130		
Perfluorohexanoic acid	200	174.56			87		70-130		
Perfluoroheptanoic acid	200	175.17			88		70-130		
Perfluorobutanesulfonate	176.8	180.01			102		70-130		
Perfluorohexanesulfonate	189.2	152.65			81		70-130		
Perfluoro-octanesulfonate	191.2	154.11			81		70-130		
Perfluorobutanoic Acid	200	179.87			90		70-130		
Perfluoropentanoic Acid	200	166.01			83		70-130		
NETFOSAA	200	183.28			92		70-130		
NMeFOSAA	200	237.35			119		70-130		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757184

Reported: 02/07/2017 12:57

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/l	LCS Conc mg/l	LCSD Spike Added mg/l	LCSD Conc mg/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 170260635001 Calcium Magnesium Potassium Sodium	Sample numbe 4.00 2.00 10	r(s): 87994 4.32 2.19 10.79 10.68	109-8799414,8	799417-8799	108 110 108 107		80-120 80-120 80-120 80-120		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 17024667631A TOC	Sample numbe	r(s): 87994 5441.01	104-8799407		90		47-143		
Batch number: 17024667631B	Sample numbe	r(s): 87994 5441.01	108		90		47-143		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17024120601A Chloride Sulfate	Sample numbe 3.00 7.50	r(s): 87994 2.97 7.56	109,8799411		99 101		90-110 90-110		
Batch number: 17024120601B Chloride Sulfate	Sample numbe 3.00 7.50	r(s): 87994 2.97 7.56	112,8799414,8	799417	99 101		90-110 90-110		
Batch number: 17029118102A Total Nitrite/Nitrate Nitrogen	Sample numbe 2.50	r(s): 87994 2.70	109,8799411-8	799412,8799	417 108		90-110		
Batch number: 17029118102B Total Nitrite/Nitrate Nitrogen	Sample numbe 2.50	r(s): 87994 2.70	114		108		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 17025008103A Total Alkalinity to pH 4.5	Sample numbe	r(s): 87994 182.44	111		97		84-110		
Batch number: 17025008104A Total Alkalinity to pH 4.5	Sample numbe	r(s): 87994 182.26	112,8799414,8	799417	97		84-110		
Batch number: 17026002103A Total Alkalinity to pH 4.5	Sample numbe	r(s): 87994 181.19	109		96		84-110		
	%	%	%	%					
Batch number: 17026820004B Moisture	Sample numbe	r(s): 87994 89.36	104-8799408		100		99-101		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757184

Reported: 02/07/2017 12:57

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked	MS Spike	MS	MSD Spike	MSD	MS	MSD	MS/MSD	RPD	RPD
	Conc	Added	Conc	Added	Conc	%Rec	%Rec	Limits		Max
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: A170272AA	-			408 UNSPK: 1						
Acetone	0.007 U	0.150	0.133	0.148	0.128	88	87	39-150	4	30
Benzene	0.0005 U	0.0200	0.0202	0.0197	0.0194	101	99	80-120	4	30
Bromochloromethane	0.001 U	0.0200	0.0211	0.0197	0.0207	105	105	80-126	2	30
Bromodichloromethane	0.001 U	0.0200	0.0205	0.0197	0.0198	102	101	75-120	4	30
Bromoform	0.001 U	0.0200	0.0222	0.0197	0.0215	111	109	57-127	3	30
Bromomethane	0.002 U	0.0200	0.0186	0.0197	0.0179	93	91	21-165	4	30
2-Butanone	0.004 U	0.150	0.141	0.148	0.133	94	90	54-129	5	30
Carbon Disulfide	0.001 U	0.0200	0.0190	0.0197	0.0190	95	96	60-120	0	30
Carbon Tetrachloride	0.001 U	0.0200	0.0224	0.0197	0.0214	112	109	69-130	4	30
Chlorobenzene	0.001 U	0.0200	0.0206	0.0197	0.0192	103	98	80-120	7	30
Chloroethane	0.002 U	0.0200	0.0170	0.0197	0.0160	85	81	10-187	6	30
Chloroform	0.001 U	0.0200	0.0210	0.0197	0.0201	105	102	80-120	4	30
Chloromethane	0.002 U	0.0200	0.0188	0.0197	0.0183	94	93	56-120	3	30
Cyclohexane	0.001 U	0.0200	0.0218	0.0197	0.0211	109	107	58-120	3	30
1,2-Dibromo-3-chloropropane	0.002 U	0.0200	0.0250	0.0197	0.0243	125*	124*	54-120	3	30
Dibromochloromethane	0.001 U	0.0200	0.0224	0.0197	0.0211	112	107	77-120	6	30
1,2-Dibromoethane	0.001 U	0.0200	0.0236	0.0197	0.0223	118	114	80-120	5	30
1,2-Dichlorobenzene	0.001 U	0.0200	0.0195	0.0197	0.0180	97	92	80-120	8	30
1,3-Dichlorobenzene	0.001 U	0.0200	0.0194	0.0197	0.0179	97	91	80-120	8	30
1,4-Dichlorobenzene	0.001 U	0.0200	0.0189	0.0197	0.0176	94	90	80-120	7	30
Dichlorodifluoromethane	0.002 U	0.0200	0.0208	0.0197	0.0194	104	99	37-126	7	30
1,1-Dichloroethane	0.001 U	0.0200	0.0203	0.0197	0.0203	101	103	77-120	0	30
1,2-Dichloroethane	0.001 U	0.0200	0.0217	0.0197	0.0207	108	105	70-133	5	30
1,1-Dichloroethene	0.001 U	0.0200	0.0217	0.0197	0.0216	108	110	73-129	1	30
cis-1,2-Dichloroethene	0.001 U	0.0200	0.0207	0.0197	0.0198	103	100	80-120	5	30
trans-1,2-Dichloroethene	0.001 U	0.0200	0.0212	0.0197	0.0213	106	108	80-125	1	30
1,2-Dichloropropane	0.001 U	0.0200	0.0203	0.0197	0.0197	101	100	76-120	3	30
cis-1,3-Dichloropropene	0.001 U	0.0200	0.0212	0.0197	0.0198	106	101	74-120	7	30
trans-1,3-Dichloropropene	0.001 U	0.0200	0.0213	0.0197	0.0208	106	106	76-120	2	30
Ethylbenzene	0.001 U	0.0200	0.0205	0.0197	0.0197	102	100	80-120	4	30
Freon 113	0.002 U	0.0200	0.0225	0.0197	0.0223	112	113	64-133	1	30
2-Hexanone	0.003 U	0.100	0.126	0.0984	0.134	126	136*	48-126	6	30
Isopropylbenzene	0.001 U	0.0200	0.0219	0.0197	0.0202	109	103	76-120	8	30
Methyl Acetate	0.002 U	0.0200	0.0224	0.0197	0.0229	112	116	52-146	2	30
Methyl Tertiary Butyl Ether	0.0005 U	0.0200	0.0213	0.0197	0.0212	106	108	72-120	0	30
4-Methyl-2-pentanone	0.003 U	0.100	0.133	0.0984	0.131	133	133	48-136	2	30
Methylcyclohexane	0.001 U	0.0200	0.0227	0.0197	0.0220	113	112	62-132	3	30
Methylene Chloride	0.002 U	0.0200	0.0201	0.0197	0.0201	100	102	76-122	0	30
Styrene	0.001 U	0.0200	0.0205	0.0197	0.0194	102	99	76-120	5	30
1,1,2,2-Tetrachloroethane	0.001 U	0.0200	0.0239	0.0197	0.0233	119	118	67-121	3	30
Tetrachloroethene	0.001 U	0.0200	0.0206	0.0197	0.0197	103	100	78-120	4	30
Toluene	0.001 U	0.0200	0.0206	0.0197	0.0198	103	101	80-120	4	30
1,2,3-Trichlorobenzene	0.001 U	0.0200	0.0176	0.0197	0.0164	88	83	63-122	7	30
1,2,4-Trichlorobenzene	0.001 U	0.0200	0.0175	0.0197	0.0159	87	81	63-121	10	30
1,1,1-Trichloroethane	0.001 U	0.0200	0.0191	0.0197	0.0183	95	93	66-128	4	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757184

Reported: 02/07/2017 12:57

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspike Conc mg/kg	ed MS Spike Added mg/kg	e MS Conc mg/kg	MSD Spike Added mg/kg	MSD Conc mg/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
1,1,2-Trichloroethane	0.001	U 0.0200	0.0213	0.0197	0.0212	106	108	80-120	0	30
Trichloroethene		U 0.0200	0.0215	0.0197	0.0204	107	104	80-120	5	30
Trichlorofluoromethane		U 0.0200	0.0226	0.0197	0.0214	113	109	47-146	6	30
Vinyl Chloride		U 0.0200	0.0198	0.0197	0.0192	99	98	59-120	3	30
m+p-Xylene		U 0.0401	0.0410	0.0394	0.0391	102	99	80-120	5	30
o-Xylene		U 0.0200	0.0203	0.0197	0.0194	101	98	80-120	5	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: Y170272AA	Sample n	umber(s): 87	99409,8799	9411-8799412	,8799414-8	3799417	UNSPK: 8	799414		
Acetone		U 150	168.97	150	168.4	113	112	50-168	0	30
Benzene	0.5	U 20	21.44	20	21.55	107	108	78-120	0	30
Bromochloromethane	1	U 20	20.01	20	20.05	100	100	80-125	0	30
Bromodichloromethane	0.5	U 20	19.17	20	19.11	96	96	80-120	0	30
Bromoform	0.5	U 20	14.62	20	14.95	73	75	59-120	2	30
Bromomethane		U 20	17.94	20	18.3	90	92	55-123	2	30
2-Butanone	3	U 150	148.41	150	149.96	99	100	57-145	1	30
Carbon Disulfide		U 20	20.01	20	20.41	100	102	58-120	2	30
Carbon Tetrachloride		U 20	20.6	20	21.07	103	105	74-130	2	30
Chlorobenzene		U 20	20.63	20	20.65	103	103	80-120	0	30
Chloroethane		U 20	18.45	20	18.89	92	94	56-120	2	30
Chloroform		U 20	21.38	20	21.56	107	108	80-120	1	30
Chloromethane		U 20	19.48	20	19.37	97	97	59-127	1	30
Cyclohexane		U 20	23.16	20	23.28	116	116	65-131	1	30
1,2-Dibromo-3-chloropropane		U 20	16.31	20	16.44	82	82	59-120	1	30
Dibromochloromethane		U 20	18.14	20	18.48	91	92	78-120	2	30
1,2-Dibromoethane		U 20	20.37	20	20.53	102	103	80-120	1	30
1,2-Dichlorobenzene		U 20	19.73	20	20.01	99	100	80-120	1	30
1,3-Dichlorobenzene		U 20	19.69	20	19.66	98	98	80-120	0	30
1,4-Dichlorobenzene		U 20	19.7	20	20.01	99	100	80-120	2	30
Dichlorodifluoromethane		U 20	18.99	20	19.41	95	97	49-134	2	30
1,1-Dichloroethane		U 20	21.9	20	22.18	110	111	80-120	1	30
1,2-Dichloroethane		U 20	20.28	20	20.4	101	102	66-128	1	30
1,1-Dichloroethene		U 20	23.1	20	23.69	116	118	76-124	3	30
cis-1,2-Dichloroethene		U 20	21.09	20	21.14	105	106	80-120	0	30
trans-1,2-Dichloroethene		U 20	22.25	20	22.7	111	113	80-120	2	30
1,2-Dichloropropane		U 20	21.25	20	21.59	106	108	80-120	2	30
cis-1,3-Dichloropropene		U 20	18.54	20	18.9	93	95	80-120	2	30
trans-1,3-Dichloropropene		ti 20	18.73	20	18.87	94	94	76-120	1	30
Ethylbenzene		U 20	21.44	20	21.64	107	108	78-120	1	30
Freon 113		U 20	22.2	20	23.23	111	116	64-136	5	30
2-Hexanone		U 100	106.48	100	106.53	106	107	49-146	0	30
z-Hexanone Isopropylbenzene		U 100	21.13	20	21.42	106	107	80-120	1	30
		U 20	19.74	20	19.5	99	98	61-137	1	30
Methyl Tortiory Butyl Ethor		U 20 U 20	19.74	20 20		99 98	98 100	61-137 75-120	2	30 30
Methyl Tertiary Butyl Ether		U 20 U 100		100	20.09 107.26	98 106		75-120 55-141	1	30
4-Methyl-2-pentanone			106.46				107			
Methylcyclohexane	1	U 20	21.44	20	22.11	107	111	66-126	3	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757184

Reported: 02/07/2017 12:57

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Methylene Chloride	2 U	20	21.21	20	21.45	106	107	80-120	1	30
Styrene	1 U	20	19.94	20	20.01	100	100	80-120	0	30
1,1,2,2-Tetrachloroethane	0.5 U	20	19.25	20	19.59	96	98	72-120	2	30
Tetrachloroethene	0.671	20	22.46	20	22.67	109	110	80-129	1	30
Toluene	0.5 U	20	21.32	20	21.53	107	108	80-120	1	30
1,2,3-Trichlorobenzene	1 U	20	19.84	20	20.12	99	101	69-120	1	30
1,2,4-Trichlorobenzene	1 U	20	20.18	20	20.61	101	103	72-120	2	30
1,1,1-Trichloroethane	0.5 U	20	20.67	20	21.23	103	106	66-126	3	30
1,1,2-Trichloroethane	0.5 U	20	19.74	20	19.93	99	100	80-120	1	30
Trichloroethene	0.5 U	20	21.63	20	21.77	108	109	80-120	1	30
Trichlorofluoromethane	0.5 U	20	20.57	20	20.86	103	104	67-129	1	30
Vinyl Chloride	0.5 U	20	19.43	20	19.66	97	98	63-121	1	30
m+p-Xylene	0.5 U	40	42.05	40	42.81	105	107	80-120	2	30
o-Xylene	0.5 U	20	20.65	20	20.78	103	104	80-120	1	30
	ng/g	ng/g	ng/g	ng/g	ng/g					
Batch number: 17024006	Sample numb	per(s): 8799	9404-8799	408 UNSPK:	P799399					
NETFOSAA	0.28 U	19.49	26.35	18.69	21.99	135*	118	70-130	18	30
NMeFOSAA	0.28 U	19.49	27.07	18.69	22.63	139*	121	70-130	18	30
Perfluorobutanesulfonate	0.19 U	17.23	16.35	16.52	17.35	95	105	70-130	6	30
Perfluorodecanoic acid	0.19 U	19.49	18.97	18.69	21.57	97	115	70-130	13	30
Perfluorododecanoic acid	0.19 U	19.49	21	18.69	21.82	108	117	70-130	4	30
Perfluoroheptanoic acid	0.19 U	19.49	22.56	18.69	20.35	116	109	70-130	10	30
Perfluorohexanesulfonate	0.19 U	18.44	21.38	17.68	19.89	116	112	70-130	7	30
Perfluorohexanoic acid	0.094 U	19.49	19.95	18.69	21.45	102	115	70-130	7	30
Perfluorononanoic acid	0.094 U	19.49	20.43	18.69	16.45	105	88	70-130	22	30
Perfluoro-octanesulfonate	0.28 U	18.64	18.64	17.87	19.24	100	108	70-130	3	30
Perfluorooctanoic acid	0.19 U	19.49	19.71	18.69	18.54	101	99	70-130	6	30
Perfluorotetradecanoic acid	0.19 U	19.49	20.8	18.69	19.83	107	106	70-130	5	30
Perfluorotridecanoic acid	0.19 U	19.49	19.95	18.69	18.41	102	98	70-130	8	30
Perfluoroundecanoic acid	0.19 U	19.49	20.52	18.69	20.29	105	109	70-130	1	30
	ng/l	ng/l	ng/l	ng/l	ng/l					
Batch number: 17030004	Sample numb	per(s): 8799	9409,8799	411-8799412	,8799414-8	3799417 τ	JNSPK: 8	799414		
Perfluorooctanoic acid	44.08	199.36	239.49	199.05	222.59	98	90	70-130	7	30
Perfluorononanoic acid	0.6 U	199.36	159.46	199.05	159.05	80	80	70-130	0	30
Perfluorodecanoic acid	0.5 U	199.36	165.96	199.05	157.77	83	79	70-130	5	30
Perfluoroundecanoic acid	1 U	199.36	182.67	199.05	187.71	92	94	70-130	3	30
Perfluorododecanoic acid	0.5 U	199.36	191.32	199.05	185.8	96	93	70-130	3	30
Perfluorotridecanoic acid	0.5 U	199.36	207.05	199.05	207.78	104	104	70-130	0	30
Perfluorotetradecanoic acid	0.5 U	199.36	170.81	199.05	180.48	86	91	70-130	6	30
Perfluorohexanoic acid	8.92	199.36	175.94	199.05	173.02	84	82	70-130	2	30
Perfluoroheptanoic acid	6.79	199.36	176.97	199.05	171.49	85	83	70-130	3	30
Perfluorobutanesulfonate	3.73	176.24	178.29	175.96	177.04	99	98	70-130	1	30
Perfluorohexanesulfonate	2.34	188.6	180.51	188.3	174.57	94	91	70-130	3	30
Perfluoro-octanesulfonate	2.98	190.59	139.37	190.29	182.5	72	94	70-130	27	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757184

Reported: 02/07/2017 12:57

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ng/l	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Perfluorobutanoic Acid	5.03	199.64	192.72	200	192.26	94	94	70-130	0	30
Perfluoropentanoic Acid	8.04	199.36	187.09	199.05	182.9	90	88	70-130	2	30
NETFOSAA	1 U	199.36	178.96	199.05	196.42	90	99	70-130	9	30
NMeFOSAA	1 U	199.36	219.49	199.05	202.2	110	102	70-130	8	30
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 170260635001	Sample numb	er(s): 8799	9409-8799	414 8799417	-8799418	IINSDK: 8'	799414			
Calcium	30.51	4.00	34.79	4.00	34.86		109 (2)	75-125	0	20
Magnesium	7.06	2.00	9.11	2.00	9.11	107 (2)	102	75-125	0	20
Potassium	4.94	10	15.46	10	15.46	105	105	75-125	0	20
Sodium	70.16	10	80.69	10	81.01		108 (2)	75-125	0	20
Doaram						103 (2)	100 (2)	75 125	J	20
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 17024667631A	Sample numb	er(s): 8799	9404-8799	407 UNSPK:	P799399					
TOC	223 U	20220	16365.48			81		47-143		
Batch number: 17024667631B	Sample numb 975.02		9408 UNSP 18475.18	K: P799432		66		47-143		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17024120601A	Sample numb	er(s): 8799	9409,8799	411 UNSPK:	P799385					
Chloride	94.61	400	482.85			97		90-110		
Sulfate	12.72	50	59.83			94		90-110		
D-+	01	(-). 070	0410 0700	414 0700417	IDIODIC. O	700414				
Batch number: 17024120601B Chloride	Sample numb	er(s): 8/95 200	358.21	414,8/9941/	UNSPK: 8	104		90-110		
Sulfate	19.77	50	67.98			96		90-110		
Batch number: 17029118102A	Sample numb	er(s): 8799	9409,8799	411-8799412	,8799417	UNSPK: P'	799385			
Total Nitrite/Nitrate Nitrogen	4.75	2.00	7.00			113*		90-110		
Batch number: 17029118102B	Sample numb	er(s): 8799	9414 UNSP	K: 8799414						
Total Nitrite/Nitrate Nitrogen	1.53	1.00	2.63			110		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 17025008103A	Sample numb				cacos					
Total Alkalinity to pH 4.5	132.51	188	221.3	188	258.71	47*	67*	84-110	16*	5
Batch number: 17025008104A	Sample numb	er(s): 8799	9412.8799	414.8799417	IINSPK: P	798933				
Total Alkalinity to pH 4.5	98.28	188	230.89	,0,,,,11,	1.011.	71*		84-110		
Batch number: 17026002103A	Sample numb	er(s): 8799	9409 UNSP	K: P804238						
Total Alkalinity to pH 4.5	109.15	188	196.55			46*		84-110		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757184

Reported: 02/07/2017 12:57

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD 1	OUP RPD Max
	mg/l	mg/l		
Batch number: 170260635001 Calcium Magnesium Potassium Sodium	Sample number(s): 30.51 7.06 4.94 70.16	8799409-8799414,879 30.66 7.05 4.94 70.42	9417-8799418 : 0 0 0 (1) 0	BKG: 8799414 20 20 20 20 20
	mg/kg	mg/kg		
Batch number: 17024667631A	Sample number(s): 223 U	8799404-8799407 BKG 223 U	: P799399 0 (1)	7
Batch number: 17024667631B	Sample number(s): 975.02	8799408 BKG: P79943 1126.01	2 14* (1)	7
	mg/l	mg/l		
Batch number: 17024120601A Chloride Sulfate	Sample number(s): 94.61 12.72	8799409,8799411 BKG 96.85 12.69	: P799385 2 (1) 0 (1)	15 15
Batch number: 17024120601B Chloride Sulfate	Sample number(s): 149.4 19.77	8799412,8799414,879 149.87 19.91	9417 BKG: 879 0 1 (1)	9414 15 15
Batch number: 17029118102A Total Nitrite/Nitrate Nitrogen	Sample number(s): 4.75	8799409,8799411-879 4.73	9412,8799417 0	BKG: P799385 2
Batch number: 17029118102B Total Nitrite/Nitrate Nitrogen	Sample number(s): 1.53	8799414 BKG: 879941 1.53	0	2
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 17025008103A Total Alkalinity to pH 4.5	Sample number(s): 132.51	8799411 BKG: P79860 133.62	7 1	5
Batch number: 17025008104A Total Alkalinity to pH 4.5	Sample number(s): 98.28	8799412,8799414,879 96.1	9417 BKG: P79 2	8933 5
Batch number: 17026002103A Total Alkalinity to pH 4.5	Sample number(s): 109.15	8799409 BKG: P80423 110.5	8	5
	%	%		
Batch number: 17026820004B Moisture	Sample number(s): 8.05	8799404-8799408 BKG 8.43	: P799399 5	5

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757184

Reported: 02/07/2017 12:57

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: A170272AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8799404	98	102	102	97
8799405	100	104	99	94
8799406	101	104	99	97
8799407	97	98	99	95
8799408	97	100	99	95
Blank	101	101	97	96
LCS	101	100	100	99
LCSD	99	101	98	98
MS	99	100	99	97
MSD	98	101	100	103
Limits:	50-141	54-135	52-141	50-131

Analysis Name: SOM02.2 Volatiles

Batch number: Y170272AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8799409	94	99	100	99
8799411	95	100	100	98
8799412	95	100	100	98
8799414	95	99	100	98
8799415	97	99	100	100
8799416	97	98	100	100
8799417	94	98	100	98
Blank	95	100	100	98
LCS	98	98	101	101
MS	97	99	100	100
MSD	97	98	100	100
Limits:	80-116	77-113	80-113	78-113

Analysis Name: 14 PFCs

Batch number: 17024006

	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA	13C8-PFOA	13C8-PFOS	
8799404	77	78	67*	83	75	86	
8799405	66*	70	72	71	74	64*	
8799406	75	74	74	84	75	69*	
8799407	66*	71	71	73	77	77	
8799408	71	74	71	86	84	77	
Blank	81	96	89	94	106	96	
LCS	80	75	73	78	82	71	
MS	73	77	71	77	79	85	
MSD	58*	52*	52*	53*	69*	57*	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757184

Reported: 02/07/2017 12:57

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 14 PFCs Batch number: 17024006

Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA	d5-NEtFOSAA	13C2-PFDoDA
8799404	82	75	65*	74	72	69*
8799405	66*	70	56*	61*	55*	57*
8799406	78	92	68*	68*	73	66*
8799407	85	72	50*	63*	62*	59*
8799408	78	78	64*	74	67*	66*
Blank	109	90	78	85	99	78
LCS	79	83	69*	78	80	78
MS	81	71	57*	69*	65*	65*
MSD	71	60*	52*	62*	47*	59*
Timita:	70-130	70-130	70-130	70-130	70-130	70-130

	13C2-PFTeDA
8799404	60*
8799405	55*
8799406	68*
8799407	56*
8799408	62*
Blank	75
LCS	75
MS	64*
MSD	56*
Limits:	70-130

Analysis Name: 16 PFCs Batch number: 17030004

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8799409	69*	71	76	77	83	97
8799411	73	74	81	68*	82	79
8799412	73	81	79	76	77	89
8799414	73	77	82	79	74	88
8799415	72	71	80	74	80	85
8799416	82	90	97	84	78	83
8799417	69*	75	80	83	75	85
Blank	75	70	72	73	77	82
LCS	78	75	70	74	74	86
MS	72	71	80	74	80	85
MSD	82	90	97	84	78	83
Limits:	70-130	70-130	70-130	70-130	70-130	70-130

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757184

Reported: 02/07/2017 12:57

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 17030004

	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8799409	73	74	88	88	68*	74
8799411	85	68*	83	77	90	72
8799412	72	82	91	79	70	79
8799414	75	74	92	69*	77	67*
8799415	70	84	94	70	65*	67*
8799416	79	88	101	83	80	72
8799417	80	82	75	71	62*	65*
Blank	67*	99	119	81	84	69*
LCS	76	73	81	76	75	70
MS	70	84	94	70	65*	67*
MSD	79	88	101	83	80	72
Limits:	70-130	70-130	70-130	70-130	70-130	70-130

	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
8799409	88	70	67*	
8799411	94	71	64*	
8799412	95	64*	64*	
8799414	83	63*	59*	
8799415	78	60*	61*	
8799416	75	71	70	
8799417	75	58*	59*	
Blank	93	67*	62*	
LCS	75	66*	70	
MS	78	60*	61*	
MSD	75	71	70	
Limits:	70-130	70-130	70-130	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



Lancaster Environmental Services Analysis Request/Chain of Custody

Acct. #:	37191		Gro	up #:	179	5718	34		Sam	ple #:	8-	79	91	10	4	- (8				COC#:	16303
Client: C.T. Male Associates						Matrix						Ar	alys	ses F	Req	uest	ed			٦	For Lab Us	se Only
Project Name/#: SGPP - Merrimack	Site ID:					Ø C]					Pı	rese	rvati	ion	Cod	es				SF#: <u>286377</u>	
Project Manager: Kirk Moline	P.O. #:] ₌	,			Н	N	s										SCR#: <u>20028</u>	0
Sampler: Stophen Johnson STJ					Sediment	Ground Surface			Ş				:0 B))							Preserva	tion Codes
Phone #: 715529 1676	Quote #:	214135			Sed			ers	- TICs	်	(353.2)		A 2320	mod.)						1	H = HCl	T = Thiosulfate
State where sample(s) were collected: NH						ble ES		Containers	() ()	(6010C)		6	rb (SM	537	câs					ľ	N = HNO ₃	B = NaOH
	Colle	ection		Composite	M	Potable r NPDES	١	# of	VOAs (8260C)	Mg, Na, K	Total NO2 / NO3	SO4- (300.0)	Carb/Bicarb	PFCs (EPA	2,2 00	FCs	Moishme)C			$S = H_2SO_4$ O = Other	$P = H_3 PO_4$
Sample Identification_	Date	Time	Grab	Com	Soil	Water	Other:	Total	TCL V	Ca, M	Total	Cl-, S(ALK +	16 PF	721	(×	12		I	Ren	narks
Sh2-APOZ-3-5-170116	V16/17	1145	V		X			5				:			X	X	X	χĵ				
342-APOZ-7-8-120116	416/17	0955	У		X			5							X	У	'X	X				
Sh2-4Poz-12-13-170116	416117	1033	M		K			5							X	Х	X	×				
Shz-4/02-14-18-170116	416/17	1057	K		K			5							y	X	X	X				
562-APOZ-20-215-170116	Y16/17	11/7	V		X			5							×	X	A	X				
Shz-AP03-68-69-17014	V16/17	1422	X		,	X		12	X	X	У	X	Ж	X							Filh me	lab
Shz-APO4-27-28-170116	416/17	1553	χ			\mathcal{X}		11	Ж	X,	X	X	X	X								
Shz-APO4-34-35-170117	YIJJIZ	0917	X			X		12	×	X	X	×	X	Ж							Filter me	14/5
Shz-APO4-44-45-170117	1/17/17	1046	×			X	21	NE	K	M	X	K	X	X							M5/N5B	
SGZ- FA01-170117	Y17/17	is the second second	×	,		×		12	X	X	X	×	M	X							Filter me	lu/s
Turnaround Time Requested (TAT) (please of	heck). Stan	dard 🗌	RUSI	H 🔀	Relir	quished	by:				Date			Time		Rec	eive	d by:			Date	Time
(RUSH TAT is subject to Eurofins Lancaster Laboratori	es approval	and surcha	ges.)		Polit	te //	by:				9-17 Date			6°4 Time		Rec	oivo	1 by			Date _/	Time
Date results are needed: E-mail address to send RUSH results:	*** \				176111	iquisiicu	IJy.				Date			111116		Nec	CIVC	a by.		İ	Date	Time
Data Package Options (please check if requir	ed)				Relir	quished	by:				Date			Time		Rec	eive	d by:			Date	Time
Type I (Validation/non-CLP)	·	TX TRRP	- 13	П						THE REAL PROPERTY.	Market Comment							A STATE OF THE PARTY OF THE PAR				
Type III (Reduced non-CLP) CT RCI					Relir	quished	by:		and the same of th		Date			Time		Ŗec	eive	d by:			Date	Time
The state of the s	уре А 🗌																	_				
	уре В 🗌	-			Relir	nquished	by:				Date			Time		Rec		d by:	•		Date	Time
EDD Format: EQuIS					Airbil	l No.:											1	1+	<u> </u>		1/21/17	9.20
If site-specific QC (MS/MSD/Dup) required, i	ndicate Q	C sample	s and		Relin	quished b			al Ca	rrier:							¥				2 =	
submit triplicate volume.					UPS		FedE	x	<u></u>	Othe	٢					Tem	pera	ture ı	ıpon r	ecei	ipt <u>(0-0 - c</u>	<u>2</u> .c



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

173642

Group Number(s): 1757184

Client: C.T. Male

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

01/20/2017 9:45

Number of Packages:

2

Number of Projects:

1

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

N/A

Custody Seal Present:

Yes

Sample Date/Times match COC:

N/A

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

Air Quality Samples Present:

No

No

Samples Chilled:

Yes

Total Trip Blank Qty:

3

Paperwork Enclosed: Samples Intact:

No Yes Trip Blank Type:

N/A

Missing Samples:

No

Extra Samples:

No N/A

Unpacked by Karen Diem (3060) at 19:50 on 01/20/2017

Discrepancy in Container Qty on COC:

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler#	Thermometer ID	Corrected Temp	Therm. Type	ice Type	Ice Present?	Ice Container	Elevated Temp?
· 1	DT121	0.9	DT	Wet	Y	Bagged	N
2	DT121	0.6	DT	Wet	Y	Bagged	N
3	DT121	0.5	DT	Wet	Υ	Bagged	N

Paperwork Not Enclosed Details

Sample ID on Label

No. of Containers

Date on Label

Comments

see att paper

1

1/20/2017 20:06

General Comments:

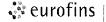
SEE ATT PAPER

1757184 - 1553 - 4 Battle's Tuicel's 1-16-17 APO4-27-28-170116 - 5 Bottles - 7 vials 1-17-17 FADI- 170117 1046 & pottles - 13 viels - 1 aB/ Mg ADOU-44-45 - 170117 ノーノフーノフ A703-68-69-17016 1422 - 7Battles - 70,0/s. 1-16-17 0915 - 5 BOHLES - 70,0/5 APOU - 34-36-170117 1-17-17 14za - 4BOHKS-7-VICITS APOU- 64-65- 170117 1-17-17 1706- 5BOHHES- M-VIUS 1-17-17 APCU - 54-55- 170117 1057 - 5BOHLES - 7 Wals 1-18-17 APOU - 83.6-845 170118 -0843 - a BOHHES - MUIUS APO4 - 74-75 - 170118 - 1-18-17 1117 - 1BOHHE-15011 Few APOUL \$20-21.5 - 170116 1-16-17 1120 - 2 BUHLES 1-18-17 FB03 - 170118 965 - 1 Bottle - 1 soil Jan 1-16-17 APOZ - 7-8 - 17016 1033 - 1 BOHHLE - 150,7 Tet 1-12e-17 APOZ - 12-13-170116 1546-1 Bottle 11-18-17 Apole - 16-8 170118 1522 - 1 BOHHe -1-soil Fer Apole - 25-45170118 1-18-17 1320 - 1BOHAE-1501 Jer -11.8-145170118 1-18-17 APOŠ 13000 - 1-BOHHE- 1501 Ju APOS - 7-8-170118 1-18-17 1848 - a Bottles - 1501 Tur 1-18-17 APOLE - 6-8 170118 1145 - 1 Bottle-1-501 Jun 1-16-17 APOZ- 3-5 170116 1381 - 1Bottle 1-50/Ter 1-18-17 2-3-170/18 APOZ-1057 - 1 Bottle 1-18-17 83.5-84.5170118 APOU -1087 - 1501 Jar 1-16-17 - 17-18-170114 SCOPA. \$ 1 BOHHL - 1501 Jour 1-18-17 FDOZ. 170118

2TB HLI

178-BOHLE

Page 70 of 72



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

173687

Group Number(s): +757

1757184

Client: C.T Male Associates

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

01/21/2017 9:20

Number of Packages:

4

Number of Projects:

1

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

No

Custody Seal Present:

Yes

Sample Date/Times match COC:

No

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

Air Quality Samples Present:

No

Samples Chilled:

Yes

Total Trip Blank Qty:

6

Paperwork Enclosed:

Yes

Trip Blank Type:

See Below No

Samples Intact: Missing Samples: Yes No

Extra Samples:

No

Discrepancy in Container Qty on COC:

Yes

Trip Blank Type(s): (2UNP.) (4HCL)

Unpacked by Porsha Hill (12046) at 11:54 on 01/21/2017

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler#	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	0.0	DT	Wet	Υ	Bagged	N
2	DT121	0.5	DT	Wet	Υ	Bagged	N
3	DT121	0.3	DT	Wet	Υ	Bagged	N
4	DT121	0.5	DT	Wet	Υ	Bagged	N

Container Quantity Discrepancy Details

Sample ID on COC

Container Qty. Received

Container Qty. on COC

Comments

AP04-44-45-170117

22

21

Sample ID Discrepancy Details

Sample ID on COC FD03-170119

Sample ID on Label

Comments

FD01-170119

only HCI vials

AP08-57-58-170119

AP08-58-59-070119

Sample Date/Time Discrepancy Details

Sample ID on COC

Date/Time on Label

Comments

AP04-34-35-170117

1/17/2017 09:15



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RLReporting Limit kg **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: February 07, 2017

Project: SGPP - Merrimack

Submittal Date: 01/21/2017 Group Number: 1757186 SDG: MMK18 PO Number: 16.6126 State of Sample Origin: NH

	Lancaster Labs
Client Sample Description	<u>(LL) #</u>
SG2-AP04-54-55-170117 Grab Groundwater	8799425
SG2-AP04-54-55-170117 Filtered Grab Groundwater	8799426
SG2-AP04-64-65-170117 Grab Groundwater	8799427
SG2-AP04-74-75-170118 Grab Groundwater	8799428
SG2-AP04-83.5-84.5-170118 Grab Groundwater	8799429
SG2-AP04-83.5-84.5-170118 Filtered Grab	8799430
SG2-FB03-170118 Grab Blank Water	8799431
SG2-AP05-7-8-170118 Grab Soil	8799432
SG2-AP05-11.5-14.5-170118 Grab Soil	8799433
SG2-AP05-2-3-170118 Grab Soil	8799434
SG2-AP06-2.5-4.5-170118 Grab Soil	8799435
SG2-FD02-170118 Grab Soil	8799436
VOC Trip Blank Water	8799437

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	Barr Engineering Company	Attn: Jonathon Carter
Electronic Copy To	Barr Engineering Company	Attn: Lauren Brady
Electronic Copy To	C. T. Male Associates	Attn: Jeff Marx
Electronic Copy To	C. T. Male Associates	Attn: Dan Reilly
Electronic Copy To	C. T. Male Associates	Attn: Kirk Moline



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250



Project Name: SGPP - Merrimack LL Group #: 1757186

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260C, GC/MS Volatiles

Batch #: A170272AA (Sample number(s): 8799432-8799436 UNSPK: P799399)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: 1,2-Dibromo-3-chloropropane, 2-Hexanone EPA 537 Rev 1.1, Misc. Organics

Sample #s: 8799425, 8799427, 8799428, 8799429, 8799431

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

<u>Batch #: 17030004 (Sample number(s): 8799425, 8799427-8799429, 8799431 UNSPK:</u> P799414)

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8799425, 8799427, 8799429, 8799431, Blank, LCS, MS EPA 537 Rev. 1.1 modified, Misc. Organics

<u>Sample #s: 8799432, 8799433, 8799434, 8799435, 8799436</u>

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Batch #: 17024006 (Sample number(s): 8799432-8799436 UNSPK: P799399)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: NEtFOSAA, NMeFOSAA

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8799432, 8799433, 8799434, 8799435, 8799436, LCS, MS, MSD

<u>SW-846 6010C, Metals</u>

Batch #: 170260635002 (Sample number(s): 8799425-8799430 UNSPK: 8799428 BKG: 8799428)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Calcium

SW-846 6010C, Metals Dissolved

Batch #: 170260635002 (Sample number(s): 8799425-8799430 UNSPK: 8799428 BKG: 8799428)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Calcium $\,$

SW-846 9060 modified, Wet Chemistry

<u>Batch #: 17024667631B (Sample number(s): 8799432-8799436 UNSPK: 8799432 BKG: 8799432)</u>

The duplicate RPD for the following analyte(s) exceeded the acceptance window: $TOC\ Solids/Sludges\ Combustion$

SM 2320 B-1997, Wet Chemistry

Batch #: 17025008104A (Sample number(s): 8799425, 8799427-8799429 UNSPK: P798933 BKG: P798933, P799390)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Alkalinity to pH $4.5\,$

v 1.9.4



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-54-55-170117 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799425 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 12:06 by SJ C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 11:24

01K18 SDG#: MMK18-01

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit	As Received Limit of * Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 8	3260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	1		0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	2		0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	1		0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



As Received

As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-54-55-170117 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799425 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 12:06 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 11:24

01K18 SDG#: MMK18-01

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea	rch						
	The results from th	e volatile li	brary search a	are list	ed on the at	cached		
	FORM 1 - VOA-TIC.	The qualifier						
	on the back of this	form.						
Misc.	Organics	EPA 537 R	ev 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic a	cid	335-67-1	42		0.5	2	1
10954	Perfluorononanoic a	cid	375-95-1	0.8	J	0.6	2	1
10954	Perfluorodecanoic a	cid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoid	acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoio	acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoi	c acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecan		376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic a		307-24-4	10		0.5	2	1
10954	Perfluoroheptanoic		375-85-9	7		0.5	2	1
10954	Perfluorobutanesulf		375-73-5	5		0.7	2	1
10954	Perfluorohexanesulf		355-46-4	2	J	1	3	1
10954	Perfluoro-octanesul		1763-23-1	4	J	2	6	1
10954	Perfluorobutanoic A		375-22-4	5	J	3	10	1
	Perfluoropentanoic	Acid	2706-90-3	10		0.5	2	1
10954	NETFOSAA		2991-50-6	1	U	1	3	1
10954	NEtFOSAA is the acr NMeFOSAA	onym for N-et	hyl perfluoroo 2355-31-9	octanesu 1	.lfonamidoace	tic Acid. 1	3	1
	NMeFOSAA is the acr	onym for N-me	thyl perfluore	octanes	ulfonamidoace	etic Acid.		
The	stated QC limits are	advisory only	y until suffic	ient da	ta points			
can :	be obtained to calcu	late statisti	cal limits.					
Metals	3	SW-846 603	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	84.8		0.0382	0.400	1
01757	Magnesium		7439-95-4	20.2		0.0190	0.200	1
01762	Potassium		7440-09-7	5.90		0.160	1.00	1
01767	Sodium		7440-23-5	51.1		0.173	2.00	1
Wet Cl	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	330		100	200	500
00228	Sulfate		14808-79-8	20.6		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitra		n.a.	1.6		0.040	0.10	1
0,002	10001 NICIICO, NICIO	.cc mrcrogen		1.0		3.010	0.10	-
		SM 2320 B	-1997	mg/1	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to	pH 4.5	n.a.	20.1		1.7	5.0	1
12149	Bicarbonate Alkalin	-	n.a.	20.1		1.7	5.0	1
12148	Carbonate Alkalinit	У	n.a.	1.7	U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-54-55-170117 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799425 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 12:06 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 11:24

01K18 SDG#: MMK18-01

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Ti	me		Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170272AA	01/27/2017	13:30	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170272AA	01/27/2017	13:30	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17030004	02/01/2017	21:05	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17030004	01/30/2017	15:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170260635002	01/27/2017	08:18	Joanne M Gates	1
01757	Magnesium	SW-846 6010C	1	170260635002	01/27/2017	08:18	Joanne M Gates	1
01762	Potassium	SW-846 6010C	1	170260635002	01/27/2017	08:18	Joanne M Gates	1
01767	Sodium	SW-846 6010C	1	170260635002	01/27/2017	08:18	Joanne M Gates	1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	170260635002	01/26/2017	22:00	Annamaria Kuhns	1
	U4							
00224	Chloride	EPA 300.0	1	17024120601B	01/24/2017	18:29	Hallie Burnett	500
00228	Sulfate	EPA 300.0	1	17024120601B	01/24/2017	18:15	Hallie Burnett	5
07882	Total Nitrite/Nitrate	EPA 353.2	1	17029118102B	01/29/2017	18:04	Joseph E McKenzie	1
	Nitrogen							
12150	Total Alkalinity to pH	SM 2320 B-1997	1	17025008104A	01/26/2017	06:54	Brandon P Costik	1
	4.5							
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	06:54	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	06:54	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE N	10.
VOLATILE ORGANICS ANAL	YSIS DATA SHEET			
TENTATIVELY IDENTIFI	!		!	
		!	01K18	!
Lab Name: Lancaster Laboratories	Contract:	!		!
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8799425			
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355.i	/17ja	an27a.b/y	j27s28.d
Level: (low/med) LOW	Date Received: 01/21/1	7		
Moisture: not dec.	Date Analyzed: 01/27/1	7		
Column: (pack/cap) CAP	Dilution Factor: 1.0			
	CONCENTRATION UNITS:			
Number TICs found: 0	(ug/L or ug/Kg) ug/L			

CAS NUMBER	! COMPOUND NAME	! RT	EST. CONC.	~
	==!===================================	•		!===== ! U
2.	!	!	!	!
	!			!
4.	_!		!	!
5	!	!		!
		!	!	!
7		!		!
8	!	!		!
9	!!	!	!	!
	!	!		!
	!	!		!
.2	!!	!	!	!
.3	!	!		!
.4	!	!		!
	!	!		!
.6		!		!
.7	!	!		!
.8	!	!		!
.9	!	!		!
20	!	!		!
21	!	!		!
.2	!	!		!
23	!	!		!
24	!	!		!
		!		!
	!	!!	!	!
	!	!		!
	!	!		!
	!	!		!
80	!!	!		!
	1	!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-54-55-170117 Filtered Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799426 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 12:06 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 11:24

02K18 SDG#: MMK18-02

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	Dissolved	SW-846	6010C	mg/l	mg/l	mg/l	
01750	Calcium		7440-70-2	85.3	0.0382	0.400	1
01757	Magnesium		7439-95-4	19.8	0.0190	0.200	1
01762	Potassium		7440-09-7	4.02	0.160	1.00	1
01767	Sodium		7440-23-5	50.8	0.173	2.00	1

Sample Comments

This sample was lab filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01750	Calcium	SW-846 6010C	1	170260635002	01/27/2017 08	:21 Joanne M Gates	1
01757	Magnesium	SW-846 6010C	1	170260635002	01/27/2017 08	:21 Joanne M Gates	1
01762	Potassium	SW-846 6010C	1	170260635002	01/27/2017 08	:21 Joanne M Gates	1
01767	Sodium	SW-846 6010C	1	170260635002	01/27/2017 08	:21 Joanne M Gates	1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	170260635002	01/26/2017 22	::00 Annamaria Kuhns	1
	U4						



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-64-65-170117 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799427 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 14:29 by SJ C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 11:24

03K18 SDG#: MMK18-03

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	1		0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	Ū	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1	1
11997	Chloroform	67-66-3	1	O	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5	1
11997	Dibromochloromethane	124-48-1	1	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	IJ	0.5	1	1
11997	1,2-Dibromoethane 1,2-Dichlorobenzene	95-50-1	0.5 1	U	0.5 1	5	1
11997	•		1	IJ	1	5	1
	1,3-Dichlorobenzene	541-73-1		-			
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U 	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	Ū	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ū	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	Ū	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ū	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	IJ	0.5	1	1
		1,,001 20 1	٠.٠		<u> </u>		

^{*=}This limit was used in the evaluation of the final result



As Received

As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-64-65-170117 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799427 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 14:29 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 11:24

03K18 SDG#: MMK18-03

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Se	arch						
	The results from t FORM 1 - VOA-TIC. on the back of thi	the volatile li The qualifier						
Misc.	Organics	EPA 537 R	ev 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic	acid	335-67-1	44		0.5	2	1
10954			375-95-1	0.6	J	0.6	2	1
10954	Perfluorodecanoic	acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecano	c acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecano	c acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecand	oic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradeca	anoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic	acid	307-24-4	9		0.5	2	1
10954	Perfluoroheptanoio	c acid	375-85-9	8		0.5	2	1
10954			375-73-5	6		0.7	2	1
10954			355-46-4	2	J	1	3	1
10954			1763-23-1	4	J	2	6	1
10954			375-22-4	5	J	3	10	1
10954	Perfluoropentanoio	c Acid	2706-90-3	11		0.5	2	1
10954			2991-50-6	1	U	1	3	1
10954	NEtFOSAA is the ac	cronym for N-et	hyl perfluoroo 2355-31-9	octanesu 1	ılfonamidoace U	tic Acid. 1	3	1
	NMeFOSAA is the ac	-				etic Acid.		
	stated QC limits ar be obtained to calc			ient da	ta points			
Metal	s	SW-846 60	10C	mg/l		mg/l	mg/l	
	Calcium		7440-70-2	86.6		0.0382	0.400	1
01757			7439-95-4	21.6		0.0190	0.200	1
01762	_		7440-09-7	5.87		0.160	1.00	1
01767	Sodium		7440-23-5	54.6		0.173	2.00	1
Wet C	hemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	319		100	200	500
00228	Sulfate		14808-79-8	20.0		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitr		n.a.	1.7		0.040	0.10	1
		SM 2320 B	-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity t		n.a.	23.6		1.7	5.0	1
12149	Bicarbonate Alkali	-	n.a.	23.6		1.7	5.0	1
12149	Carbonate Alkalini	-	n.a.	1.7	U	1.7	5.0	1
12170	Carbonacc Arnarini	1	π.α.	±.,	J	± • /	3.0	_

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-64-65-170117 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799427 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 14:29 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 11:24

03K18 SDG#: MMK18-03

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Tir	me		Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170272AA	01/27/2017	13:52	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170272AA	01/27/2017	13:52	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17030004	02/01/2017	21:26	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17030004	01/30/2017	15:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170260635002	01/27/2017	08:30	Joanne M Gates	1
01757	Magnesium	SW-846 6010C	1	170260635002	01/27/2017	08:30	Joanne M Gates	1
01762	Potassium	SW-846 6010C	1	170260635002	01/27/2017	08:30	Joanne M Gates	1
01767	Sodium	SW-846 6010C	1	170260635002	01/27/2017	08:30	Joanne M Gates	1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	170260635002	01/26/2017	22:00	Annamaria Kuhns	1
	U4							
00224	Chloride	EPA 300.0	1	17024120601A	01/24/2017	15:38	Hallie Burnett	500
00228	Sulfate	EPA 300.0	1	17024120601A	01/24/2017	15:24	Hallie Burnett	5
07882	Total Nitrite/Nitrate	EPA 353.2	1	17029118102B	01/29/2017	18:06	Joseph E McKenzie	1
	Nitrogen							
12150	Total Alkalinity to pH	SM 2320 B-1997	1	17025008104A	01/26/2017	07:22	Brandon P Costik	1
	4.5							
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	07:22	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	07:22	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E VOLATILE ORGANICS AN	TALVOTO DATA CHEET	EPA SAMPLE NO).
TENTATIVELY IDENT	!		
		! 03K18	!
ab Name: Lancaster Laboratories	Contract:	!	!
ab Code: LANCAS Case No.:	SAS No.:	SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 879	9427	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP093	55.i/17jan27a.b/y	j27s29.d
evel: (low/med) LOW	Date Received: 01/	21/17	
Moisture: not dec.	Date Analyzed: 01/	27/17	
column: (pack/cap) CAP	Dilution Factor: 1	.0	
	CONCENTRATION UN	ITS:	
Number TICs found: 0	(ug/L or ug/Kg)	uq/L	

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
	==!===================================	===!=====! !		!==== ! U
	!	i i		!
3.	· ·			!
	· ·			!
	<u> </u>			!
6.	!			!
				!
8.	· ·			!
				!
	· ·			!
	· ·			!
	!			!
	<u> </u>			!
	· ·			!
5.	!			!
6.	· ·			!
	· ·			!
8.	_!			!
	!			!
		!		!
1.	_!			!
	!	!		!
	!	!		!
4.	!!	! !		!
		!		!
6	!	!		!
7	_!	!!		!
8	!	!!		!
9	!	!		!
0.	· ·	! !		!
	1			

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-74-75-170118 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799428 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 08:43 by SJ C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 11:24

CAT No.	Analysis Name	CAS Number	As Rec Result	ceived	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 82	260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	Ū	0.5	1	1
11997	Bromochloromethane	74-97-5	1	IJ	1	5	1
11997	Bromodichloromethane	75-27-4	1	· ·	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	II	0.5	1	1
11997	Chloroform	67-66-3	1	O	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	IJ	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5	1
11997	Dibromochloromethane	124-48-1	1	O	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	Ū	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	IJ	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	Ū	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	IJ	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	Ū	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	IJ	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-01-5	0.5	IJ	0.5	1	1
11997	Ethylbenzene	10061-02-6	0.5	IJ	0.5	1	1
11997	Freon 113	76-13-1	2	IJ	2	10	1
11997	2-Hexanone	591-78-6	3	IJ	3	10	1
11997			3 1	U	1	5	1
11997	Isopropylbenzene	98-82-8 79-20-9	1	IJ	1	5	1
	Methyl Acetate		0.5	τι			
11997	Methyl Tertiary Butyl Ether	1634-04-4	3	U	0.5	1 10	1 1
11997 11997	4-Methyl-2-pentanone	108-10-1 108-87-2	3 1	τι	1	5	1
	Methylcyclohexane		_	-			=
11997	Methylene Chloride	75-09-2	2 1	U U	2 1	4 5	1
11997	Styrene	100-42-5		U TT			1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	· ·	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	-	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U 	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



As Received

As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-74-75-170118 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799428 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 08:43 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 11:24

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846 82	260C	ug/l		ug/l	ug/l	
•	o-Xylene	95-47-6	0.5	υ	0.5	1	1
00882	VOA Library Search						
	The results from the volatile 1	ibrary search a	re list	ed on the att	ached		
	FORM 1 - VOA-TIC. The qualifie on the back of this form.	rs appearing in	the "Q	" column are	defined		
Misc.	Organics EPA 537 F	Rev 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	45		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	9		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	8		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	5		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	3	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	3	J	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	5	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	10		0.5	2	1
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-e						
10954		2355-31-9	1	Ŭ	. 1	3	1
	NMeFOSAA is the acronym for N-m				tic Acid.		
	stated QC limits are advisory on		ient da	ta points			
can	be obtained to calculate statist	ical limits.					
Metals	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium	7440-70-2	85.3		0.0382	0.400	1
01757	Magnesium	7439-95-4	21.3		0.0190	0.200	1
01762	Potassium	7440-09-7	3.88		0.160	1.00	1
01767	Sodium	7440-23-5	45.9		0.173	2.00	1
wat al	nemistry EPA 300.0	•	mg/l		mg/l	mg/l	
			_		_	=	500
00224	Chloride	16887-00-6	316		100	200	500
00228	Sulfate	14808-79-8	22.6		1.5	5.0	5
	EPA 353.2	2	mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	1.5		0.040	0.10	1
	SM 2320 E	3-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	25.5		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	25.5		1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7	U	1.7	5.0	1
12110	carsonace minarintel		± • /	•	±• /	5.5	-

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-74-75-170118 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799428 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 08:43 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 11:24

04K18 SDG#: MMK18-04

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170272AA	01/27/2017	14:14	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170272AA	01/27/2017	14:14	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17030004	02/02/2017	12:50	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17030004	01/30/2017	15:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170260635002	01/27/2017	07:59	Joanne M Gates	1
01757	Magnesium	SW-846 6010C	1	170260635002	01/27/2017	07:59	Joanne M Gates	1
01762	Potassium	SW-846 6010C	1	170260635002	01/27/2017	07:59	Joanne M Gates	1
01767	Sodium	SW-846 6010C	1	170260635002	01/27/2017	07:59	Joanne M Gates	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170260635002	01/26/2017	22:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	17024120601A	01/24/2017	16:06	Hallie Burnett	500
00228	Sulfate	EPA 300.0	1	17024120601A	01/24/2017	15:52	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17029118102B	01/29/2017	18:07	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17025008104A	01/26/2017	07:08	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	07:08	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	07:08	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE	NO.	
VOLATILE ORGANICS	ANALYSIS DATA SHEET				
TENTATIVELY IDEN	TIFIED COMPOUNDS	!			!
		!	04K18		!
Lab Name: Lancaster Laboratories	Contract:	!			!
Lab Code: LANCAS Case No.:_			No.:		_
Matrix: (soil/water) WATER	Lab Sample ID: 879942	3			
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355.:	L/17j	an27a.b/	уj27	s30.d
Level: (low/med) LOW	Date Received: 01/21/	L7			
Moisture: not dec.	Date Analyzed: 01/27/	L7			
Column: (pack/cap) CAP	Dilution Factor: 1.0				
	CONCENTRATION UNITS	:			
Number TICs found: 0	(ug/L or ug/Kg) ug/I	_			

! ! CAS NUMBER	! ! COMPOUND NAME ==!==================================	! ! RT	! ! EST. CONC.	~
!=======! ! 1. VOCTIC	==:===================================	: !	•	!====== ! U
. 2	!	!	!	!
! 3	!!	!	!	!
		!	!	!
	!	!	!	!
	_!	!	!	!
	_!	!	!	!
	!	!	!	!
	<u></u> !	!	!	!
			!	!
		:	!	!
			!	<u>;</u>
14.		<u>-</u> i	!	:
	i	;	·	<u>;</u>
		:	·	i
		;	!	i
			 !	!
	<u> </u>	i	 !	i ———
20			!	!
21		!	!	!
22	!		!	!
23	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!		!	!
	!	!	!	!
30	_!	!	!	!
page 1 of 1	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-83.5-84.5-170118 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799429 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 10:57 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 11:24

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



As Received

As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-83.5-84.5-170118 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799429 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 10:57 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 11:24

05K18 SDG#: MMK18-05

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	ug/l		ug/l	ug/l	
•	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea	arch						
	The results from t	he volatile li	brary search a	re list	ed on the att	ached		
	FORM 1 - VOA-TIC. on the back of thi		s appearing in	the "Q	" column are	defined		
Misc.	Organics	EPA 537 R	ev 1.1	ng/l		ng/l	ng/l	
10954	Perfluorooctanoic		335-67-1	27		0.5	2	1
10954			375-95-1	0.6	U	0.6	2	1
10954			335-76-2	0.5	U	0.5	2	1
10954			2058-94-8	1	U	1	3	1
10954			307-55-1	0.5	U	0.5	2	1
10954		ic acid	72629-94-8	0.5	U	0.5	2	1
10954			376-06-7	0.5	U	0.5	2	1
10954			307-24-4	6		0.5	2	1
10954	-		375-85-9	6		0.5	2	1
10954	Perfluorobutanesul		375-73-5	2	J	0.7	2	1
10954			355-46-4	2	J	1	3	1
10954			1763-23-1	2	U	2	6	1
10954			375-22-4	3	J	3	10	1
10954	-	Acid	2706-90-3	5		0.5	2	1
10954			2991-50-6	2	J	1	3	1
	NEtFOSAA is the ac	ronym for N-et						
10954	NMeFOSAA		2355-31-9	1	U	1	3	1
	NMeFOSAA is the ac	_				etic Acid.		
	stated QC limits are			ient da	ta points			
can	be obtained to calcu	ılate statıstı	cal limits.					
Metal	5	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	42.4		0.0382	0.400	1
01757	Magnesium		7439-95-4	13.9		0.0190	0.200	1
01762	Potassium		7440-09-7	11.2		0.160	1.00	1
01767	Sodium		7440-23-5	67.1		0.173	2.00	1
Wet Cl	nemistry	EPA 300.0		mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	145		20.0	40.0	100
00228	Sulfate		14808-79-8	45.5		1.5	5.0	5
		EPA 353.2		mg/l		mg/l	mg/l	
07882	Total Nitrite/Nitr		n.a.	1.2		0.040	0.10	1
		SM 2320 B	1007	mcr / 1	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
10150	m + 1 221 21 11 11			_	ab cacos		-	1
12150	Total Alkalinity t	-	n.a.	42.3		1.7	5.0	1
12149	Bicarbonate Alkali	_	n.a.	42.3		1.7	5.0	1
12148	Carbonate Alkalini	ГУ	n.a.	1.7	U	1.7	5.0	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-83.5-84.5-170118 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8799429 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 10:57 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 11:24

05K18 SDG#: MMK18-05

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Ti	me		Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170272AA	01/27/2017	14:36	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170272AA	01/27/2017	14:36	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17030004	02/01/2017	22:07	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17030004	01/30/2017	15:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170260635002	01/27/2017	08:33	Joanne M Gates	1
01757	Magnesium	SW-846 6010C	1	170260635002	01/27/2017	08:33	Joanne M Gates	1
01762	Potassium	SW-846 6010C	1	170260635002	01/27/2017	08:33	Joanne M Gates	1
01767	Sodium	SW-846 6010C	1	170260635002	01/27/2017	08:33	Joanne M Gates	1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	170260635002	01/26/2017	22:00	Annamaria Kuhns	1
	U4							
00224	Chloride	EPA 300.0	1	17024120601B	01/24/2017	22:17	Hallie Burnett	100
00228	Sulfate	EPA 300.0	1	17024120601B	01/24/2017	22:03	Hallie Burnett	5
07882	Total Nitrite/Nitrate	EPA 353.2	1	17029118102B	01/29/2017	18:09	Joseph E McKenzie	1
	Nitrogen							
12150	Total Alkalinity to pH	SM 2320 B-1997	1	17025008104A	01/26/2017	07:01	Brandon P Costik	1
	4.5							
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	07:01	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17025008104A	01/26/2017	07:01	Brandon P Costik	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.
VOLATILE ORGANICS AN	ALYSIS DATA SHEET	
TENTATIVELY IDENTI	FIED COMPOUNDS	!!!
		! 05K18 !
Lab Name: Lancaster Laboratories	Contract:	!
Lab Code: LANCAS Case No.:	SAS No.:	SDG No.:
Matrix: (soil/water) WATER	Lab Sample ID: 8799	9429
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0935	55.i/17jan27a.b/yj27s31.d
Level: (low/med) LOW	Date Received: 01/2	21/17
Moisture: not dec.	Date Analyzed: 01/2	
Column: (pack/cap) CAP	Dilution Factor: 1.	. 0
	CONCENTRATION UNI	ITS:
Number TICs found: 0	(ug/L or ug/Kg) ı	ıg/L

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
	==!===================================	!		!===== ! U
2.	!	!	!	!
	!			!
		!		!
i	!	!	!	!
5	!	!	!	!
·	!	!	!	!
3	!	!	!	!
		!!	!	!
)	!	!	!	!
· ·	!	!	<u> </u>	!
2	!	!		!
8	!	!	<u> </u>	!
! .	<u>!</u>	!	!	!
·	<u>!</u>	!	!	!
5	!	!		!
·	!	!!	!	!
	!	!!	!	!
	!	!:	!	!
)		!	! <u></u>	!
	!	!:	!	!
	!	!	! <u></u>	!
	!	!		!
	!	!	! <u></u>	!
	!	!		!
	!	!		!
	!	!	!	!
3	!	!	!	!
•	_!	!	!	!
٠	!	!!		!
	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP04-83.5-84.5-170118 Filtered Grab

LL Sample # GW 8799430 LL Group # 1757186 Groundwater SGPP - Merrimack Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 10:57 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 11:24

06K18 SDG#: MMK18-06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	Dissolved	SW-846 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	35.6	0.0382	0.400	1
01757	Magnesium	7439-95-4	10.1	0.0190	0.200	1
01762	Potassium	7440-09-7	4.22	0.160	1.00	1
01767	Sodium	7440-23-5	64.3	0.173	2.00	1

Sample Comments

This sample was lab filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
01750	Calcium	SW-846 6010C	1	170260635002	01/27/2017	08:36	Joanne M Gates	1
01757	Magnesium	SW-846 6010C	1	170260635002	01/27/2017	08:36	Joanne M Gates	1
01762	Potassium	SW-846 6010C	1	170260635002	01/27/2017	08:36	Joanne M Gates	1
01767	Sodium	SW-846 6010C	1	170260635002	01/27/2017	08:36	Joanne M Gates	1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	1	170260635002	01/26/2017	22:00	Annamaria Kuhns	1
	114							



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www,LancasterLabs.com

Sample Description: SG2-FB03-170118 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8799431 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 11:20

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 11:24

07K18 SDG#: MMK18-07FB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor	
Misc.	Organics EPA 537 F	Rev 1.1	ng/l		ng/l	ng/l		
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1	
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1	
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1	
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1	
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1	
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1	
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1	
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1	
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1	
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1	
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1	
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1	
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1	
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1	
10954	NETFOSAA	2991-50-6	1	U	1	3	1	
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.							
10954	NMeFOSAA	2355-31-9	1	U	1	3	1	
	NMeFOSAA is the acronym for N-m	ethyl perfluoro	octanes	ulfonamido	acetic Acid.			
m1.	1 00 11 11 11							

The stated QC limits are advisory only until sufficient data points

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
	16 PFCs PFAA Water Prep	EPA 537 Rev 1.1 EPA 537 Rev 1.1	1 2	17030004 17030004	02/02/2017 13 01/30/2017 15	_	1 1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-7-8-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799432 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 13:00 by SJ

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/21/2017 09:20

Latham NY 12110

Reported: 02/07/2017 11:24

				Dry	Dry	
CAT			Dry	Method	Limit of	Dilution
No.	Analysis Name	CAS Number	Result	Detection Limit*	Quantitation	Factor
GC/MS	Volatiles SW-846	8260C	mg/kg	mg/kg	mg/kg	
11995	Acetone	67-64-1	0.037	0.008	0.023	0.98
11995	Benzene	71-43-2	0.0006 U	0.0006	0.006	0.98
11995	Bromochloromethane	74-97-5	0.001 U	0.001	0.006	0.98
11995	Bromodichloromethane	75-27-4	0.001 U	0.001	0.006	0.98
11995	Bromoform	75-25-2	0.001 U	0.001	0.006	0.98
11995	Bromomethane	74-83-9	0.002 U	0.002	0.006	0.98
11995	2-Butanone	78-93-3	0.005 U	0.005	0.012	0.98
11995	Carbon Disulfide	75-15-0	0.001 U	0.001	0.006	0.98
11995	Carbon Tetrachloride	56-23-5	0.001 U	0.001	0.006	0.98
11995	Chlorobenzene	108-90-7	0.001 U	0.001	0.006	0.98
11995	Chloroethane	75-00-3	0.002 U	0.002	0.006	0.98
11995	Chloroform	67-66-3	0.001 U	0.001	0.006	0.98
11995	Chloromethane	74-87-3	0.002 U	0.002	0.006	0.98
11995	Cyclohexane	110-82-7	0.001 U	0.001	0.006	0.98
11995	1,2-Dibromo-3-chloropropane	96-12-8	0.002 U	0.002	0.006	0.98
11995	Dibromochloromethane	124-48-1	0.001 U	0.001	0.006	0.98
11995	1,2-Dibromoethane	106-93-4	0.001 U	0.001	0.006	0.98
11995	1,2-Dichlorobenzene	95-50-1	0.001 U	0.001	0.006	0.98
11995	1,3-Dichlorobenzene	541-73-1	0.001 U	0.001	0.006	0.98
11995	1,4-Dichlorobenzene	106-46-7	0.001 U	0.001	0.006	0.98
11995	Dichlorodifluoromethane	75-71-8	0.002 U	0.002	0.006	0.98
11995	1,1-Dichloroethane	75-34-3	0.001 U	0.001	0.006	0.98
11995	1,2-Dichloroethane	107-06-2	0.001 U	0.001	0.006	0.98
11995	1,1-Dichloroethene	75-35-4	0.001 U	0.001	0.006	0.98
11995	cis-1,2-Dichloroethene	156-59-2	0.001 U	0.001	0.006	0.98
11995	trans-1,2-Dichloroethene	156-60-5	0.001 U	0.001	0.006	0.98
11995	1,2-Dichloropropane	78-87-5	0.001 U	0.001	0.006	0.98
11995	cis-1,3-Dichloropropene	10061-01-5	0.001 U	0.001	0.006	0.98
11995	trans-1,3-Dichloropropene	10061-02-6	0.001 U	0.001	0.006	0.98
11995	Ethylbenzene	100-41-4	0.001 U	0.001	0.006	0.98
11995	Freon 113	76-13-1	0.002 U	0.002	0.012	0.98
11995	2-Hexanone	591-78-6	0.004 U	0.004	0.012	0.98
11995	Isopropylbenzene	98-82-8	0.001 U	0.001	0.006	0.98
11995	Methyl Acetate	79-20-9	0.002 U	0.002	0.006	0.98
11995	Methyl Tertiary Butyl Ether	1634-04-4	0.0006 U	0.0006	0.006	0.98
11995	4-Methyl-2-pentanone	108-10-1	0.004 U	0.004	0.012	0.98
11995	Methylcyclohexane	108-87-2	0.001 U	0.001	0.006	0.98
11995	Methylene Chloride	75-09-2	0.002 U	0.002	0.006	0.98
11995	Styrene	100-42-5	0.001 U	0.001	0.006	0.98
11995	1,1,2,2-Tetrachloroethane	79-34-5	0.001 U	0.001	0.006	0.98
11995	Tetrachloroethene	127-18-4	0.001 U	0.001	0.006	0.98
11995	Toluene	108-88-3	0.001 U	0.001	0.006	0.98
11995	1,2,3-Trichlorobenzene	87-61-6	0.001 U	0.001	0.006	0.98
11995	1,2,4-Trichlorobenzene	120-82-1	0.001 U	0.001	0.006	0.98
11995	1,1,1-Trichloroethane	71-55-6	0.001 U	0.001	0.006	0.98
11995	1,1,2-Trichloroethane	79-00-5	0.001 U	0.001	0.006	0.98
11995	Trichloroethene	79-01-6	0.001 U	0.001	0.006	0.98
11995	Trichlorofluoromethane	75-69-4	0.002 U	0.002	0.006	0.98
11995	Vinyl Chloride	75-01-4	0.001 U	0.001	0.006	0.98
11995	m+p-Xylene	179601-23-1	0.001 U	0.001	0.006	0.98
			• • • •	* * * * *		

^{*=}This limit was used in the evaluation of the final result



Drv

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-7-8-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799432 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 13:00 by SJ

C. T. Male Associates
50 Century Hill Drive

Drv

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 11:24

08K18 SDG#: MMK18-08

CAT No.	Analysis Name		CAS Number	Dry Result	:	Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	0C	mg/kg		mg/kg	mg/kg	
11995	o-Xylene		95-47-6	0.001	U	0.001	0.006	0.98
00882	VOA Library Sea							
	The results from th FORM 1 - VOA-TIC. on the back of this	The qualifier:						
Misc.	Organics	EPA 537 Remodified	ev. 1.1	ng/g		ng/g	ng/g	
14027	NETFOSAA		2991-50-6	0.34	U	0.34	1.0	1
1.4005	NEtFOSAA is the acr	onym for N-etl					1.0	
14027	NMeFOSAA	5 27	2355-31-9	0.34	U	0.34	1.0	1
1 40 0 7	NMeFOSAA is the acr						0.60	1
14027 14027	Perfluorobutanesulf Perfluorodecanoic a		375-73-5	0.23	U	0.23 0.23	0.68 0.68	1 1
14027	Perfluorodecanoic a		335-76-2 307-55-1	0.23	U U	0.23	0.68	1
14027	Perfluorododecanoic Perfluoroheptanoic		375-85-9	0.23	IJ	0.23	0.68	1
14027	Perfluorohexanesulf		355-46-4	0.23	U	0.23	0.68	1
14027	Perfluorohexanoic a		307-24-4	0.23	U	0.11	0.45	1
14027	Perfluorononanoic a		375-95-1	0.11	Ū	0.11	0.45	1
14027	Perfluoro-octanesul		1763-23-1	0.34	U	0.34	1.0	1
	Perfluoroctanoic a		335-67-1	0.23	IJ	0.23	0.68	1
	Perfluorotetradecan		376-06-7	0.23	Ū	0.23	0.68	1
	Perfluorotridecanoi		72629-94-8	0.23	Ū	0.23	0.68	1
14027	Perfluoroundecanoic		2058-94-8	0.23	IJ	0.23	0.68	1
	stated OC limits are				a points			_
	be obtained to calcu				[
Wet Ch	nemistry	SW-846 906	0 modified	mg/kg		mg/kg	mg/kg	
02079	TOC	2 020 200	n.a.	1,160		180	539	1
Wet Ch	nemistry	SM 2540 G-	1997	%		%	%	
00111	-		n.a.	16.0		0.50	0.50	1
	Moisture represents 103 - 105 degrees C as-received basis.		weight of the s	sample a				

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
------------	--------	----------	--------

CAT	Analysis Name	Method	Trial#	Batch#	Analysis	Analyst	Dilution
No.					Date and Time		Factor
11995	SOM02.2 Volatiles	SW-846 8260C	1	A170272AA	01/28/2017 02:33	Stephen C Nolte	0.98



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-7-8-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799432 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 13:00 by SJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 11:24

	Laboratory Sample Analysis Record								
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor	
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	1	201702344143	01/18/2017	13:00	Client Supplied	1	
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	2	201702344143	01/18/2017	13:00	Client Supplied	1	
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201702344143	01/18/2017	13:00	Client Supplied	1	
14027	14 PFCs	EPA 537 Rev. 1.1 modified	1	17024006	01/26/2017	18:04	Marissa C Drexinger	1	
14090	PFC Solid Prep	EPA 537 Rev. 1.1 modified	1	17024006	01/24/2017	14:10	Devon M Whooley	1	
02079	TOC	SW-846 9060 modified	1	17024667631B	01/24/2017	17:00	Drew M Gerhart	1	
00111	Moisture	SM 2540 G-1997	1	17026820004B	01/26/2017	12:53	Larry E Bevins	1	

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE NO.	
VOLATILE ORGANICS ANAL	YSIS DATA SHEET	_		_
TENTATIVELY IDENTIFI	ED COMPOUNDS	!		!
		!	08K18	!
Lab Name: Lancaster Laboratories	Contract:	!		_!
ab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	
Matrix: (soil/water) SOIL	Lab Sample ID: 8799432			
Sample wt/vol: 5.09 (g/mL) g	Lab File ID: HP09685.i	/17 ja	an27b.b/aj2	7s35.d
Level: (low/med) LOW	Date Received: 01/21/1	7		
Moisture: not dec. 16	Date Analyzed: 01/28/1	7		
Column: (pack/cap) CAP	Dilution Factor: 1.0			
	CONCENTRATION UNITS:			
Number TICs found: 1	(mg/L or mg/Kg) mg/K	g		

CAS NUMBER	! COMPOUND NAME !		EST. CONC.	
	!Cyclotetrasiloxane, octameth!			•
3. VOCTIC	! !Total VOC TICs	: !	0.015	: ! J
	-!!	!		!
	-!!			<u>:</u>
	_			
/ •	_!!	:		:
		:		<u>;</u>
	_!!	i		<u>;</u> ———
	_	i		;
		i		<u>;</u> ———
	_ i	i		<u>;</u> ———
	- <u>i</u> i	i		;
	<u>-</u>	i		;——
	_::	i		;
				!
		!		!
	_!!	!		!
21.	_!!	!		!
22	_ !!	!		!
23	_!!	!		!
24	_!!	!		!
25	_!!	!		!
	_!!	!		!
	_!!	!		!
	_!!	!		!
	_!!	!		!
30	_!!	!		!
	_!!	!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-11.5-14.5-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799433 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 13:20 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 11:24

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	mg/kg	mg/kg	mg/kg	
11995	Acetone	67-64-1	0.009 U	0.009	0.026	0.99
11995	Benzene	71-43-2	0.0007 U	0.0007	0.007	0.99
11995	Bromochloromethane	74-97-5	0.001 U	0.001	0.007	0.99
11995	Bromodichloromethane	75-27-4	0.001 U	0.001	0.007	0.99
11995	Bromoform	75-25-2	0.001 U	0.001	0.007	0.99
11995	Bromomethane	74-83-9	0.003 U	0.003	0.007	0.99
11995	2-Butanone	78-93-3	0.005 U	0.005	0.013	0.99
11995	Carbon Disulfide	75-15-0	0.001 U	0.001	0.007	0.99
11995	Carbon Tetrachloride	56-23-5	0.001 U	0.001	0.007	0.99
11995	Chlorobenzene	108-90-7	0.001 U	0.001	0.007	0.99
11995	Chloroethane	75-00-3	0.003 U	0.003	0.007	0.99
11995	Chloroform	67-66-3	0.001 U	0.001	0.007	0.99
11995	Chloromethane	74-87-3	0.003 U	0.003	0.007	0.99
11995	Cyclohexane	110-82-7	0.001 U	0.001	0.007	0.99
11995	1,2-Dibromo-3-chloropropane	96-12-8	0.003 U	0.003	0.007	0.99
11995	Dibromochloromethane	124-48-1	0.001 U	0.001	0.007	0.99
11995	1,2-Dibromoethane	106-93-4	0.001 U	0.001	0.007	0.99
11995	1,2-Dichlorobenzene	95-50-1	0.001 U	0.001	0.007	0.99
11995	1,3-Dichlorobenzene	541-73-1	0.001 U	0.001	0.007	0.99
11995	1,4-Dichlorobenzene	106-46-7	0.001 U	0.001	0.007	0.99
11995	Dichlorodifluoromethane	75-71-8	0.003 U	0.003	0.007	0.99
11995	1,1-Dichloroethane	75-34-3	0.001 U	0.001	0.007	0.99
11995	1,2-Dichloroethane	107-06-2	0.001 U	0.001	0.007	0.99
11995	1,1-Dichloroethene	75-35-4	0.001 U	0.001	0.007	0.99
11995	cis-1,2-Dichloroethene	156-59-2	0.001 U	0.001	0.007	0.99
11995	trans-1,2-Dichloroethene	156-60-5	0.001 U	0.001	0.007	0.99
11995	1,2-Dichloropropane	78-87-5	0.001 U	0.001	0.007	0.99
11995	cis-1,3-Dichloropropene	10061-01-5	0.001 U	0.001	0.007	0.99
11995	trans-1,3-Dichloropropene	10061-02-6	0.001 U	0.001	0.007	0.99
11995	Ethylbenzene	100-41-4	0.001 U	0.001	0.007	0.99
11995	Freon 113	76-13-1	0.003 U	0.003	0.013	0.99
11995	2-Hexanone	591-78-6	0.004 U	0.004	0.013	0.99
11995	Isopropylbenzene	98-82-8	0.001 U	0.001	0.007	0.99
11995	Methyl Acetate	79-20-9	0.003 U	0.003	0.007	0.99
11995	Methyl Tertiary Butyl Ether	1634-04-4	0.0007 U	0.0007	0.007	0.99
11995	4-Methyl-2-pentanone	108-10-1	0.004 U	0.004	0.013	0.99
11995	Methylcyclohexane	108-87-2	0.001 U	0.001	0.007	0.99
11995	Methylene Chloride	75-09-2	0.003 U	0.003	0.007	0.99
11995 11995	Styrene	100-42-5 79-34-5	0.001 U 0.001 U	0.001	0.007	0.99
	1,1,2,2-Tetrachloroethane			0.001	0.007	0.99
11995 11995	Tetrachloroethene Toluene	127-18-4 108-88-3	0.001 U 0.001 U	0.001 0.001	0.007 0.007	0.99 0.99
11995 11995	1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene	87-61-6 120-82-1	0.001 U 0.001 U	0.001 0.001	0.007 0.007	0.99 0.99
11995			0.001 U			
11995	1,1,1-Trichloroethane 1,1,2-Trichloroethane	71-55-6 79-00-5	0.001 U	0.001 0.001	0.007 0.007	0.99 0.99
11995	Trichloroethene	79-00-5 79-01-6	0.001 U	0.001	0.007	0.99
11995	Trichlorofluoromethane	75-69-4	0.001 U	0.001	0.007	0.99
11995	Vinyl Chloride	75-09-4	0.003 U	0.003	0.007	0.99
11995	m+p-Xylene	179601-23-1	0.001 U	0.001	0.007	0.99
11332	m+b-viteme	1/9001-23-1	0.001 0	0.001	0.007	0.99

^{*=}This limit was used in the evaluation of the final result



Drv

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-11.5-14.5-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799433 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 13:20 by SJ C. T. Male Associates

50 Century Hill Drive

Drv

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 11:24

Reported: 02/0//2017 11:.

09K18 SDG#: MMK18-09

CAT No.	Analysis Name		CAS Number	Dry Result	:	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	0C	mg/kg		mg/kg	mg/kg	
11995	o-Xylene		95-47-6	0.001	Ū	0.001	0.007	0.99
00882	VOA Library Seas		orarv search ar	e liste	ed on the attac	hed		
	FORM 1 - VOA-TIC. Ton the back of this		s appearing in	the "Q'	column are de	fined		
Misc.	Organics	EPA 537 Remodified	v. 1.1	ng/g		ng/g	ng/g	
14027	NEtFOSAA is the acro	onym for N-etl	2991-50-6 nyl perfluorooc	0.37 tanesul	U fonamidoacetic	0.37 Acid.	1.1	1
14027	NMeFOSAA is the acro	onym for N-met	2355-31-9 chyl perfluoroo	0.37 octanesi	U ulfonamidoaceti	0.37 c Acid.	1.1	1
14027	Perfluorobutanesulfo	onate	375-73-5	0.24	U	0.24	0.73	1
14027	Perfluorodecanoic ad	cid	335-76-2	0.24	U	0.24	0.73	1
14027	Perfluorododecanoic	acid	307-55-1	0.24	U	0.24	0.73	1
14027	Perfluoroheptanoic a	acid	375-85-9	0.24	U	0.24	0.73	1
14027	Perfluorohexanesulfo	onate	355-46-4	0.24	U	0.24	0.73	1
14027	Perfluorohexanoic ad	cid	307-24-4	0.12	U	0.12	0.49	1
14027	Perfluorononanoic ad	cid	375-95-1	0.12	U	0.12	0.49	1
14027	Perfluoro-octanesul:	fonate	1763-23-1	0.37	U	0.37	1.1	1
	Perfluorooctanoic ad		335-67-1	0.24	U	0.24	0.73	1
14027	Perfluorotetradecand	oic acid	376-06-7	0.24	U	0.24	0.73	1
14027	Perfluorotridecanoi	c acid	72629-94-8	0.24	U	0.24	0.73	1
14027	Perfluoroundecanoic	acid	2058-94-8	0.24	U	0.24	0.73	1
	stated QC limits are be obtained to calcul			ent dat	a points			
Wet Ch	nemistry	SW-846 906	0 modified	mg/kg		mg/kg	mg/kg	
02079	TOC		n.a.	755		206	619	1
	nemistry	SM 2540 G-		%		%	8	
00111	Moisture		n.a.	24.4		0.50	0.50	1
	Moisture represents 103 - 105 degrees Co as-received basis.					ng at		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
------------	--------	----------	--------

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	SOM02.2 Volatiles	SW-846 8260C	1	A170272AA	01/28/2017 02:56	Stephen C Nolte	0.99



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-11.5-14.5-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799433 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 13:20 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 11:24

	Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor			
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	1	201702344143	01/18/2017	13:20	Client Supplied	1			
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	2	201702344143	01/18/2017	13:20	Client Supplied	1			
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201702344143	01/18/2017	13:20	Client Supplied	1			
14027	14 PFCs	EPA 537 Rev. 1.1 modified	1	17024006	01/26/2017	19:27	Marissa C Drexinger	1			
14090	PFC Solid Prep	EPA 537 Rev. 1.1 modified	1	17024006	01/24/2017	14:10	Devon M Whooley	1			
02079	TOC	SW-846 9060 modified	1	17024667631B	01/24/2017	15:08	Drew M Gerhart	1			
00111	Moisture	SM 2540 G-1997	1	17026820004B	01/26/2017	12:53	Larry E Bevins	1			

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE NO	
VOLATILE ORGANICS ANAL	YSIS DATA SHEET			
TENTATIVELY IDENTIFI	ED COMPOUNDS	!		!
		!	09K18	!
Lab Name: Lancaster Laboratories	Contract:	!		!
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	
Matrix: (soil/water) SOIL	Lab Sample ID: 8799433			
Sample wt/vol: 5.03 (g/mL) g	Lab File ID: HP09685.i	/17ja	an27b.b/aj	27s36.d
Level: (low/med) LOW	Date Received: 01/21/1	7		
Moisture: not dec. 24.4	Date Analyzed: 01/28/1	7		
Column: (pack/cap) CAP	Dilution Factor: 1.0			
	CONCENTRATION UNITS:			
Number TICs found: 1	(mg/L or mg/Kg) mg/K	3		

CAS NUMBER	: ! COMPOUND NAME ==!==================================	! RT !	EST. CONC.	
1.	==!========= !Unknown	! 12.00 !		•
4	! !Total VOC TICs !	! ! ! ! !	0.009	!
	! _!	!! !		! !
	!! _!!			!
9	<u> </u>	ii		!
	!			! !
2	!!	!!		!
. 4	!!	::		! !
	!!			!
7		ii		!
	!! !			! !
20	!	::		!
21 22	!	ii		! !
	!! !	<u>-</u>		!
25	!	ii		!
	!! !	!!		! !
28	!!	!!		!
30		ii		!
age 1 of 1	!	!!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-2-3-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799434 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 13:51 by SJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 11:24

				Dry Method	Dry Limit of	
CAT No.	Analysis Name	CAS Number	Dry Result	Detection Limit*	Quantitation	Dilution Factor
	-					FACCOI
-	Volatiles SW-846		mg/kg	mg/kg	mg/kg	
11995	Acetone	67-64-1	0.13	0.009	0.025	0.96
11995	Benzene	71-43-2	0.0006 U	0.0006	0.006	0.96
11995	Bromochloromethane	74-97-5	0.001 U	0.001	0.006	0.96
11995	Bromodichloromethane	75-27-4	0.001 U	0.001	0.006	0.96
11995	Bromoform	75-25-2	0.001 U	0.001	0.006	0.96
11995	Bromomethane	74-83-9	0.002 U	0.002	0.006	0.96
11995	2-Butanone	78-93-3	0.008 J	0.005	0.012	0.96
11995	Carbon Disulfide	75-15-0	0.001 U	0.001	0.006	0.96
11995	Carbon Tetrachloride	56-23-5	0.001 U	0.001	0.006	0.96
11995	Chlorobenzene	108-90-7	0.001 U	0.001	0.006	0.96
11995	Chloroethane	75-00-3	0.002 U	0.002	0.006	0.96
11995	Chloroform	67-66-3	0.001 U	0.001	0.006	0.96
11995	Chloromethane	74-87-3	0.002 U	0.002	0.006	0.96
11995	Cyclohexane	110-82-7	0.001 U	0.001	0.006	0.96
11995	1,2-Dibromo-3-chloropropane	96-12-8	0.002 U	0.002	0.006	0.96
11995	Dibromochloromethane	124-48-1	0.001 U	0.001	0.006	0.96
11995	1,2-Dibromoethane	106-93-4	0.001 U	0.001	0.006	0.96
11995	1,2-Dichlorobenzene	95-50-1	0.001 U	0.001	0.006	0.96
11995	1,3-Dichlorobenzene	541-73-1	0.001 U	0.001	0.006	0.96
11995	1,4-Dichlorobenzene	106-46-7	0.001 U	0.001	0.006	0.96
11995	Dichlorodifluoromethane	75-71-8	0.002 U	0.002	0.006	0.96
11995	1,1-Dichloroethane	75-34-3	0.001 U	0.001	0.006	0.96
11995	1,2-Dichloroethane	107-06-2	0.001 U	0.001	0.006	0.96
11995	1,1-Dichloroethene	75-35-4	0.001 U	0.001	0.006	0.96
11995	cis-1,2-Dichloroethene	156-59-2	0.001 U	0.001	0.006	0.96
11995	trans-1,2-Dichloroethene	156-60-5	0.001 U	0.001	0.006	0.96
11995	1,2-Dichloropropane	78-87-5	0.001 U	0.001	0.006	0.96
11995	cis-1,3-Dichloropropene	10061-01-5	0.001 U	0.001	0.006	0.96
11995	trans-1,3-Dichloropropene	10061-02-6	0.001 U	0.001	0.006	0.96
11995	Ethylbenzene	100-41-4	0.001 U	0.001	0.006	0.96
11995	Freon 113	76-13-1	0.002 U	0.002	0.012	0.96
11995	2-Hexanone	591-78-6	0.004 U	0.004	0.012	0.96
11995	Isopropylbenzene	98-82-8	0.001 U 0.002 U	0.001	0.006	0.96
11995 11995	Methyl Acetate	79-20-9 1634-04-4	0.002 U 0.0006 U	0.002 0.0006	0.006 0.006	0.96 0.96
11995	Methyl Tertiary Butyl Ether		0.0006 U			0.96
11995	4-Methyl-2-pentanone	108-10-1 108-87-2	0.004 U	0.004 0.001	0.012 0.006	0.96
11995	Methylcyclohexane	75-09-2	0.001 U	0.001	0.006	0.96
11995	Methylene Chloride Styrene	100-42-5	0.002 U	0.002	0.006	0.96
11995	1,1,2,2-Tetrachloroethane	79-34-5	0.001 U	0.001	0.006	0.96
11995	Tetrachloroethene	127-18-4	0.001 U	0.001	0.006	0.96
11995	Toluene	108-88-3	0.001 U	0.001	0.006	0.96
11995		87-61-6	0.001 U		0.006	
11995	1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene	120-82-1	0.001 U	0.001 0.001	0.006	0.96 0.96
11995	1,1,1-Trichloroethane	71-55-6	0.001 U	0.001	0.006	0.96
11995	1,1,2-Trichloroethane	79-00-5	0.001 U	0.001	0.006	0.96
11995	Trichloroethene	79-00-5 79-01-6	0.001 U	0.001	0.006	0.96
11995	Trichlorofluoromethane	79-01-6 75-69-4	0.001 U	0.001	0.006	0.96
11995	Vinyl Chloride	75-69-4 75-01-4	0.002 U	0.002	0.006	0.96
11995	m+p-Xylene	179601-23-1	0.001 U	0.001	0.006	0.96
11223	m±b-vì telle	1/9001-23-1	0.001 0	0.001	0.000	0.90

^{*=}This limit was used in the evaluation of the final result



Drv

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-2-3-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799434 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 13:51 by SJ

C. T. Male Associates

50 Century Hill Drive Latham NY 12110

Drv

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 11:24

as-received basis.

10K18 SDG#: MMK18-10

CAT No.	Analysis Name		CAS Number	Dry Result	:	Method Detection Limit	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	60C	mg/kg		mg/kg	mg/kg	
11995	o-Xylene		95-47-6	0.001	U	0.001	0.006	0.96
00882	VOA Library Se The results from t FORM 1 - VOA-TIC. on the back of thi	the volatile l The qualifie						
Misc.	Organics	EPA 537 R modified	ev. 1.1	ng/g		ng/g	ng/g	
14027	NEtFOSAA		2991-50-6	0.36	U	0.36	1.1	1
	NEtFOSAA is the ac	cronym for N-e			fonamido	acetic Acid.		
14027	NMeFOSAA		2355-31-9	0.36	U	0.36	1.1	1
	NMeFOSAA is the ac							
14027	Perfluorobutanesul		375-73-5	0.24	U	0.24	0.71	1
14027	Perfluorodecanoic		335-76-2	0.30	J	0.24	0.71	1
14027	Perfluorododecano		307-55-1	0.24	U	0.24	0.71	1
14027	Perfluoroheptanoio		375-85-9	0.73		0.24	0.71	1
14027	Perfluorohexanesul		355-46-4	0.24	U	0.24	0.71	1
14027	Perfluorohexanoic		307-24-4	1.4		0.12	0.48	1
14027	Perfluorononanoic		375-95-1	0.62		0.12	0.48	1
14027	Perfluoro-octanesu		1763-23-1	1.4		0.36	1.1	1
14027	Perfluorooctanoic		335-67-1	5.2		0.24	0.71	1
	Perfluorotetradeca		376-06-7	0.24	U	0.24	0.71	1
	Perfluorotridecand		72629-94-8	0.24	U	0.24	0.71	1
	Perfluoroundecano		2058-94-8	0.24	U	0.24	0.71	1
	stated QC limits ar be obtained to calc			ient dat	a points			
Wet C	hemistry	SW-846 90	60 modified	mg/kg		mg/kg	mg/kg	
02079	TOC		n.a.	11,800)	994	2,980	1
Wet Cl	hemistry	SM 2540 G	-1997	%		8	%	
00111	Moisture		n.a.	22.9		0.50	0.50	1
	Moisture represent							

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

 $103\,$ - $\,105\,$ degrees Celsius. The moisture result reported is on an

Laboratory	Sample	Analysis	Record
------------	--------	----------	--------

CAT	Analysis Name	Method	Trial#	Batch#	Analysis	Analyst	Dilution
No.					Date and Time		Factor
11995	SOM02.2 Volatiles	SW-846 8260C	1	A170272AA	01/28/2017 03:18	Stephen C Nolte	0.96



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-2-3-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799434 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 13:51 by SJ

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/21/2017 09:20

Latham NY 12110

Reported: 02/07/2017 11:24

	Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor			
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	1	201702344143	01/18/2017	13:51	Client Supplied	1			
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	2	201702344143	01/18/2017	13:51	Client Supplied	1			
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201702344143	01/18/2017	13:51	Client Supplied	1			
14027	14 PFCs	EPA 537 Rev. 1.1 modified	1	17024006	01/26/2017	19:47	Marissa C Drexinger	1			
14090	PFC Solid Prep	EPA 537 Rev. 1.1 modified	1	17024006	01/24/2017	14:10	Devon M Whooley	1			
02079	TOC	SW-846 9060 modified	1	17024667631B	01/24/2017	15:15	Drew M Gerhart	1			
00111	Moisture	SM 2540 G-1997	1	17026820004B	01/26/2017	12:53	Larry E Bevins	1			

^{*=}This limit was used in the evaluation of the final result



page 1 of 1

Lancaster Laboratories Environmental

Analysis Report

EPA SAMPLE NO.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E VOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

| 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K18 | 10K1

Matrix: (soil/water) SOIL Lab Sample ID: 8799434
Sample wt/vol: 5.19 (g/mL) g Lab File ID: HP09685.i/17jan27b.b/aj27s37.d

Level: (low/med) LOW Date Received: 01/21/17 % Moisture: not dec. 22.9 Date Analyzed: 01/28/17 Column: (pack/cap) CAP Dilution Factor: 1.0 CONCENTRATION UNITS: Number TICs found: 3 (mg/L or mg/Kg) mg/Kg

! ! CAS NUMBER			EST. CONC.	~
! 1.	!Unknown	! 8.23		
		10.34		
	!Cyclotetrasiloxane, octameth			
! 4.	:Cyclotetrasiloxane, octameth	1 12.00	0.013	: 0 :
	: !Total VOC TICs	:	0.046	: : ! T !
			0.040	: 0 :
! 6		<u>; </u>	<u> </u>	::
	!	<u>; </u>	<u> </u>	::
	!!	:		::
!10.		:	<u> </u>	;;
!11.		i		;;
!12		·		::
!13		i		;;
!14		i		::
	·	;	·	:i
	·	i	·	ii
	·	i	·	ii
	!	;	İ	:i
!19		i	·	ii
	İ	i	İ	ii
!21.		i		;;
122.		i	·	ii
123.		i		;;
! 24		i		;;
! 25		i	İ	ii
! 26		i		;;
! 27		i		;;
! 28.		;i	·	;i
129.		ii		;i
!30.		·		;i
	·	;i	·	;i
•	•	·		٠:

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP06-2.5-4.5-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799435 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 15:22 by SJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 11:24

				Dry Method	Dry Limit of	
CAT	Analysis Name	CAS Number	Dry	Detection Limit*	Quantitation	Dilution
No.	Midly 515 Name	CAD Number	Result		•	Factor
GC/MS	Volatiles SW-846	8260C	mg/kg	mg/kg	mg/kg	
11995	Acetone	67-64-1	0.036	0.01	0.027	1.04
11995	Benzene	71-43-2	0.0007 U	0.0007	0.007	1.04
11995	Bromochloromethane	74-97-5	0.001 U	0.001	0.007	1.04
11995	Bromodichloromethane	75-27-4	0.001 U	0.001	0.007	1.04
11995	Bromoform	75-25-2	0.001 U	0.001	0.007	1.04
11995	Bromomethane	74-83-9	0.003 U	0.003	0.007	1.04
11995	2-Butanone	78-93-3	0.005 U	0.005	0.014	1.04
11995	Carbon Disulfide	75-15-0	0.001 U	0.001	0.007	1.04
11995	Carbon Tetrachloride	56-23-5	0.001 U	0.001	0.007	1.04
11995	Chlorobenzene	108-90-7	0.001 U	0.001	0.007	1.04
11995	Chloroethane	75-00-3	0.003 U	0.003	0.007	1.04
11995	Chloroform	67-66-3	0.001 U	0.001	0.007	1.04
11995	Chloromethane	74-87-3	0.003 U	0.003	0.007	1.04
11995	Cyclohexane	110-82-7	0.001 U	0.001	0.007	1.04
11995	1,2-Dibromo-3-chloropropane	96-12-8	0.003 U	0.003	0.007	1.04
11995	Dibromochloromethane	124-48-1	0.001 U	0.001	0.007	1.04
11995	1,2-Dibromoethane	106-93-4	0.001 U	0.001	0.007	1.04
11995	1,2-Dichlorobenzene	95-50-1	0.001 U	0.001	0.007	1.04
11995	1,3-Dichlorobenzene	541-73-1	0.001 U	0.001	0.007	1.04
11995	1,4-Dichlorobenzene	106-46-7	0.001 U	0.001	0.007	1.04
11995	Dichlorodifluoromethane	75-71-8	0.003 U	0.003	0.007	1.04
11995	1,1-Dichloroethane	75-34-3	0.001 U	0.001	0.007	1.04
11995	1,2-Dichloroethane	107-06-2	0.001 U	0.001	0.007	1.04
11995	1,1-Dichloroethene	75-35-4	0.001 U	0.001	0.007	1.04
11995	cis-1,2-Dichloroethene	156-59-2	0.001 U	0.001	0.007	1.04
11995	trans-1,2-Dichloroethene	156-60-5	0.001 U	0.001	0.007	1.04
11995	1,2-Dichloropropane	78-87-5	0.001 U	0.001	0.007	1.04
11995	cis-1,3-Dichloropropene	10061-01-5	0.001 U	0.001	0.007	1.04
11995	trans-1,3-Dichloropropene	10061-02-6	0.001 U	0.001	0.007	1.04
11995	Ethylbenzene	100-41-4	0.001 U	0.001	0.007	1.04
11995	Freon 113	76-13-1	0.003 U	0.003	0.014	1.04
11995	2-Hexanone	591-78-6	0.003 U	0.004	0.014	1.04
11995	Isopropylbenzene	98-82-8	0.001 U	0.001	0.007	1.04
11995	Methyl Acetate	79-20-9	0.001 U	0.003	0.007	1.04
11995	Methyl Tertiary Butyl Ether	1634-04-4	0.003 U	0.0007	0.007	1.04
11995	4-Methyl-2-pentanone	108-10-1	0.004 U	0.004	0.014	1.04
11995	Methylcyclohexane	108-87-2	0.001 U	0.001	0.007	1.04
11995	Methylene Chloride	75-09-2	0.001 U	0.003	0.007	1.04
11995	Styrene Chioride	100-42-5	0.003 U	0.003	0.007	1.04
11995	1,1,2,2-Tetrachloroethane	79-34-5	0.001 U	0.001	0.007	1.04
11995	Tetrachloroethene	127-18-4	0.001 U	0.001	0.007	1.04
11995	Toluene	108-88-3	0.001 U	0.001	0.007	1.04
11995	1,2,3-Trichlorobenzene	87-61-6	0.001 U	0.001	0.007	1.04
11995	1,2,4-Trichlorobenzene	120-82-1	0.001 U	0.001	0.007	1.04
11995	1,1,1-Trichloroethane	71-55-6	0.001 U	0.001	0.007	1.04
11995	1,1,1-Trichloroethane	71-55-6				1.04
11995				0.001	0.007	
	Trichloroethene	79-01-6	0.001 U	0.001	0.007	1.04
11995	Trichlorofluoromethane	75-69-4	0.003 U	0.003	0.007	1.04
11995	Vinyl Chloride	75-01-4	0.001 U	0.001	0.007	1.04
11995	m+p-Xylene	179601-23-1	0.001 U	0.001	0.007	1.04

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP06-2.5-4.5-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799435 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 15:22 by SJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 11:24

11K18 SDG#: MMK18-11

CAT No.	Analysis Name		CAS Number	Dry Result	:	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	0C	mg/kg		mg/kg	mg/kg	
11995	o-Xylene		95-47-6	0.001	Ū	0.001	0.007	1.04
00882	VOA Library Sea The results from th FORM 1 - VOA-TIC. on the back of this	e volatile lil The qualifier:						
Misc.	Organics	EPA 537 Remodified	ev. 1.1	ng/g		ng/g	ng/g	
14027	NEtFOSAA NEtFOSAA is the acr	onvm for N-etl	2991-50-6	0.36	U fonamidoacetic	0.36 : Acid.	1.1	1
14027	NMeFOSAA NMeFOSAA is the acr	_	2355-31-9	0.36	U	0.36	1.1	1
14027	Perfluorobutanesulf		375-73-5	0.24	U	0.24	0.72	1
14027	Perfluorodecanoic a	cid	335-76-2	0.24	U	0.24	0.72	1
14027	Perfluorododecanoic	acid	307-55-1	0.24	U	0.24	0.72	1
14027	Perfluoroheptanoic	acid	375-85-9	0.24	U	0.24	0.72	1
14027	Perfluorohexanesulf	onate	355-46-4	0.24	U	0.24	0.72	1
14027	Perfluorohexanoic a	cid	307-24-4	0.12	U	0.12	0.48	1
14027	Perfluorononanoic a	cid	375-95-1	0.12	U	0.12	0.48	1
14027	Perfluoro-octanesul	fonate	1763-23-1	0.36	U	0.36	1.1	1
14027	Perfluorooctanoic a	cid	335-67-1	0.24	U	0.24	0.72	1
14027	Perfluorotetradecan	oic acid	376-06-7	0.24	U	0.24	0.72	1
14027	Perfluorotridecanoi	c acid	72629-94-8	0.24	U	0.24	0.72	1
14027	Perfluoroundecanoic	acid	2058-94-8	0.24	U	0.24	0.72	1
	stated QC limits are be obtained to calcui			ent dat	a points			
Wet Ch	nemistry	SW-846 906	0 modified	mg/kg		mg/kg	mg/kg	
02079	TOC		n.a.	8,230		854	2,560	1
	nemistry	SM 2540 G-	1997	%		8	%	
00111			n.a.	24.2		0.50	0.50	1
	Moisture represents 103 - 105 degrees C as-received basis.		_	-	-	ng at		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
------------	--------	----------	--------

CAT	Analysis Name	Method	Trial#	Batch#	Analysis	Analyst	Dilution
No.					Date and Time		Factor
11995	SOM02.2 Volatiles	SW-846 8260C	1	A170272AA	01/28/2017 03:41	Stephen C Nolte	1.04



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP06-2.5-4.5-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799435 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 15:22

by SJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 11:24

		Laborat	cory Sa	ample Analysi	s Record			
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	1	201702344143	01/18/2017	15:22	Client Supplied	1
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	2	201702344143	01/18/2017	15:22	Client Supplied	1
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201702344143	01/18/2017	15:22	Client Supplied	1
14027	14 PFCs	EPA 537 Rev. 1.1 modified	1	17024006	01/26/2017	20:08	Marissa C Drexinger	1
14090	PFC Solid Prep	EPA 537 Rev. 1.1 modified	1	17024006	01/24/2017	14:10	Devon M Whooley	1
02079	TOC	SW-846 9060 modified	1	17024667631B	01/24/2017	15:53	Drew M Gerhart	1
00111	Moisture	SM 2540 G-1997	1	17026820004B	01/26/2017	12:53	Larry E Bevins	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE NO.
VOLATILE ORGANICS AND	ALYSIS DATA SHEET	
TENTATIVELY IDENTIA	FIED COMPOUNDS	!!!
		! 11K18 !
Lab Name: Lancaster Laboratories	Contract:	!
Lab Code: LANCAS Case No.:	SAS No.:	SDG No.:
Matrix: (soil/water) SOIL	Lab Sample ID: 8799	9435
Sample wt/vol: 4.83 (g/mL) g	Lab File ID: HP0968	85.i/17jan27b.b/aj27s38.d
Level: (low/med) LOW	Date Received: 01/2	21/17
% Moisture: not dec. 24.2	Date Analyzed: 01/2	28/17
Column: (pack/cap) CAP	Dilution Factor: 1.	. 0
	CONCENTRATION UNI	TTS:

Number TICs found: 1 CONCENTRATION UNITS: (mg/L or mg/Kg) mg/Kg

1	1			
	: ! COMPOUND NAME		EST. CONC.	
!=========	!===========			
! 1.	!Unknown	! 10.34	0.037	! J !
	! !Total VOC TICs	! !	0.037	!! !.T!
! 4	!	!!	!	!!
	!	!!	l	!!
	!	!		!!
! 7		!		!!
	!	!		!:
! 9	!	!		!:
!11.		:		::
!12		i	·	;;
!13		i ————		ii
!14.		!		·
!15	!	!!		!!
!16	!	!!		!!
	!	!!	l	!!
!18		!!		!!
	!	!!		!!
	!	!		!!
!21		!		!!
! 22		!		!!
! 23		!		!:
! 24 ! 25		!	<u> </u>	::
! 26		:		;;
! 27		i	İ	:i
! 28.		i		ii
! 29		i		ii
!30.				· ·
!	!	!		! !

page 1 of 1 FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-FD02-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799436 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 by SJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20 Reported: 02/07/2017 11:24

12K18 SDG#: MMK18-12FD

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	mg/kg	mg/kg	mg/kg	
11995	Acetone	67-64-1	0.009 U	0.009	0.026	1
11995	Benzene	71-43-2	0.0007 U	0.0007	0.007	1
11995	Bromochloromethane	74-97-5	0.001 U	0.001	0.007	1
11995	Bromodichloromethane	75-27-4	0.001 U	0.001	0.007	1
11995	Bromoform	75-25-2	0.001 U	0.001	0.007	1
11995	Bromomethane	74-83-9	0.003 U	0.003	0.007	1
11995	2-Butanone	78-93-3	0.005 U	0.005	0.013	1
11995	Carbon Disulfide	75-15-0	0.001 U	0.001	0.007	1
11995	Carbon Tetrachloride	56-23-5	0.001 U	0.001	0.007	1
11995	Chlorobenzene	108-90-7	0.001 U	0.001	0.007	1
11995	Chloroethane	75-00-3	0.003 U	0.003	0.007	1
11995	Chloroform	67-66-3	0.001 U	0.001	0.007	1
11995	Chloromethane	74-87-3	0.003 U	0.003	0.007	1
11995	Cyclohexane	110-82-7	0.001 U	0.001	0.007	1
11995	1,2-Dibromo-3-chloropropane	96-12-8	0.003 U	0.003	0.007	1
11995	Dibromochloromethane	124-48-1	0.001 U	0.001	0.007	1
11995	1,2-Dibromoethane	106-93-4	0.001 U	0.001	0.007	1
11995	1,2-Dichlorobenzene	95-50-1	0.001 U	0.001	0.007	1
11995	1,3-Dichlorobenzene	541-73-1	0.001 U	0.001	0.007	1
11995	1,4-Dichlorobenzene	106-46-7	0.001 U	0.001	0.007	1
11995	Dichlorodifluoromethane	75-71-8	0.003 U	0.003	0.007	1
11995	1,1-Dichloroethane	75-34-3	0.001 U	0.001	0.007	1
11995	1,2-Dichloroethane	107-06-2	0.001 U	0.001	0.007	1
11995	1,1-Dichloroethene	75-35-4	0.001 U	0.001	0.007	1
11995	cis-1,2-Dichloroethene	156-59-2	0.001 U	0.001	0.007	1
11995	trans-1,2-Dichloroethene	156-60-5	0.001 U	0.001	0.007	1
11995	1,2-Dichloropropane	78-87-5	0.001 U	0.001	0.007	1
11995	cis-1,3-Dichloropropene	10061-01-5	0.001 U	0.001	0.007	1
11995	trans-1,3-Dichloropropene	10061-02-6	0.001 U	0.001	0.007	1
11995	Ethylbenzene	100-41-4	0.001 U	0.001	0.007	1
11995	Freon 113	76-13-1	0.003 U	0.003	0.013	1
11995	2-Hexanone	591-78-6	0.004 U	0.004	0.013	1
11995	Isopropylbenzene	98-82-8	0.001 U	0.001	0.007	1
11995	Methyl Acetate	79-20-9	0.003 U	0.003	0.007	1
11995	Methyl Tertiary Butyl Ether	1634-04-4	0.0007 U	0.0007	0.007	1
11995	4-Methyl-2-pentanone	108-10-1	0.004 U	0.004	0.013	1
11995	Methylcyclohexane	108-87-2	0.001 U	0.001	0.007	1
11995	Methylene Chloride	75-09-2	0.003 U	0.003	0.007	1
11995	Styrene	100-42-5	0.001 U	0.001	0.007	1
11995	1,1,2,2-Tetrachloroethane	79-34-5	0.001 U	0.001	0.007	1
11995	Tetrachloroethene	127-18-4	0.001 U	0.001	0.007	1
11995	Toluene	108-88-3	0.001 U	0.001	0.007	1
11995	1,2,3-Trichlorobenzene	87-61-6	0.001 U	0.001	0.007	1
11995	1,2,4-Trichlorobenzene	120-82-1	0.001 U	0.001	0.007	1
11995	1,1,1-Trichloroethane	71-55-6	0.001 U	0.001	0.007	1
11995	1,1,2-Trichloroethane	79-00-5	0.001 U	0.001	0.007	1
11995	Trichloroethene	79-01-6	0.001 U	0.001	0.007	1
11995	Trichlorofluoromethane	75-69-4	0.003 U	0.003	0.007	1
11995	Vinyl Chloride	75-01-4	0.001 U	0.001	0.007	1
11995	m+p-Xylene	179601-23-1	0.001 U	0.001	0.007	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-FD02-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799436 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 by SJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/21/2017 09:20

Reported: 02/07/2017 11:24

12K18 SDG#: MMK18-12FD

CAT No.	Analysis Name		CAS Number	Dry Result	:	Dry Method Detection Limit*	Dry Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 826	0C	mg/kg		mg/kg	mg/kg	
11995	o-Xylene		95-47-6	0.001	U	0.001	0.007	1
00882	VOA Library Sea The results from the FORM 1 - VOA-TIC. on the back of this	e volatile lik The qualifiers						
Misc.	Organics	EPA 537 Remodified	v. 1.1	ng/g		ng/g	ng/g	
14027	NETFOSAA	modifica	2991-50-6	0.38	ŢŢ	0.38	1.1	1
1102,	NEtFOSAA is the acr	onvm for N-eth			-			-
14027	NMeFOSAA		2355-31-9	0.38	Ū	0.38	1.1	1
	NMeFOSAA is the acr	onym for N-met	hyl perfluorod	ctanesi	lfonamidoaceti	c Acid.		
14027	Perfluorobutanesulf	onate	375-73-5	0.25	U	0.25	0.75	1
14027	Perfluorodecanoic a	cid	335-76-2	0.25	U	0.25	0.75	1
14027	Perfluorododecanoic	acid	307-55-1	0.25	U	0.25	0.75	1
14027	Perfluoroheptanoic	acid	375-85-9	0.25	U	0.25	0.75	1
14027	Perfluorohexanesulf	onate	355-46-4	0.25	U	0.25	0.75	1
14027	Perfluorohexanoic a	cid	307-24-4	0.13	U	0.13	0.50	1
14027	Perfluorononanoic a	cid	375-95-1	0.13	U	0.13	0.50	1
14027	Perfluoro-octanesul	fonate	1763-23-1	0.38	U	0.38	1.1	1
14027	Perfluorooctanoic a	cid	335-67-1	0.25	U	0.25	0.75	1
14027	Perfluorotetradecan	oic acid	376-06-7	0.25	U	0.25	0.75	1
14027	Perfluorotridecanoi	c acid	72629-94-8	0.25	U	0.25	0.75	1
14027	Perfluoroundecanoic	acid	2058-94-8	0.25	U	0.25	0.75	1
	stated QC limits are be obtained to calcul			ent dat	a points			
Wet Ch	nemistry	SW-846 906	0 modified	mg/kg		mg/kg	mg/kg	
02079	TOC		n.a.	860		207	621	1
Wet Ch	nemistry	SM 2540 G-	1997	%		%	%	
00111	Moisture		n.a.	24.2		0.50	0.50	1
	Moisture represents 103 - 105 degrees C as-received basis.					ng at		

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
------------	--------	----------	--------

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11995	SOM02.2 Volatiles	SW-846 8260C	1	A170272AA	01/28/2017 04:03	Stephen C Nolte	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-FD02-170118 Grab Soil

SGPP - Merrimack

LL Sample # SW 8799436 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 by SJ

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/21/2017 09:20

Latham NY 12110

Reported: 02/07/2017 11:24

12K18 SDG#: MMK18-12FD

		Laborat	ory Sa	ample Analysi	s Record			
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	1	201702344143	01/18/2017	00:00	Client Supplied	1
02392	GC/MS - Field Preserved NaHSO4	SW-846 5035A	2	201702344143	01/18/2017	00:00	Client Supplied	1
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201702344143	01/18/2017	00:00	Client Supplied	1
14027	14 PFCs	EPA 537 Rev. 1.1 modified	1	17024006	01/26/2017	20:28	Marissa C Drexinger	1
14090	PFC Solid Prep	EPA 537 Rev. 1.1 modified	1	17024006	01/24/2017	14:10	Devon M Whooley	1
02079	TOC	SW-846 9060 modified	1	17024667631B	01/24/2017	16:04	Drew M Gerhart	1
00111	Moisture	SM 2540 G-1997	1	17026820004B	01/26/2017	12:53	Larry E Bevins	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE NO.	
VOLATILE ORGANICS ANAL	YSIS DATA SHEET			
TENTATIVELY IDENTIFI	ED COMPOUNDS	!		!
		!	12K18	!
ab Name: Lancaster Laboratories	Contract:	!		.!
ab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	_
Matrix: (soil/water) SOIL	Lab Sample ID: 8799436			
Sample wt/vol: 4.98 (g/mL) g	Lab File ID: HP09685.i	/17ja	an27b.b/aj27	s39.d
evel: (low/med) LOW	Date Received: 01/21/1	7		
Moisture: not dec. 24.2	Date Analyzed: 01/28/1	7		
clumn: (pack/cap) CAP	Dilution Factor: 1.0			
	CONCENTRATION UNITS:			
Number TICs found: 0	(mg/L or mg/Kg) mg/K	g		

CAS NUMBER	: ! COMPOUND NAME ==!==================================		EST. CONC.	~
	!Total VOC TICs	!		: ! U
2	!	!	<u> </u>	!
3	!	!	<u> </u>	!
4	!	!	!	!
	!	!	!	!
6	!!	!		!
7	!	!		!
8	!	!	<u> </u>	!
	!	!		!
10	!	!		!
11	!	!		!
12	!	!!	!	!
13	!		!	!
14	!!		!	!
	!	!!	!	!
16	<u> </u>	!	!	!
17	!	!	!	!
18.	!	!	!	!
19.	!	!	!	!
20.	!	!	!	!
21	!	!	!	!
22.	_!		!	!
	!		!	!
24.		· ·		!
25.	Ţ.	i		!
	Ţ.	· ·		!
	!			
		· ·		!
29	!	!		!
		1		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: VOC Trip Blank Water

SGPP - Merrimack

LL Group # 1757186 Account # 37191

LL Sample # WW 8799437

Project Name: SGPP - Merrimack

Collected: 01/17/2017

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 11:24

13K18 SDG#: MMK18-13TB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: VOC Trip Blank Water

SGPP - Merrimack

LL Sample # WW 8799437 LL Group # 1757186 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/17/2017 C. T. Male Associates

50 Century Hill Drive

Submitted: 01/21/2017 09:20 Latham NY 12110

Reported: 02/07/2017 11:24

13K18 SDG#: MMK18-13TB

CAT
No. Analysis Name

CAS Number Result

Method Limit of Dilution
Detection Limit* Quantitation Factor

GC/MS Volatiles SW-846 8260C ug/l ug/l ug/l

11997 o-Xylene 95-47-6 0.5 U 0.5

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170272AA	01/27/2017 14:58	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170272AA	01/27/2017 14:58	Anita M Dale	1



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA SAMPLE NO.		
VOLATILE ORGANICS ANAI			
TENTATIVELY IDENTIF	!!!		
		! 13K18 !	
Lab Name: Lancaster Laboratories	Contract:	!	
Lab Code: LANCAS Case No.:	SAS No.:	_ SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8799	437	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0935	5.i/17jan27a.b/yj27s	32.d
Level: (low/med) LOW	Date Received: 01/2	1/17	
% Moisture: not dec.	Date Analyzed: 01/2	7/17	
		_	

Column: (pack/cap) CAP Dilution Factor: 1.0 CONCENTRATION UNITS:

Number TICs found: 0 (ug/L or ug/Kg) ug/L

	! COMPOUND NAME		! EST. CONC.	~
	:=!======== !Total VOC TICs	====!======	!======================================	•
	!!	: !	;	. 0
		i	·	·
	<u>_</u>	i	·	i
	<u>_</u>	i	·	i
		i	·	·
	i	i	·	·
		i	·	·
	_ :!	i	·	·
	i		·	·
	i	i	·	i
	_ :!	i	·	·
	i	i	·	·
	 	i	i	i
		i	·	·
		i	i	:
		i	i	i
		i	·	·
		i	i	:
		i	i	:
		<u>i</u>	i	:
			! !	·
			! !	
	`	i	·	·
24 25		<u>:</u>	<u> </u>	<u> </u>
26.	_ ;	<u>-</u>	!	:
		:	<u> </u>	:
	!	<u>-</u>	<u>:</u>	!
		<u>-</u>	:	:
	!	<u>-</u>	<u>!</u>	!
· U •	_!	<u>-</u>	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757186

Reported: 02/07/2017 11:24

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	mg/kg		mg/kg	mg/kg
Batch number: A170272AA	Sample	number	(s): 87994	32-8799436
Acetone	0.007	U	0.007	0.020
Benzene	0.0005	U	0.0005	0.005
Bromochloromethane	0.001	U	0.001	0.005
Bromodichloromethane	0.001	U	0.001	0.005
Bromoform	0.001	U	0.001	0.005
Bromomethane	0.002	U	0.002	0.005
2-Butanone	0.004	U	0.004	0.010
Carbon Disulfide	0.001	U	0.001	0.005
Carbon Tetrachloride	0.001	U	0.001	0.005
Chlorobenzene	0.001	U	0.001	0.005
Chloroethane	0.002	U	0.002	0.005
Chloroform	0.001	U	0.001	0.005
Chloromethane	0.002	U	0.002	0.005
Cyclohexane	0.001	U	0.001	0.005
1,2-Dibromo-3-chloropropane	0.002	U	0.002	0.005
Dibromochloromethane	0.001	U	0.001	0.005
1,2-Dibromoethane	0.001	U	0.001	0.005
1,2-Dichlorobenzene	0.001	U	0.001	0.005
1,3-Dichlorobenzene	0.001	U	0.001	0.005
1,4-Dichlorobenzene	0.001	U	0.001	0.005
Dichlorodifluoromethane	0.002	U	0.002	0.005
1,1-Dichloroethane	0.001	U	0.001	0.005
1,2-Dichloroethane	0.001	U	0.001	0.005
1,1-Dichloroethene	0.001	U	0.001	0.005
cis-1,2-Dichloroethene	0.001	U	0.001	0.005
trans-1,2-Dichloroethene	0.001	U	0.001	0.005
1,2-Dichloropropane	0.001	U	0.001	0.005
cis-1,3-Dichloropropene	0.001	U	0.001	0.005
trans-1,3-Dichloropropene	0.001	U	0.001	0.005
Ethylbenzene	0.001	U	0.001	0.005
Freon 113	0.002	U	0.002	0.010
2-Hexanone	0.003	U	0.003	0.010
Isopropylbenzene	0.001	U	0.001	0.005
Methyl Acetate	0.002	U	0.002	0.005
Methyl Tertiary Butyl Ether	0.0005	U	0.0005	0.005
4-Methyl-2-pentanone	0.003	U	0.003	0.010
Methylcyclohexane	0.001	U	0.001	0.005
Methylene Chloride	0.002	U	0.002	0.005
Styrene	0.001	U	0.001	0.005
1,1,2,2-Tetrachloroethane	0.001	U	0.001	0.005

^{*-} Outside of specification

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757186

Reported: 02/07/2017 11:24

Method Blank (continued)

Analysis Name	Result	.	MDL**	LOQ
	mg/kg		mg/kg	mg/kg
Tetrachloroethene	0.001	U	0.001	0.005
Toluene	0.001	U	0.001	0.005
1,2,3-Trichlorobenzene	0.001	Ū	0.001	0.005
1,2,4-Trichlorobenzene	0.001	U	0.001	0.005
1,1,1-Trichloroethane	0.001	U	0.001	0.005
1,1,2-Trichloroethane	0.001	U	0.001	0.005
Trichloroethene	0.001	U	0.001	0.005
Trichlorofluoromethane	0.002	U	0.002	0.005
Vinyl Chloride	0.001	Ū	0.001	0.005
m+p-Xylene	0.001	U	0.001	0.005
o-Xylene	0.001	U	0.001	0.005
	ug/l		ug/l	ug/l
Batch number: Y170272AA	Sample	number	r(s): 879	9425,8799427-8799429,8799437
Acetone	6	U	6	20
Benzene	0.5	U	0.5	1
Bromochloromethane	1	U	1	5
Bromodichloromethane	0.5	U	0.5	1
Bromoform	0.5	U	0.5	4
Bromomethane	0.5	Ū	0.5	1
2-Butanone	3	U	3	10
Carbon Disulfide	1	U	1	5
Carbon Tetrachloride	0.5	Ū	0.5	1
Chlorobenzene	0.5	U	0.5	1
Chloroethane	0.5	U	0.5	1
Chloroform	0.5	U	0.5	1
Chloromethane	0.5	U	0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	U	2	5
Dibromochloromethane	0.5	U	0.5	1
1,2-Dibromoethane	0.5	U	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5
Dichlorodifluoromethane	0.5	U	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	U	0.5	1
trans-1,2-Dichloroethene	0.5	U	0.5	1
1,2-Dichloropropane	0.5	U	0.5	1
cis-1,3-Dichloropropene	0.5	U	0.5	1
trans-1,3-Dichloropropene	0.5	U	0.5	1
Ethylbenzene	0.5	U	0.5	1
Freon 113	2	U	2	10
2-Hexanone	3	U	3	10
Isopropylbenzene	1	U	1	5
Methyl Acetate	1	U	1	5
Methyl Tertiary Butyl Ether	0.5	U	0.5	1

^{*-} Outside of specification

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757186

Reported: 02/07/2017 11:24

Method Blank (continued)

Analysis Name	Result	:	MDL**	LOQ
	ug/l		ug/l	ug/l
4-Methyl-2-pentanone	3	U	3	10
Methylcyclohexane	1	U	1	5
Methylene Chloride	2	Ū	2	4
Styrene	1	U	1	5
1,1,2,2-Tetrachloroethane	0.5	U	0.5	1
Tetrachloroethene	0.5	Ū	0.5	1
Toluene	0.5	U	0.5	1
1,2,3-Trichlorobenzene	1	U	1	5
1,2,4-Trichlorobenzene	1	U	1	5
1,1,1-Trichloroethane	0.5	U	0.5	1
1,1,2-Trichloroethane	0.5	U	0.5	1
Trichloroethene	0.5	U	0.5	1
Trichlorofluoromethane	0.5	U	0.5	1
Vinyl Chloride	0.5	U	0.5	1
m+p-Xylene	0.5	U	0.5	1
o-Xylene	0.5	U	0.5	1
-				
	ng/g		ng/g	ng/g
Batch number: 17024006				9432-8799436
NEtFOSAA	0.30	U	0.30	0.90
NMeFOSAA	0.30	U	0.30	0.90
Perfluorobutanesulfonate	0.20	U	0.20	0.60
Perfluorodecanoic acid	0.20	U	0.20	0.60
Perfluorododecanoic acid	0.20	U	0.20	0.60
Perfluoroheptanoic acid	0.20	U	0.20	0.60
Perfluorohexanesulfonate	0.20	U	0.20	0.60
Perfluorohexanoic acid	0.10	U	0.10	0.40
Perfluorononanoic acid	0.10	U	0.10	0.40
Perfluoro-octanesulfonate	0.30	Ū	0.30	0.90
Perfluorooctanoic acid	0.20	U	0.20	0.60
Perfluorotetradecanoic acid	0.20	U	0.20	0.60
Perfluorotridecanoic acid	0.20	U	0.20	0.60
Perfluoroundecanoic acid	0.20	U	0.20	0.60
	ng/l		ng/l	ng/l
Batch number: 17030004	Sample	number	r(s): 8799	9425,8799427-8799429,8799431
Perfluorooctanoic acid	0.5	U	0.5	2
Perfluorononanoic acid	0.6	U	0.6	2
Perfluorodecanoic acid	0.5	U	0.5	2
Perfluoroundecanoic acid	1	U	1	3
Perfluorododecanoic acid	0.5	U	0.5	2
Perfluorotridecanoic acid	0.5	U	0.5	2
Perfluorotetradecanoic acid	0.5	U	0.5	2
Perfluorohexanoic acid	0.5	U	0.5	2
Perfluoroheptanoic acid	0.5	U	0.5	2
Perfluorobutanesulfonate	0.7	U	0.7	2
Perfluorohexanesulfonate	1	U	1	3
Perfluoro-octanesulfonate	2	U	2	6
Perfluorobutanoic Acid	3	U	3	10

^{*-} Outside of specification

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757186

Reported: 02/07/2017 11:24

Method Blank (continued)

Analysis Name	Result	MDL**	LOQ
	ng/l	ng/l	ng/l
Perfluoropentanoic Acid	0.5 U	0.5	2
NETFOSAA	1 U	1	3
NMeFOSAA	1 U	1	3
	mg/l	mg/l	mg/l
Batch number: 170260635002	Sample numb	per(s): 8799	425-8799430
Calcium	0.0382 U		
Magnesium	0.0190 U	0.0190	
Potassium	0.160 U		
Sodium	0.173 U	0.173	2.00
	mg/kg	mg/kg	mg/kg
Batch number: 17024667631B	Sample numb	per(s): 8799	432-8799436
TOC	100 U	100	300
	mg/l	mg/l	mg/l
Batch number: 17024120601A	Sample numb	per(s): 8799	427-8799428
Chloride	0.20 U	0.20	0.40
Sulfate	0.30 U	0.30	1.0
Batch number: 17024120601B	Sample numb	per(s): 8799	425,8799429
Chloride	0.20 U	0.20	0.40
Sulfate	0.30 U	0.30	1.0
Batch number: 17029118102B	Sample numb	per(s): 8799	425,8799427-8799429
Total Nitrite/Nitrate Nitrogen	0.040 U	0.040	0.10
	mg/l as Ca	CO3 mg/l as	- '
		CaCO3	CaCO3
Batch number: 17025008104A	-		425,8799427-8799429
Total Alkalinity to pH 4.5	3.3 J	1.7	5.0

LCS/LCSD

Analysis Name	LCS Spike Added mg/kg	LCS Conc mg/kg	LCSD Spike Added mg/kg	LCSD Conc mg/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max		
Batch number: A170272AA	Sample numbe	Sample number(s): 8799432-8799436									
Acetone	0.150	0.138	0.150	0.133	92	89	39-150	4	30		
Benzene	0.0200	0.0195	0.0200	0.0194	98	97	80-120	1	30		
Bromochloromethane	0.0200	0.0200	0.0200	0.0191	100	96	80-126	4	30		
Bromodichloromethane	0.0200	0.0193	0.0200	0.0188	97	94	75-120	3	30		
Bromoform	0.0200	0.0189	0.0200	0.0187	95	93	57-127	1	30		
Bromomethane	0.0200	0.0187	0.0200	0.0168	93	84	21-165	11	30		
2-Butanone	0.150	0.148	0.150	0.138	99	92	54-129	8	30		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



50-168

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757186

Reported: 02/07/2017 11:24

LCS/LCSD (continued)

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	mg/kg	mg/kg	mg/kg	mg/kg					
Carbon Disulfide	0.0200	0.0184	0.0200	0.0182	92	91	60-120	1	30
Carbon Tetrachloride	0.0200	0.0201	0.0200	0.0192	100	96	69-130	4	30
Chlorobenzene	0.0200	0.0196	0.0200	0.0194	98	97	80-120	1	30
Chloroethane	0.0200	0.0165	0.0200	0.0158	82	79	10-187	4	30
Chloroform	0.0200	0.0199	0.0200	0.0191	99	95	80-120	4	30
Chloromethane	0.0200	0.0183	0.0200	0.0173	92	86	56-120	6	30
Cyclohexane	0.0200	0.0197	0.0200	0.0195	99	98	58-120	1	30
1,2-Dibromo-3-chloropropane	0.0200	0.0192	0.0200	0.0181	96	91	54-120	6	30
Dibromochloromethane	0.0200	0.0195	0.0200	0.0190	98	95	77-120	3	30
1,2-Dibromoethane	0.0200	0.0197	0.0200	0.0198	99	99	80-120	0	30
1,2-Dichlorobenzene	0.0200	0.0194	0.0200	0.0193	97	96	80-120	1	30
1,3-Dichlorobenzene	0.0200	0.0199	0.0200	0.0191	99	96	80-120	4	30
1,4-Dichlorobenzene	0.0200	0.0194	0.0200	0.0189	97	94	80-120	2	30
Dichlorodifluoromethane	0.0200	0.0173	0.0200	0.0163	87	82	37-126	6	30
1,1-Dichloroethane	0.0200	0.0198	0.0200	0.0198	99	99	77-120	0	30
1,2-Dichloroethane	0.0200	0.0195	0.0200	0.0192	98	96	70-133	1	30
1,1-Dichloroethene	0.0200	0.0205	0.0200	0.0199	102	100	73-129	3	30
cis-1,2-Dichloroethene	0.0200	0.0199	0.0200	0.0194	99	97	80-120	3	30
trans-1,2-Dichloroethene	0.0200	0.0202	0.0200	0.0201	101	100	80-125	1	30
1,2-Dichloropropane	0.0200	0.0193	0.0200	0.0191	96	95	76-120	1	30
cis-1,3-Dichloropropene	0.0200	0.0195	0.0200	0.0190	97	95	74-120	3	30
trans-1,3-Dichloropropene	0.0200	0.0200	0.0200	0.0197	100	98	76-120	2	30
Ethylbenzene	0.0200	0.0199	0.0200	0.0196	100	98	80-120	2	30
Freon 113	0.0200	0.0202	0.0200	0.0195	101	98	64-133	3	30
2-Hexanone	0.100	0.0974	0.100	0.0946	97	95	48-126	3	30
Isopropylbenzene	0.0200	0.0206	0.0200	0.0203	103	102	76-120	1	30
Methyl Acetate	0.0200	0.0196	0.0200	0.0200	98	100	52-146	2	30
Methyl Tertiary Butyl Ether	0.0200	0.0193	0.0200	0.0193	97	97	72-120	0	30
4-Methyl-2-pentanone	0.100	0.0966	0.100	0.0925	97	93	48-136	4	30
Methylcyclohexane	0.0200	0.0192	0.0200	0.0185	96	93	62-132	4	30
Methylene Chloride	0.0200	0.0191	0.0200	0.0189	96	94	76-122	2	30
Styrene	0.0200	0.0218	0.0200	0.0209	109	104	76-120	4	30
1,1,2,2-Tetrachloroethane	0.0200	0.0195	0.0200	0.0195	98	97	67-121	0	30
Tetrachloroethene	0.0200	0.0198	0.0200	0.0189	99	94	78-120	5	30
Toluene	0.0200	0.0202	0.0200	0.0194	101	97	80-120	4	30
1,2,3-Trichlorobenzene	0.0200	0.0188	0.0200	0.0178	94	89	63-122	6	30
1,2,4-Trichlorobenzene	0.0200	0.0192	0.0200	0.0182	96	91	63-121	6	30
1,1,1-Trichloroethane	0.0200	0.0174	0.0200	0.0169	87	85	66-128	3	30
1,1,2-Trichloroethane	0.0200	0.0174	0.0200	0.0107	97	98	80-120	2	30
Trichloroethene	0.0200	0.0201	0.0200	0.0193	100	97	80-120	4	30
Trichlorofluoromethane	0.0200	0.0188	0.0200	0.0193	94	90	47-146	4	30
Vinyl Chloride	0.0200	0.0184	0.0200	0.0177	92	89	59-120	4	30
m+p-Xylene	0.0400	0.0402	0.0200	0.0392	100	98	80-120	3	30
o-Xylene	0.0200	0.0205	0.0200	0.0392	102	97	80-120	5	30
O Ayrone					102	21	00-120	5	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: Y170272AA	-		25,8799427-87	99429,8799			F0		
Agetone	1	17/ [1			116		EN 160		

^{*-} Outside of specification

Acetone

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757186

Reported: 02/07/2017 11:24

LCS/LCSD (continued)

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Benzene	20	22.02			110		78-120		
Bromochloromethane	20	21.27			106		80-125		
Bromodichloromethane	20	19.91			100		80-120		
Bromoform	20	16.44			82		59-120		
Bromomethane	20	18.36			92		55-123		
2-Butanone	150	162.74			108		57-145		
Carbon Disulfide	20	20.82			104		58-120		
Carbon Tetrachloride	20	20.41			102		74-130		
Chlorobenzene	20	21.58			108		80-120		
Chloroethane	20	18.85			94		56-120		
Chloroform	20	21.71			109		80-120		
Chloromethane	20	19.75			99		59-127		
Cyclohexane	20	19.77			99		65-131		
1,2-Dibromo-3-chloropropane	20	18.31			92		59-120		
Dibromochloromethane	20	19.51			98		78-120		
1,2-Dibromoethane	20	22.11			111		80-120		
1,2-Dichlorobenzene	20	20.99			105		80-120		
1,3-Dichlorobenzene	20	20.71			104		80-120		
1,4-Dichlorobenzene	20	20.88			104		80-120		
Dichlorodifluoromethane	20	16.51			83		49-134		
1,1-Dichloroethane	20	22.8			114		80-120		
1,2-Dichloroethane	20	21.49			107		66-128		
1,1-Dichloroethene	20	22.74			114		76-124		
cis-1,2-Dichloroethene	20	21.78			109		80-120		
trans-1,2-Dichloroethene	20	22.44			112		80-120		
1,2-Dichloropropane	20	22.18			111		80-120		
cis-1,3-Dichloropropene	20	20.74			104		80-120		
trans-1,3-Dichloropropene	20	20.85			104		76-120		
Ethylbenzene	20	22.04			110		78-120		
Freon 113	20	18.8			94		64-136		
2-Hexanone	100	115.5			115		49-146		
Isopropylbenzene	20	21.59			108		80-120		
Methyl Acetate	20	22.21			111		61-137		
Methyl Tertiary Butyl Ether	20	21.51			108		75-120		
4-Methyl-2-pentanone	100	115.76			116		55-141		
Methylcyclohexane	20	18.51			93		66-126		
Methylene Chloride	20	22.34			112		80-120		
Styrene	20	21.1			105		80-120		
1,1,2,2-Tetrachloroethane	20	21.21			106		72-120		
Tetrachloroethene	20	21.67			108		80-129		
Toluene	20	22.04			110		80-120		
1,2,3-Trichlorobenzene	20	21.7			108		69-120		
1,2,4-Trichlorobenzene	20	22.01			110		72-120		
1,1,1-Trichloroethane	20	20.87			104		66-126		
1,1,2-Trichloroethane	20	21.35			107		80-120		
Trichloroethene	20	22.11			111		80-120		
Trichlorofluoromethane	20	18.21			91		67-129		
Vinyl Chloride	20	19.07			95		63-121		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757186

Reported: 02/07/2017 11:24

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/1	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
m+p-Xylene	40	43.82			110		80-120		
o-Xylene	20	21.71			109		80-120		
	ng/g	ng/g	ng/g	ng/g					
Batch number: 17024006	Sample numbe	r(s): 87994	132-8799436						
NETFOSAA	20	23.48			117		70-130		
NMeFOSAA	20	24.25			121		70-130		
Perfluorobutanesulfonate	17.68	16.44			93		70-130		
Perfluorodecanoic acid	20	20.5			102		70-130		
Perfluorododecanoic acid	20	21.76			109		70-130		
Perfluoroheptanoic acid	20	23.67			118		70-130		
Perfluorohexanesulfonate	18.92	20.22			107		70-130		
Perfluorohexanoic acid	20	20.75			104		70-130		
Perfluorononanoic acid	20	22.02			110		70-130		
Perfluoro-octanesulfonate	19.12	20.53			107		70-130		
Perfluorooctanoic acid	20	20.44			102		70-130		
Perfluorotetradecanoic acid	20	21.66			108		70-130		
Perfluorotridecanoic acid	20	21.38			107		70-130		
Perfluoroundecanoic acid	20	21.51			108		70-130		
	ng/l	ng/l	ng/l	ng/l					
Batch number: 17030004	Sample numbe	r(s): 87994	125,8799427-8	799429.879	9431				
Perfluorooctanoic acid	200	184.09	120,0,0,012,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	92		70-130		
Perfluorononanoic acid	200	156.4			78		70-130		
Perfluorodecanoic acid	200	162.11			81		70-130		
Perfluoroundecanoic acid	200	209.77			105		70-130		
Perfluorododecanoic acid	200	179.17			90		70-130		
Perfluorotridecanoic acid	200	203.02			102		70-130		
Perfluorotetradecanoic acid	200	180.69			90		70-130		
Perfluorohexanoic acid	200	174.56			87		70-130		
Perfluoroheptanoic acid	200	175.17			88		70-130		
Perfluorobutanesulfonate	176.8	180.01			102		70-130		
Perfluorohexanesulfonate	189.2	152.65			81		70-130		
Perfluoro-octanesulfonate	191.2	154.11			81		70-130		
Perfluorobutanoic Acid	200	179.87			90		70-130		
Perfluoropentanoic Acid	200	166.01			83		70-130		
NEtFOSAA	200	183.28			92		70-130		
NMeFOSAA	200	237.35			119		70-130		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 170260635002	Sample numbe	r(s): 87994	125-8799430						
Calcium	4.00	3.98			99		80-120		
Magnesium	2.00	2.02			101		80-120		
Potassium	10	10.07			101		80-120		
Sodium	10	9.92			99		80-120		
	mg/kg	mg/kg	mg/kg	mg/kg					

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757186

Reported: 02/07/2017 11:24

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/kg	LCS Conc mg/kg	LCSD Spike Added mg/kg	LCSD Conc mg/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 17024667631B	Sample number 6030	er(s): 87994 5441.01	432-8799436		90		47-143		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17024120601A	Sample numb	er(s): 87994	427-8799428						
Chloride	3.00	2.97			99		90-110		
Sulfate	7.50	7.56			101		90-110		
Batch number: 17024120601B	Sample numb	er(s): 87994	425,8799429						
Chloride	3.00	2.97			99		90-110		
Sulfate	7.50	7.56			101		90-110		
Batch number: 17029118102B	Sample numb	er(s): 87994	425,8799427-87	799429					
Total Nitrite/Nitrate Nitrogen	2.50	2.70			108		90-110		
	mg/l as	mg/l as	mg/l as	mg/l as					
	CaCO3	CaCO3	CaCO3	CaCO3					
Batch number: 17025008104A	Sample numb		425,8799427-87	799429					
Total Alkalinity to pH 4.5	188	182.26			97		84-110		
	%	%	%	%					
Batch number: 17026820004B	Sample numb	er(s): 87994	432-8799436						
Moisture	89.5	89.36			100		99-101		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/kg	MS Spike Added mg/kg	MS Conc mg/kg	MSD Spike Added mg/kg	MSD Conc mg/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: A170272AA	Sample numb	er(s): 8799	9432-8799	436 UNSPK:	P799399					
Acetone	0.007 U	0.150	0.133	0.148	0.128	88	87	39-150	4	30
Benzene	0.0005 U	0.0200	0.0202	0.0197	0.0194	101	99	80-120	4	30
Bromochloromethane	0.001 U	0.0200	0.0211	0.0197	0.0207	105	105	80-126	2	30
Bromodichloromethane	0.001 U	0.0200	0.0205	0.0197	0.0198	102	101	75-120	4	30
Bromoform	0.001 U	0.0200	0.0222	0.0197	0.0215	111	109	57-127	3	30
Bromomethane	0.002 U	0.0200	0.0186	0.0197	0.0179	93	91	21-165	4	30
2-Butanone	0.004 U	0.150	0.141	0.148	0.133	94	90	54-129	5	30
Carbon Disulfide	0.001 U	0.0200	0.0190	0.0197	0.0190	95	96	60-120	0	30
Carbon Tetrachloride	0.001 U	0.0200	0.0224	0.0197	0.0214	112	109	69-130	4	30
Chlorobenzene	0.001 U	0.0200	0.0206	0.0197	0.0192	103	98	80-120	7	30
Chloroethane	0.002 U	0.0200	0.0170	0.0197	0.0160	85	81	10-187	6	30
Chloroform	0.001 U	0.0200	0.0210	0.0197	0.0201	105	102	80-120	4	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757186

Reported: 02/07/2017 11:24

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/kg	MS Spike Added mg/kg	MS Conc mg/kg	MSD Spike Added mg/kg	MSD Conc mg/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Chloromethane	0.002 U	0.0200	0.0188	0.0197	0.0183	94	93	56-120	3	30
Cyclohexane	0.002 U	0.0200	0.0188	0.0197	0.0183	109	107	58-120	3	30
1,2-Dibromo-3-chloropropane	0.001 U	0.0200	0.0218	0.0197	0.0211	125*	124*	54-120	3	30
Dibromochloromethane	0.002 U	0.0200	0.0230	0.0197	0.0243	112	107	77-120	6	30
1,2-Dibromoethane	0.001 U	0.0200	0.0224	0.0197	0.0211	118	114	80-120	5	30
1,2-Dichlorobenzene	0.001 U	0.0200	0.0236	0.0197	0.0223	97	92	80-120	8	30
1,3-Dichlorobenzene	0.001 U	0.0200	0.0193	0.0197	0.0179	97	91	80-120	8	30
1,4-Dichlorobenzene	0.001 U	0.0200	0.0194	0.0197	0.0179	94	90	80-120	7	30
Dichlorodifluoromethane	0.001 U	0.0200	0.0109	0.0197	0.0170	104	99	37-126	7	30
1,1-Dichloroethane	0.002 U	0.0200	0.0203	0.0197	0.0194	101	103	77-120	0	30
1,2-Dichloroethane	0.001 U	0.0200	0.0203	0.0197	0.0203	108	105	70-133	5	30
1,1-Dichloroethene	0.001 U	0.0200	0.0217	0.0197	0.0207	108	110	73-129	1	30
cis-1,2-Dichloroethene	0.001 U	0.0200	0.0217	0.0197	0.0210	103	100	80-120	5	30
trans-1,2-Dichloroethene	0.001 U	0.0200	0.0207	0.0197	0.0133	106	108	80-125	1	30
1,2-Dichloropropane	0.001 U	0.0200	0.0212	0.0197	0.0213	101	100	76-120	3	30
cis-1,3-Dichloropropene	0.001 U	0.0200	0.0203	0.0197	0.0198	106	101	74-120	7	30
trans-1,3-Dichloropropene	0.001 U	0.0200	0.0212	0.0197	0.0208	106	106	76-120	2	30
Ethylbenzene	0.001 U	0.0200	0.0215	0.0197	0.0197	102	100	80-120	4	30
Freon 113	0.001 U	0.0200	0.0225	0.0197	0.0223	112	113	64-133	1	30
2-Hexanone	0.002 U	0.100	0.126	0.0984	0.134	126	136*	48-126	6	30
Isopropylbenzene	0.003 U	0.0200	0.0219	0.0197	0.0202	109	103	76-120	8	30
Methyl Acetate	0.002 U	0.0200	0.0224	0.0197	0.0229	112	116	52-146	2	30
Methyl Tertiary Butyl Ether	0.0005 U	0.0200	0.0213	0.0197	0.0212	106	108	72-120	0	30
4-Methyl-2-pentanone	0.003 U	0.100	0.133	0.0984	0.131	133	133	48-136	2	30
Methylcyclohexane	0.001 U	0.0200	0.0227	0.0197	0.0220	113	112	62-132	3	30
Methylene Chloride	0.002 U	0.0200	0.0201	0.0197	0.0201	100	102	76-122	0	30
Styrene	0.001 U	0.0200	0.0205	0.0197	0.0194	102	99	76-120	5	30
1,1,2,2-Tetrachloroethane	0.001 U	0.0200	0.0239	0.0197	0.0233	119	118	67-121	3	30
Tetrachloroethene	0.001 U	0.0200	0.0206	0.0197	0.0197	103	100	78-120	4	30
Toluene	0.001 U	0.0200	0.0206	0.0197	0.0198	103	101	80-120	4	30
1,2,3-Trichlorobenzene	0.001 U	0.0200	0.0176	0.0197	0.0164	88	83	63-122	7	30
1,2,4-Trichlorobenzene	0.001 U	0.0200	0.0175	0.0197	0.0159	87	81	63-121	10	30
1,1,1-Trichloroethane	0.001 U	0.0200	0.0191	0.0197	0.0183	95	93	66-128	4	30
1,1,2-Trichloroethane	0.001 U	0.0200	0.0213	0.0197	0.0212	106	108	80-120	0	30
Trichloroethene	0.001 U	0.0200	0.0215	0.0197	0.0204	107	104	80-120	5	30
Trichlorofluoromethane	0.002 U	0.0200	0.0226	0.0197	0.0214	113	109	47-146	6	30
Vinyl Chloride	0.001 U	0.0200	0.0198	0.0197	0.0192	99	98	59-120	3	30
m+p-Xylene	0.001 U	0.0401	0.0410	0.0394	0.0391	102	99	80-120	5	30
o-Xylene	0.001 U	0.0200	0.0203	0.0197	0.0194	101	98	80-120	5	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: Y170272AA	Sample numb	er(s): 8799	425,8799	427-8799429	,8799437 t	JNSPK: P'	799414			
Acetone	6 U	150	168.97	150	168.4	113	112	50-168	0	30
Benzene	0.5 U	20	21.44	20	21.55	107	108	78-120	0	30
Bromochloromethane	1 U	20	20.01	20	20.05	100	100	80-125	0	30
Bromodichloromethane	0.5 U	20	19.17	20	19.11	96	96	80-120	0	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757186

Reported: 02/07/2017 11:24

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspi Cor ug/	c	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Bromoform	0.5	U	20	14.62	20	14.95	73	75	59-120	2	30
Bromomethane	0.5	U	20	17.94	20	18.3	90	92	55-123	2	30
2-Butanone	3	U	150	148.41	150	149.96	99	100	57-145	1	30
Carbon Disulfide	1	U	20	20.01	20	20.41	100	102	58-120	2	30
Carbon Tetrachloride	0.5	U	20	20.6	20	21.07	103	105	74-130	2	30
Chlorobenzene	0.5	Ū	20	20.63	20	20.65	103	103	80-120	0	30
Chloroethane	0.5	U	20	18.45	20	18.89	92	94	56-120	2	30
Chloroform	0.5	U	20	21.38	20	21.56	107	108	80-120	1	30
Chloromethane	0.5	U	20	19.48	20	19.37	97	97	59-127	1	30
Cyclohexane	2	U	20	23.16	20	23.28	116	116	65-131	1	30
1,2-Dibromo-3-chloropropane	2	U	20	16.31	20	16.44	82	82	59-120	1	30
Dibromochloromethane	0.5	U	20	18.14	20	18.48	91	92	78-120	2	30
1,2-Dibromoethane	0.5	U	20	20.37	20	20.53	102	103	80-120	1	30
1,2-Dichlorobenzene	1	U	20	19.73	20	20.01	99	100	80-120	1	30
1,3-Dichlorobenzene	1	U	20	19.69	20	19.66	98	98	80-120	0	30
1,4-Dichlorobenzene	1	U	20	19.7	20	20.01	99	100	80-120	2	30
Dichlorodifluoromethane	0.5	U	20	18.99	20	19.41	95	97	49-134	2	30
1,1-Dichloroethane	0.5	U	20	21.9	20	22.18	110	111	80-120	1	30
1,2-Dichloroethane	0.5	U	20	20.28	20	20.4	101	102	66-128	1	30
1,1-Dichloroethene	0.5	U	20	23.1	20	23.69	116	118	76-124	3	30
cis-1,2-Dichloroethene	0.5	U	20	21.09	20	21.14	105	106	80-120	0	30
trans-1,2-Dichloroethene	0.5	U	20	22.25	20	22.7	111	113	80-120	2	30
1,2-Dichloropropane	0.5	U	20	21.25	20	21.59	106	108	80-120	2	30
cis-1,3-Dichloropropene	0.5	U	20	18.54	20	18.9	93	95	80-120	2	30
trans-1,3-Dichloropropene	0.5	U	20	18.73	20	18.87	94	94	76-120	1	30
Ethylbenzene	0.5	U	20	21.44	20	21.64	107	108	78-120	1	30
Freon 113	2	U	20	22.2	20	23.23	111	116	64-136	5	30
2-Hexanone	3	U	100	106.48	100	106.53	106	107	49-146	0	30
Isopropylbenzene	1	U	20	21.13	20	21.42	106	107	80-120	1	30
Methyl Acetate	1	U	20	19.74	20	19.5	99	98	61-137	1	30
Methyl Tertiary Butyl Ether	0.5	U	20	19.64	20	20.09	98	100	75-120	2	30
4-Methyl-2-pentanone	3	U	100	106.46	100	107.26	106	107	55-141	1	30
Methylcyclohexane	1	U	20	21.44	20	22.11	107	111	66-126	3	30
Methylene Chloride	2	U	20	21.21	20	21.45	106	107	80-120	1	30
Styrene	1	U	20	19.94	20	20.01	100	100	80-120	0	30
1,1,2,2-Tetrachloroethane	0.5	U	20	19.25	20	19.59	96	98	72-120	2	30
Tetrachloroethene	0.6	71	20	22.46	20	22.67	109	110	80-129	1	30
Toluene	0.5	U	20	21.32	20	21.53	107	108	80-120	1	30
1,2,3-Trichlorobenzene	1	U	20	19.84	20	20.12	99	101	69-120	1	30
1,2,4-Trichlorobenzene	1	U	20	20.18	20	20.61	101	103	72-120	2	30
1,1,1-Trichloroethane	0.5	U	20	20.67	20	21.23	103	106	66-126	3	30
1,1,2-Trichloroethane	0.5	U	20	19.74	20	19.93	99	100	80-120	1	30
Trichloroethene	0.5	U	20	21.63	20	21.77	108	109	80-120	1	30
Trichlorofluoromethane	0.5	U	20	20.57	20	20.86	103	104	67-129	1	30
Vinyl Chloride	0.5	U	20	19.43	20	19.66	97	98	63-121	1	30
m+p-Xylene	0.5	U	40	42.05	40	42.81	105	107	80-120	2	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757186

Reported: 02/07/2017 11:24

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
o-Xylene	0.5 U	20	20.65	20	20.78	103	104	80-120	1	30
	ng/g	ng/g	ng/g	ng/g	ng/g					
Batch number: 17024006	Sample numi	ber(s): 8799	9432-8799	436 UNSPK:	P799399					
NETFOSAA	0.28 U	19.49	26.35	18.69	21.99	135*	118	70-130	18	30
NMeFOSAA	0.28 U	19.49	27.07	18.69	22.63	139*	121	70-130	18	30
Perfluorobutanesulfonate	0.19 U	17.23	16.35	16.52	17.35	95	105	70-130	6	30
Perfluorodecanoic acid	0.19 U	19.49	18.97	18.69	21.57	97	115	70-130	13	30
Perfluorododecanoic acid	0.19 U	19.49	21	18.69	21.82	108	117	70-130	4	30
Perfluoroheptanoic acid	0.19 U	19.49	22.56	18.69	20.35	116	109	70-130	10	30
Perfluorohexanesulfonate	0.19 U	18.44	21.38	17.68	19.89	116	112	70-130	7	30
Perfluorohexanoic acid	0.094 U	19.49	19.95	18.69	21.45	102	115	70-130	7	30
Perfluorononanoic acid	0.094 U	19.49	20.43	18.69	16.45	105	88	70-130	22	30
Perfluoro-octanesulfonate	0.28 U	18.64	18.64	17.87	19.24	100	108	70-130	3	30
Perfluorooctanoic acid	0.19 U	19.49	19.71	18.69	18.54	101	99	70-130	6	30
Perfluorotetradecanoic acid	0.19 U	19.49	20.8	18.69	19.83	107	106	70-130	5	30
Perfluorotridecanoic acid	0.19 U	19.49	19.95	18.69	18.41	102	98	70-130	8	30
Perfluoroundecanoic acid	0.19 U	19.49	20.52	18.69	20.29	105	109	70-130	1	30
	ng/l	ng/l	ng/l	ng/l	ng/l					
Batch number: 17030004	Sample num	ber(s): 8799	9425,8799	427-8799429	,8799431	UNSPK: P'	799414			
Perfluorooctanoic acid	44.08	199.36	239.49	199.05	222.59	98	90	70-130	7	30
Perfluorononanoic acid	0.6 U	199.36	159.46	199.05	159.05	80	80	70-130	0	30
Perfluorodecanoic acid	0.5 U	199.36	165.96	199.05	157.77	83	79	70-130	5	30
Perfluoroundecanoic acid	1 U	199.36	182.67	199.05	187.71	92	94	70-130	3	30
Perfluorododecanoic acid	0.5 U	199.36	191.32	199.05	185.8	96	93	70-130	3	30
Perfluorotridecanoic acid	0.5 U	199.36	207.05	199.05	207.78	104	104	70-130	0	30
Perfluorotetradecanoic acid	0.5 U	199.36	170.81	199.05	180.48	86	91	70-130	6	30
Perfluorohexanoic acid	8.92	199.36	175.94	199.05	173.02	84	82	70-130	2	30
Perfluoroheptanoic acid	6.79	199.36	176.97	199.05	171.49	85	83	70-130	3	30
Perfluorobutanesulfonate	3.73	176.24	178.29	175.96	177.04	99	98	70-130	1	30
Perfluorohexanesulfonate	2.34	188.6	180.51	188.3	174.57	94	91	70-130	3	30
Perfluoro-octanesulfonate	2.98	190.59	139.37	190.29	182.5	72	94	70-130	27	30
Perfluorobutanoic Acid	5.03	199.64	192.72	200	192.26	94	94	70-130	0	30
Perfluoropentanoic Acid	8.04	199.36	187.09	199.05	182.9	90	88	70-130	2	30
NETFOSAA	1 U	199.36	178.96	199.05	196.42	90	99	70-130	9	30
NMeFOSAA	1 U	199.36	219.49	199.05	202.2	110	102	70-130	8	30
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 170260635002	Sample numi	ber(s): 8799	9425-8799	430 UNSPK:	8799428					
Calcium	85.26	4.00	88.87	4.00	87.43	90 (2)	54 (2)	75-125	2	20
Magnesium	21.27	2.00	23.16	2.00	22.81	94 (2)	77 (2)	75-125	2	20
Potassium	3.88	10	13.99	10	13.86	101	100	75-125	1	20
Sodium	45.92	10	55.35	10	54.59	94 (2)	87 (2)	75-125	1	20

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757186

Reported: 02/07/2017 11:24

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/kg	MS Spike Added mg/kg	MS Conc mg/kg	MSD Spike Added mg/kg	MSD Conc mg/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 17024667631B	Sample numb 975.02		9432-8799 18475.18		8799432	66		47-143		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17024120601A	Sample numb	er(s): 8799	9427-8799	428 UNSPK:	P799385					
Chloride	94.61	400	482.85			97		90-110		
Sulfate	12.72	50	59.83			94		90-110		
Batch number: 17024120601B	Sample numb	er(s): 8799	9425,8799	429 UNSPK:	P799414					
Chloride	149.4	200	358.21			104		90-110		
Sulfate	19.77	50	67.98			96		90-110		
Batch number: 17029118102B	Sample numb	er(s): 8799	9425,8799	427-8799429	UNSPK: P	799414				
Total Nitrite/Nitrate Nitrogen	1.53	1.00	2.63			110		90-110		
Batch number: 17025008104A	mg/l as CaCO3 Sample numb	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	700022				
Total Alkalinity to pH 4.5	98.28	188	230.89	441-0199449	UNSPK. P	790933		84-110		
TOCAL ALKALIHICY CO PR 4.5	20.40	T00	230.09			/ 1		04-110		

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc	DUP Conc	DUP RPD	DUP RPD Max
	mg/l	mg/l		
Batch number: 170260635002	Sample number(s):	8799425-8799430 B	KG: 8799428	
Calcium	85.26	85.7	1	20
Magnesium	21.27	21.37	0	20
Potassium	3.88	3.84	1 (1)	20
Sodium	45.92	46.14	0	20
	mg/kg	mg/kg		
Batch number: 17024667631B	Sample number(s):	8799432-8799436 B	KG: 8799432	
TOC	975.02	1126.01	14* (1)	7
	mg/l	mg/l		
Batch number: 17024120601A	Sample number(s):	8799427-8799428 B	KG: P799385	
Chloride	94.61	96.85	2 (1)	15
Sulfate	12.72	12.69	0 (1)	15
Batch number: 17024120601B	Sample number(s):	8799425.8799429 B	KG: P799414	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757186

Reported: 02/07/2017 11:24

Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc		DUP RPD	DUP RPD Max
	mg/l	mg/l		
Chloride	149.4	149.87	0	15
Sulfate	19.77	19.91	1 (1)	15
Batch number: 17029118102B	Sample number(s):	8799425,8799427-87994	29 BKG:	P799414
Total Nitrite/Nitrate Nitrogen	1.53	1.53	0	2
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 17025008104A	Sample number(s):	8799425,8799427-87994	29 BKG:	P798933
Total Alkalinity to pH 4.5	98.28	96.1	2	5
	%	%		
Batch number: 17026820004B	Sample number(s):	8799432-8799436 BKG:	P799399	
Moisture	8.05	8.43	5	5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: A170272AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8799432	98	101	99	95
8799433	96	98	101	95
8799434	98	100	105	84
8799435	100	102	97	94
8799436	99	101	98	97
Blank	101	101	97	96
LCS	101	100	100	99
LCSD	99	101	98	98
MS	99	100	99	97
MSD	98	101	100	103
Limits:	50-141	54-135	52-141	50-131

Analysis Name: SOM02.2 Volatiles

Batch number: Y170272AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8799425	95	99	100	98
8799427	95	99	100	99
8799428	95	98	100	98
8799429	95	99	100	98
8799437	95	100	100	98

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1757186

Reported: 02/07/2017 11:24

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

70-130

Analysis Name: SOM02.2 Volatiles

Batch number: Y170272AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
Blank	95	100	100	98
LCS	98	98	101	101
MS	97	99	100	100
MSD	97	98	100	100
Limits:	80-116	77-113	80-113	78-113

Analysis Name: 14 PFCs Batch number: 17024006

70-130

Limits:

	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA	13C8-PFOA	13C8-PFOS
8799432	62*	64*	66*	71	69*	74
8799433	70	69*	68*	70	76	70
8799434	69*	70	62*	76	72	67*
8799435	67*	65*	57*	75	67*	60*
8799436	66*	64*	57*	65*	70	64*
Blank	81	96	89	94	106	96
LCS	80	75	73	78	82	71
MS	73	77	71	77	79	85
MSD	58*	52*	52*	53*	69*	57*

70-130

	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA	d5-NEtFOSAA	13C2-PFDoDA	
8799432	86	74	58*	60*	62*	60*	
8799433	90	79	63*	59*	66*	69*	
8799434	87	63*	62*	57*	58*	51*	
8799435	74	70	44*	55*	62*	56*	
8799436	62*	66*	50*	54*	54*	51*	
Blank	109	90	78	85	99	78	
LCS	79	83	69*	78	80	78	
MS	81	71	57*	69*	65*	65*	
MSD	71	60*	52*	62*	47*	59*	
Limits:	70-130	70-130	70-130	70-130	70-130	70-130	

70-130

70-130

70-130

	13C2-PFTeDA
8799432	52*
8799433	61*
8799434	43*
8799435	53*
8799436	49*
Blank	75
LCS	75
MS	64*
MSD	56*

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



80

70-130

72

70-130

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Group Number: 1757186 Client Name: C. T. Male Associates

101

70-130

Reported: 02/07/2017 11:24

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed $\,$ unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 14 PFCs Batch number: 17024006 70-130

Analysis Name: 16 PFCs Batch number: 17030004

79

70 - 130

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8799425	71	86	84	78	88	84
8799427	74	79	77	92	85	94
8799428	81	90	89	89	89	96
8799429	76	91	85	77	90	89
8799431	73	78	75	83	75	103
Blank	75	70	72	73	77	82
LCS	78	75	70	74	74	86
MS	72	71	80	74	80	85
MSD	82	90	97	84	78	83
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8799425	76	72	83	73	69*	70
8799427	95	85	107	82	76	72
8799428	84	86	83	85	78	76
8799429	78	82	100	94	94	80
8799431	80	104	89	67*	80	68*
Blank	67*	99	119	81	84	69*
LCS	76	73	81	76	75	70
MS	70	84	94	70	65*	67*

83

70-130

	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
8799425	82	62*	62*	
8799427	84	65*	65*	
8799428	97	70	71	
8799429	130	69*	72	
8799431	81	61*	56*	
Blank	93	67*	62*	
LCS	75	66*	70	
MS	78	60*	61*	
MSD	75	71	70	
Limits:	70-130	70-130	70-130	

88

70-130

MSD

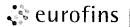
Limits:

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



Lancaster Laboratories

Environmental Services Analysis Request/Chain of Custody

Acct. #:	Acct. #: 37191 Group #					1757(86 sample #: 879942-5-37								COC#: 16303								
Client: C.T. Male Associates						Matrix						Ar	nalys	es F	Requ	uest	ed			For L	.ab Us	se Only
Project Name/#: SGPP - Merrimack	Site ID:						ų					Pı	rese	rvati	on (Code	es	_		SF#: <u>2</u>	86377	
Project Manager: Kirk Moline	P.O. #:				ᇉ	age ,	water		Н	N	S									SCR#:	200280	0
Sampler: Shephon Johnson STI					Sediment	Ground Surface	1 1		S				0 B)								Preservat	ion Codes
Phone #: 7/5 529 1670	Quote #:	214135			Sed		4	ers	+ TICs	છ	(353.2)		1 2320	mod.)						H = HCI		T = Thiosulfate
State where sample(s) were collected: NH					l	Se ES	1	Containers	() ()	6010		<u> </u>	NS) q	537 r	064					N = HNC)3	B = NaOH
	Colle	ection		posite		Potable NPDES	PFZA	4	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	Total NO2 / NO3	4- (300.0)	Carb/Bicarb (SM	(EPA	2.2 V	57.1	Moislan	00		S = H ₂ So		$P = H_3PO_4$
Sample Identification	Date	Time	Grab	Comp	Soil	Water	Other:	Total #	ICL VC	Ca, Mg	Total N	CI-, SO4-	ALK + C	16 PFCs	101	C	Mo			O = Oth		narks
542-APOH-54-55-170117 417/17 1206 X					X		12	X	Xi	V	X	×	· УД						EN	bo me	1 /	
562-APO4-64-65-170117	VITIT	1479	X			X		11	×	X	X	, VI	V	Á								
Shz- APO4-74-75 -170118	118/17	0843	V			<i>y</i>			Ÿ.	·\/	X	-/\ \/	y)	V							-	
Shz- APO4-835-845-170118	V18/17	1057	X			`X		12	×	V	λı	χ	X	X						F: I	kr Me	tala
542- FB03- 170118	Y1810	1120	X				2							X								
Sh.Z- APOS -7-8-170118	418/17	1300	1/2/		X			5							Xi	X	Xì	У		***************************************		
ShZ-APO5-11.5-14.5-170118	418/17	1320	×		У			5							X	X	X	X)				
542- APa5-2-3-170118	418/7	1351	X		X			5							X	Z	X	X				
Shz AA06-25-45-170118	118/17	1522	X		X			5							X	X	X	W				
Sh2-F202-170118	418/17	Chrystanian (1919)	X		χ			5							Xi	X	X	X				
Turnaround Time Requested (TAT) (please of	check): Stan	dard 🗌	RUS	нД	Relin	quished	by:				Date			Time	1	Rec	eived	by:		Da	ate	Time
(RUSH TAT is subject to Eurofins Lancaster Laboratori	ies approval	and surchar	ges.)			Stow					9-15	7		Fine a		D	-1	1 6				T:
Date results are needed: E-mail address to send RUSH results:		***************************************			Kelli	quished	⊌by:				Date			Time		Rec	eivec	ı by:		Da	ate	Time
Data Package Options (please check if requi	red)				Relir	quished	by:				Date			Time		Rec	eivec	by:		Da	ate	Time
Type I (Validation/non-CLP)		TX TRRP	- 13			•		and the same of th										•			SACRATOR AND TO	
Type III (Reduced non-CLP) CT RC		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			Relir	quished	by:				Date			Time		Rec	eivec	by:		Di	ate	Time
Type IV (CLP SOW) ASP T				,																		
	· · · · · · · · · · · · · · · · · · ·				Relir	quished	by:				Date			Time		Rec	//	by: ,			ate	Time
EDD Format: EQuIS																PHIL			1/2/	411	9:20	
If site-specific QC (MS/MSD/Dup) required, i submit triplicate volume.	indicate Q	C sample:	s and		Airbill Relind UPS	quished b	y Com FedE			rrier: Othe	·r	· ·				Tem	pera	ture ι	ıpon re	ceipt <u>& (</u>	<u> </u>	<u>√</u> °C

Environmental Analysis Request/Chain of Custody

	e	u	r	0	f	i	n	S
--	---	---	---	---	---	---	---	---

For Eurofins Lancaster Laboratories Environmental use only

Lancaster Laboratories

Acct. # 37/9 Group # 1757186 Sample # 8799425-37

COC #518835

Client Information	n		CARAMAN SCIE	202008A0-60	\$5000000000000000000000000000000000000	Matri	(Gillian dan s		conscionary periodicis	Ą	nalys	is F	eque	sted	warresie han w	**************		For Lab Us	e Only	
Client:	Acct. #:							Series				Presei	vati	on Co	des				FSC:		
CI Male Associalis						╽ᆜ╵└	ᆀ						a processor de						SCR#:		
CT Male Associalis Project Name/#: Shff-Mernimall	PWSID #:				Tissue	Ground														rvation (
SWI Thomas	P.O. #:				F	E #			100										H=HCI		niosulfate
Project Manager: Virk Maline	P.O. #:					(a)	_	S.	7 60										N=HNO S=H₂SC		
Sampler:	Quote #:	Quote #:					<u>"</u> نسا ال	2.0	(8)	Þ									and the second s	Remarks	
Stephen Johnson SP 5	្ន	214135					70710	Triangle	A S												
State where samples were collected: For Compliance: Yes	No 🗆			site	Sediment	Potable	10	Total # of Containers	VOA												
Sample Identification	Colle	ected	ڡۣ	Composite		ā	Other:	# 10	75												
Cample Identification	Date	Time	Grab	ပ္ပိ	Soil	Water	를	į													
VOC Top Blank		· Minarcollina.				X	$\perp \lambda$	1/2	X							Ĩ					
		000000000000000000000000000000000000000																			
								Ī	Ĭ												
								T										Ī			
								Ī	Î		Î	***************************************									
Turnaround Time (TAT) Requested	(please circ	e)	Relinq	uished	by	۸				Date	d	Time		Received	l by	00000000000000000000000000000000000000		an arterior district Ab		Date	Time
	Rush			M	v A	JV			ommonton memor	<u> </u>	917	172								n .	1
(Rush TAT is subject to laboratory approval and surchare	je.)		Helinq	uished	by /			_		Date		Time		Received	юу					Date	Time
Date results are needed:		-	Relinq	uished	by					Date		Time		Received	by					Date	Time
E-mail address:			Relinq	uished	by					Date		Time		Received	l by					Date	Time
Data Package Options (circle if r	equired)	t til sterningste symmetriet i til stor til tr	,	/										/							
Type I (EPA Level 3	(Raw Data	Only	Relinqu	uished	by					Date		Time		Received	by (1 .	,			Date	Time
Equivalent/non-CLP)	(I Idw Dala	○ (II y)			76000000000000000000000000000000000000	32 Se S S 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	William	eneros en és				Allanistoikoitaan maliela		V	· -	<u>11 </u>	1				9,20
Type III (Reduced non-CLP) NJ DKQ	Р ТХТ	RRP-13		ı	f voc	EDD R	equire	d?	Yes	No							Con FedE		cjal Carrie Other		
						ecific QC	(MS	MSD	/Dup\?) Y	es	- No									
NYSDEC Category A or B MA MCF	CT F	RCP				ate QC sar	•								Tem	pera	ture i	upon	receipt <u>č</u>	w-w5	_°C



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

173642

Group Number(s): 1757186

Client: C.T. Male

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

01/20/2017 9:45

Number of Packages:

2

Number of Projects:

1

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

N/A

Custody Seal Present:

Yes

Sample Date/Times match COC:

N/A

Custody Seal Intact:

VOA Vial Headspace ≥ 6mm:

No -

Samples Chilled:

Yes Yes

Total Trip Blank Qty:

Paperwork Enclosed:

No Yes. Trip Blank Type:

Samples Intact: Missing Samples:

No

Extra Samples:

No. N/A Air Quality Samples Present:

No

Discrepancy in Container Qty on COC:

Unpacked by Karen Diem (3060) at 19:50 on 01/20/2017

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler#	Thermometer ID	Corrected Temp	Therm. Type	ice Type	Ice Present?	Ice Container	Elevated Temp?
. 1	DT121	0.9	DT	Wet	Y	Bagged	N .
2	DT121	0.6	DT	Wet	Y	Bagged	N
3	DT121	0.5	DT	Wet	Y	Bagged	N

Paperwork Not Enclosed Details

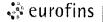
Sample ID on Label	,	No. of Containers	Date on Label		Comments	
see att paper		1 .	1/20/2017 20:06			

General Comments:

SEE ATT PAPER

1757186 - 1553 - 4 Battles 7010/s 1-16-17 APO4-27-28-170116 - 5 Bottles - 7 vials 1-17-17 FADI- 170117 ADOU-44-45 - 1701/7 1046 & pottles - 13 vals - 1 aB/ May 1-17-17 APO3-68-69-170116 1422 - 7BOHLES - 7000/5. 0915 - 5BOHLES - 7000/5. 1429 - 4BOHLES - 7-000/5 1-16-17 APOU - 34-36-170117 1-17-17 APOU- 64-65- 170117 1-17-17 1206- BBHAS- M-VIELS ルリブーノフ APCU - 54-55- 17017 1057 - 5BOHLES - 7 Vials 1-18-17 APOU - 83.6-845 170118 -0843 - a BOHHES - Mulais APOU - 74-75 - 170118 APOU - \$20-21.5 - 170116 - 1-18-17 1117 - 1BOHLE - Isail Few 1-16-17 1120 - a Buttles 1-18-17 FB03 - 170118 965 - 1 Bottle - 1 soil Jan 1-16-17 APOZ - 7-8 - 17016 1033 - 1 ROTHE - 150,7 Text 1-12e-17 Apoz - 12-13-170116 1546-1 BOHTLE 11-18-17 Apole - 16-8 170118 1522 - 1 Bittle -1-501 Fer APOLE - 25-45170118 1-18-17 1320 - 1BOHAE-1501 Jun APOS - 11.5-145170118 1-18-17 1300 - 1-BOHHE- 150/Ju 1-18-17 APOS - 7-8-170118 1848 - a Bottles - 1501 Ten 1-18-17 Apole - 6-8 170118 1145 - 1 Bottle-1-Soil Jun 1381 - 1 Bottle 1-50/1 Jun 1-16-17 APOZ- 3-5 170116 1-18-17 APOZ- 2-3-170/15 1057 - 1 Bottle 83.5-84.5.170118 1-18-17 APOU -1087 - 1501 Jan 1-16-17 - 17-18-170114 SCOPA. of 1 Bottle - 1501 Jour 1-18-17 FDOZ. 170118

2TB HCi 1TB-BOHHE



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

173687

Group Number(s): 1757186

Client: C.T Male Associates

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

01/21/2017 9:20

Number of Packages:

4

Number of Projects:

1

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

No

Custody Seal Present:

Yes

Sample Date/Times match COC:

No

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

Air Quality Samples Present:

No

Samples Chilled:

Yes

Total Trip Blank Qty:

6

Paperwork Enclosed:

Yes

Trip Blank Type:

See Below No

Samples Intact:
Missing Samples:

Yes

No

Extra Samples:

No

Extra Samples.

Yes

Trip Blank Type(s): (2UNP.) (4HCL)

Discrepancy in Container Qty on COC:

Unpacked by Porsha Hill (12046) at 11:54 on 01/21/2017

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp `	Therm. Type	<u>Ice Type</u>	Ice Present?	Ice Container	Elevated Temp?
1	DT121	0.0	DT	Wet	Υ	Bagged	N
2	DT121	0.5	DT	Wet	Υ	Bagged	N
3	DT121	0.3	DT	Wet	Υ	Bagged	N
4	DT121	0.5	DT	Wet	Υ	Bagged	N

Container Quantity Discrepancy Details

Sample ID on COC

Container Qty. Received

Container Qty. on COC

Comments

AP04-44-45-170117

22

2

Sample ID Discrepancy Details

Sample ID on COC

Sample ID on Label

Comments

FD03-170119 AP08-57-58-170119 FD01-170119

only HCl vials

AP08-57-58-170119

AP08-58-59-070119

Sample Date/Time Discrepancy Details

Sample ID on COC

Date/Time on Label

Comments

AP04-34-35-170117

1/17/2017 09:15



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÙ International Units pg/L picogram/liter kilogram(s) RLReporting Limit kg **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: February 17, 2017

Project: SGPP - Merrimack

Submittal Date: 01/26/2017 Group Number: 1758641 SDG: MMK19 PO Number: 16.6126 State of Sample Origin: NH

Lancaster Labs
<u>(LL) #</u>
8805593
8805594
8805595
8805596
8805597
8805598
8805599
8805600
8805601
8805602
8805603
8805604
8805605
8805606

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	Barr Engineering Company	Attn: Jonathon Carter
Electronic Copy To	Barr Engineering Company	Attn: Lauren Brady
Electronic Copy To	C. T. Male Associates	Attn: Jeff Marx
Electronic Copy To	C. T. Male Associates	Attn: Dan Reilly
Electronic Copy To	C. T. Male Associates	Attn: Kirk Moline



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250



Project Name: SGPP - Merrimack LL Group #: 1758641

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260C, GC/MS Volatiles

Batch #: Y170322AA (Sample number(s): 8805593-8805597, 8805603, 8805606)

The recovery(ies) for the following analyte(s) in the LCS and/or LCSD exceeded the acceptance window indicating a positive bias: Acetone

EPA 537 Rev 1.1, Misc. Organics

<u>sample #s: 8805593, 8805594, 8805595, 8805596, 8805597, 8805598, 8805599, 8805601,</u>

8805602, 8805603, 8805605

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Batch #: 17027007 (Sample number(s): 8805593-8805603, 8805605 UNSPK: 8805593)

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8805593, 8805594, 8805595, 8805596, 8805597, 8805598, 8805599, 8805601, 8805602, 8805603, 8805605, Blank, LCS, MS

EPA 300.0, Wet Chemistry

Batch #: 17027987601A (Sample number(s): 8805597, 8805603 UNSPK: P806927 BKG: P806927)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Sulfate

EPA 353.2, Wet Chemistry

Batch #: 17034118101A (Sample number(s): 8805593-8805597, 8805603 UNSPK: 8805593 BKG: 8805593)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Nitrite/Nitrate Nitrogen

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Total Nitrite/Nitrate Nitrogen



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-17-18-170123 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805593 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017 08:42 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1901 SDG#: MMK19-01

GC/MS Volatiles SW-846 8260C ug/l ug/l ug/l 11997 Acetone 67-64-1 6 U 6 20	1
11007 Agetons	1
11997 Acetone 67-64-1 6 U 6 20	1
11997 Benzene 71-43-2 0.5 U 0.5 1	1
11997 Bromochloromethane 74-97-5 1 U 1 5	1
11997 Bromodichloromethane 75-27-4 0.5 U 0.5 1	1
11997 Bromoform 75-25-2 0.5 U 0.5 4	_ 1
11997 Bromomethane 74-83-9 0.5 U 0.5 1	1
11997 2-Butanone 78-93-3 3 U 3 10	1
11997 Carbon Disulfide 75-15-0 1 U 1 5	1
11997 Carbon Tetrachloride 56-23-5 0.5 U 0.5 1	1
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1	1
11997 Chloroethane 75-00-3 0.5 U 0.5 1	1
11997 Chloroform 67-66-3 0.5 U 0.5 1	1
11997 Chloromethane 74-87-3 0.5 U 0.5 1	1
11997 Cyclohexane 110-82-7 2 U 2 5	1
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5	1
11997 Dibromochloromethane 124-48-1 0.5 U 0.5 1	1
11997 1,2-Dibromoethane 106-93-4 0.5 U 0.5 1	1
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5	1
11997 1,3-Dichlorobenzene 541-73-1 1 U 1 5	1
11997 1,4-Dichlorobenzene 106-46-7 1 U 1 5	1
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1	1
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1	1
11997 1,2-Dichloroethane 107-06-2 0.5 U 0.5 1	1
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1	1
11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1	1
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1	1
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1	1
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1	1
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1	1
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1	1
11997 Freon 113 76-13-1 2 U 2 10	1
11997 2-Hexanone 591-78-6 3 U 3 10	1
11997 Isopropylbenzene 98-82-8 1 U 1 5	1
11997 Methyl Acetate 79-20-9 1 U 1 5	1
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	1
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10	1
11997 Methylcyclohexane 108-87-2 1 U 1 5	1
11997 Methylene Chloride 75-09-2 2 U 2 4	1
11997 Styrene 100-42-5 1 U 1 5	1
11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1	1
11997 Tetrachloroethene 127-18-4 0.5 U 0.5 1	1
11997 Toluene 108-88-3 0.5 U 0.5 1	1
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5	1
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5	1
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1	1
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1	1
11997 Trichloroethene 79-01-6 0.5 U 0.5 1	1
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1	1
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1	1
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1	1

^{*=}This limit was used in the evaluation of the final result



As Received

As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-17-18-170123 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805593 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017 08:42 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1901 SDG#: MMK19-01

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846	8260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea	rch						
	The results from th FORM 1 - VOA-TIC. on the back of this	e volatile The qualif						
	Organics	EPA 537	Rev 1.1	ng/l		ng/l	ng/l	
10954	NETFOSAA		2991-50-6	1	U	1	3	1
10954	NEtFOSAA is the acr NMeFOSAA	onym for N	ethyl perfluoroo 2355-31-9	octanesu 1	ılfonamidoac U	etic Acid. 1	3	1
	NMeFOSAA is the acr	onym for N			ulfonamidoa			
10954	Perfluorobutanesu	ılfonate	375-73-5	5		0.7	2	1
10954	Perfluorobutanoio	acid	375-22-4	5	J	3	10	1
10954	Perfluorodecanoic a		335-76-2	0.5	U	0.5	2	1
10954			307-55-1	0.5	U	0.5	2	1
10954			375-85-9	15		0.5	2	1
10954	Perfluorohexanesu		355-46-4	4		1	3	1
10954	Perfluorohexanoio	acid	307-24-4	15		0.5	2	1
10954	Perfluorononanoio	acid	375-95-1	1	J	0.6	2	1
10954	Perfluoro-octanes	ulfonate	1763-23-1	5	J	2	6	1
10954	Perfluorooctanoio	acid	335-67-1	140		0.5	2	1
10954	Perfluoropentanoi	c Acid	2706-90-3	8		0.5	2	1
10954			376-06-7	0.5	U	0.5	2	1
	Perfluorotridecanoi		72629-94-8	0.5	U	0.5	2	1
	Perfluoroundecanoic		2058-94-8	1	. U	1	3	1
	stated QC limits are be obtained to calcu			lent da	ta points			
Metal	5	SW-846	6010C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	24.9		0.0382	0.400	1
01757	Magnesium		7439-95-4	6.92		0.0190	0.200	1
01762	Potassium		7440-09-7	5.42		0.160	1.00	1
01767	Sodium		7440-23-5	59.2		0.173	2.00	1
Wet C	nemistry	EPA 300	.0	mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	102		10.0	20.0	50
00228	Sulfate		14808-79-8	15.1		1.5	5.0	5
		EPA 353	.2	mg/l		mg/l	mg/l	
07882	Total Nitrite/Nit	rate	n.a.	4.4		0.20	0.50	5
	Nitrogen							
		SM 2320	B-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-17-18-170123 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805593 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017 08:42 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1901 SDG#: MMK19-01

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Cl	nemistry SM 2320 B	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	58.4	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	58 .4	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170322AA	02/01/2017	18:27	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170322AA	02/01/2017	18:27	Angela D Sneeringer	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17027007	02/03/2017	07:20	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17027007	01/30/2017	16:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170270635002	01/30/2017	19:42	Cindy M Gehman	1
01757	Magnesium	SW-846 6010C	1	170270635002	01/30/2017	19:42	Cindy M Gehman	1
01762	Potassium	SW-846 6010C	1	170270635002	01/30/2017	19:42	Cindy M Gehman	1
01767	Sodium	SW-846 6010C	1	170270635002	01/30/2017	19:42	Cindy M Gehman	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170270635002	01/29/2017	22:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	17026987151A	01/27/2017	02:06	Alexandria M Lanager	50
00228	Sulfate	EPA 300.0	1	17026987151A	01/27/2017	01:27	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17034118101A	02/03/2017	04:13	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17030003103A	01/31/2017	02:31	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17030003103A	01/31/2017	02:31	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17030003103A	01/31/2017	02:31	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E VOLATILE ORGANICS A	אואו עפופ האידא פטיניייי	EPA	SAMPLE	NO.
TENTATIVELY IDENT		!		!
Lab Name: Lancaster Laboratories	Contract:		M1901	! !
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8805	5593		
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP0935	55.i/17fe	eb01a.b/	yf01s41.d
Level: (low/med) LOW	Date Received: 01/2	26/17		
Moisture: not dec.	Date Analyzed: 02/0	1/17		
Column: (pack/cap) CAP	Dilution Factor: 1.	. 0		
	CONCENTRATION UNI	TS:		
Number TICs found: 0	(lig/L or lig/Kg) i	ıa/T.		

CAS NUMBER	! COMPOUND NAME ==!===========		EST. CONC.	~
	!Total VOC TICs	===:==================================		! =====: !
2	!	!	!	!
3.	!	!	!	!
4.	!	!		!
	!			!
6.	!	!		!
	· ·	!		!
8.	· ·	!		!
9.	<u> </u>	!		!
0.	!	i		!
1.		i		!
	!	!		!
	<u> </u>	i		
	<u> </u>	i		
	!	i	i	
	<u> </u>	i		
	<u> </u>	i		
	<u> </u>	i		·
		i	i————	i
	<u>;</u>	i	i————	i
	!	i		
	_ <u>;</u>	i		i
	!	i		i
	:	i		·
	!	i		i
		i		i
		i		
.,	i	i	·	i
99	<u>i</u>	i	·	i
		i	·	i ———
,	·	:	<u> </u>	i
ge 1 of 1	:	·		•

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-35-36-170123 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805594 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017 10:57 by SJ C. T. Male Associates

50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1902 SDG#: MMK19-02

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	U	0.5	4	1
11997	Bromomethane	74-83-9	0.5	U	0.5	1	1
11997	2-Butanone	78-93-3	3	U	3	10	1
11997	Carbon Disulfide	75-15-0	1	U	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	U	0.5	1	1
11997	Chloromethane	74-87-3	0.5	U	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1	5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl	1634-04-4	0.5	J	0.5	1	1
	Ether						
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1	1

^{*=}This limit was used in the evaluation of the final result



As Received

As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-35-36-170123 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805594 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017 10:57 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1902 SDG#: MMK19-02

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	260C	ug/l		ug/l	ug/l	
11997	Vinyl Chloride		75-01-4	0.5	U	0.5	1	1
11997	m+p-Xylene		179601-23-1	0.5	U	0.5	1	1
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea			7.1				
	The results from th FORM 1 - VOA-TIC. on the back of this	The qualifie	-					
Misc.	Organics	EPA 537 R	Rev 1.1	ng/l		ng/l	ng/l	
	NETFOSAA		2991-50-6	1	U	1	3	1
	NEtFOSAA is the acr	onym for N-e	thyl perfluoroo	ctanesu	lfonamidoac	etic Acid.		
10954	NMeFOSAA		2355-31-9	1	U	1	3	1
	NMeFOSAA is the acr	onym for N-m		octanes	ulfonamidoa			
10954	Perfluorobutanesu	lfonate	375-73-5	10		0.7	2	1
10954	Perfluorobutanoio	Acid	375-22-4	7	J	3	10	1
10954	Perfluorodecanoio	acid	335-76-2	0.6	J	0.5	2	1
10954	Perfluorododecanoic	acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluoroheptanoi	c acid	375-85-9	14		0.5	2	1
10954	Perfluorohexanesu	lfonate	355-46-4	3		1	3	1
10954	Perfluorohexanoio	acid	307-24-4	17		0.5	2	1
10954	Perfluorononanoio	acid	375-95-1	1	J	0.6	2	1
10954	Perfluoro-octanes	ulfonate	1763-23-1	11		2	6	1
10954	Perfluorooctanoio		335-67-1	120		0.5	2	1
10954	Perfluoropentanoi		2706-90-3	12		0.5	2	1
10954	Perfluorotetradecan		376-06-7	0.5	IJ	0.5	2	1
10954			72629-94-8	0.5	IJ	0.5	2	1
10954	Perfluoroundecanoic	acid	2058-94-8	1	Ū	1	3	1
The :	stated QC limits are	advisory on	ly until suffici	ent dat	a points			
can l	be obtained to calcul	late statist:	ical limits.					
Metals	3	SW-846 60	10C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	15.2		0.0382	0.400	1
01757	Magnesium		7439-95-4	2.77		0.0190	0.200	1
01762	Potassium		7440-09-7	3.56		0.160	1.00	1
01767	Sodium		7440-23-5	60.7		0.173	2.00	1
				(3		/3	/1	
	nemistry	EPA 300.0		mg/1		mg/l	mg/l	
00224	Chloride		16887-00-6	93.2		10.0	20.0	50
00228	Sulfate		14808-79-8	15.6		1.5	5.0	5
		EPA 353.2	•	mg/l		mg/l	mg/l	
07882	Total Nitrite/Nit		n.a.	5.1		0.20	0.50	5
07002	Nitrogen	race	11.0.	3.1		0.20	0.50	J

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-35-36-170123 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805594 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017 10:57 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1902 SDG#: MMK19-02

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Cl	nemistry SM 2320 B-	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	21.7	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	21.7	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time		Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170322AA	02/01/2017	18:49	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170322AA	02/01/2017	18:49	Angela D Sneeringer	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17027007	02/03/2017	09:03	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17027007	01/30/2017	16:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170270635002	01/30/2017	19:45	Cindy M Gehman	1
01757	Magnesium	SW-846 6010C	1	170270635002	01/30/2017	19:45	Cindy M Gehman	1
01762	Potassium	SW-846 6010C	1	170270635002	01/30/2017	19:45	Cindy M Gehman	1
01767	Sodium	SW-846 6010C	1	170270635002	01/30/2017	19:45	Cindy M Gehman	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170270635002	01/29/2017	22:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	17026987151A	01/27/2017	02:33	Alexandria M Lanager	50
00228	Sulfate	EPA 300.0	1	17026987151A	01/27/2017	02:20	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17034118101A	02/03/2017	04:18	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17030003103A	01/31/2017	03:04	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17030003103A	01/31/2017	03:04	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17030003103A	01/31/2017	03:04	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	NALVOTO DAMA OVERM	EPA SAMPLE NO).
VOLATILE ORGANICS AI TENTATIVELY IDENT		!	
		! M1902	!
ab Name: Lancaster Laboratories	Contract:	!	!
ab Code: LANCAS Case No.:	SAS No.:	SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 880	5594	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP093	55.i/17feb01a.b/yf	01s42.d
evel: (low/med) LOW	Date Received: 01/	26/17	
Moisture: not dec.	Date Analyzed: 02/	01/17	
column: (pack/cap) CAP	Dilution Factor: 1	.0	
	CONCENTRATION UN	ITS:	
Number TICs found: 0	(ua/L or ua/Ka)	ua /T.	

! ! CAS NUMBER	! ! COMPOUND NAME ==!===========	! ! RT	! ! EST. CONC.	
! 1. VOCTIC	==!===================================	!	•	! ===== ! ! U
! 2	!!	!	!	!!
! 3	!	!	!	!!
	!	!	!	!!
! 5	!	!	!	!
	!	!	!	!
	!	!	!	!
	!	!	!	!
	!			!
!10	!	!	!	!
!11			!	!
	!	<u>-</u>	!	<u>:</u> ———
	<u>-</u>	:	·	:
		<u>i</u>	·	i
		i	:	i
		i	·	i
		i	·	i
!19.	!	i	 !	
! 20.		i	 !	!
	!		!	!
	1		!	!
!23	!	!	!	!
!24	!	!	!	!
	<u></u>	!	!	!
	!	!	!	!!
!27	!	!	!	!!
!28	!	!	!	!!
!29		!	!	!!
!30	!	!	!	!!
!	!	!	!	!

page 1 of 1

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-47-48-170123 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805595 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017 12:42 by SJ C. T. Male Associates

50 Century Hill Drive Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1903 SDG#: MMK19-03

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	Li	Received mit of mantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug	r/l	
11997	Acetone	67-64-1	6	U	6	20)	1
11997	Benzene	71-43-2	0.5	IJ	0.5	1		1
11997	Bromochloromethane	74-97-5	1	IJ	1	5		1
11997	Bromodichloromethane	75-27-4	0.5	IJ	0.5	1		1
11997	Bromoform	75-25-2	0.5	U	0.5	4		1
11997	Bromomethane	74-83-9	0.5	U	0.5	1		1
11997	2-Butanone	78-93-3	3	IJ	3	10)	1
11997	Carbon Disulfide	75-15-0	1	U	1	5		1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1		1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1		1
11997	Chloroethane	75-00-3	0.5	IJ	0.5	1		1
11997	Chloroform	67-66-3	0.5	U	0.5	1		1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1		1
11997	Cyclohexane	110-82-7	2	IJ	2	5		1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	IJ	2	5		1
11997	Dibromochloromethane	124-48-1	0.5	Ū	0.5	1		1
11997	1,2-Dibromoethane	106-93-4	0.5	Ū	0.5	1		1
11997	1,2-Dichlorobenzene	95-50-1	1	IJ	1	5		1
11997	1,3-Dichlorobenzene	541-73-1	1	IJ	1	5		1
11997	1,4-Dichlorobenzene	106-46-7	1	Ū	1	5		1
11997	Dichlorodifluoromethane	75-71-8	0.5	Ū	0.5	1		1
11997	1,1-Dichloroethane	75-34-3	0.5	IJ	0.5	1		1
11997	1,2-Dichloroethane	107-06-2	0.5	IJ	0.5	1		1
11997	,	75-35-4	0.5	Ū	0.5	1		1
11997	1,1-Dichloroethene		0.5	Ū	0.5	1		1
	cis-1,2-Dichloroethene	156-59-2	0.5	IJ	0.5	1		1
11997	trans-1,2-Dichloroethene	156-60-5		IJ		1		
11997	1,2-Dichloropropane	78-87-5	0.5	-	0.5	_		1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1		1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1		1
11997	Ethylbenzene	100-41-4	0.5	U 	0.5	1		1
11997	Freon 113	76-13-1	2	U 	2	10		1
11997	2-Hexanone	591-78-6	3	U 	3	10)	1
11997	Isopropylbenzene	98-82-8	1	Ū	1	5		1
11997	Methyl Acetate	79-20-9	1	U	1	5		1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1		1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10)	1
11997	Methylcyclohexane	108-87-2	1	U	1	5		1
11997	Methylene Chloride	75-09-2	2	U	2	4		1
11997	Styrene	100-42-5	1	U	1	5		1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1		1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1		1
11997	Toluene	108-88-3	0.5	U	0.5	1		1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5		1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5		1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5	1		1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5	1		1
11997	Trichloroethene	79-01-6	0.5	U	0.5	1		1
11997	Trichlorofluoromethane	75-69-4	0.5	U	0.5	1		1
11997	Vinyl Chloride	75-01-4	0.5	U	0.5	1		1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5	1		1

^{*=}This limit was used in the evaluation of the final result



As Received

As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-47-48-170123 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805595 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017 12:42 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1903 SDG#: MMK19-03

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8	260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Se	arch						
	The results from t FORM 1 - VOA-TIC. on the back of thi	The qualifi						
Misc.	Organics	EPA 537	Rev 1.1	ng/l		ng/l	ng/l	
10954	NETFOSAA		2991-50-6	1	U	1	3	1
10954	NEtFOSAA is the ac	ronym for N-	ethyl perfluoro 2355-31-9	octanesu 1	lfonamidoa U	cetic Acid. 1	3	1
	NMeFOSAA is the ac	ronym for N-		ooctanes		acetic Acid.	-	_
10954			375-73-5	10		0.7	2	1
10954	Perfluorobutano	c Acid	375-22-4	6	J	3	10	1
10954	Perfluorodecano	c acid	335-76-2	0.5	J	0.5	2	1
10954	Perfluorododecanoi	c acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluoroheptano	oic acid	375-85-9	16		0.5	2	1
10954	Perfluorohexanes	ulfonate	355-46-4	2	J	1	3	1
10954	Perfluorohexano	c acid	307-24-4	18		0.5	2	1
10954	Perfluorononano	c acid	375-95-1	0.7	J	0.6	2	1
10954	Perfluoro-octane	sulfonate	1763-23-1	6	J	2	6	1
10954	Perfluorooctano	c acid	335-67-1	100		0.5	2	1
10954	Perfluoropentano	oic Acid	2706-90-3	10		0.5	2	1
	Perfluorotetradeca		376-06-7	0.5	U	0.5	2	1
10954			72629-94-8	0.5	U 	0.5	2	1
	Perfluoroundecanoi		2058-94-8	1	U nointa	1	3	1
	stated QC limits ar be obtained to calc			rient da	la points			
Metals	5	SW-846 6	010C	mg/1		mg/l	mg/l	
01750	Calcium		7440-70-2	16.2		0.0382	0.400	1
01757	Magnesium		7439-95-4	2.80		0.0190	0.200	1
01762	Potassium		7440-09-7	3.15		0.160	1.00	1
01767	Sodium		7440-23-5	50.2		0.173	2.00	1
Wet Ch	nemistry	EPA 300.	0	mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	95.6		10.0	20.0	50
00228	Sulfate		14808-79-8	12.0		1.5	5.0	5
		EPA 353.	2	mg/l		mg/l	mg/l	
07882	Total Nitrite/Ni		n.a.	4.9		0.20	0.50	5
	Nitrogen							-
		SM 2320	B-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-47-48-170123 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805595 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017 12:42 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1903 SDG#: MMK19-03

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet C	hemistry SM 2320 B-	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	12.6	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	12.6	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170322AA	02/01/2017		Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170322AA	02/01/2017	19:11	Angela D Sneeringer	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17027007	02/03/2017	10:04	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17027007	01/30/2017	16:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170270635002	01/30/2017	19:55	Cindy M Gehman	1
01757	Magnesium	SW-846 6010C	1	170270635002	01/30/2017	19:55	Cindy M Gehman	1
01762	Potassium	SW-846 6010C	1	170270635002	01/30/2017	19:55	Cindy M Gehman	1
01767	Sodium	SW-846 6010C	1	170270635002	01/30/2017	19:55	Cindy M Gehman	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170270635002	01/29/2017	22:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	17026987151A	01/27/2017	02:59	Alexandria M Lanager	50
00228	Sulfate	EPA 300.0	1	17026987151A	01/27/2017	02:46	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17034118101A	02/03/2017	04:20	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17030003103A	01/31/2017	02:01	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17030003103A	01/31/2017	02:01	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17030003103A	01/31/2017	02:01	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E VOLATILE ORGANICS ANAL	VCIC DATA CUEFT	EPA	SAMPLE N	10.
TENTATIVELY IDENTIFI		!	M1002	!
		!	M1903	!
Lab Name: Lancaster Laboratories	Contract:	!		!
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8805595			
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID: HP09355.i	/17f	eb01a.b/y	f01s43.d
Level: (low/med) LOW	Date Received: 01/26/1	7	_	
% Moisture: not dec.	Date Analyzed: 02/01/1	7		
Column: (pack/cap) CAP	Dilution Factor: 1.0 CONCENTRATION UNITS:			
Number TICs found: 0	(ug/L or ug/Kg) ug/L			

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
	==!===================================	!		!===== ! U
2.	!	!	!	!
	!			!
		!		!
i	!	!	!	!
5	!	!	!	!
·	!	!	!	!
3	!	!	!	!
		!!	!	!
)	!	!	!	!
· ·	!	!	<u> </u>	!
2	!	!		!
8	!	!	<u> </u>	!
! .	<u>!</u>	!	!	!
·	<u>!</u>	!	!	!
5	!	!		!
·	!	!!	!	!
	!	!!	!	!
	!	!:	!	!
)		!	! <u></u>	!
	!	!:	!	!
	!	!	! <u></u>	!
	!	!		!
	!	!	! <u></u>	!
	!	!		!
	!	!		!
	!	!	!	!
3	!	!	!	!
•	_!	!	!	!
٠	!	!!		!
	!	!	!	!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-56-57-170123 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805596 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017 14:19 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1904 SDG#: MMK19-04

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



As Received

As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-56-57-170123 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805596 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017 14:19 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1904 SDG#: MMK19-04

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8	3260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Se	arch						
	The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.							
Misc.	Organics	EPA 537	Rev 1.1	ng/l		ng/l	ng/l	
10954	NETFOSAA		2991-50-6	1	U	1	3	1
10954	NEtFOSAA is the ac	ronym for N-	ethyl perfluoro. 2355-31-9	octanesu 1	lfonamidoac U	etic Acid. 1	3	1
	NMeFOSAA is the ac	ronym for N-		ooctanes	ulfonamidoa	cetic Acid.		
10954	Perfluorobutanes	ulfonate	375-73-5	9		0.7	2	1
10954	Perfluorobutanoi	.c Acid	375-22-4	6	J	3	10	1
10954	Perfluorodecanoi	.c acid	335-76-2	0.6	J	0.5	2	1
10954	Perfluorododecanoi	c acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluoroheptano	oic acid	375-85-9	16		0.5	2	1
10954	Perfluorohexanes	ulfonate	355-46-4	3	J	1	3	1
10954	Perfluorohexanoi	.c acid	307-24-4	17		0.5	2	1
10954	Perfluorononanoi	.c acid	375-95-1	1	J	0.6	2	1
10954	Perfluoro-octane	sulfonate	1763-23-1	6		2	6	1
10954	Perfluorooctanoi	.c acid	335-67-1	110		0.5	2	1
10954	Perfluoropentano	oic Acid	2706-90-3	12		0.5	2	1
	Perfluorotetradeca		376-06-7	0.5	U	0.5	2	1
10954			72629-94-8	0.5	U 	0.5	2	1
	Perfluoroundecanoi		2058-94-8	1	U to points	1	3	1
	stated QC limits ar be obtained to calc			rient da	ta points			
Metals	3	SW-846 6	5010C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	16.9		0.0382	0.400	1
01757	Magnesium		7439-95-4	2.85		0.0190	0.200	1
01762	Potassium		7440-09-7	3.25		0.160	1.00	1
01767	Sodium		7440-23-5	51.9		0.173	2.00	1
Wet Ch	nemistry	EPA 300.	. 0	mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	92.9		10.0	20.0	50
00228	Sulfate		14808-79-8	13.6		1.5	5.0	5
		EPA 353.	. 2	mg/l		mg/l	mg/l	
07882	Total Nitrite/Ni		n.a.	5.0		0.20	0.50	5
0,002	Nitrogen	crace	11.4.	5.0		0.20	0.00	J
	SM 2320		B-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-56-57-170123 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805596 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017 14:19 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1904 SDG#: MMK19-04

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Cl	nemistry SM 2320 B-	1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	16.0	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	16.0	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
------------	--------	----------	--------

CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time		Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170322AA	02/01/2017	19:32	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170322AA	02/01/2017	19:32	Angela D Sneeringer	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17027007	02/03/2017	10:25	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17027007	01/30/2017	16:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170270635002	01/30/2017	19:22	Cindy M Gehman	1
01757	Magnesium	SW-846 6010C	1	170270635002	01/30/2017	19:22	Cindy M Gehman	1
01762	Potassium	SW-846 6010C	1	170270635002	01/30/2017	19:22	Cindy M Gehman	1
01767	Sodium	SW-846 6010C	1	170270635002	01/30/2017	19:22	Cindy M Gehman	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170270635002	01/29/2017	22:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	17026987151A	01/27/2017	03:26	Alexandria M Lanager	50
00228	Sulfate	EPA 300.0	1	17026987151A	01/27/2017	03:12	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17034118101A	02/03/2017	04:22	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17030003103A	01/31/2017	01:33	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17030003103A	01/31/2017	01:33	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17030003103A	01/31/2017	01:33	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E	EPA	SAMPLE NO.		
VOLATILE ORGANICS ANALY			_	
TENTATIVELY IDENTIFI	!		!	
		!	M1904	!
Lab Name: Lancaster Laboratories	Contract:	!		_!
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 8805596			
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355.i	/17fe	eb01a.b/yf01	ls44.
Level: (low/med) LOW	Date Received: 01/26/1	7		
% Moisture: not dec.	Date Analyzed: 02/01/1	7		
Column: (pack/cap) CAP	Dilution Factor: 1.0			

CONCENTRATION UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

CAS NUMBER	! COMPOUND NAME		EST. CONC.	~
	!Total VOC TICs	!		!====: ! U
	_!	1		!
	<u> </u>	i		!
	<u> </u>	i		! !
	1	i i		!
6.	!	i		!
	<u> </u>	i		! !
	<u> </u>	i i		!
	!	<u> </u>		!
	!	i		!
	!	i		!
	_!			!
	!	i		!
	!	!	!	!
.5.	<u> </u>	!		!
.6.	_!	!	!	!
	_!	!	!	!
.8.	!	!	!	!
.9.	_!		!	!
	_!		!	!
1	!	!	!	!
2	!	!	!	!
3.	!			!
4	!	!!	!	!
5.		!	!	!
6	!!	!!		!
	!	!!	!	!
8	!	!!	!	!
9	!!	!!		!
0	!	!!	!	!
		1	1	

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-65-66-170123 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805597 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017 16:11 by SJ C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/26/2017 09:50 Reported: 02/17/2017 10:10

M1905 SDG#: MMK19-05

CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l	
11997	Acetone	67-64-1	6	U	6	20	1
11997	Benzene	71-43-2	0.5	U	0.5	1	1
11997	Bromochloromethane	74-97-5	1	U	1	5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1
11997	Bromoform	75-25-2	0.5	Ū	0.5	4	1
11997	Bromomethane	74-83-9	0.5	IJ	0.5	1	1
11997	2-Butanone	78-93-3	3	Ū	3	10	1
11997	Carbon Disulfide	75-15-0	1	IJ	1	5	1
11997	Carbon Tetrachloride	56-23-5	0.5	Ū	0.5	1	1
11997	Chlorobenzene	108-90-7	0.5	IJ	0.5	1	1
11997	Chloroethane	75-00-3	0.5	U	0.5	1	1
11997	Chloroform	67-66-3	0.5	IJ	0.5	1	1
11997	Chloromethane	74-87-3	0.5	IJ	0.5	1	1
11997	Cyclohexane	110-82-7	2	U	2	5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2	5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1
11997	1,2-Dibromoethane	106-93-4	0.5	ττ	0.5	1	1
11997	1,2-Dibromoethane 1,2-Dichlorobenzene	95-50-1	0.5 1	U	1	5	1
11997	•		1	ττ	1	5 5	1
	1,3-Dichlorobenzene	541-73-1		-			
11997	1,4-Dichlorobenzene	106-46-7	1	U	1	5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U 	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5	1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5	1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5	1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5	1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	U	0.5	1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5	1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5	1	1
11997	Freon 113	76-13-1	2	U	2	10	1
11997	2-Hexanone	591-78-6	3	U	3	10	1
11997	Isopropylbenzene	98-82-8	1	U	1	5	1
11997	Methyl Acetate	79-20-9	1	U	1	5	1
11997	Methyl Tertiary Butyl Ether	1634-04-4	0.5	U	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	3	U	3	10	1
11997	Methylcyclohexane	108-87-2	1	U	1	5	1
11997	Methylene Chloride	75-09-2	2	U	2	4	1
11997	Styrene	100-42-5	1	U	1	5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1
11997	Toluene	108-88-3	0.5	U	0.5	1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	U	1	5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	Ū	0.5	1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	Ū	0.5	1	1
11997	Trichloroethene	79-01-6	0.5	Ū	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5	1	1
11997	Vinyl Chloride	75-01-4	0.5	Ū	0.5	1	1
11997	m+p-Xylene	179601-23-1	0.5	IJ	0.5	1	1
		1,,001 20 1	0.0		<u> </u>		

^{*=}This limit was used in the evaluation of the final result



As Received

As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-65-66-170123 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805597 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017 16:11 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1905 SDG#: MMK19-05

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 82	260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Se	earch						
	The results from FORM 1 - VOA-TIC. on the back of th	The qualifie						
Misc.	Organics	EPA 537 F	Rev 1.1	ng/l		ng/l	ng/l	
10954	NETFOSAA		2991-50-6	1	U	1	3	1
10954	NEtFOSAA is the a NMeFOSAA	cronym for N-e	thyl perfluoro 2355-31-9	octanesu 1	lfonamidoace U	etic Acid. 1	3	1
	NMeFOSAA is the a	cronym for N-m	ethyl perfluor	ooctanes	ulfonamidoad	cetic Acid.		
10954	Perfluorobutane	sulfonate	375-73-5	8		0.7	2	1
10954	Perfluorobutano	ic Acid	375-22-4	8	J	3	10	1
10954	Perfluorodecano	ic acid	335-76-2	0.8	J	0.5	2	1
10954			307-55-1	0.5	U	0.5	2	1
10954		oic acid	375-85-9	20		0.5	2	1
10954	Perfluorohexane	sulfonate	355-46-4	4		1	3	1
10954	Perfluorohexano	ic acid	307-24-4	23		0.5	2	1
10954	Perfluorononano	ic acid	375-95-1	1	J	0.6	2	1
10954	Perfluoro-octan	esulfonate	1763-23-1	13		2	6	1
10954	Perfluorooctano	ic acid	335-67-1	140		0.5	2	1
10954	Perfluoropentan	oic Acid	2706-90-3	18		0.5	2	1
10954	Perfluorotetradec	anoic acid	376-06-7	0.5	U	0.5	2	1
10954			72629-94-8	0.5	Ŭ	0.5	2	1
	Perfluoroundecano		2058-94-8	1	. U	1	3	1
	stated QC limits and be obtained to calc			eient da	ta points			
Metal	s	SW-846 60	010C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	15.4		0.0382	0.400	1
01757	Magnesium		7439-95-4	2.70		0.0190	0.200	1
01762	Potassium		7440-09-7	2.98		0.160	1.00	1
01767	Sodium		7440-23-5	108		0.173	2.00	1
Wet C	hemistry	EPA 300.0)	mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	175		10.0	20.0	50
00228	Sulfate		14808-79-8	16.0		1.5	5.0	5
		EPA 353.2	2	mg/l		mg/l	mg/l	
07882	Total Nitrite/N		n.a.	5.7		0.20	0.50	5
	Nitrogen							
		SM 2320 E	3-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-65-66-170123 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805597 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017 16:11 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1905 SDG#: MMK19-05

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Ch	nemistry SM 2320 B-	-1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	23.2	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	23.2	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record
------------	--------	----------	--------

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170322AA	02/01/2017	19:54	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170322AA	02/01/2017	19:54	Angela D Sneeringer	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17027007	02/03/2017	10:45	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17027007	01/30/2017	16:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170270635002	01/30/2017	19:58	Cindy M Gehman	1
01757	Magnesium	SW-846 6010C	1	170270635002	01/30/2017	19:58	Cindy M Gehman	1
01762	Potassium	SW-846 6010C	1	170270635002	01/30/2017	19:58	Cindy M Gehman	1
01767	Sodium	SW-846 6010C	1	170270635002	01/30/2017	19:58	Cindy M Gehman	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170270635002	01/29/2017	22:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	17027987601A	01/27/2017	19:36	Hallie A Burnett	50
00228	Sulfate	EPA 300.0	1	17027987601A	01/27/2017	19:22	Hallie A Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17034118101A	02/03/2017	04:24	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17030003103A	01/31/2017	03:34	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17030003103A	01/31/2017	03:34	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17030003103A	01/31/2017	03:34	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE N	10.	
VOLATILE ORGANICS ANAL	YSIS DATA SHEET				
TENTATIVELY IDENTIFI	ED COMPOUNDS	!		!	
		!	М1905	!	
Lab Name: Lancaster Laboratories	Contract:	!		!	
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:		
Matrix: (soil/water) WATER	Lab Sample ID: 8805597				
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355.i	/17fe	eb01a.b/y	f01s45.d	
Level: (low/med) LOW	Date Received: 01/26/1				
Moisture: not dec.	Date Analyzed: 02/01/1	7			
Column: (pack/cap) CAP	Dilution Factor: 1.0				
	CONCENTRATION UNITS:				
Number TICs found: 0	(ug/L or ug/Kg) ug/L				

CAS NUMBER	! COMPOUND NAME		EST. CONC.	
	==!===================================	===!=====! !		! =====: ! U
	!	i i		!
3.	· ·			!
	· ·			!
	· ·			!
6.	· ·	!		!
7.	!	!		!
8	!!	!		!
9	!!	!		!
0	!!	!		!
1	!	!		!
2	!	!!	!	!
3	!	!		!
4	!!	!!		!
5	!!	!!		!
6	!!	!!		!
7	!	!!		!
8	!!	!!		!
9	!	!!		!
0	!	!!		!
1	!	!!		!
	!	!!		!
3	!	!!		!
4	!	!!		!
5	!	!!		!
	!	!!	l	!
7	!	!!		!
8	!	!!		!
	!	!!		!
0	!	!!		!
	1	!!!		!

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-FB05-170124 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8805598 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/24/2017 08:22 by SJ C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/26/2017 09:50 Reported: 02/17/2017 10:10

M1906 SDG#: MMK19-06FB

CAT No.	Analysis Name	CAS Number	Result	=	Method Detection Limit*	Limit of Quantitation	Dilution Factor				
Misc.	Organics EPA 537 Re	ev 1.1	ng/l		ng/l	ng/l					
10954	NETFOSAA	2991-50-6	1	U	1	3	1				
	NEtFOSAA is the acronym for N-et	hyl perfluorood	ctanesul	lfonamidoacetic	Acid.						
10954	NMeFOSAA	2355-31-9	1	U	1	3	1				
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.										
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1				
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1				
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1				
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1				
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1				
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1				
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1				
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1				
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1				
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1				
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1				
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1				
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1				
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1				
The :	stated QC limits are advisory only	y until suffici	ent dat	a points							
can 1	he obtained to calculate statistic	cal limite									

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
	16 PFCs PFAA Water Prep	EPA 537 Rev 1.1 EPA 537 Rev 1.1	1 1	17027007 17027007	02/03/2017 01/30/2017		Jason W Knight Devon M Whooley	1 1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-EBDW-170124 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8805599 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/24/2017 08:25 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1907 SDG#: MMK19-07EB

CAT No.	Analysis Name	CAS Number	Result	:	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 Re	v 1.1	ng/l		ng/l	ng/l	
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	hyl perfluorood	tanesul	fonamidoacetic	Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me	thyl perfluorod	octanesi	lfonamidoaceti	c Acid.		
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
The	stated QC limits are advisory only		ent dat	a points			

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
	16 PFCs PFAA Water Prep	EPA 537 Rev 1.1 EPA 537 Rev 1.1	1 1	17027007 17027007	02/03/2017 01/30/2017		Jason W Knight Devon M Whooley	1 1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-EBSW-170124 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8805600 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/24/2017 08:27 by SJ C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/26/2017 09:50 Reported: 02/17/2017 10:10

M1908 SDG#: MMK19-08EB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 Re	ev 1.1	ng/l		ng/l	ng/l	
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	hyl perfluoroo	ctanesu	lfonamidoacet	ic Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanes	ulfonamidoace	tic Acid.		
10954	Perfluorobutanesulfonate	375-73-5	1	J	0.7	2	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	2		0.5	2	1
10954	Perfluorohexanesulfonate	355-46-4	2	J	1	3	1
10954	Perfluorohexanoic acid	307-24-4	1	J	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorooctanoic acid	335-67-1	5		0.5	2	1
10954	Perfluoropentanoic Acid	2706-90-3	1	J	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
	16 PFCs PFAA Water Prep	EPA 537 Rev 1.1 EPA 537 Rev 1.1	1 1	17027007 17027007	- , , -	Jason W Knight Devon M Whooley	1 1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-EBWP02-170124 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8805601 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/24/2017 08:42 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1909 SDG#: MMK19-09EB

CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 Re	ev 1.1	ng/l		ng/l	ng/l	
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	hyl perfluoroo	ctanesu	lfonamidoacetic	Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me	thyl perfluoro	octanes	ulfonamidoaceti	c Acid.		
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
	stated QC limits are advisory only	•	lent dat	ta points			

can be obtained to calculate statistical limits.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tir	ne	Analyst	Dilution Factor
	16 PFCs PFAA Water Prep	EPA 537 Rev 1.1 EPA 537 Rev 1.1	1 1	17027007 17027007	02/03/2017 01/30/2017		Jason W Knight Devon M Whooley	1 1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-EBPP02-170124 Grab Blank Water

SGPP - Merrimack

LL Sample # WW 8805602 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/24/2017 08:53 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1910 SDG#: MMK19-10EB

CAT No.	Analysis Name	CAS Number	Resul	ŧ	Method Detection Limit*	Limit of Quantitation	Dilution Factor		
Misc.	Organics EPA 537 R	ev 1.1	ng/l		ng/l	ng/l			
10954	NEtFOSAA	2991-50-6	1	J	1	3	1		
	NEtFOSAA is the acronym for N-et	thyl perfluoroo	ctanesu	lfonamidoacetic	c Acid.				
10954	NMeFOSAA	2355-31-9	1	U	1	3	1		
	NMeFOSAA is the acronym for N-me	ethyl perfluoro	octanes	ulfonamidoaceti	ic Acid.				
10954	Perfluorobutanesulfonate	375-73-5	0.8	J	0.7	2	1		
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1		
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1		
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1		
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1		
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1		
10954	Perfluorohexanoic acid	307-24-4	0.9	J	0.5	2	1		
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1		
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1		
10954	Perfluorooctanoic acid	335-67-1	1	J	0.5	2	1		
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1		
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1		
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1		
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1		
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.								

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev 1.1	1	17027007	02/03/2017	12:28	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17027007	01/30/2017	16:00	Devon M Whooley	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-70-71-170125 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805603 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/25/2017 10:38 by SJ C. T. Male Associates

50 Century Hill Drive

Latham NY 12110

Submitted: 01/26/2017 09:50 Reported: 02/17/2017 10:10

M1911 SDG#: MMK19-11

GC/MS Volatiles SW-846 8260C Ug/1	CAT No.	Analysis Name	CAS Number	As Re Resul	ceived t	As Received Method Detection Limi	As Received Limit of t* Quantitation	Dilution Factor	
11997 Benzene	GC/MS	Volatiles SW-846	8260C	ug/l		ug/l	ug/l		
11997 Bromodichloromethane	11997	Acetone	67-64-1	6	U	6	20	1	
11997 Bromofichloromethane 75-27-4 0.5 U 0.5 4 1 1 1 1 1 1 1 1 1	11997	Benzene	71-43-2	0.5	U	0.5	1	1	
11997 Bromoform	11997	Bromochloromethane	74-97-5	1	U	1	5	1	
11997 Bromomethane	11997	Bromodichloromethane	75-27-4	0.5	U	0.5	1	1	
11997 2-Butanone 78-93-3 3 U 3 10 1 11997 Carbon Disulfide 75-15-0 1 U 1 1 5 1 1 1 1 1 1 1	11997	Bromoform	75-25-2	0.5	U	0.5	4	1	
11997 Carbon Disulfide	11997	Bromomethane	74-83-9	0.5	U	0.5	1	1	
11997 Carbon Tetrachloride	11997	2-Butanone	78-93-3	3	U	3	10	1	
11997 Chlorobenzene 108-90-7 0.5 U 0.5 1 1 1 11997 Chlorothame 75-00-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloroform 67-66-3 0.5 U 0.5 1 1 1 11997 Chloromethame 74-87-3 0.5 U 0.5 1 1 1 11997 Cyclohexane 110-82-7 2 U 2 5 1 1 1 1 1 1 1 1 1	11997	Carbon Disulfide	75-15-0	1	U	1	5	1	
11997 Chloroethane	11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5	1	1	
11997 Chloroethane	11997	Chlorobenzene	108-90-7	0.5	U	0.5	1	1	
11997 Chloroform	11997	Chloroethane		0.5	U	0.5	1	1	
11997 Cyclohexane	11997	Chloroform		0.5	Ū		1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Chloromethane	74-87-3	0.5	U	0.5	1	1	
11997 1,2-Dibromo-3-chloropropane 96-12-8 2 U 2 5 1	11997	Cyclohexane		2	U	2	5	1	
11997 1,2-Dichlorobenzene					Ū				
11997 1,2-Dichlorobenzene 95-50-1 1 U 1 5 1 1 1 1 5 1 1 1	11997	Dibromochloromethane	124-48-1	0.5	U	0.5	1	1	
11997 1,2-Dichlorobenzene	11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5	1	1	
11997	11997	·	95-50-1	1	Ū	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1,3-Dichlorobenzene	541-73-1	1	U	1	5	1	
11997 Dichlorodifluoromethane 75-71-8 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997	1.4-Dichlorobenzene	106-46-7	1	U	1	5	1	
11997 1,1-Dichloroethane 75-34-3 0.5 U 0.5 1 1 1 1 1 1 1 1 1	11997		75-71-8	0.5	Ū	0.5		1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				0.5	U	0.5	1	1	
11997 1,1-Dichloroethene 75-35-4 0.5 U 0.5 1 1 11997 cis-1,2-Dichloroethene 156-59-2 0.5 U 0.5 1 1 11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jasopropylbenzene 591-78-6 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1<		•		0.5	U		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Jebayana 78-8-3 3 U 3 10 1 11997 Methyl Acetate 79-20-9 1 U 1	11997	·	75-35-4	0.5	Ū		1	1	
11997 trans-1,2-Dichloroethene 156-60-5 0.5 U 0.5 1 1 11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 tethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1	11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5	1	1	
11997 1,2-Dichloropropane 78-87-5 0.5 U 0.5 1 1 11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 Persanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcochexane 108-87-2 1 U 1 5 1					U		1	1	
11997 cis-1,3-Dichloropropene 10061-01-5 0.5 U 0.5 1 1 11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcpchexane 108-87-2 1 U 1 5 1 11997 Methylcene Chloride 75-09-2 2 U 2 4 1	11997	•	78-87-5	0.5	Ū	0.5	1	1	
11997 trans-1,3-Dichloropropene 10061-02-6 0.5 U 0.5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11997		10061-01-5	0.5	U	0.5	1	1	
11997 Ethylbenzene 100-41-4 0.5 U 0.5 1 1 11997 Freon 113 76-13-1 2 U 2 10 1 11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997			0.5	U	0.5	1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1		,		0.5	Ū		1	1	
11997 2-Hexanone 591-78-6 3 U 3 10 1 11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Freon 113	76-13-1	2	U	2	10	1	
11997 Isopropylbenzene 98-82-8 1 U 1 5 1 11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		591-78-6		U		10	1	
11997 Methyl Acetate 79-20-9 1 U 1 5 1 11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1					Ū				
11997 Methyl Tertiary Butyl Ether 1634-04-4 0.5 U 0.5 1 1 11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		79-20-9	1	U	1	5	1	
11997 4-Methyl-2-pentanone 108-10-1 3 U 3 10 1 11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	-	1634-04-4	0.5	U	0.5	1	1	
11997 Methylcyclohexane 108-87-2 1 U 1 5 1 11997 Methylene Chloride 75-09-2 2 U 2 4 1 11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1					Ū	3	10	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997		108-87-2	1	U	1	5	1	
11997 Styrene 100-42-5 1 U 1 5 1 11997 1,1,2,2-Tetrachloroethane 79-34-5 0.5 U 0.5 1 1	11997	Methylene Chloride	75-09-2	2	U	2	4	1	
				1	Ū			1	
11997 Tetrachloroethene 127-18-4 0.5 II 0.5 1 1	11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	U	0.5	1	1	
	11997	Tetrachloroethene	127-18-4	0.5	U	0.5	1	1	
11997 Toluene 108-88-3 0.5 U 0.5 1 1	11997	Toluene	108-88-3	0.5	U	0.5	1	1	
11997 1,2,3-Trichlorobenzene 87-61-6 1 U 1 5 1	11997	1,2,3-Trichlorobenzene	87-61-6	1	U	1	5	1	
11997 1,2,4-Trichlorobenzene 120-82-1 1 U 1 5 1					U				
11997 1,1,1-Trichloroethane 71-55-6 0.5 U 0.5 1 1									
11997 1,1,2-Trichloroethane 79-00-5 0.5 U 0.5 1 1				0.5	U	0.5			
11997 Trichloroethene 79-01-6 0.5 U 0.5 1 1									
11997 Trichlorofluoromethane 75-69-4 0.5 U 0.5 1 1									
11997 Vinyl Chloride 75-01-4 0.5 U 0.5 1 1									
11997 m+p-Xylene 179601-23-1 0.5 U 0.5 1 1		1			U		1	1	

^{*=}This limit was used in the evaluation of the final result



As Received

As Received

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-70-71-170125 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805603 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/25/2017 10:38 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1911 SDG#: MMK19-11

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived t	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8	3260C	ug/l		ug/l	ug/l	
11997	o-Xylene		95-47-6	0.5	U	0.5	1	1
00882	VOA Library Sea							
	The results from th FORM 1 - VOA-TIC. on the back of this	The qualifi	-					
Misc.	Organics	EPA 537	Rev 1.1	ng/l		ng/l	ng/l	
10954	NETFOSAA		2991-50-6	1	U	1	3	1
	NEtFOSAA is the acr	onym for N-						_
10954	NMeFOSAA NMeFOSAA is the acr	onim for N	2355-31-9	1	U ulfonomidooo	1	3	1
10954		-	-methyl perliuoro 375-73-5	8	ullonamidoac	0.7	2	1
10954			375-22-4	8	J	3	10	1
10954			335-76-2	1	J	0.5	2	1
10954			307-55-1	0.5	U	0.5	2	1
10954	Perfluoroheptanoi	.c acid	375-85-9	20		0.5	2	1
10954	Perfluorohexanesu	ılfonate	355-46-4	3		1	3	1
10954	Perfluorohexanoio	acid	307-24-4	22		0.5	2	1
10954	Perfluorononanoio	acid	375-95-1	1	J	0.6	2	1
10954	Perfluoro-octanes	ulfonate	1763-23-1	15		2	6	1
10954	Perfluorooctanoio	e acid	335-67-1	150		0.5	2	1
10954	T CT TT GOT OP CHICANO		2706-90-3	16		0.5	2	1
10954			376-06-7	0.5	U	0.5	2	1
10954	Perfluorotridecanoi Perfluoroundecanoic		72629-94-8 2058-94-8	0.5 1	U U	0.5 1	2	1
The	stated QC limits are be obtained to calcu	advisory o	only until suffic		-	1	3	1
Metals	5	SW-846 6	5010C	mg/l		mg/l	mg/l	
01750	Calcium		7440-70-2	17.8		0.0382	0.400	1
01757	Magnesium		7439-95-4	4.32		0.0190	0.200	1
01762	Potassium		7440-09-7	5.26		0.160	1.00	1
01767	Sodium		7440-23-5	122		0.173	2.00	1
Wet Cl	nemistry	EPA 300	. 0	mg/l		mg/l	mg/l	
00224	Chloride		16887-00-6	186		10.0	20.0	50
00228	Sulfate		14808-79-8	18.4		1.5	5.0	5
		EPA 353	. 2	mg/l		mg/l	mg/l	
07882	Total Nitrite/Nit Nitrogen	rate	n.a.	5.3		0.20	0.50	5
		SM 2320	B-1997	mg/l	as CaCO3	mg/l as CaCO3	mg/l as CaCO3	

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-70-71-170125 Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805603 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/25/2017 10:38 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1911 SDG#: MMK19-11

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Cl	nemistry SM 2320 B-	1997	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	
12150	Total Alkalinity to pH 4.5	n.a.	28.9	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	28.9	1.7	5.0	1
12148	Carbonate Alkalinity	n.a.	1.7 U	1.7	5.0	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170322AA	02/01/2017	20:16	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170322AA	02/01/2017	20:16	Angela D Sneeringer	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17027007	02/03/2017	13:50	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17027007	01/30/2017	16:00	Devon M Whooley	1
01750	Calcium	SW-846 6010C	1	170270635002	01/30/2017	20:01	Cindy M Gehman	1
01757	Magnesium	SW-846 6010C	1	170270635002	01/30/2017	20:01	Cindy M Gehman	1
01762	Potassium	SW-846 6010C	1	170270635002	01/30/2017	20:01	Cindy M Gehman	1
01767	Sodium	SW-846 6010C	1	170270635002	01/30/2017	20:01	Cindy M Gehman	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170270635002	01/29/2017	22:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	17027987601A	01/27/2017	19:07	Hallie A Burnett	50
00228	Sulfate	EPA 300.0	1	17027987601A	01/27/2017	18:53	Hallie A Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17034118101A	02/03/2017	04:25	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17030003103A	01/31/2017	02:24	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17030003103A	01/31/2017	02:24	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	17030003103A	01/31/2017	02:24	Brandon P Costik	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA SAMPLE N	ο.
VOLATILE ORGANICS ANA	LYSIS DATA SHEET		
TENTATIVELY IDENTIF	TIED COMPOUNDS	!	!
		! M1911	!
Lab Name: Lancaster Laboratories	Contract:	!	!
Lab Code: LANCAS Case No.:	SAS No.:	SDG No.:	
Matrix: (soil/water) WATER	Lab Sample ID: 88056	03	
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID:HP09355	.i/17feb01a.b/y	f01s46.d
Level: (low/med) LOW	Date Received: 01/26	/17	
% Moisture: not dec.	Date Analyzed: 02/01	/17	

Column: (pack/cap) CAP Dilution Factor: 1.0
CONCENTRATION UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

1	1	1 1		
			EST. CONC.	
•	=!====================================	==!=====!	.========	!===== ! U
! 2				: U
	!	:i		i ———
		:i		i
	!	;i		!
! 6				·
	!	;i		!
	i i			!
! 9.		· ·		!
!10				!
!11.	i i			!
!12				!
!13.	i i			!
!14		!		!
!15				!
!16	!	!		!
!17	!	!!		!
	!	!		!
!19.		!		!
	!	!!		!
!21.	!			!
! 22	!			!
!23		!!		!
!24		!!		!
! 25	.!	!!		!
! 26	_!	!!		!
! 27	.!	!!		!
! 28	.!	!!		!
! 29	.!	!!		!
!30		!!		!
!	!	!!		!

page 1 of 1 FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-70-71-170125 Filtered Grab Groundwater

SGPP - Merrimack

LL Sample # GW 8805604 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/25/2017 10:38 by SJ C. T. Male Associates 50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1912 SDG#: MMK19-12

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals	s Dissolved	SW-846 6010C	mg/l	mg/l	mg/l	
01750	Calcium	7440-70-2	15.7	0.0382	0.400	1
01757	Magnesium	7439-95-4	3.45	0.0190	0.200	1
01762	Potassium	7440-09-7	4.58	0.160	1.00	1
01767	Sodium	7440-23-5	117	0.173	2.00	1

Sample Comments

This sample was lab filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01750	Calcium	SW-846 6010C	1	170300635002	01/31/2017 23:5	7 Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	170330635001	02/03/2017 08:3	7 Eric L Eby	1
01762	Potassium	SW-846 6010C	2	170330635001	02/03/2017 08:3	7 Eric L Eby	1
01767	Sodium	SW-846 6010C	1	170330635001	02/03/2017 08:3	7 Eric L Eby	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170300635002	01/31/2017 06:3	5 Lisa J Cooke	1
10635	ICP-WW, 3005A (tot rec) -	SW-846 3005A	2	170330635001	02/02/2017 22:0	O Annamaria Kuhns	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: Trip Blank PFCs Water

SGPP - Merrimack

LL Sample # WW 8805605 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

Submitted: 01/26/2017 09:50

Reported: 02/17/2017 10:10

M1913 SDG#: MMK19-13TB

CAT No.	Analysis Name	CAS Number	Result	:	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc.	Organics EPA 537 Re	ev 1.1	ng/l		ng/l	ng/l	
10954	NETFOSAA	2991-50-6	1	U	1	3	1
	NEtFOSAA is the acronym for N-et	hyl perfluorood	ctanesul	fonamidoacetic	Acid.		
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-me	thyl perfluorod	octanesi	ılfonamidoaceti	c Acid.		
10954	Perfluorobutanesulfonate	375-73-5	0.7	U	0.7	2	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluorodecanoic acid	335-76-2	0.5	U	0.5	2	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	0.5	U	0.5	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	Perfluorohexanoic acid	307-24-4	0.5	U	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorooctanoic acid	335-67-1	0.5	U	0.5	2	1
10954	Perfluoropentanoic Acid	2706-90-3	0.5	U	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	0.5	U	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	0.5	U	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	1	U	1	3	1
	stated QC limits are advisory only be obtained to calculate statistic	-	ent dat	a points			

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
	16 PFCs PFAA Water Prep	EPA 537 Rev 1.1 EPA 537 Rev 1.1	1 1	17027007 17027007	02/03/2017 01/30/2017		Jason W Knight Devon M Whooley	1 1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: Trip Blank VOCs Water

SGPP - Merrimack

LL Group # 1758641 Account # 37191

LL Sample # WW 8805606

Project Name: SGPP - Merrimack

Collected: 01/23/2017

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1914 SDG#: MMK19-14TB

CAT No.	Analysis Name	CAS Number	Resul	Ė	Method Detection L	imit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260C	ug/l		ug/l		ug/l	
11997	Acetone	67-64-1	6	U	6		20	1
11997	Benzene	71-43-2	0.5	U	0.5		1	1
11997	Bromochloromethane	74-97-5	1	Ū	1		5	1
11997	Bromodichloromethane	75-27-4	0.5	U	0.5		1	1
11997	Bromoform	75-25-2	0.5	U	0.5		4	1
11997	Bromomethane	74-83-9	0.5	U	0.5		1	1
11997	2-Butanone	78-93-3	3	U	3		10	1
11997	Carbon Disulfide	75-15-0	1	U	1		5	1
11997	Carbon Tetrachloride	56-23-5	0.5	U	0.5		1	1
11997	Chlorobenzene	108-90-7	0.5	U	0.5		1	1
11997	Chloroethane	75-00-3	0.5	U	0.5		1	1
11997	Chloroform	67-66-3	0.5	U	0.5		1	1
11997	Chloromethane	74-87-3	0.5	U	0.5		1	1
11997	Cyclohexane	110-82-7	2	U	2		5	1
11997	1,2-Dibromo-3-chloropropane	96-12-8	2	U	2		5	1
11997	Dibromochloromethane	124-48-1	0.5	U	0.5		1	1
11997	1,2-Dibromoethane	106-93-4	0.5	U	0.5		1	1
11997	1,2-Dichlorobenzene	95-50-1	1	U	1		5	1
11997	1,3-Dichlorobenzene	541-73-1	1	U	1		5	1
11997	1,4-Dichlorobenzene	106-46-7	1	U	1		5	1
11997	Dichlorodifluoromethane	75-71-8	0.5	U	0.5		1	1
11997	1,1-Dichloroethane	75-34-3	0.5	U	0.5		1	1
11997	1,2-Dichloroethane	107-06-2	0.5	U	0.5		1	1
11997	1,1-Dichloroethene	75-35-4	0.5	U	0.5		1	1
11997	cis-1,2-Dichloroethene	156-59-2	0.5	U	0.5		1	1
11997	trans-1,2-Dichloroethene	156-60-5	0.5	U	0.5		1	1
11997	1,2-Dichloropropane	78-87-5	0.5	U	0.5		1	1
11997	cis-1,3-Dichloropropene	10061-01-5	0.5	Ū	0.5		1	1
11997	trans-1,3-Dichloropropene	10061-02-6	0.5	U	0.5		1	1
11997	Ethylbenzene	100-41-4	0.5	U	0.5		1	1
11997	Freon 113	76-13-1	2	U	2		10	1
11997	2-Hexanone	591-78-6	3 1	U U	3 1		10 5	1 1
11997 11997	Isopropylbenzene	98-82-8 79-20-9	1	U	1		5	1
11997	Methyl Tontions Butsl Ethon	1634-04-4	0.5	U	0.5		1	1
11997	Methyl Tertiary Butyl Ether 4-Methyl-2-pentanone	108-10-1	3	IJ	3		10	1
11997	Methylcyclohexane	108-10-1	1	IJ	1		5	1
11997	Methylene Chloride	75-09-2	2	IJ	2		4	1
11997	Styrene	100-42-5	1	IJ	1		5	1
11997	1,1,2,2-Tetrachloroethane	79-34-5	0.5	IJ	0.5		1	1
11997	Tetrachloroethene	127-18-4	0.5	U	0.5		1	1
11997	Toluene	108-88-3	0.5	IJ	0.5		1	1
11997	1,2,3-Trichlorobenzene	87-61-6	1	IJ	1		5	1
11997	1,2,4-Trichlorobenzene	120-82-1	1	IJ	1		5	1
11997	1,1,1-Trichloroethane	71-55-6	0.5	U	0.5		1	1
11997	1,1,2-Trichloroethane	79-00-5	0.5	U	0.5		1	1
11997	Trichloroethene	79-01-6	0.5	U	0.5		1	1
11997	Trichlorofluoromethane	75-69-4	0.5	Ū	0.5		1	1
11997	Vinyl Chloride	75-01-4	0.5	Ū	0.5		1	1
11997	m+p-Xylene	179601-23-1	0.5	U	0.5		1	1

^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: Trip Blank VOCs Water

SGPP - Merrimack

LL Sample # WW 8805606 LL Group # 1758641 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017

C. T. Male Associates
50 Century Hill Drive

Submitted: 01/26/2017 09:50 Latham NY 12110

Reported: 02/17/2017 10:10

M1914 SDG#: MMK19-14TB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260C	ug/l	ug/l	ug/l	
11997	o-Xylene	95-47-6	0.5 υ	0.5	1	1

00882 VOA Library Search

The results from the volatile library search are listed on the attached FORM 1 - VOA-TIC. The qualifiers appearing in the "Q" column are defined on the back of this form.

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170322AA	02/01/2017 18:05	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170322AA	02/01/2017 18:05	Angela D Sneeringer	1

^{*=}This limit was used in the evaluation of the final result



Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

1E		EPA	SAMPLE NO.	
VOLATILE ORGANICS ANALYS:	IS DATA SHEET			
TENTATIVELY IDENTIFIED	COMPOUNDS	!		!
		!	M1914	!
Lab Name: Lancaster Laboratories	Contract:	!		!
Lab Code: LANCAS Case No.:	SAS No.:	SDG	No.:	_
Matrix: (soil/water) WATER La	ab Sample ID: 8805606			
Sample wt/vol: 5.0 (g/mL)mL	Lab File ID: HP09355.i/	17fe	eb01a.b/yf01	s40.d

Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/
Level: (low/med) LOW Date Received: 01/26/17
% Moisture: not dec. Date Analyzed: 02/01/17

Column: (pack/cap) CAP Dilution Factor: 1.0 CONCENTRATION UNITS: Number TICs found: 0 (ug/L or ug/Kg) ug/L

	! COMPOUND NAME		EST. CONC.	
	!!====================================	===!=====! !		!===== ! U
2		į	_	!
3	!	!!		!
4.	!			!
5	_!	!!		!
	_!	!!		!
	_!	!!		!
	_!	!!		!
	_!			
	_!			!
	_!	!!		!
12		!!		!
13		!!		!
14		!!		!
	<u>-</u> !	!!		!
16	- !	<u>:</u>		!
	- !	::		!
	_! !	::		!
20		::		·
21.		::		·
22.		::		:
23.		:		i
24				
25	- †	:i		i
26	·	ii		;
27		;;		;——
28		i		·
29	·	i		!
30	!			!
	·	i		

FORM I VOA-TIC



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1758641

Reported: 02/17/2017 10:10

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result		MDL**	LOQ
	ug/l		ug/l	ug/l
Batch number: Y170322AA	Sample	number	(s): 88055	93-8805597,8805603,8805606
Acetone	6	U	6	20
Benzene	0.5	U	0.5	1
Bromochloromethane	1	U	1	5
Bromodichloromethane	0.5	U	0.5	1
Bromoform	0.5	U	0.5	4
Bromomethane	0.5	U	0.5	1
2-Butanone	3	U	3	10
Carbon Disulfide	1	U	1	5
Carbon Tetrachloride	0.5	U	0.5	1
Chlorobenzene	0.5	U	0.5	1
Chloroethane	0.5	U	0.5	1
Chloroform	0.5	U	0.5	1
Chloromethane	0.5	U	0.5	1
Cyclohexane	2	U	2	5
1,2-Dibromo-3-chloropropane	2	U	2	5
Dibromochloromethane	0.5	U	0.5	1
1,2-Dibromoethane	0.5	U	0.5	1
1,2-Dichlorobenzene	1	U	1	5
1,3-Dichlorobenzene	1	U	1	5
1,4-Dichlorobenzene	1	U	1	5
Dichlorodifluoromethane	0.5	U	0.5	1
1,1-Dichloroethane	0.5	U	0.5	1
1,2-Dichloroethane	0.5	U	0.5	1
1,1-Dichloroethene	0.5	U	0.5	1
cis-1,2-Dichloroethene	0.5	U	0.5	1
trans-1,2-Dichloroethene	0.5	U	0.5	1
1,2-Dichloropropane	0.5	U	0.5	1
cis-1,3-Dichloropropene	0.5	U	0.5	1
trans-1,3-Dichloropropene	0.5	U	0.5	1
Ethylbenzene	0.5	U	0.5	1
Freon 113	2	U	2	10
2-Hexanone	3	U	3	10
Isopropylbenzene	1	U	1	5
Methyl Acetate	1	U	1	5
Methyl Tertiary Butyl Ether	0.5	U	0.5	1
4-Methyl-2-pentanone	3	U	3	10
Methylcyclohexane	1	U	1	5
Methylene Chloride	2	U	2	4
Styrene	1	U	1	5
1,1,2,2-Tetrachloroethane	0.5	U	0.5	1

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1758641

Reported: 02/17/2017 10:10

Method Blank (continued)

Analysis Name	Result	MDL**	LOQ
	ug/l	ug/l	ug/l
Tetrachloroethene Toluene 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Trichlorofluoromethane Vinyl Chloride m+p-Xylene o-Xylene	0.5 U 0.5 U 1 U 1 U 0.5 U 0.5 U 0.5 U 0.5 U 0.5 U 0.5 U 0.5 U 0.5 U 0.5 U	0.5 0.5 1 1 0.5 0.5 0.5 0.5 0.5	1 1 5 5 1 1 1 1 1
	ng/l	ng/l	ng/l
Batch number: 17027007 Perfluorooctanoic acid Perfluorononanoic acid Perfluorodecanoic acid Perfluoroundecanoic acid Perfluorotridecanoic acid Perfluorotridecanoic acid Perfluorotetradecanoic acid Perfluorohexanoic acid Perfluorohexanoic acid Perfluorobutanesulfonate Perfluoroctanesulfonate Perfluorobutanoic Acid Perfluoropentanoic Acid NELFOSAA NMeFOSAA	Sample numb 0.5 U 0.6 U 0.5 U 1 U 0.5 U 0.5 U 0.5 U 0.5 U 0.5 U 0.7 U 1 U 2 U 3 U 0.5 U 0.5 U 1 U 1 U	er(s): 88059 0.5 0.6 0.5 1 0.5 0.5 0.5 0.5 0.7 1 2 3 0.5 1	593-8805603,8805605 2 2 2 2 2 2 2 2 2 2 2 2 2
	mg/l	mg/l	mg/l
Batch number: 170270635002 Calcium Magnesium Potassium Sodium	0.0382 U 0.0190 U 0.160 U 0.173 U	0.0382 0.0190 0.160 0.173	593-8805597,8805603 0.400 0.200 1.00 2.00
Batch number: 170300635002 Calcium	Sample numb 0.0388 J	er(s): 88050 0.0382	0.400
Batch number: 170330635001 Magnesium Potassium Sodium	Sample numb 0.0190 U 0.160 U 0.173 U	0.0190 0.160 0.173	0.200 1.00 2.00
Batch number: 17026987151A Chloride Sulfate	Sample numb 0.20 U 0.30 U	er(s): 8805! 0.20 0.30	593-8805596 0.40 1.0
Batch number: 17027987601A	Sample numb	er(s): 8805	597,8805603

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1758641

Reported: 02/17/2017 10:10

Method Blank (continued)

Analysis Name	Result mg/l	MDL** mg/l	LOQ mg/l
Chloride Sulfate	0.20 U 0.30 U	0.20 0.30	0.40 1.0
Batch number: 17034118101A Total Nitrite/Nitrate Nitrogen	Sample number 0.040 U	(s): 88055 0.040	93-8805597,8805603 0.10
	mg/l as CaCO3	mg/l as CaCO3	mg/1 as CaCO3
Batch number: 17030003103A Total Alkalinity to pH 4.5	Sample number 2.1 J	1.7 88055	93-8805597,8805603 5.0

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: Y170322AA		_	593-8805597,88	-	606				
Acetone	150	280.65	150	272.32	187*	182*	50-168	3	30
Benzene	20	20.79	20	20.46	104	102	78-120	2	30
Bromochloromethane	20	19.39	20	19.28	97	96	80-125	1	30
Bromodichloromethane	20	19.39	20	19.24	96	96	80-120	0	30
Bromoform	20	17.19	20	17.25	86	96 86	59-120	0	30
	20		20			86 89			
Bromomethane		18.34		17.76	92		55-123	3	30
2-Butanone	150	198.48	150	197.5	132	132	57-145	0	30
Carbon Disulfide	20	19.91	20	19.39	100	97	58-120	3	30
Carbon Tetrachloride	20	19.69	20	19.25	98	96	74-130	2	30
Chlorobenzene	20	20.38	20	20.09	102	100	80-120	1	30
Chloroethane	20	18.78	20	18.18	94	91	56-120	3	30
Chloroform	20	20.7	20	20.43	103	102	80-120	1	30
Chloromethane	20	19.1	20	18.56	96	93	59-127	3	30
Cyclohexane	20	20.1	20	19.94	100	100	65-131	1	30
1,2-Dibromo-3-chloropropane	20	18.51	20	18.66	93	93	59-120	1	30
Dibromochloromethane	20	19.42	20	19.19	97	96	78-120	1	30
1,2-Dibromoethane	20	21.14	20	21.01	106	105	80-120	1	30
1,2-Dichlorobenzene	20	19.84	20	19.63	99	98	80-120	1	30
1,3-Dichlorobenzene	20	19.73	20	19.54	99	98	80-120	1	30
1,4-Dichlorobenzene	20	19.85	20	19.73	99	99	80-120	1	30
Dichlorodifluoromethane	20	17.81	20	17.72	89	89	49-134	0	30
1,1-Dichloroethane	20	21.6	20	21.47	108	107	80-120	1	30
1,2-Dichloroethane	20	20.26	20	20.05	101	100	66-128	1	30
1,1-Dichloroethene	20	21.37	20	20.9	107	104	76-124	2	30
cis-1,2-Dichloroethene	20	20.67	20	20.36	103	102	80-120	2	30
trans-1,2-Dichloroethene	20	21.14	20	21.1	106	105	80-120	0	30
1,2-Dichloropropane	20	21.17	20	21.02	106	105	80-120	1	30
cis-1,3-Dichloropropene	20	20.17	20	20.23	101	101	80-120	0	30

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1758641

Reported: 02/17/2017 10:10

LCS/LCSD (continued)

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
trans-1,3-Dichloropropene	20	20.6	20	20.48	103	102	76-120	1	30
Ethylbenzene	20	20.88	20	20.56	104	103	78-120	2	30
Freon 113	20	19.3	20	19.16	97	96	64-136	1	30
2-Hexanone	100	120.51	100	120.13	121	120	49-146	0	30
Isopropylbenzene	20	20.41	20	20.09	102	100	80-120	2	30
Methyl Acetate	20	20.59	20	20.65	103	103	61-137	0	30
Methyl Tertiary Butyl Ether	20	20.35	20	20.3	102	101	75-120	0	30
4-Methyl-2-pentanone	100	111	100	111.75	111	112	55-141	1	30
Methylcyclohexane	20	18.47	20	18.35	92	92	66-126	1	30
Methylene Chloride	20	20.65	20	20.61	103	103	80-120	0	30
Styrene	20	19.95	20	19.76	100	99	80-120	1	30
1,1,2,2-Tetrachloroethane	20	20.26	20	20.35	101	102	72-120	0	30
Tetrachloroethene	20	20.72	20	20.41	104	102	80-129	2	30
Toluene	20	20.9	20	20.63	105	103	80-120	1	30
1,2,3-Trichlorobenzene	20	20.54	20	20.47	103	102	69-120	0	30
1,2,4-Trichlorobenzene	20	20.67	20	20.61	103	103	72-120	0	30
1,1,1-Trichloroethane	20	19.87	20	19.62	99	98	66-126	1	30
1,1,2-Trichloroethane	20	20.3	20	20.22	102	101	80-120	0	30
Trichloroethene Trichlorofluoromethane	20	20.72	20	20.32	104	102	80-120	2	30 30
Vinyl Chloride	20 20	17.62 18.29	20 20	17.38 17.9	88 91	87 90	67-129 63-121	1 2	30 30
m+p-Xylene	40	18.29 41.42	40	40.81	104	102	80-121	1	30
o-Xylene	20	20.24	20	20.1	104	102	80-120	1	30
0-xylene	20	20.24	20	20.1	101	101	80-120	1	30
	ng/l	ng/l	ng/l	ng/l					
Batch number: 17027007	Sample numbe	er(s): 88055	93-8805603,88	805605					
Perfluorooctanoic acid	200	181.31	200	157.28	91	79	70-130	14	30
Perfluorononanoic acid	200	162.92	200	170.59	81	85	70-130	5	30
Perfluorodecanoic acid	200	154.85	200	170.17	77	85	70-130	9	30
Perfluoroundecanoic acid	200	178.07	200	177.16	89	89	70-130	1	30
Perfluorododecanoic acid	200	182.47	200	183.15	91	92	70-130	0	30
Perfluorotridecanoic acid	200	204.85	200	208.96	102	104	70-130	2	30
Perfluorotetradecanoic acid	200	161.08	200	182.28	81	91	70-130	12	30
Perfluorohexanoic acid	200	174.66	200	163.64	87	82	70-130	7	30
Perfluoroheptanoic acid	200	149.36	200	163.14	75	82	70-130	9	30
Perfluorobutanesulfonate	176.8	146.98	176.8	174.1	83	98	70-130	17	30
Perfluorohexanesulfonate	189.2	134.02	189.2	154.39	71	82	70-130	14	30
Perfluoro-octanesulfonate	191.2	135.49	191.2	157.29	71	82	70-130	15	30
Perfluorobutanoic Acid	200	177.61	200	189.79	89	95	70-130	7	30
Perfluoropentanoic Acid	200	163.27	200	165.74	82	83	70-130	1	30
NETFOSAA	200	174.87	200	160.64	87	80	70-130	8	30
NMeFOSAA	200	223.87	200	185.79	112	93	70-130	19	30
	mg/l	mg/l	mg/l	mg/l					
Batch number: 170270635002	Sample numbe	er(s): 88055	93-8805597,88	805603					
Calcium	4.00	4.20	,		105		80-120		
Magnesium	2.00	2.18			109		80-120		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1758641

Reported: 02/17/2017 10:10

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/l	LCS Conc mg/l	LCSD Spike Added mg/l	LCSD Conc mg/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Potassium Sodium	10 10	10.52 10.19			105 102		80-120 80-120		
Batch number: 170300635002	Sample numbe		504		104		00 100		
Calcium	4.00	4.16			104		80-120		
Batch number: 170330635001	Sample numbe								
Magnesium	2.00	2.05	2.00	2.04	102	102	80-120	0	20
Potassium	10	10.18	10	10.17	102	102	80-120	0	20
Sodium	10	10.06	10	10.04	101	100	80-120	0	20
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17026987151A	Sample numbe	r(s): 88055	593-8805596						
Chloride	3.00	2.93	3.00	2.93	98	98	90-110	0	20
Sulfate	7.50	7.40	7.50	7.38	99	98	90-110	0	20
Batch number: 17027987601A	Sample numbe	r(s): 88055	597,8805603						
Chloride	3.00	3.09			103		90-110		
Sulfate	7.50	7.85			105		90-110		
Batch number: 17034118101A	Sample numbe	r(s): 88055	593-8805597,88	05603					
Total Nitrite/Nitrate Nitrogen	2.50	2.63			105		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 17030003103A	-		593-8805597,88	05603	0.2		04 110		
Total Alkalinity to pH 4.5	188	174.74			93		84-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ng/l	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 17027007	Sample numb	er(s): 880	5593-8805	603,8805605	UNSPK:	8805593				
Perfluorooctanoic acid	135.8	200.9	341.84			112		70-130		
Perfluorononanoic acid	1.36	200.9	162.88			80		70-130		
Perfluorodecanoic acid	0.5 U	200.9	165.79			83		70-130		
Perfluoroundecanoic acid	1 U	200.9	175.38			87		70-130		
Perfluorododecanoic acid	0.5 U	200.9	188.63			94		70-130		
Perfluorotridecanoic acid	0.5 U	200.9	218.08			109		70-130		
Perfluorotetradecanoic acid	0.5 U	200.9	176.28			88		70-130		
Perfluorohexanoic acid	15.22	200.9	197.85			91		70-130		
Perfluoroheptanoic acid	15.06	200.9	179.49			82		70-130		

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1758641

Reported: 02/17/2017 10:10

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ng/l	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Perfluorobutanesulfonate	5.48	177.6	179.71			98		70-130		
Perfluorohexanesulfonate	4.45	190.06	168.26			87		70-130		
Perfluoro-octanesulfonate	5.19	192.06	166.39			84		70-130		
Perfluorobutanoic Acid	4.75	200.9	189.64			92		70-130		
Perfluoropentanoic Acid	7.99	200.9	174.11			83		70-130		
NETFOSAA	1 U	200.9	173.11			86		70-130		
NMeFOSAA	1 U	200.9	221.63			110		70-130		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 170270635002	Sample numb	er(s): 8805	5593-8805	597,8805603	UNSPK: 8	805596				
Calcium	16.88	4.00	20.95	4.00	21.05	102 (2)	104 (2)	75-125	0	20
Magnesium	2.85	2.00	4.98	2.00	4.98	107	106	75-125	0	20
Potassium	3.25	10	13.89	10	13.7	106	105	75-125	1	20
Sodium	51.89	10	62.79	10	62.02	109 (2)	101 (2)	75-125	1	20
Batch number: 170300635002										
Calcium	2.27	4.00	6.15	4.00	6.19	97	98	75-125	1	20
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17026987151A	Sample numb	er(s): 8805	5593-8805	596 UNSPK:	P805184					
Chloride	258.02	800	1089.42	800	1090.24	104	104	90-110	0	20
Sulfate	1815.28	2000	3974.78	2000	3988.82	108	109	90-110	0	20
Batch number: 17027987601A	Sample numb			603 UNSPK:	P806927					
Chloride	29.92	40	68.43			96		90-110		
Sulfate	38.66	50	134.89			192*		90-110		
Batch number: 17034118101A	Sample numb			597,8805603	UNSPK: 8	805593				
Total Nitrite/Nitrate Nitrogen	4.37	5.00	10.23			117*		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 17030003103A	Sample numb	er(s): 880	5593-8805	597.8805603	UNSPK: P	806471				
Total Alkalinity to pH 4.5	155.2	188	323.21		1.011.	89		84-110		

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name BKG Conc DUP Conc DUP RPD DUP RPD Max mg/1 mg/1

Batch number: 170270635002 Sample number(s): 8805593-8805597,8805603 BKG: 8805596

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Group Number: 1758641 Client Name: C. T. Male Associates

Reported: 02/17/2017 10:10

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Calcium Magnesium Potassium Sodium	16.88 2.85 3.25 51.89	16.8 2.85 3.27 51.96	0 0 1 (1) 0	20 20 20 20
Batch number: 170300635002 Calcium	Sample number(s): 2.27	8805604 BKG: P809203 2.17	3 5	20
	mg/l	mg/l		
Batch number: 17026987151A Chloride Sulfate	Sample number(s): 258.02 1815.28	8805593-8805596 BKG: 254.51 1819.57	P805184 1 (1) 0	15 15
Batch number: 17027987601A Chloride Sulfate	Sample number(s): 29.92 38.66	8805597,8805603 BKG: 28.62 38.67	P806927 4 0	15 15
Batch number: 17034118101A Total Nitrite/Nitrate Nitrogen		8805593-8805597,8805 4.62	5603 BKG: 5*	8805593 2
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 17030003103A	_	8805593-8805597,8805		

Total Alkalinity to pH 4.5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: Y170322AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8805593	95	100	100	99
8805594	96	101	99	99
8805595	95	100	99	99
8805596	95	100	100	99
8805597	95	98	100	99
8805603	95	98	100	100
8805606	95	100	99	100
Blank	95	99	100	100
LCS	98	100	100	101
LCSD	98	99	100	100

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



70-130

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1758641

Reported: 02/17/2017 10:10

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SOM02.2 Volatiles

Batch number: Y170322AA

Limits: 80-116 77-113 80-113 78-113

Analysis Name: 16 PFCs Batch number: 17027007

	13C4-PFBA	13C5-PFPeA	13C3-PFBS	13C5-PFHxA	13C3-PFHxS	13C4-PFHpA
8805593	82	95	97	76	75	76
8805594	75	89	92	92	84	85
8805595	80	89	103	77	89	78
8805596	86	95	109	101	93	95
8805597	81	94	116	86	83	91
8805598	74	76	76	78	82	88
8805599	81	81	79	103	103	93
8805600	78	81	84	80	75	80
8805601	77	67*	70	88	69*	69*
8805602	76	92	86	68*	70	79
8805603	82	94	102	84	82	79
8805605	71	71	74	81	69*	84
Blank	63*	61*	61*	57*	66*	61*
LCS	76	79	81	75	84	83
LCSD	80	78	84	85	90	91
MS	82	90	89	93	93	102
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8805593	76	87	100	81	75	77
8805594	81	72	89	75	82	81
8805595	79	90	105	89	72	71
8805596	92	98	100	81	67*	81
8805597	85	100	97	84	85	83
8805598	83	88	91	79	78	71
8805599	92	93	91	89	76	79
8805600	83	80	83	89	85	80
8805601	73	74	89	83	79	68*
8805602	72	83	92	82	74	71
8805603	87	74	96	82	67*	76
8805605	77	87	81	69*	60*	63*
Blank	61*	66*	90	63*	61*	51*
LCS	73	90	79	84	72	73
LCSD	85	84	83	80	87	79
MS	84	84	94	89	78	80

70-130

70-130

70-130

Limits:

70-130

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

70-130

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1758641

Reported: 02/17/2017 10:10

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 16 PFCs Batch number: 17027007

	d5-NEtFOSAA	13C2-PFDoDA	13C2-PFTeDA	
8805593	83	61*	64*	
8805594	73	66*	64*	
8805595	93	66*	70	
8805596	79	65*	67*	
8805597	94	67*	71	
8805598	90	72	64*	
8805599	88	71	67*	
8805600	100	73	71	
8805601	73	61*	60*	
8805602	82	59*	60*	
8805603	82	66*	63*	
8805605	66*	56*	58*	
Blank	58*	51*	47*	
LCS	88	64*	70	
LCSD	98	73	72	
MS	87	69*	76	
Limits:	70-130	70-130	70-130	

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

Environmental Analysis Request/Chain of Custody

🗱 eurofins		e	u	ro	fi	n	5
------------	--	---	---	----	----	---	---

For Eurofins Lancaster Laboratories Environmental use only

Lancaster Laboratories

Acct. # 37 19 Group # 1758611 Sample # 8805593-606

COC #518836

Client Information	n		Matrix						Analysis I				sis F	Requested			For L	For Lab Use Only					
Client:	Acct. #:									Preservat					ntion Codes					FSC:			
CT Male Associates					ا و		니												SCR#	i.			
Project Name/#: Shpp - Mornimack	PWSID #:				Tissue	Ground	Surface	è		ICS	3	2)		(SN220A)	7				- 1	Preserva HCI		odes niosulfate	
Project Manager: Virk Moline	P.O. #;					Ö	Su	wake	ers	1	(60 led)	(353.2)	(300.0)		537,med.					:HNO3 :H2SO4	B =Na O =Ot	8	
Sampler: Stephen Johnson SJ	Quote #:	14135	1		Sediment	l ec	NPDES [Free	of Containers	VCAHS (& 266C)+TICS	6. K	1103		16: carb	EPA					Re	marks		
State where samples were collected: For Compliance:				<u>a</u>	Sed	Potable	<u>B</u>	R	ပိ	1/2 (Mo, Na,	NO2,	, z	ark	7							Witness	
Yes □	No □			Sol	~ 		- 1	'	‡ Of	\ \ \	M	2	,	7	74								
Sample Identification	Collec		Grab	Composite	Soil	Water		Other:	Total#	Tel	$C_{\delta_{J}}$	Tohal	, J	412	d 91								
60 - 11 - 12 - 12 - 12 - 12 - 12	ogolosko oto o o o o o o o o o o o o o o o o o	Time		۱ د	<u>v</u>	2000	Mexico.	0	Ě						. 6				popove do cita de la constituidada	ropinsidanse di N <u>J</u> anonian	new somether a singleton		
SAZ-APO9-17-18-170123		842	<i>y</i>			<u> </u>			Щ	V	<u> </u>	×	<u> </u>	X	<u>X</u>		_						
542-AP09-35-36-120123		1057	X			^			Ŋ	Y	χ		X	X	X								
Shz-AP09-47-48-170123	Y25/17 1		N			<u> </u>			Ŋ	X	×	X	X)V	Х								
SGZ-Af09-56-157-170123	Y23/17	1419	X	[X			M	×	×	X	`Xi	×	И								
Shz-AP09-65=166-170123	Y23/17 1	611	Y			Ż)		, padder	X	N	X	Ж	Χ	X								
SG2- FB05- 176124	V24/17 0	2535	×			L		X	2			/			X								
S42-EBAW-170/24	V24/17 0	825	Х					Х	2						X								
Sh2- EBSW-170124	424/17 (0827	X					У	2						Х								
Sh2-EBWPG2-176124	424/17 C	842	У	T			Ì	X	24						X								
542-EBPP02-170124	424/17 C		×	T				V	2						X								
Turnaround Time (TAT) Requested	The second secon		Relinquiş	hed b	y	٨		ana finisanana			Date	,	Time		Received	by		AND DESCRIPTIONS	Maria de la composición dela composición de la composición de la composición de la composición de la composición de la composición dela composición dela composición dela composición de la composición dela composición de la composición dela composición dela composición dela composición dela composición dela composición dela composición dela composición dela composición dela composición de	Date)	Time	
Standard (Ri	ush)		K	Tyl	2	M	paren.				1/25	117	13	۷>_					·				
(Rush TAT is subject to laboratory approval and surcharge	»;)		Relinquis	hed b	y ~						Date		Time		Received	by				Date		Time	
Date results are needed:			Relinquis	hed b	у		ann a i mai le mai de				Date		Time		Received	by				Date	ŀ	Time	
E-mail address:			Relinquis	hed b	у						Date		Time		Received	by	٠			Date	,	Time	
Data Package Options (circle if re	quired)					,		_								Na Carrier	grande and a second						
Type I (FPA Level 3	Raw Data Or	nly)	Relinquis	hed b	У						Date		Time		Received	by	5			Date (-)	٠ ك (أي - فا كر	Time りすい	
Type III (Reduced non-CLP) NJ DKQF	Y TXTR	RP-13		If	f yes,	EDD forma	2000	On.		Yes/	No		_		Relinquished by Commercial C				arrier: Other				
NYSDEC Category A or B MA MCP	CT RC	P				ecific (No lume.)	Temperature upon receipt <u>しらっし</u>			-2,4	.°C					

Environmental Analysis Request/Chain of Custody

🗱 eurofins		e	u	ro	f	i	n	S
------------	--	---	---	----	---	---	---	---

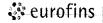
For Eurofins Lancaster Laboratories Environmental use only

Lancaster Laboratories Environmental

Acct. # 37/91 Group # 175864 | Sample # 8805593-606

COC #518925

Client Information	n				STOCKE WAY	Ma	trix				er format en de propertie de la constantina del constantina de la constantina de la constantina de la constantina de la constantina del constantina de la constantina de la constantina de la constantina de la constantina de la constantina de la constantina de la constantina de la constantina de la constantina de la constantina de la constantina de la constantina de la constantina de la co	ρ	naly	sis l	₹equ	este	d	CONNECTO		For Lab U	ise Only	
Client:	Acct. #:		in ellocine politicum			团						(eleganero-Gara)	Pres	ervat	ion C	odes				FSC:		
CTMale Associates					<u></u>	ł	└─┤													SCR#:		
Project Name/#: Sh. P.P Mennimack	PWSID #:				Tissue	Ground	Surface	र इ.स.		*TEC>	3	(7.5	(ÉM 23700	37mal)					Pres H=HCI	ervation T=T	Codes hiosulfate
Project Manager: Kink Moline	P.O. #:	<u> </u>				g] Su	DEVOSES	ırs	D+1	JO109	(1555)	(3,00.0)	5 EM.	50					N=HN0 S=H ₂ S	D ₃ B =N	laOH Other
Sampler: Stephen Johnson STI	Quote #:	214135	e e e e e e e e e e e e e e e e e e e		nent	<u>0</u>	S.		ıtaine	(2007 3)	3/2	(ND-5))	Bianh	(EPM						Remark	ALL STREET, ST
State where samples were collected: For Compliance: Yes	No 🗆			ite	Sediment	Potable	NPDES	PEC Free	of Cor	VOAS (_ st	700N	409	Garle.	150							
Sample Identification		ected	ap	Composite		Wotor.		Other:	Total # of Containers	JCL VI	Ga, Ms,	78	er,	#1K+	16 4							
•	Date	Time	Grab	ပိ	Soil	1	0 > >	ð	2	17	\cup	17									(2007)	
A Sh2-APO9-70-71-170125	425/17	1038	X				X/		15	X	X	X	X	X	\mathcal{V}					F: K	Meta	/5
Trip Blank PFCs	*Ancomorphish (Company)	- المراجع من	Ÿ					X							X						411V	
Trip Blank VOCS		Approxime of	¥					X	2	X											0.00	
				ĺ																		
Turnaround Time (TAT) Requested	(please circl	e)	Relinqu	ished l	оу	N				Tarolinie (Genicia)	Date	. I .	Time		Receiv	ed by					Date	Time
	tush 🤍			如		7/						5/17	132	72							5	Time
(Rush TAT is subject to laboratory approval and surshare	e.)		Relinqu	iished i	by -						Date		Time	// ·	Receive	ea by					Date	Time
Date results are needed:			Relingu	ished I	Dγ						Date	-	Time		Receive	ed by					Date	Time
Bate results are needed.		•	<u> </u>																	<i>/</i> ,		
E-mail address:			Relinqu	ished l	ру						Date		Time		Receive	ed by	g	Carlow and the Carlow	·		Date	Time
Data Package Options (circle if r	equired)		<u> </u>														otan,		•			
Type I (EPA Level 3	(Raw Data	Only)	Relinqu	ished t	ру						Date		Time		Receive	ed by	7	and the same of th			Date	Time りょう
Equivalent/non-CLP)	Data	- · · · <i>)</i> /	Garages acception								ieconne solleie	Squawither:	SSA SA SA SA SA SA SA SA SA SA SA SA SA		D - 11	- Company (see 100)		9		-:-! 0		
Type III (Reduced non-CLP) NJ DKQ	Р ТХТ	RRP-13		ı	f vee		Req at:				No Relinquished by Cor UPS FedE											
				Site	- yes, e-Sne	ecific	QC (I	VIS/N	/SD/F	Oup\?	Y	 9s	No.		O F							
NYSDEC Category A or B MA MCF	CT F	RCP	(sample									Ter	mper	ature	upon	receipt _	74	_,C



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

174031

Group Number(s): 1758641

Client: C.T. Male

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

01/26/2017 9:50

Number of Packages:

2

Number of Projects:

1

State/Province of Origin:

<u>NH</u>

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

Yes

Custody Seal Present:

Yes

Sample Date/Times match COC:

Yes

Custody Seal Intact:

Yes

VOA Vial Headspace ≥ 6mm:

No

Samples Chilled:

Yes

Total Trip Blank Qty:

3

Paperwork Enclosed: Samples Intact:

Yes

Trip Blank Type:

See Below

Missing Samples:

Yes No Air Quality Samples Present:

No

Extra Samples:

Discrepancy in Container Qty on COC:

No No

Trip Blank Type(s): 2 HCL, 1 250mL unpreserved bottle

Unpacked by Timothy Cubberley (6520) at 11:33 on 01/26/2017

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler#	<u>Thermometer ID</u>	Corrected Temp	Therm. Type	<u>Ice Type</u>	<u>lce Present?</u>	<u>Ice Container</u>	Elevated Temp?
1	DT131	2.0	DT	Wet	Υ	Bagged	N
2	DT131	2.4	DT	Wet	Υ	Bagged	N



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RLReporting Limit kg **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 C. T. Male Associates 50 Century Hill Drive Latham NY 12110

Report Date: February 06, 2017

Project: SGPP - Merrimack

Submittal Date: 01/26/2017 Group Number: 1758664 SDG: MMK20 PO Number: 16.6126 State of Sample Origin: NH

	Lancaster Labs
Client Sample Description	<u>(LL) #</u>
SG2-AP02-25.7-26.5-170116 Grab Soil	8805648
SG2-AP02-27-28.4-170116 Grab Soil	8805649
SG2-AP05-SWS-27.6-29.8-170118 Composite Soil	8805650
SG2-AP09-FS-14.1-17-170120 Composite Soil	8805651
SG2-AP09-34-35-170123 Grab Soil	8805652

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To C. T. Male Associates Attn: Jeff Marx Electronic Copy To C. T. Male Associates Attn: Dan Reilly Electronic Copy To C. T. Male Associates Attn: Kirk Moline

Respectfully Submitted,

Nancy Jean Bornholm Principal Specialist

(717) 556-7250

Project Name: SGPP - Merrimack LL Group #: 1758664

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

No additional comments are necessary.



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-25.7-26.5-170116 Grab Soil

SGPP - Merrimack

LL Sample # SW 8805648 LL Group # 1758664 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 by STJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/26/2017 09:50

Reported: 02/06/2017 10:03

M2001 SDG#: MMK20-01

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet C	hemistry	ASTM D422-63	% Passing	% Passing	% Passing	
		(reapproved 2007)				
07103	75 mm	n.a.	100	0.50	0.50	1
07103	37.5 mm	n.a.	100	0.50	0.50	1
07103	19 mm	n.a.	100	0.50	0.50	1
07103	4.75 mm	n.a.	100	0.50	0.50	1
07103	3.35 mm	n.a.	99.7	0.50	0.50	1
07103	2.36 mm	n.a.	99.5	0.50	0.50	1
07103	1.18 mm	n.a.	98.5	0.50	0.50	1
07103	0.6 mm	n.a.	96.8	0.50	0.50	1
07103	0.3 mm	n.a.	94.3	0.50	0.50	1
07103	0.15 mm	n.a.	66.1	0.50	0.50	1
07103	0.075 mm	n.a.	25.4	0.50	0.50	1
07103	0.064 mm	n.a.	19.0	0.50	0.50	1
07103	0.05 mm	n.a.	9.0	0.50	0.50	1
07103	0.02 mm	n.a.	0.50 U	0.50	0.50	1
07103	0.005 mm	n.a.	0.50 U	0.50	0.50	1
07103	0.002 mm	n.a.	0.50 U	0.50	0.50	1
07103	0.001 mm	n.a.	0.50 U	0.50	0.50	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
07103	Grain Size to 1 um	ASTM D422-63 (reapproved 2007)	1	17027710301A	01/27/2017	10:00	Joshua Trost	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP02-27-28.4-170116 Grab Soil

SGPP - Merrimack

LL Sample # SW 8805649 LL Group # 1758664 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/16/2017 by STJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/26/2017 09:50

Reported: 02/06/2017 10:03

M2002 SDG#: MMK20-02

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Cl	nemistry	ASTM D422-63	% Passing	% Passing	% Passing	
		(reapproved 2007)				
07103	75 mm	n.a.	100	0.50	0.50	1
07103	37.5 mm	n.a.	100	0.50	0.50	1
07103	19 mm	n.a.	100	0.50	0.50	1
07103	4.75 mm	n.a.	98.9	0.50	0.50	1
07103	3.35 mm	n.a.	98.1	0.50	0.50	1
07103	2.36 mm	n.a.	96.4	0.50	0.50	1
07103	1.18 mm	n.a.	83.5	0.50	0.50	1
07103	0.6 mm	n.a.	55.8	0.50	0.50	1
07103	0.3 mm	n.a.	31.7	0.50	0.50	1
07103	0.15 mm	n.a.	9.3	0.50	0.50	1
07103	0.075 mm	n.a.	2.7	0.50	0.50	1
07103	0.064 mm	n.a.	2.0	0.50	0.50	1
07103	0.05 mm	n.a.	0.50 U	0.50	0.50	1
07103	0.02 mm	n.a.	0.50 U	0.50	0.50	1
07103	0.005 mm	n.a.	0.50 U	0.50	0.50	1
07103	0.002 mm	n.a.	0.50 U	0.50	0.50	1
07103	0.001 mm	n.a.	0.50 U	0.50	0.50	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
07103	Grain Size to 1 um	ASTM D422-63 (reapproved 2007)	1	17027710301A	01/27/2017	10:00	Joshua Trost	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP05-SWS-27.6-29.8-170118 Composite Soil

SGPP - Merrimack

LL Sample # SW 8805650 LL Group # 1758664 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 by STJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/26/2017 09:50

Reported: 02/06/2017 10:03

M2003 SDG#: MMK20-03

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet C	hemistry	ASTM D422-63	% Passing	% Passing	% Passing	
		(reapproved 2007)				
07103	75 mm	n.a.	100	0.50	0.50	1
07103	37.5 mm	n.a.	100	0.50	0.50	1
07103	19 mm	n.a.	100	0.50	0.50	1
07103	4.75 mm	n.a.	100	0.50	0.50	1
07103	3.35 mm	n.a.	99.8	0.50	0.50	1
07103	2.36 mm	n.a.	99.7	0.50	0.50	1
07103	1.18 mm	n.a.	99.5	0.50	0.50	1
07103	0.6 mm	n.a.	98.0	0.50	0.50	1
07103	0.3 mm	n.a.	93.3	0.50	0.50	1
07103	0.15 mm	n.a.	58.5	0.50	0.50	1
07103	0.075 mm	n.a.	24.6	0.50	0.50	1
07103	0.064 mm	n.a.	18.5	0.50	0.50	1
07103	0.05 mm	n.a.	9.0	0.50	0.50	1
07103	0.02 mm	n.a.	0.50 U	0.50	0.50	1
07103	0.005 mm	n.a.	0.50 U	0.50	0.50	1
07103	0.002 mm	n.a.	0.50 U	0.50	0.50	1
07103	0.001 mm	n.a.	0.50 U	0.50	0.50	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
07103	Grain Size to 1 um	ASTM D422-63 (reapproved 2007)	1	17027710301A	01/27/2017	10:00	Joshua Trost	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-FS-14.1-17-170120 Composite Soil

SGPP - Merrimack

LL Sample # SW 8805651 LL Group # 1758664 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/20/2017 by STJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/26/2017 09:50

Reported: 02/06/2017 10:03

M2004 SDG#: MMK20-04

CAT No.	Analysis Name	CAS Number	As Receiv Result	ved	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Cl	nemistry	ASTM D422-63	% Passing	3	% Passing	% Passing	
		(reapproved 2007)					
07103	75 mm	n.a.	100		0.50	0.50	1
07103	37.5 mm	n.a.	100		0.50	0.50	1
07103	19 mm	n.a.	100		0.50	0.50	1
07103	4.75 mm	n.a.	99.8		0.50	0.50	1
07103	3.35 mm	n.a.	99.5		0.50	0.50	1
07103	2.36 mm	n.a.	99.3		0.50	0.50	1
07103	1.18 mm	n.a.	99.3		0.50	0.50	1
07103	0.6 mm	n.a.	99.1		0.50	0.50	1
07103	0.3 mm	n.a.	96.7		0.50	0.50	1
07103	0.15 mm	n.a.	90.5		0.50	0.50	1
07103	0.075 mm	n.a.	83.0		0.50	0.50	1
07103	0.064 mm	n.a.	77.0		0.50	0.50	1
07103	0.05 mm	n.a.	57.5		0.50	0.50	1
07103	0.02 mm	n.a.	20.0		0.50	0.50	1
07103	0.005 mm	n.a.	2.0		0.50	0.50	1
07103	0.002 mm	n.a.	0.50 U		0.50	0.50	1
07103	0.001 mm	n.a.	0.50 U		0.50	0.50	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
07103	Grain Size to 1 um	ASTM D422-63 (reapproved 2007)	1	17027710301A	01/27/2017	10:00	Joshua Trost	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: SG2-AP09-34-35-170123 Grab Soil

SGPP - Merrimack

LL Sample # SW 8805652 LL Group # 1758664 Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/23/2017 by STJ

C. T. Male Associates
50 Century Hill Drive

Latham NY 12110

Submitted: 01/26/2017 09:50

Reported: 02/06/2017 10:03

M2005 SDG#: MMK20-05

CAT No.	Analysis Name	CAS Number	As Rec Result	eived	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Cl	hemistry	ASTM D422-63	% Pass	ing	% Passing	% Passing	
		(reapproved 2007)					
07103	75 mm	n.a.	100		0.50	0.50	1
07103	37.5 mm	n.a.	100		0.50	0.50	1
07103	19 mm	n.a.	100		0.50	0.50	1
07103	4.75 mm	n.a.	99.9		0.50	0.50	1
07103	3.35 mm	n.a.	99.8		0.50	0.50	1
07103	2.36 mm	n.a.	99.7		0.50	0.50	1
07103	1.18 mm	n.a.	99.6		0.50	0.50	1
07103	0.6 mm	n.a.	98.5		0.50	0.50	1
07103	0.3 mm	n.a.	83.6		0.50	0.50	1
07103	0.15 mm	n.a.	41.0		0.50	0.50	1
07103	0.075 mm	n.a.	17.1		0.50	0.50	1
07103	0.064 mm	n.a.	13.0		0.50	0.50	1
07103	0.05 mm	n.a.	5.5		0.50	0.50	1
07103	0.02 mm	n.a.	0.50	U	0.50	0.50	1
07103	0.005 mm	n.a.	0.50	U	0.50	0.50	1
07103	0.002 mm	n.a.	0.50	U	0.50	0.50	1
07103	0.001 mm	n.a.	0.50	U	0.50	0.50	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
07103	Grain Size to 1 um	ASTM D422-63 (reapproved 2007)	1	17027710301A	01/27/2017	10:00	Joshua Trost	1



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1758664

Reported: 02/06/2017 10:03

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

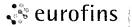
P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

^{*-} Outside of specification

^{**-}This limit was used in the evaluation of the final result for the blank

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



Lancaster Environmental Services Analysis Request/Chain of Custody

(Laboratories Acct. #:	37191		Group	#:	175	5866	,4		Sample #: <u>6805648 = 5</u>						<u>ə</u>				COC#: 16237		
Client: C.T. Male Associates	-					Matrix						Ar	nalyses	Req	uest	ed				For Lab Use Only	
Project Name/#: SGPP - Merrimack	Site ID:											Pi	reserva	tion	Cod	es				SF#: <u>266803</u>	
Project Manager: Kirk Moline	P.O. #:	16.6126			ا ا	ace are														SCR#: <u>199966</u>	<u>3</u>
Sampler: Stephen Johnson 575					Sediment	Ground														Preservat	ion Codes
Phone #: '7/5 5 29 16 70	Quote #:	214135			Sed]	ers			J.)	D422)								H = HCI	T = Thiosulfate
State where sample(s) were collected: NH						be ES		Containers		ගි	7 mod.)	D MI			İ					N = HNO ₃	B = NaOH
	Colle	ction		Composite	V	Potable NPDES		# of	(5310 B)	re (2540 G)	(EPA 537	Size (ASTM								$S = H_2SO_4$ $O = Other$	P = H ₃ PO ₄
Sample Identification	Date	Time	Grab	Com	Soil	Water	Other:	Total	TOC	Moisture	PFCs	Grain								Rem	arks
Sh2-4PO2-25,7-265-170116	1/16/17	Plantage and Park	K		X			-				X									
SLZ-Afoz - 27-28.4-170116	V16/17	· · · · · · · · · · · · · · · · · · ·	V		X			١				×									
SGZ- APOS-5NS-27.6-29.8-170118	418/17	· magazina	555	X	X			r)				X									
362-AP09-FS-141-17-170120	420/17	10kolastatus 19 ⁸		X				1				χ									
562-AP09-34-35-170123	423/17	-	×		X			1				×									
				Δ		:															
Turnaround Time Requested (TAT) (please of (RUSH TAT is subject to Eurofins Lancaster Laboratori	,			Ø	Relin	nquished	by:	,0	Mary Company	, <i>/</i>	Date 2//		Tim. 10.3		Reg	eived (Ab	by:	Philipping and the State of the		Date V12/17	Time 15:05
Date results are needed:	oo approvar	and out on a	900.7		Reli	nquished	þy:				Dațe		Tim	e	Rec	4	2		1	Date	Time
E-mail address to send RUSH results: 🔾 ്നേറി	e a ctm	allicon				itaph.		Majori de la compania de la compania de la compania de la compania de la compania de la compania de la compani		1/2	5/1	7	13.2.								
Data Package Options (please check if require	ed)				Relir	nquished	by:				Date	animikan dakendari	Tim	е	Rec	eived	d by:			Date	Time
Type I (Validation/non-CLP)		TX TRRP	- 13		D. iii				- Alexandr	- Carlon Control	D - 4 -				<u> </u>	_ •	J E		_	Dete	Time -
	Гуре III (Reduced non-CLP)				Reili	nquished	Dy:	and the state of t	arian a		Date		Tim	е	Rec	eivec	а бу:			Date	Time
ype IV (CLP SOW) ASP Type A 🗌 ype VI (Raw Data Only) 🔲 ASP Type B 🗌					Reli	nguished	by:				Date		Tim		Rec	eived	d bv:		-	,Date,	Time
EDD Format: EQuIS	1600 C				/	, J	y -								C		hil			1/26/17	0950
If site-specific QC (MS/MSD/Dup) required, i	ndicate O	° camplo	e and			l No.:			ini Os							occurred to	<u> </u>				
submit triplicate volume.	ndicate Q	o sample:	o anu		UPS	quished b	FedE		15	rrier: Othe	r				Tem	pera	ıture ı	upon i	rece	ipt <u>NA</u>	°C



Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

174021

Group Number(s): 1758664

Client: CT MALE ASSOC

SGPP-MERRIMACK

Delivery and Receipt Information

Delivery Method:

Fed Ex

Arrival Timestamp:

01/26/2017 9:50

Number of Packages:

1

Number of Projects:

1

State/Province of Origin:

<u>NH</u>

Arrival Condition Summary

Shipping Container Sealed:

Yes

Sample IDs on COC match Containers:

Yes

Custody Seal Present:

No

Sample Date/Times match COC:

Yes

Samples Chilled:

No

VOA Vial Headspace ≥ 6mm:

N/A

Paperwork Enclosed:

Yes Yes Total Trip Blank Qty:
Air Quality Samples Present:

No

Samples Intact:
Missing Samples:

No

No

Extra Samples:
Discrepancy in Container Qty on COC:

Nο

Unpacked by Corey Eshleman (3647) at 10:54 on 01/26/2017



Lancaster Laboratories Environmental

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IÚ International Units pg/L picogram/liter kilogram(s) RLReporting Limit kg **TNTC** liter(s) Too Numerous To Count lb. pound(s) microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Appendix F

Boring Logs

LOG OF BORING AP02 Barr Engineering Company 4300 MarketPointe Drive Suite 200 Minneapolis, MN 55435 BARR Telephone: 952-832-2600 SHEET 1 OF 2 Project:SGPP - Merrimack MVD 4/5 Surface Elevation:119.1 ft Project No.:32421001.01 NH2 002 Drilling Method: Hand Auger/Geoprobe Location: Merrimack, NH Sampling Method: Hand Auger/Direct Push Coordinates: UTM 19N N:297047.6m, E:4749425.9m Datum:H:NAD83, V:NAVD88 Completion Depth:30.0 ft Elevation, feet Sample Type & Recovery Graphic Log Depth, feet Sample No. **ENVIRONMENTAL** LITHOLOGIC DESCRIPTION DATA Dark brown TOPSOIL; trace fine to coarse Gravel; with roots and leaves. Pale yellow fine SAND; trace Silt; moist. G/S/F:0%/ 98%/ 2% 117.5 2.5 SG2-AP02 D/O/S:None/ None/ None O'IGINTIPROJECTS\32421001 PFOA FATE AND TRANSPORTISGPP_MERRIMACK_LONGA_20170206.GPJ_BARRLIBRARY - SGPP_GLB_ENVIRO_LOG_BARR_TEMPLATE.GDT 115.0 5.0 **PID:**0.0 D/O/S:None/ None/ None 112.5 AP02 -7-8-170116 7.5 **PID:**0.0 D/O/S:None/ None/ None 110.0 10.0-PID:0.0 D/O/S:None/ None/ None 107.5 SG2-170116 12.5 PID:0.0 105.0· D/O/S:None/ None/ None 15.0-

-20.0 Late Boring Started:

17.5-

Drill Rig:

1/16/17

PID:0.0 D/O/S:None/ None/ None

G/S/F:0%/ 95%/ 5% PID:0.0 D/O/S:None/ None/ None

Date Boring Completed: 1/16/17 Logged By:

Stephen Johnson

Drilling Contractor: Cascade

SG2-AP02 -17-18-170116

Geoprobe 7822DT

Remarks:

Light gray fine SAND; trace Silt; orange brown mottling throughout; moist.

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines Additional data may have been collected in the field which is not included on this log

102.5

100.0

Barr Engineering Company 4300 MarketPointe Drive Suite 200 Minneapolis, MN 55435 Telephone: 952-832-2600

LOG OF BORING AP02

SHEET 2 OF 2

Project:SGPP - Merrimack MVD 4/5 Project No.:32421001.01 NH2 002

Location:Merrimack, NH

Coordinates:UTM 19N N:297047.6m, E:4749425.9m

Surface Elevation:119.1 ft

Drilling Method:Hand Auger/Geoprobe Sampling Method:Hand Auger/Direct Push

Completion Depth:30.0 ft

Datu	Datum:H:NAD83, V:NAVD88 Completion Depth:30.0 ft									
ک o Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log		LITHOLOGIC DESCRIPTION	Elevation, feet			
7 7		SG2- AP02 -20-21.5 -170116	G/S/F:0%/ 95%/ 5% PID:0.0 D/O/S:None/ None/ None		Light gray fine SANI At 21.5 feet, saturat	D; trace Silt; orange brown mottling throughout; moist. (continued) ed.	97.5-			
BARR TEMPLATE GD 0 92	-		PID:0.0 D/O/S:None/ None/ None G/S/F:100%/ 0%/ 0%/	000	Light gray fine GRA\	/EL; saturated.	95.0-			
SPP GLB ENVIRO LOG		SG2- AP02- 25.7-26.5 -170116 SG2- AP02- 27-28.4 -170116	G/S/F:0%/ 75%/ 25% PID:0.2 D/O/S:None/ None/ None G/S/F:5%/ 90%/ 5%			SAND; trace to some (25%) Silt; occasional lens of increased (little) Silt; saturated. se SAND; trace fine Gravel and Silt; saturated.	92.5-			
0.00 BARKLIBRARY - SI			PID:0.5 D/O/S:None/ None/ None		End of boring 30.0 fo	eet	90.0-			
RIMACK_LONGA_201702 201702 201702 201702 201702 201702	- - ;- -									
ANSPORTISGPP_MER 32.00	 - -									
01 PFOA FATE AND 187	 - - - -									
O:/GINJ/PROJECTS/324210 -40.0 Date Logg Drillin	PID.0.5 PID.0.									

LOG OF BORING AP05 Barr Engineering Company 4300 MarketPointe Drive Suite 200 Minneapolis, MN 55435 BARR MILITINE PROPERTY SERVICE PROPERTY SHEET 1 OF 2 Surface Elevation:116.0 ft Project:SGPP - Merrimack MVD 4/5 Project No.:32421001.01 NH2 002 Drilling Method: Hand Auger/Geoprobe Location: Merrimack, NH Sampling Method: Hand Auger/Direct Push Coordinates: UTM 19N N:297163.9m, E:4749628.6m Datum:H:NAD83, V:NAVD88 Completion Depth:30.0 ft feet Sample Type & Recovery Graphic Log feet Š Elevation, Sample ! **ENVIRONMENTAL** Depth, LITHOLOGIC DESCRIPTION DATA -0.0 Dark brown TOPSOIL; with roots and leaves; moist. 115.0 1.1/ 2 3 1/2 2.5 JECTS\32421001 PFOA FATE AND TRANSPORT\SGPP_MERRIMACK_LONGA_20170206.GPU BARRLIBRARY - SGPP.GLB ENVIRO LOG BARR TEMPLATE.GD1 Very pale brown fine SAND; little Silt; trace Clay; with small roots and organic silt; dry. G/S/F:0%/ 85%/ 15% 112.5 5.0 110.0 PID:0.0 D/O/S:None/ None/ None AP05 -7-8-170118 7.5 107.5 D/O/S:None/ None/ None 10.0-Pale yellow fine SAND; trace Silt and Clay; dry. G/S/F:0%/ 98%/ 2% Pale yellow fine SAND; little Silt; trace Clay; orange brown mottling throughout; moist. G/S/F:0%/ 85%/ 15% 105.0 SG2-AP05 PID:0.0 D/O/S:None/ None/ None 12.5 102.5 PID:0.0 Pale yellow fine SAND; trace Silt and Clay; moist. D/O/S:None/ None/ None G/S/F:0%/ 98%/ 2% 15.0-Very pale brown fine SAND; little Silt; trace Clay; with small roots; moist. G/S/F:0%/ 85%/ 15% 1 **PID:**0.0 100.0 Light gray fine SAND; trace Clay; moist. D/O/S:None/ None/ None G/S/F:0%/ 98%/ 2% At 16 feet, saturated. 17.5-Light gray fine GRAVEL; little fine to medium Sand; red discoloration due to iron oxidation; saturated. G/S/F:85%/ 15%/ 0% 97.5 Light gray fine SAND; trace Clay; laminated; saturated. G/S/F:0%/ 98%/ 2% PID:0.0 D/O/S:None/ None/ None Light gray fine GRAVEL; little fine to medium Sand; saturated. G/S/F:85%/ 15%/ 0% Date Boring Started: 1/18/17 Remarks: Date Boring Completed: 1/18/17 O:\GINT\PRO Logged By: Stephen Johnson

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines

Additional data may have been collected in the field which is not included on this log

Drilling Contractor:

Drill Rig:

Cascade

Geoprobe 7822DT

Barr Engineering Company 4300 MarketPointe Drive Suite 200 Minneapolis, MN 55435 Telephone: 952-832-2600 Project:SGPP - Merrimack MVD 4/5 Project No.:32421001.01 NH2 002 Location:Merrimack, NH Coordinates:UTM 19N N:297163.9m, E:4749628.6m

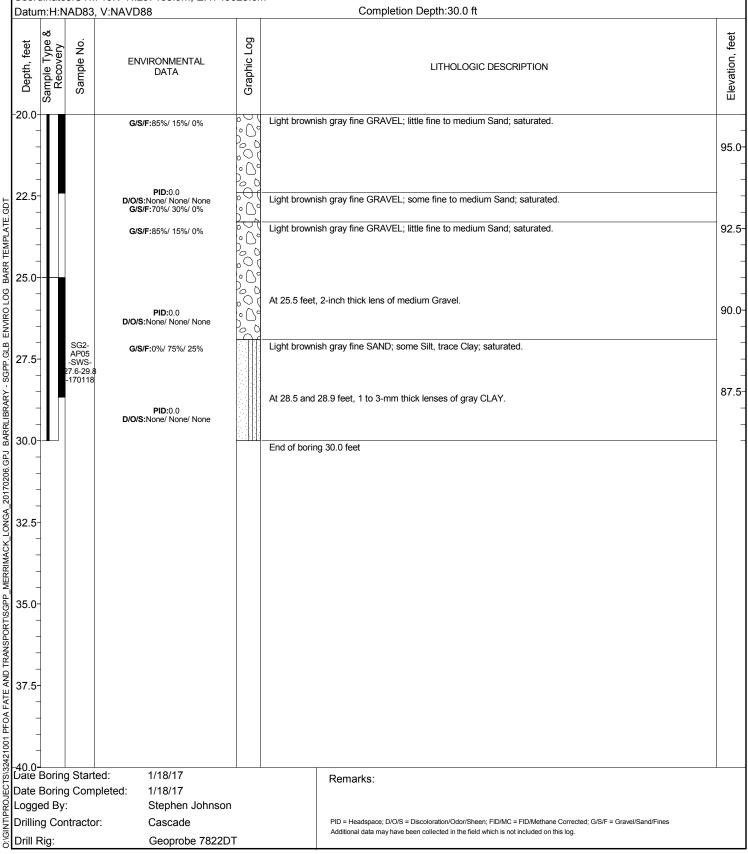


SHEET 2 OF 2

Surface Elevation:116.0 ft

Drilling Method:Hand Auger/Geoprobe

Sampling Method: Hand Auger/Direct Push



LOG OF BORING AP06 Barr Engineering Company 4300 MarketPointe Drive Suite 200 Minneapolis, MN 55435 BARR Millineapons, Mil 50 152 Telephone: 952-832-2600 SHEET 1 OF 1 Project:SGPP - Merrimack MVD 4/5 Surface Elevation:116.2 ft Project No.:32421001.01 NH2 002 Drilling Method:Geoprobe Location: Merrimack, NH Sampling Method:Direct Push Coordinates: UTM 19N N:297140.6m, E:4749674.6m Datum:H:NAD83, V:NAVD88 Completion Depth:15.0 ft Elevation, feet Sample Type & Recovery Graphic Log feet Sample No Depth, 1 **ENVIRONMENTAL** LITHOLOGIC DESCRIPTION DATA 0.0 Dark brown TOPSOIL; with roots, leaves and wood; moist. 1/2. 1.1/ 115.0 12 3 **PID:**0.0 SG2-AP06-2.5-4.5-170118 D/O/S:None/ None/ None <u>V./.</u> O'IGINTIPROJECTS\32421001 PFOA FATE AND TRANSPORT\SGPP_MERRIMACK_LONGA_20170206.GPJ BARRLIBRARY - SGPP.GLB ENVIRO LOG BARR TEMPLATE.GDT Pale yellow fine SAND; trace Silt and Clay; brown and black mottling throughout; dry. G/S/F:0%/ 95%/ 5% 112.5 PID:0.0 D/O/S:None/ None/ None 5.0 SG2-AP06 110.0 PID:0.0 D/O/S:None/ None/ None 7.5 107.5 PID:0.0 D/O/S:None/ None/ None 10.0-Gray fine SAND; trace Silt and Clay; moist. G/S/F:0%/ 98%/ 2% Ī At 10.8 feet, saturated. 105.0 **PID:**0.0 D/O/S:None/ None/ None 12.5 At 12.6 feet, lens of increased (15%) coarse Sand. Light brown fine GRAVEL; little medium to coarse Sand; trace fine Sand and Silt; saturated. G/S/F:83%/ 15%/ 2% 102.5 At 13.6 feet, 1-inch thick lens of fine Sand. PID:0.0 D/O/S:None/ None/ None G/S/F:0%/ 98%/ 2% Light brown fine SAND; trace Silt and Clay; saturated. Light brown fine GRAVEL; little medium to coarse Sand; trace fine Sand and Silt; saturated. 15.0· G/S/F:83%/ 15%/ 2% End of boring 15.0 feet 17.5-

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines

Additional data may have been collected in the field which is not included on this log

Date Boring Started:

Drilling Contractor:

Logged By:

Drill Rig:

Date Boring Completed:

1/18/17

1/18/17

Cascade

Stephen Johnson

Geoprobe 7822DT

LOG OF BORING AP09 Barr Engineering Company 4300 MarketPointe Drive Suite 200 Minneapolis, MN 55435 BARR Telephone: 952-832-2600 SHEET 1 OF 2 Project:SGPP - Merrimack MVD 4/5 Surface Elevation:137.6 ft Project No.:32421001.01 NH2 002 Drilling Method: Hand Auger/Geoprobe Location: Merrimack, NH Sampling Method: Hand Auger/Direct Push Coordinates: UTM 19N N:297336.9m, E:4750058.2m Datum:H:NAD83, V:NAVD88 Completion Depth:35.0 ft feet Sample Type 8 Recovery Graphic Log feet Š Elevation, Sample ! **ENVIRONMENTAL** Depth, LITHOLOGIC DESCRIPTION DATA -0.0 137.5 Dark brown TOPSOIL. From 0.7 to 0.8 feet, ASPHALT. G/S/F:15%/ 70%/ 15% Very pale brown medium to coarse SAND; little fine Gravel and fine Sand; trace coarse Gravel, Clay and Cobbles; reworked fill sand; moist. 0 SG2 AP09 -2.5-3-Ö 2.5 135.0 **PID:**1.9 JECTS/32421001 PFOA FATE AND TRANSPORT/SGPP MERRIMACK LONGA 20170206.GPJ BARRLIBRARY - SGPP.GLB ENVIRO LOG BARR TEMPLATE.GDT C 170120 D/O/S:None/ None/ None o. 0 C 5.0 132.5 o. SG2-AP09 At 5.6 feet, 0.5-inch diameter pieces of clay. 0 C PID:2.0 D/O/S:None/ None/ None 7.5 130.0 Ö At 7.9 feet, wood pieces. Pinkish gray SILT; trace fine Sand and Clay; laminated in 1 to 3-mm layers; moist. V G/S/F:0%/ 2%/ 98% At 9 feet, saturated. PID:1.5 D/O/S:None/ None/ None At 9.5 feet, 1-inch thick lens of fine SAND; trace Silt. 10.0-127.5 BLIND DRILLED. Light gray SILT; trace fine Sand and Clay; laminated in 1 to 3-mm layers; saturated. G/S/F:0%/ 2%/ 98% 12.5 125.0 G/S/F:0%/ 90%/ 10% Light gray fine SAND; little clay; orange mottling present at 1-mm thick seams of coarse Sand; saturated. PID:2.1 D/O/S:None/ None/ None G/S/F:0%/ 2%/ 98% Light gray SILT; trace fine Sand and Clay; laminated in 1 to 3-mm layers; saturated. SG2-P09-FS 14.1-17 170120 Light gray fine SAND; trace Silt and Clay; loose; saturated. G/S/F:0%/ 98%/ 2% At 14.5 feet, 2-inch thick lens of SILT. 15.0· 122.5 **PID:**1.4 Light gray SILT; trace fine Sand and Clay; saturated. D/O/S:None/ None/ None G/S/F:0%/ 2%/ 98% From 16 to 16.3 feet, occasional 3-mm thick lenses of fine SAND. Light gray fine SAND; trace Silt and Clay; saturated. G/S/F:0%/ 98%/ 2% BLIND DRILLED. 17.5-120.0

Date Boring Started: Date Boring Completed:

Logged By:

Drill Rig:

1/20/17

1/23/17

Drilling Contractor:

O:\GINT\PRO

Stephen Johnson

Cascade

Geoprobe 7822DT

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines Additional data may have been collected in the field which is not included on this log

Barr Engineering Company 4300 MarketPointe Drive Suite 200 Minneapolis, MN 55435 Telephone: 952-832-2600

LOG OF BORING AP09

SHEET 2 OF 2

Project:SGPP - Merrimack MVD 4/5 Project No.:32421001.01 NH2 002

Location:Merrimack, NH

Coordinates:UTM 19N N:297336.9m, E:4750058.2m

Datum:H:NAD83, V:NAVD88

Surface Elevation:137.6 ft

Drilling Method:Hand Auger/Geoprobe Sampling Method:Hand Auger/Direct Push

Completion Depth:35.0 ft

Datum:H:NA	D83, V:NAVD88		Completion Depth:35.0 ft						
vi	Sample Type Recovery								
-20.0	G/S/F :0%/ 98%/ 2% PID :0.5 D/O/S: None/ None/ None	At 20.4 feet From 20.7 to	ne SAND; trace Silt and Clay; saturated. , 2-inch thick lens of light brownish gray CLAY. o 21.0 feet, red discoloration due to iron oxidation. o 23.1 feet, red discoloration due to iron oxidation.	117.5i - - - - 115.0i					
	G/S/F:0%/ 80%/ 20% PID:0.5 D/O/S:None/ None/ None	At 23.6 feet	ne SAND; little Silt; trace Clay; saturated. , 0.25-inch thick lens of light brownish gray CLAY. , 1-inch thick lens of light brownish gray CLAY.						
	G/S/F:0%/ 98%/ 2% G/S/F:0%/ 80%/ 20% PID:0.9 D/O/S:None/ None/ None	Light gray fil Light gray fil At 26.4 feet	, 2-inch thick lens of light brownish gray CLAY. ne SAND; trace Silt; saturated. ne SAND; little Silt; trace Clay; loose; saturated. , 4-inch thick lens of SILT; little fine Sand. , 2-inch thick lens of light brownish gray CLAY; firm.	112.5					
27.5- - - - - - - - - - - - - - - - - - -	G/S/F:0%/ 98%/ 2% G/S/F:0%/ 80%/ 20% PID:0.7 D/O/S:None/ None/ None G/S/F:0%/ 95%/ 5%	At 27.6 and Light gray fi	27.8 feet, 0.25-inch thick lenses of fine SAND. ne SAND; trace Silt; 0.25-inch thick lens of CLAY at bottom of unit; saturated. ne SAND; little Silt; trace Clay; saturated. ne SAND; trace Silt; firm; orange mottling occuring throughout as lenses; saturated.	110.0					
25.00 Berkkillerakky 201.001 Programmer 201.001 Pro				105.0					
S S S S S S S S S S S S S S S S S S S	G2- P09- I-35- 0123 G/S/F :0%/ 95%/ 5%	Pale yellow End of borin	fine SAND; little medium Sand; trace Silt; loose; saturated.						
37.5-									
40.0 Date Boring C Logged By:			Remarks:						
Drilling Control	actor: Cascade Geoprobe 7822DT		PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines Additional data may have been collected in the field which is not included on this log.						

Appendix G

Aquifer Profiling and Sampling Data Package

Final Data Package for Waterloo Profiling Services

SITE LOCATION: MERRIMACK, NH

Project ID: 205169222

Report Date: November 10, 2016



This project was performed by Cascade Technical Services for C.T. Male Associates.

Prepared for:

C.T. Male Associates
Kirk Moline
50 Century Hill Drive
Latham, NY 12110
Tel. / 518.786.7400
E-Mail / k.moline@ctmale.com

Prepared by:

Cascade Technical Services
Jessica Bulova
1 Home Farm Way
Montpelier, VT 05602
Tel. / 802.229.2195
E-Mail / jbulova@cascade-env.com



Table of Contents

1. PLOTS OF PHYSIOCHEMICAL AND (I _K) DATA	4
2. PHYSIOCHEMICAL DAILY LOGS	1





Narrative

Cascade Technical Services (Cascade) is pleased to present this data report to C.T. Male Associates for the Waterloo^{APS TM} (APS) services that were provided between the dates of October 17 – November 4, 2016 at your Site in Merrimack, NH.

The results associated with the data and plots presented in this report were generated in accordance to Cascade's Standard Operating Procedures (SOPs) for the APS services.

All APS field work which includes the collection of Index of Hydraulic Conductivity (I_k) data, sample collection, APS equipment calibration, multiparameter sonde calibration and equipment decontamination were completed by trained, scientific professionals and all QA/QC measurements associated with these data were found to be within the tolerances set forth in the SOPs. Exceptions/deviations regarding these data are noted below.

- Location AP01: No samples collected. No I_k data available from 29.55 to 30.50 feet due to an equipment failure. I_k data collected deeper than 87.5 feet below ground surface is questionable due to broken tooling, use data with caution.
- Location AP02: No samples collected.
- Location AP04: No samples collected.

I certify that the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this data package has been authorized by the data manager or her designee, as verified by the following signature.

Signature: Sessice Bulon

Jessica Bulova, Data Manager, Cascade Technical Services



1. PLOTS OF PHYSIOCHEMICAL AND ($I_{\mbox{\scriptsize K}}$) DATA



Total Depth 91.00 ft.

Waterloo APS-DTA ADVANCED PROFILING SYSTEM

Project Name CT Male Merrimack, NH

Client C.T. Male Associates

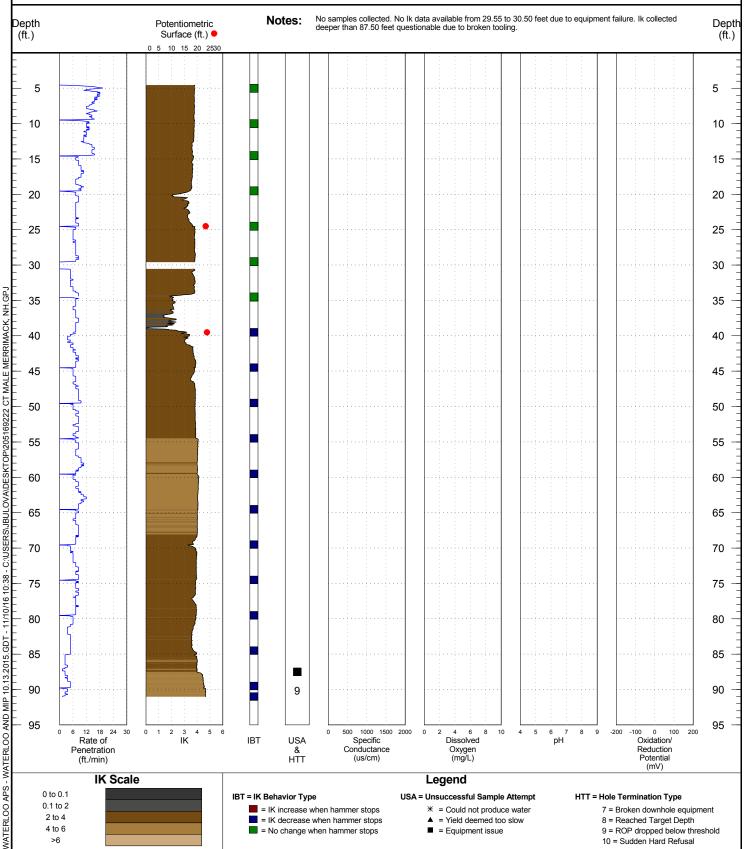
Cascade Project Number 205169222

Project Location Merrimack, NH

Date Completed 11/1/2016

Sampler(s) VLD

Drilling Contractor Cascade



Total Depth 64.90 ft.

Waterloo APS-DTM ADVANCED PROFILING SYSTEM

Project Name CT Male Merrimack, NH

Client C.T. Male Associates

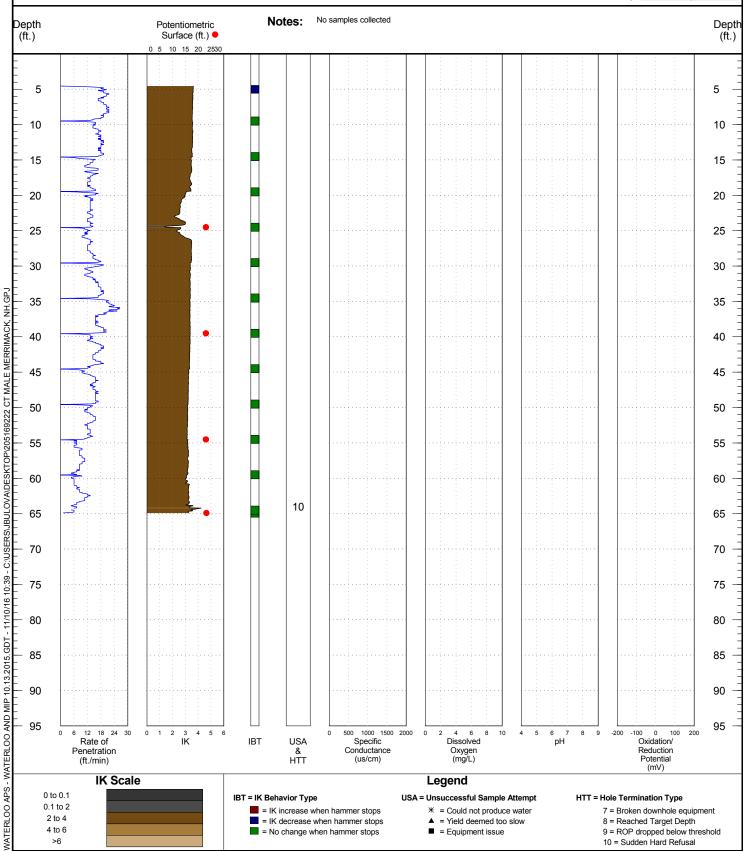
Cascade Project Number 205169222

Project Location Merrimack, NH

Date Completed 11/1/2016

Sampler(s) VLD

Drilling Contractor Cascade



Total Depth 69.40 ft.

Waterloo APS-DTA ADVANCED PROFILING SYSTEM

Project Name CT Male Merrimack, NH

Client C.T. Male Associates

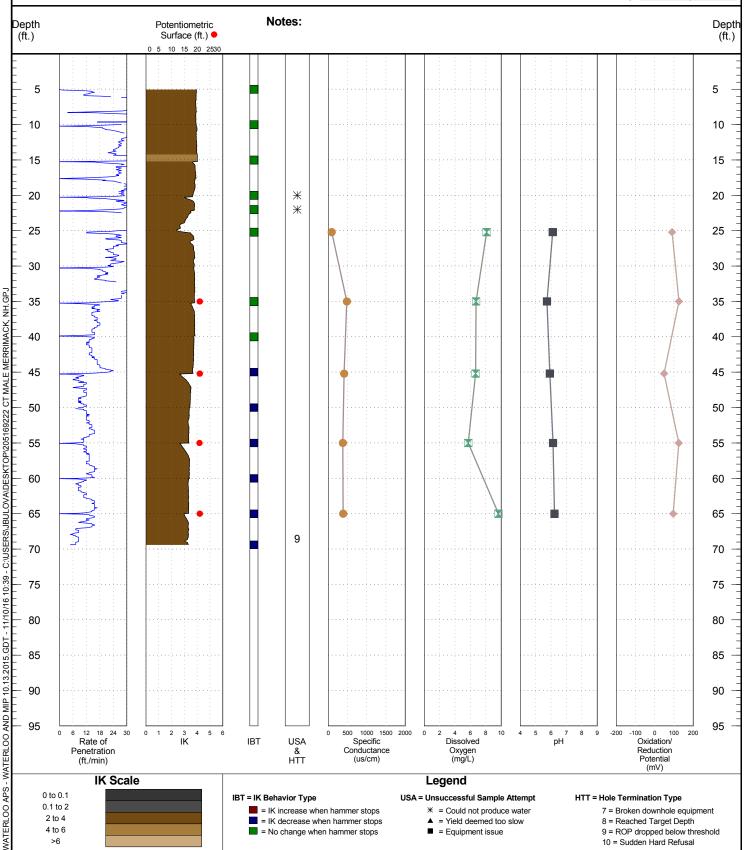
Cascade Project Number 205169222

Project Location Merrimack, NH

Date Completed 10/31/2016

Sampler(s) VLD

Drilling Contractor Cascade



Total Depth 89.15 ft.



Project Name CT Male Merrimack, NH

Client C.T. Male Associates

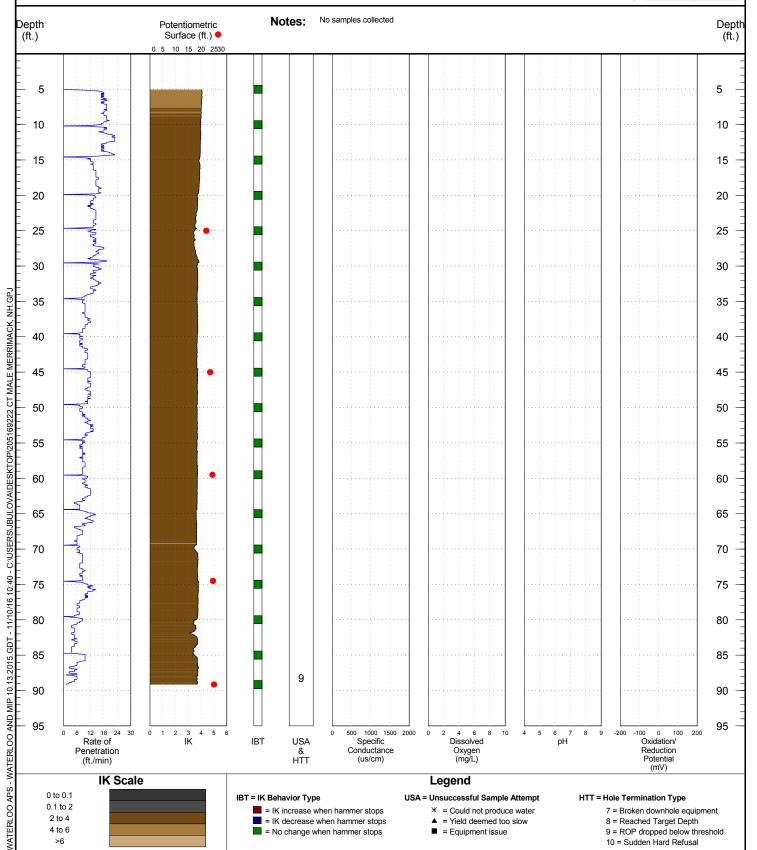
Cascade Project Number 205169222

Project Location Merrimack, NH

Date Completed 11/1/2016

Sampler(s) VLD

Drilling Contractor Cascade



Total Depth 69.10 ft.



Project Name CT Male Merrimack, NH

Client C.T. Male Associates

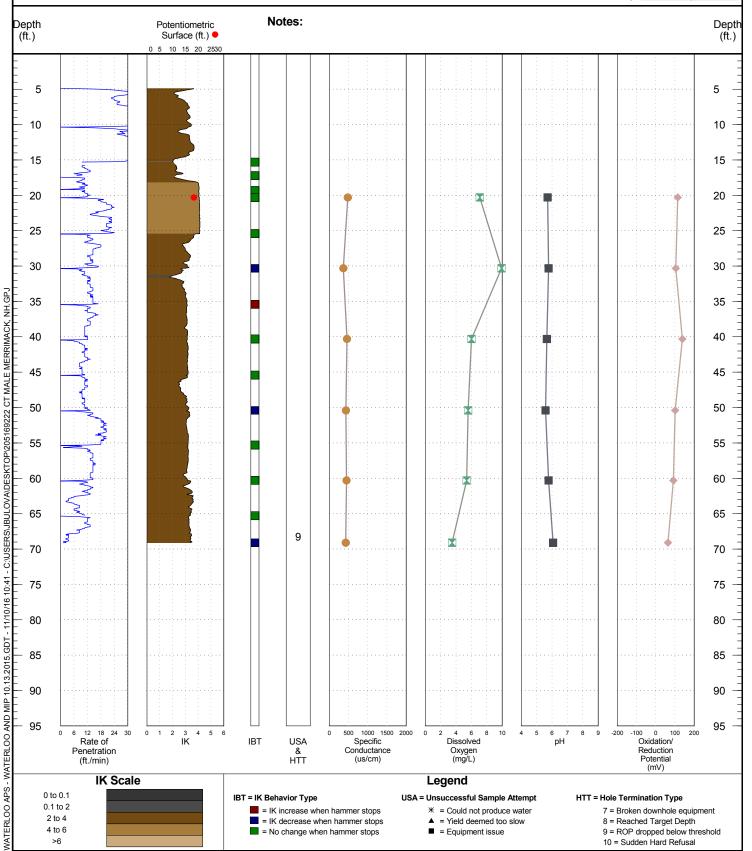
Cascade Project Number 205169222

Project Location Merrimack, NH

Date Completed 10/25/2016

Sampler(s) NFL/EC

Drilling Contractor Cascade



Total Depth 75.65 ft.



Project Name CT Male Merrimack, NH

Client C.T. Male Associates

Cascade Project Number 205169222

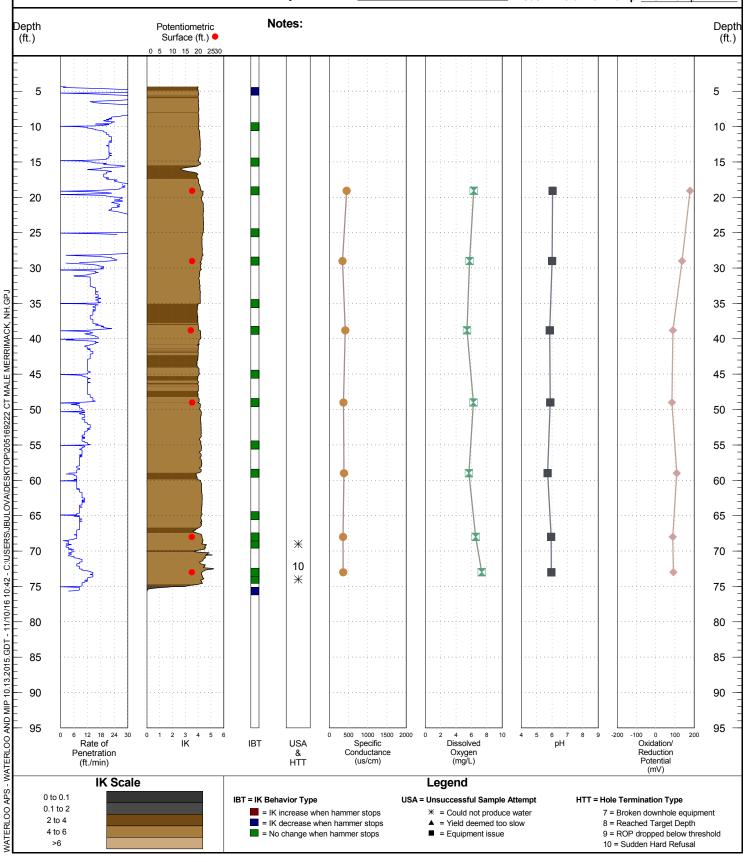
Project Location Merrimack, NH

Date Completed 10/27/2016

Sampler(s) VLD

Drilling Contractor Cascade





Total Depth 85.60 ft.



Project Name CT Male Merrimack, NH

Client C.T. Male Associates

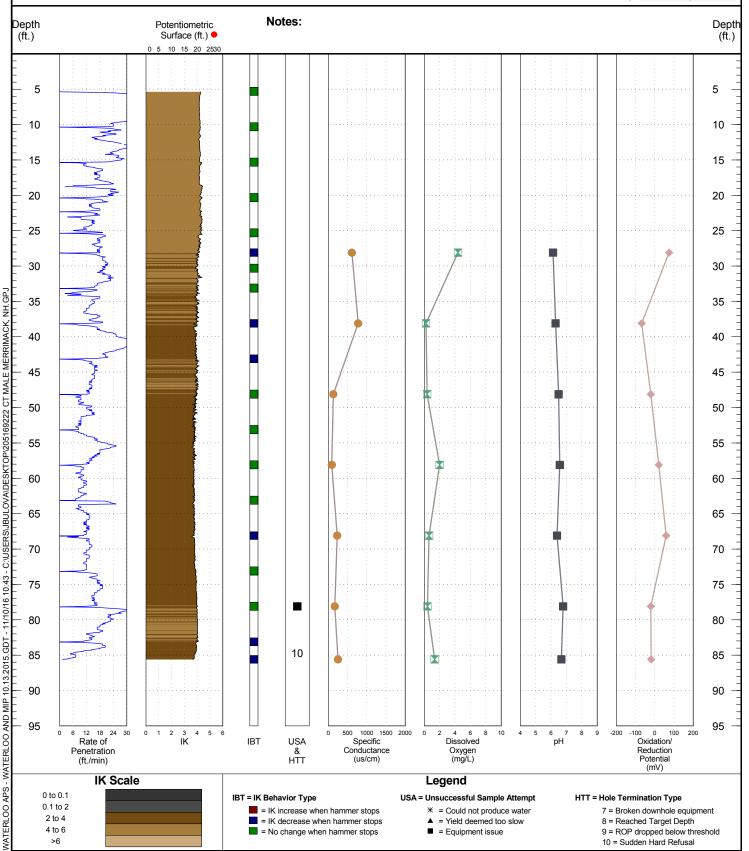
Cascade Project Number 205169222

Project Location Merrimack, NH

Date Completed 10/24/2016

Sampler(s) NFL/EC

Drilling Contractor Cascade



Total Depth 82.00 ft.



Project Name CT Male Merrimack, NH

Client C.T. Male Associates

Cascade Project Number 205169222

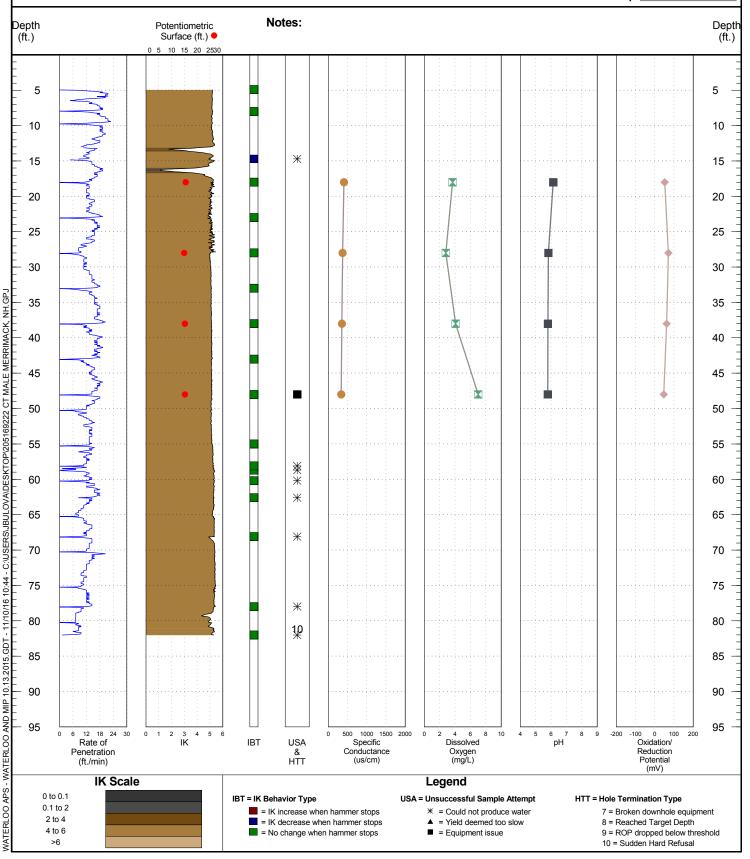
Project Location Merrimack, NH

Date Completed 10/19/2016

Sampler(s) NFL / EC

Drilling Contractor Cascade

Gas Drive or Peri Pump Gas Drive



Total Depth 71.30 ft.



Project Name CT Male Merrimack, NH

Client C.T. Male Associates

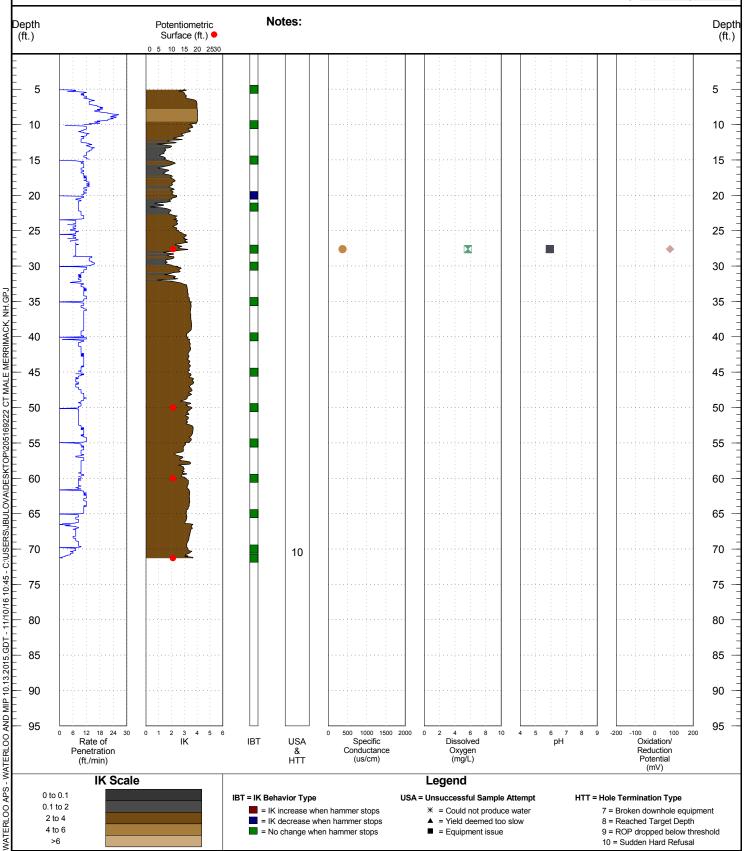
Cascade Project Number 205169222

Project Location Merrimack, NH

Date Completed 11/4/2016

Sampler(s) VLD

Drilling Contractor Cascade



Total Depth 84.45 ft.

Waterloo APS-DTAD ADVANCED PROFILING SYSTEM

Project Name CT Male Merrimack, NH

Client C.T. Male Associates

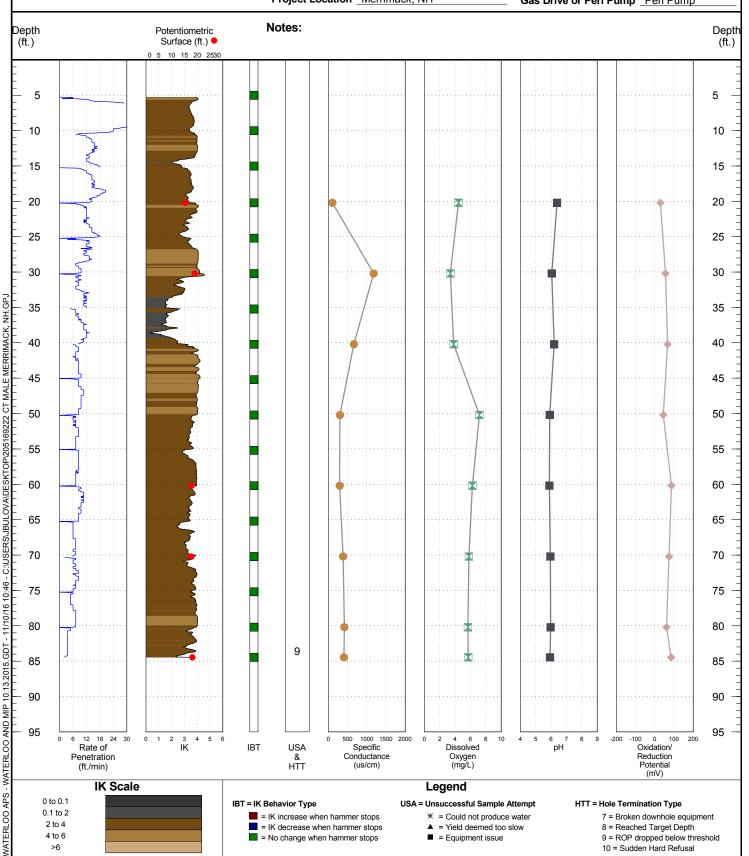
Cascade Project Number 205169222

Project Location Merrimack, NH

Date Completed 11/3/2016

Sampler(s) VLD

Drilling Contractor Cascade





2. PHYSIOCHEMICAL DAILY LOGS



Client:	CT Male			GROUN	DWATER		LOG	Profile Location: AP01
	Started	Completed			CAS DRILLING TEC	CADE CHNICAL SERVICES		
Dates:	11/1/2016	11/1/2016	ı	KPRO Box Serial # / Acquisition Laptop:	800/ Rasc 6			Gas Drive or Peri Pump: Peri Pump
	Merrimack, NH		•	Sonde Serial #:				Atmospheric Pressure: 34.50
SEI#:	205169222			rilling Contractor:	Cascade		KPRO N ₂ Pre	ssure (set via P transducer): 69.97
Sampler(s):	VLD		Average	e Depth to Water:	-23.55		G	sas Drive Pump N ₂ Pressure: NA
				PHYS	ICOCHEMI	CAL PAR	AMETERS	
Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	рН	ORP (mV)	COMMENTS
-24.50			-23.30					
-39.50			-23.80					
-54.50			>25					Cannot collect head greater than 25' bgs
	Upoi	n trip out rod		n 45' below gro	No samples co			ely comprimised due to broken rods.

Client:	GROUNDWATER PROFILE LOG Client: CT Male Profile Location: AP02										
	Started	Completed			CAS(CADE CHNICAL SERVICES					
Dates:	: 11/1/2016	11/1/2016		KPRO Box Serial # / Acquisition Laptop:	800/ Rasc 6			Gas Drive or Peri Pump: Peri Pump			
	Merrimack, NH		-	Sonde Serial #:			•	Atmospheric Pressure: 34.78			
	205169222			Filling Contractor:			KPRO N ₂ Pre	ssure (set via P transducer): 69.81			
Sampler(s):	VLD		Averag	e Depth to Water:	-23.05		. G	as Drive Pump N ₂ Pressure: NA			
				PHYS	SICOCHEMI	CAL PAR	AMETERS				
Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	рН	ORP (mV)	COMMENTS			
-24.50			-23.00								
-24.50			-23.00								
-39.50			-23.00								
-54.50			-23.00								
-64.90			-23.20								
					No samples co	llected per C	Γ Male				

Client: CT Male

CASCADE

Profile Location: AP03

Started Completed

Dates: 10/28/2016 10/31/2016

KPRO Box Serial # /
Acquisition Laptop: 800/ Rasc 6

Gas Drive or Peri Pump: Peri Pump

Location: Merrimack, NH

Sonde Serial #: YSI 4024

Atmospheric Pressure: 35.30

SEI #: 205169222

Drilling Contractor: Cascade

KPRO N₂ Pressure (set via P transducer): 68.56

Sampler(s): VLD Average Depth to Water: -20.98

Gas Drive Pump N₂ Pressure: NA

					SICOCHEMI	CAL PAR	ΔMETERS	· · · · · · · · · · · · · · · · · · ·
Depth	Date / Time	Volume Purged	Head	sc	DO	pH	ORP	COMMENTS
(ft)		(mL)	(ft)	(uS/cm)	(PPM)		(mV)	
-25.20	10/28/16 9:47	500	NC	86	8.10	6.10	90	Turbidity 2.95, head slow to equilibrate
-35.00	10/28/16 12:19	700	-21.00	481	6.73	5.73	126	Turbidity 0.75
-45.20	10/31/16 10:10	700	-21.00	410	6.67	5.92	48	Turbidity 1.08
-55.00	10/31/16 12:53	700	-20.90	376	5.70	6.12	125	Turbidity 3.15
							. = -	
-65.00	10/31/16 16:09	500	-21.00	385	9.64	6.22	96	Turbidity 3.45
	ļ ļ		ļ	ļ	ļ	ļ	ļ	Į

01:	CT Mala			GROUN	DWATER	PROFILE	E LOG Profile Location: AP04				
Client:	CT Male				CAS(CADE					
	Started	Completed				CHNICAL SERVICES					
Dates:	11/1/2016	11/1/2016		KPRO Box Serial # / Acquisition Laptop:	800/ Rasc 6		•	Gas Drive or Peri Pump: Peri Pump			
Location:	Merrimack, NH		•	Sonde Serial #:	YSI 4024		•	Atmospheric Pressure: 34.99			
SEI#:	205169222			rilling Contractor:			KPRO N ₂ Pre	ssure (set via P transducer): 67.83			
Sampler(s):	VLD		Average	e Depth to Water:	-23.90		G	as Drive Pump N ₂ Pressure: NA			
PHYSICOCHEMICAL PARAMETERS											
Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pН	ORP (mV)	COMMENTS			
-25.00			-22.00								
-45.00			-23.50								
-59.50			-24.40								
-74.50			-24.60								
			-25.00								
-89.15			-20.00								
					No samples co	llected per C1	Г Male				

Client: CT Male

CASCADE

Profile Location: AP05

Started Completed

Dates: 10/24/2016 10/25/2016

KPRO Box Serial # /
Acquisition Laptop: 800/Rasc 6

Gas Drive or Peri Pump: Peri Pump

Location: Merrimack, NH

Sonde Serial #: YSI4024

Atmospheric Pressure: 34.88

SEI #: 205169222

Drilling Contractor: Cascade

KPRO N₂ Pressure (set via P transducer): 69.33

Sampler(s): NFL/EC Average Depth to Water: -18.30

Gas Drive Pump N₂ Pressure: NA

		PHYSICOCHEMICAL PARAMETERS Volume										
Depth (ft)	Date / Time	Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	рН	ORP (mV)	COMMENTS				
20.30	10/24/16 16:28	880	-18.30	479	7.08	5.71	114	Turbidity= 1.72				
30.30	10/24/16 17:55	550	NC	363	9.92	5.77	104	Turbidty = 1.92				
-40.30	10/25/16 8:25	1000	NC	458	6.00	5.66	138	MS/MSD; turbidity = 0.38				
-50.40	10/25/16 10:57	1050	NC	430	5.56	5.57	101	Turbidity=0.71				
-60.30	10/25/16 12:34	700	NC	446	5.37	5.77	92	Turbidity = 1.38				
-69.10	10/25/16 14:26	800	NC	425	3.47	6.06	63	Turbidity=113.0				

Client: CT Male

SEI #: 205169222

Sampler(s): VLD

CASCADE

Profile Location: AP06

Started Completed

Dates: 10/26/2016 10/27/2016

Dates: 10/26/2016 10/27/2016

Location: Merrimack, NH

KPRO Box Serial # /
Acquisition Laptop: 800/ Rasc 6

Sonde Serial #: YSI 4024

Gas Drive or Peri Pump: Peri Pump

Atmospheric Pressure: 35.31

Drilling Contractor: Cascade KPRO N₂ Pressure (set via P transducer): 68.2

Average Depth to Water: $\underline{\ \ }$ 17.48 Gas Drive Pump N_2 Pressure: $\underline{\ \ }$ NA

PHYSICOCHEMICAL PARAMETERS											
Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	рН	ORP (mV)	COMMENTS			
-19.07	10/26/16 10:09	700	-17.60	448	6.30	6.03	178	Turbidity Not Collected			
-29.00	10/26/16 11:44	600	-17.60	342	5.76	6.00	137	Turbidity 3.4			
			47.40	440	5 40	5.04		T 4: 10 4 0			
-38.80	10/26/16 13:23	800	-17.10	413	5.42	5.84	89	Turbidity 1.3			
-49.00	10/26/16 15:00	600	-17.60	366	6.24	5.88	84	Turbidity 1.63			
-59.00	10/27/16 9:04	700	NC	379	5.67	5.71	109	Turbidity 2.81. Head slow to equilibrate			
-68.00	10/27/16 11:35	700	-17.50	355	6.55	5.94	88	Turbidity 2.32			
-73.00	10/27/16 13:55	600	-17.50	359	7.33	5.95	92	Turbidity 4.93			
								<u> </u>			
								-			

Client: CT Male

CASCADE

Profile Location:

AP07

Started Completed

Dates: 10/19/2016 10/24/2016

KPRO Box Serial # /
Acquisition Laptop: 800/Rasc6

Gas Drive or Peri Pump: Peri Pump

Location: Merrimack, NH

Sonde Serial #: YSI4024

Atmospheric Pressure: 33.95

KPRO N₂ Pressure (set via P transducer): 70.34

SEI #: 205169222
Sampler(s): NFL/EC

Drilling Contractor: Cascade KF
Average Depth to Water: NC

Gas Drive Pump N₂ Pressure: 60-80

Sampler(s):	NFL/EC		_ Averag	e Depth to Water:	NC		-	Gas Drive Pump N ₂ Pressure: 60-80
				PHYS	SICOCHEMI	CAL PAR	AMETERS	
Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	рН	ORP (mV)	COMMENTS
-28.10	10/20/16 10:41	820	NC	611	4.37	6.12	74	Turbidity= 49.9NTU
-38.10	10/20/16 12:45	1140	NC	775	0.21	6.29	-68	Turbidty= 80.7
-48.10	10/20/16 14:29	890	NC	128	0.36	6.49	-21	Turbidity= 52.8
-58.10	10/20/16 16:20	930	NC	88	1.98	6.56	21	Turbidity= 60.3
-58.1A	10/21/16 9:10	760	NC	69	2.66	6.89	43	Turbidity= 83
-68.10	10/21/16 10:55	1130	NC	228	0.61	6.39	59	Turbidity= 12.3
-78.10	10/21/16 17:28	920	NC	166	0.39	6.78	-21	Turbidity= 73.2
-85.60	10/24/16 10:33	700	NC	249	1.34	6.67	-19	Turbidity = 100.5

Client: CT Male

Sampler(s): NFL / EC

CASCADE

AP08 **Profile Location:**

Completed

Dates: 10/17/2016 10/19/2016

Location: Merrimack, NH CTS #: 205169222

KPRO Box Serial # / Acquisition Laptop: 800/Rasc 6

Sonde Serial #: YSI 4024

Drilling Contractor: Cascade Average Depth to Water: -15.20

Gas Drive or Peri Pump: Gas Drive

Atmospheric Pressure: 34.53

KPRO N₂ Pressure (set via P transducer): 68.81

Gas Drive Pump N₂ Pressure: 60-80

					SICOCHEMI	CAL PAR	AMETERS	
Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	рН	ORP (mV)	COMMENTS
-18.00	10/17/16 15:41	760	-15.50	406	3.67	6.14	52	
-28.00	10/18/16 7:58	845	-14.90	370	2.79	5.82	71	
-38.00	10/18/16 11:20	980	-15.20	352	4.07	5.79	62	
-48.00	10/18/16 15:25	600	-15.20	334	7.00	5.78	47	
			L		ļ	<u> </u>	ļ	

GROUNDWATER PROFILE LOG Client: CT Male **Profile Location:** AP09 **CASCADE** Completed KPRO Box Serial # / Dates: 11/4/2016 11/4/2016 Acquisition Laptop: 800/Rasc6 Gas Drive or Peri Pump: Peri Pump Location: Merrimack, NH Troll Serial #: YSI 4024 Atmospheric Pressure: 34.62 KPRO N₂ Pressure (set via P transducer): 68.94 SEI #: 205169222 Drilling Contractor: Cascade Sampler(s): VLD Average Depth to Water: -10.50 Gas Drive Pump N₂ Pressure: NA PHYSICOCHEMICAL PARAMETERS Date / Time COMMENTS Depth Purged Head DO рΗ (mL) (PPM) (ft) (ft) (uS/cm) (mV) -27.60 11/4/16 9:47 800 -10.50 368 5.67 5.92 79 Turbidity 1.2 -50.00 -10.50 -60.00 -10.50 -71.28 -10.50

Client: CT Male

CASCADE

Completed

Dates: 11/2/2016 11/3/2016

Location: Merrimack, NH SEI #: 205169222 Sampler(s): VLD

KPRO Box Serial # / Acquisition Laptop: 800/ Rasc 6

Sonde Serial #: YSI 4024

Atmospheric Pressure: 34.67 KPRO N₂ Pressure (set via P transducer): 70.52

Drilling Contractor: Cascade Average Depth to Water: -17.52

Gas Drive Pump N₂ Pressure: NA

Gas Drive or Peri Pump: Peri Pump

Profile Location:

AP10

				PHYS	ICOCHEMI	CAL PARA	AMFTERS	
Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pН	ORP (mV)	COMMENTS
-20.20	11/2/16 9:53	900	-15.20	104	4.43	6.39	29	Turbidity 9.47
-30.20	11/2/16 12:09	800	-19.00	1178	3.37	6.04	56	Turbidity 0.54
-40.20	11/2/16 14:33	700	NC	664	3.82	6.20	67	Turbidity 1.5
-50.20	11/3/16 7:51	600	NC	300	7.17	5.91	44	Turbidity 0.85
-60.20	11/3/16 9:55	700	-17.80	293	6.25	5.89	87	Turbidity 1.33
00.20	1 170, 10 0.00			200	0.20	0.00		Table 19
-70.20	11/3/16 12:02	700	-17.50	382	5.80	5.95	74	Turbidity 0.49
-80.20	11/3/16 14:18	700	NC	416	5.66	5.97	61	Turbidity 1.43
-84.46	44/2/46 46:24	600	-18.10	404	5.70	5.93	85	Turbidity 1.58
-04.40	11/3/16 16:31	600	-16.10	404	5.70	5.93	05	Turbidity 1.56

