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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 jgreer@barr.com if you have any questions.

Sincerely,

Digitally signed by John C. Greer
DN: cn=John C. Greer, o=Barr Engineering Co., ou, email=jgreer@barr.com, c=US
Date: 2017.03.27 15:29:49 -05'00'

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

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MVD Supply Wells 4 and 5 Investigation

March 2017

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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.

Digitally signed by John C. Greer
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Adobe Acrobat version: 11.0.19

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PG #: 00737

March 27, 2017
Date

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
    - Highest PFOS concentration: 11 ppt on 5/5/2016
    - 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
    - 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:

- Aquifer 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 (AP01 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 Studio^{TM} (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 $gm/m^2/year*10^{-6}$ 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/m^2/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 $gm/m^2/year*10^{-6}$ 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

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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
Nitrogen, Nitrate + Nitrite, as N	E353.2
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
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 (0.15 mm)	D422
Hydrometer Diameter (0.3 mm)	D422
Hydrometer Diameter (0.6 mm)	D422
Hydrometer Diameter (1.18 mm)	D422
Hydrometer Diameter (19 mm)	D422
Hydrometer Diameter (2.36 mm)	D422
Hydrometer Diameter (3.35 mm)	D422
Hydrometer Diameter (37.5 mm)	D422
Hydrometer Diameter (4.75 mm)	D422
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
Perfluorooctane 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

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
AP01	296973.1	4749447.4	136.1	23.3	36.6	Groundwater	45	46	91.1	90.1	Geoprobe
							55	56	81.1	80.1	
							65	66	71.1	70.1	
							75	76	61.1	60.1	
							79	80	57.1	56.1	
AP02	297047.6	4749425.9	119.1	23.0	23.0	Soil Chemistry	3	5	116.1	114.1	Geoprobe
							7	8	112.1	111.1	
							12	13	107.1	106.1	
							17	18	102.1	101.1	
							20	21.5	99.1	97.6	
						Soil Grain Size	25.7	26.5	93.4	92.6	
							27	28.4	92.1	90.7	
						Groundwater	24	25	95.1	94.1	
							34	35	85.1	84.1	
							44	45	75.1	74.1	
							54	55	65.1	64.1	
							64	65	55.1	54.1	
AP03	297102.7	4749368.5	119.9	21.0	24.0	Groundwater	25	25	94.9	94.9	Waterloo[APS]
							35	35	84.9	84.9	
							35	35	84.9	84.9	
							55	55	64.9	64.9	
							65	65	54.9	54.9	
							68	69	51.9	50.9	Geoprobe
AP04	297056.9	4749261.4	119.6	22.0	23.1	Groundwater	27	28	92.6	91.6	Geoprobe
							34	35	85.6	84.6	
							44	45	75.6	74.6	
							54	55	65.6	64.6	
							64	65	55.6	54.6	
							74	75	45.6	44.6	
							83.5	84.5	36.1	35.1	
AP05	297163.9	4749628.6	116.0	18.3	16.0	Soil Chemistry	2	3	114.0	113.0	Geoprobe
							7	8	109.0	108.0	
							11.5	14.5	104.5	101.5	
						Soil Grain Size	27.6	29.8	88.4	86.2	
						Groundwater	21	21	95.0	95.0	Waterloo[APS]
							31	31	85.0	85.0	
							41	41	75.0	75.0	
							51	51	65.0	65.0	
							61	61	55.0	55.0	
							69	69	47.0	47.0	
AP06	297140.6	4749674.6	116.2	17.6	10.8	Soil	2.5	4.5	113.7	111.7	Geoprobe
							6	8	110.2	108.2	
						Groundwater	19	19	97.2	97.2	Waterloo[APS]
							29	29	87.2	87.2	
							39	39	77.2	77.2	
							49	49	67.2	67.2	
							59	59	57.2	57.2	
							68	68	48.2	48.2	
							73	73	43.2	43.2	

Table 2
Aquifer Profiling Summary
MVD-4/5 Investigation

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
AP07	297182.1	4750227.9	164.2	25.6	NM	Groundwater	28	28	136.2	136.2	Waterloo[APS]
							38	38	126.2	126.2	
							48	48	116.2	116.2	
							58	58	106.2	106.2	
							68	68	96.2	96.2	
							78	78	86.2	86.2	
							85	85	79.2	79.2	
AP08	297264.8	4750145.2	145.7	15.5	14.9	Groundwater	18	18	127.7	127.7	Waterloo[APS]
							28	28	117.7	117.7	
							38	38	107.7	107.7	
							48	48	97.7	97.7	
							57	58	88.7	87.7	Geoprobe
							67	68	78.7	77.7	
							77	78	68.7	67.7	
							81	82	64.7	63.7	
AP09	297336.9	4750058.2	137.6	10.5	10.3	Soil Chemistry	2.5	3	135.1	134.6	Geoprobe
							6	8	131.6	129.6	
						Soil Grain Size	14.1	17	123.5	120.6	
							34	35	103.6	102.6	
						Groundwater	11	12	126.6	125.6	
							17	18	120.6	119.6	
							28	28	109.6	109.6	Waterloo[APS]
							35	36	102.6	101.6	Geoprobe
							47	48	90.6	89.6	
							56	57	81.6	80.6	
							65	66	72.6	71.6	
							70	71	67.6	66.6	
AP10	297376.9	4749936.4	125.6	15.2	NM	Groundwater	20	20	105.6	105.6	Waterloo[APS]
							30	30	95.6	95.6	
							40	40	85.6	85.6	
							50	50	75.6	75.6	
							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	

[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

Monitoring Location Type	Location	Easting (UTM19N)	Northing (UTM19N)	Ground Surface Elevation[1] (ft NAVD88)	Reference Elevation[1] (ft NAVD88)	Top of Well Screen (ft bgs)	Bottom of Well Screen (ft bgs)	Top of Well Screen Elevation (ft NAVD88)	Bottom of Well Screen Elevation (ft NAVD88)	Total Depth (ft below Reference)	Depth To Water (ft bgs)			Water Table Elevation (ft NAVD88)		
										Nov 2016	10/31/2016	11/7/2016	11/23/2016	10/31/2016	11/7/2016	11/23/2016
Longa Monitoring Well	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
	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
	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
	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 Well	MVD-4	297129.52	4749648.93	115.9[2]	--	43	53	72.9	62.9	--	--	--	--	--	--	--
	MVD-5	297064.53	4749582.18	120.3[2]	--	50	65	70.3	55.3	--	--	--	--	--	--	--
MVD Monitoring Well	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
	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
	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
	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
Surface Water Location	SWUp_Baboosic	296319.62	4750036.64	--	160.94	--	--	--	--	--	ND	ND	ND	ND	ND	ND
	SWMid_Baboosic	296672.74	4749144.22	--	102.47	--	--	--	--	--	ND	ND	ND	ND	ND	ND
	SWDn_Baboosic	296504.18	4748647.67	--	92.45	--	--	--	--	--	ND	0.19	ND	ND	92.26	ND
	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.

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

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

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

Table 4
Groundwater and Surface Water Data
Wells MVD-4/5 Investigation

			Location	AP01	AP01	AP01	AP01	AP01	AP02	AP02	AP02	AP02	AP02	AP03	AP03		AP03	AP03	AP03	AP03	AP03	AP04	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	1/16/2017	1/17/2017	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	FD	N	N	N
Parameter	Total or Dissolved	Units	Comparison Criteria																									
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	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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	--	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	--	1 j	1 j	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	--	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

Table 4
Groundwater and Surface Water Data
Wells MVD-4/5 Investigation

Parameter	Total or Dissolved	Units	Comparison Criteria	Location	AP04	AP04	AP04	AP04	AP05	AP05	AP05	AP05	AP05	AP05	AP06	AP06	AP06	AP06	AP06	AP06	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
Exceedance Key			**Bold**																						
General Parameters																									
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	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	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	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
Metals																									
Calcium	Dissolved	mg/l			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Magnesium	Dissolved	mg/l			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Potassium	Dissolved	mg/l			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sodium	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
Magnesium	Total	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
Potassium	Total	mg/l			5.87	3.88	4.22	11.2	2.13	2.71	3.00	2.94	2.84	4.13	2.19	2.06	2.49	2.54	2.82 b	2.28 b	2.62 b	3.12	4.98	2.53	3.19
Sodium	Total	mg/l			54.6	45.9	64.3	67.1	64.9	49.4	59.3	60.0	62.9	49.5	64.3	47.0	52.8	47.9	48.7 b	47.3 b	48.0 b	104	72.3	28.1	31.8
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
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	< 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
Bromodichloromethane	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	ug/l			< 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	< 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
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
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	< 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																									
Perfluorooctane sulfonate (PFOS)	NA	ng/l			4 j	3 j	--	< 6	2 j	5 j	10	10 *	9	6	< 10	12	7 j	7 j	6 j	< 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 j	5 j	--	3 j	8 jb*	7 jb*	9 jb*	8 jb*	6 jb*	7 jb*	4 j	4 j	5 j	4 j	4 j	4 j	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 jb*	--
Perfluorohexane sulfonate (PFHxS)	NA	ng/l			2 j	3 j	--	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 jb*	4 b*	--
Perfluorononanoic acid (PFNA)	NA	ng/l			0.6 j	< 2	--	< 2	< 2 *	0.9 j*	1 j*	1 j*	0.8 j*	1 j	< 2	1 j	1 j	< 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 jb*	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 *	--

Table 4
Groundwater and Surface Water Data
Wells MVD-4/5 Investigation

Parameter	Total or Dissolved	Units	Comparison Criteria	Location	Date	Depth	Sample Type
				AP07	10/21/2016	58 ft	N
				AP07	10/21/2016	68 ft	N
				AP07	10/21/2016	78 ft	N
				AP07	10/24/2016	85 ft	N
				AP08	10/17/2016	18 ft	N
				AP08	10/18/2016	28 ft	N
							FD
				AP08	10/18/2016	38 ft	N
				AP08	10/18/2016	48 ft	N
				AP08	1/19/2017	57 - 58 ft	N
				AP08	1/19/2017	67 - 68 ft	N
							FD
				AP08	1/19/2017	77 - 78 ft	N
				AP08	1/19/2017	81 - 82 ft	N
				AP08	1/20/2017	81 - 82 ft	N
				AP09	1/20/2017	11 - 12 ft	N
				AP09	1/20/2017	11 - 12 ft	N
				AP09	1/23/2017	17 - 18 ft	N
				AP09	11/04/2016	28 ft	N
				AP09	1/23/2017	35 - 36 ft	N
				AP09	1/23/2017	47 - 48 ft	N
				AP09	1/23/2017	56 - 57 ft	N
				AP09	1/23/2017	65 - 66 ft	N
				AP09	1/25/2017	70 - 71 ft	N
Exceedance Key			**Bold**				
General Parameters							
Alkalinity, bicarbonate, as CaCO3	NA	mg/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	mg/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	58.4	27.5	--	--	--	--	28.9
Chloride	NA	mg/l		--	43.8	21.0	57.2	84.5	78.6	81.1	81.3	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	4.4	4.2	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	11.3 b	11.5 b	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																											
Calcium	Dissolved	mg/l		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.7
Magnesium	Dissolved	mg/l		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.45
Potassium	Dissolved	mg/l		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.58
Sodium	Dissolved	mg/l		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	117
Calcium	Total	mg/l		--	15.7	10.8	14.3	15.7	16.0 b	15.7 b	15.3 b	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	4.29 b	3.61 b	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	4.33	4.11	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	43.9	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																											
1,1-Dichloroethane	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
1,1-Dichloroethylene	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
Acetone	NA	ug/l		--	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	--	--	< 20	< 6	< 20	< 6	< 6	< 6	< 6	< 6
Bromodichloromethane	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
Carbon disulfide	NA	ug/l		--	< 5	< 5	< 5	2 jb	< 5	< 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	--	--	< 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 *	< 6 *	< 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 *	71 *	47 *	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**	**71 a**	47 a	49 a	**98 a**	**139**	**131**	**149**	**132**	--	--	31	**145 a**	**161**	**131**	**106 a**	**116**	**153**	**165**
N-Ethyl perfluorooctanesulfonamidoacetic acid	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
Perfluorobutane sulfonate (PFBS)	NA	ng/l		< 2	1 jb	1 jb	3	7	5	5	4	3 *	7	9	8	10	9	--	--	6	5	7	10	10	9	8	8
Perfluorobutanoic acid (PFBA)	NA	ng/l		6 jb*	9 jb*	9 jb*	9 jb*	12 *	11 b*	9 jb*	9 jb*	7 jb*	6 j	8 j	7 j	8 j	10	--	--	5 j	5 j	6 j	7 j	6 j	6 j	8 j	8 j
Perfluorodecanoic acid (PFDA)	NA	ng/l		< 2	< 2 *	< 2	0.6 j*	< 2 *	0.6 jb*	< 2 *	< 2 *	0.6 jb*	< 2	0.7 j	0.6 j	0.6 j	0.8 j	--	--	2	< 0.5	< 2	0.6 j	0.5 j	0.6 j	0.8 j	1 j
Perfluorododecanoic acid (PFDoA)	NA	ng/l		0.7 jb*	< 2 *	< 2 *	< 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	ng/l		2 jb	2	1 jb	6	28 *	14 *	14 *	9 *	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 j*	3	3 *	3	3	3	4	3	--	--	1 j	4	4	3	2 j	3 j	4	3
Perfluorohexanoic acid (PFHxA)	NA	ng/l		2 jb	6 b	4 b	8	21 *	17 *	16 *	12 *	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*	< 2 *	< 2 *	1 jb*	0.8 j	1 j	1 j	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 *	10 *	8 *	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

Table 4
Groundwater and Surface Water Data
Wells MVD-4/5 Investigation

Parameter	Total or Dissolved	Units	Comparison Criteria	Location	AP10	AP10	AP10	AP10	AP10	AP10	AP10	AP10	MVD4	MVD4		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	11/14/2016		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 min		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
Exceedance Key			**Bold**																							
General Parameters																										
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, total, 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
Chloride	NA	mg/l		17.9	439	225	89.0	85.9	116	125	128	90.5	83.7	86.8		87.3	87.6	117	105	109	112	4.5	13.2	122	42.2	293
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l		< 0.10	1.6	1.2	4.3	4.3	4.9	4.8	4.4	2.8	2.9	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	mg/l		4.3 j	12.7	10.5	12.8	13.1	13.1	14.0	13.2	14.7	14.5	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																										
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	16.1	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	3.00	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	2.12	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	50.8	53.0		49.7	52.4	58.1	58.9	61.4	64.4	6.65	10.9	41.9	12.3	140
VOCs																										
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	< 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	20
Bromodichloromethane	NA	ug/l		< 1	< 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	< 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	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 j	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 *	< 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 *		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 *

Table 4
Groundwater and Surface Water Data
Wells MVD-4/5 Investigation

			Location	45-10	45-11	45-1A	45-28	45-2A	45-3A	45-4A	45-5A		45-6	45-7	45-8	45-9	SWDnBab	SWDnr	SWMidBab		SWUpBab	SWUpr
			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	11/07/2016		11/08/2016	11/08/2016
			Depth																			
			Sample Type	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	FD	N	N
Parameter	Total or Dissolved	Units	Comparison 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	26.9	21.0	20.4	21.8	17.1	12.7	8.7	12.7	11.6	11.8 *	5.4
Chloride	NA	mg/l		155	303	319	138	285	99.4	91.1	118	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	1.9	2.2	3.0 *	2.3	3.6	0.17	0.20	0.19	0.19	0.18 *	0.20
Sulfate, as SO4	NA	mg/l		10.3	9.9	10.7	6.1	11.6	12.0	13.2	11.3	11.2	13.6	11.4	13.9	12.9	29.5	5.2 *	30.4	29.8	30.7	6.4
Metals																						
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	3.45	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	2.96	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
1,1-Dichloroethylene	NA	ug/l		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Acetone	NA	ug/l		< 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	< 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	< 1	< 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
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
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
Tetrachloroethylene	NA	ug/l		< 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
Perfluorinated Compounds																						
Perfluorooctane sulfonate (PFOS)	NA	ng/l		< 6 *	< 10	< 6 *	3 j*	16 *	9 *	4 j*	3 j*	2 j*	3 j*	4 j	3 j*	8 *	4 j	< 6	4 j*	5 j*	4 j*	< 6 *
Perfluorooctanoic acid (PFOA)	NA	ng/l		17 *	32	26 *	59 *	26 *	140 *	82 *	62	59 *	49 *	58	52 *	93 *	13 *	3 b	12 *	11 *	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 a	15 a	3 a
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Perfluorobutane sulfonate (PFBS)	NA	ng/l		1 j*	< 10	6 *	4 *	4 *	7 *	6	4 *	3 *	3 *	4	4 *	6	3	< 2	3	2	3	1 j
Perfluorobutanoic acid (PFBA)	NA	ng/l		< 10 *	5 j	5 j*	5 j*	6 j*	7 j*	5 j*	5 j	5 j*	4 j*	5 j	5 j*	6 j*	7 j	< 10	7 j*	6 j*	9 j*	< 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 *	< 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 *	< 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 b*	3 b*	2 b*
Perfluorohexane sulfonate (PFHxS)	NA	ng/l		1 j*	< 10	1 j*	3 *	1 j*	4	4 b	4 *	3 j*	2 j	3 b	3 b*	6 b*	2 jb	< 3	2 jb*	2 jb*	2 jb	< 3 *
Perfluorohexanoic acid (PFHxA)	NA	ng/l		4 *	11	10 *	12 *	12 *	19 *	14 b*	12 *	11 *	9 b*	13 b*	11 b*	19 b*	5 b*	2 jb	5 b*	5 b*	4 *	2 jb*
Perfluorononanoic acid (PFNA)	NA	ng/l		< 2 *	< 2	< 2 *	< 2	2 *	1 j*	0.6 j*	< 2 *	< 2 *	< 2 *	0.7 j	< 2 *	0.8 j*	< 2	< 2	0.8 j*	< 2 *	0.6 j*	< 2 *
Perfluoropentanoic acid (PFPeA)	NA	ng/l		4	10	8 *	9	13 *	12 *	9	9	8 *	7 *	8	8 *	10	3 b	2 jb	4 b	5 b	3 b	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 *	< 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 *	< 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.
a	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.

Table 5
QA/QC Blank Sample Data Summary
MVD-4/5 Investigation

		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
		Sample 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
Parameter	Total or Dissolved	Units													
General Parameters															
Alkalinity, bicarbonate, as CaCO3	NA	mg/l	--	**15.9**	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, total, as CaCO3	NA	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	< 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**

Table 5
QA/QC Blank Sample Data Summary
MVD-4/5 Investigation

		Location	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
		Sample 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	--	--	--	--	--	**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	--	--	--	< 4
Perfluorobutanoic acid (PFBA)	NA	ng/l	< 3	< 3	--	--	< 3	< 3	--	< 3	< 3	--	--	--	< 3
Perfluorodecanoic acid (PFDA)	NA	ng/l	< 1	< 1	--	--	< 1	< 1	--	< 0.5	< 0.5	--	--	--	< 1
Perfluorododecanoic acid (PFDoA)	NA	ng/l	< 3 *	< 3	--	--	< 3	< 3 *	--	< 0.5	< 0.5	--	--	--	< 3
Perfluoroheptanoic acid (PFHpA)	NA	ng/l	< 1	< 1	--	--	< 1	< 1	--	< 0.5	< 0.5	--	--	--	< 1
Perfluorohexane sulfonate (PFHxS)	NA	ng/l	< 4	< 4	--	--	< 4	< 4	--	< 1	< 1	--	--	--	< 4
Perfluorohexanoic acid (PFHxA)	NA	ng/l	< 1	< 1	--	--	< 1	< 1	--	< 0.5	< 0.5	--	--	--	< 1
Perfluorononanoic acid (PFNA)	NA	ng/l	< 1	< 1	--	--	< 1	< 1	--	< 0.6	< 0.6	--	--	--	< 1
Perfluorooctane sulfonate (PFOS)	NA	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	< 3 *	< 3	--	--	< 3	< 3 *	--	< 0.5	< 0.5 *	--	--	--	< 3
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l	< 2	< 2	--	--	< 2	< 2	--	< 0.5	< 0.5	--	--	--	< 2
Perfluoroundecanoic acid (PFUnA)	NA	ng/l	< 2 *	< 2	--	--	< 2	< 2 *	--	< 1	< 1	--	--	--	< 2

Table 5
QA/QC Blank Sample Data Summary
MVD-4/5 Investigation

			Location	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
			Sample 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
Parameter	Total or 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

Table 5
QA/QC Blank Sample Data Summary
MVD-4/5 Investigation

		Location	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
		Sample 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	--	--	--	--	--	--	--	--	--	< 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	< 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	< 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 *

Table 5
QA/QC Blank Sample Data Summary
MVD-4/5 Investigation

		Location	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
		Sample 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	--	--	--	--	--	--	< 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	< 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 *

Table 5
QA/QC Blank Sample Data Summary
MVD-4/5 Investigation

			Location	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
			Sample 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
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	--	--	--	--	--	--	--	< 0.20	< 0.20	--	--	--	--	--
Nitrogen, Nitrate + Nitrite, as N	NA	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	< 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	< 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 *	--	

Table 5
QA/QC Blank Sample Data Summary
MVD-4/5 Investigation

		Location	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	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
		Sample Type	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Trip Blank	Lab Blank	Trip Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank
Parameter	Total or 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	--	--	--

Table 5
QA/QC Blank Sample Data Summary
MVD-4/5 Investigation

		Location	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	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	11/17/2016	11/18/2016	11/18/2016
		Sample Type	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab 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	**2.8 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	--	--	--	--	--	--	--	--	--	< 0.0382	--	--	--
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	--	--	--	--	--	--	--	--	--	--

Table 5
QA/QC Blank Sample Data Summary
MVD-4/5 Investigation

		Location	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	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
		Sample Type	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank
Parameter	Total or 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 *	--	--	--	--	--	--	--

Table 5
QA/QC Blank Sample Data Summary
MVD-4/5 Investigation

	Location	QC	QC	QC	QC	QC	QC	QC	QC	QC	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
	Sample Type	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Trip Blank	Trip Blank	Field Blank	Equipment Blank	Equipment Blank
Parameter	Total or Dissolved	Units												
General Parameters														
Alkalinity, bicarbonate, as CaCO3	NA	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, total, as CaCO3	NA	mg/l	< 1.7	--	--	--	--	--	--	--	--	--	--	--
Chloride	NA	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														
Calcium	Total	mg/l	--	--	--	--	**0.0472 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	--	--	--	--	--	--	< 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 *	--	< 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 *

Table 5
QA/QC Blank Sample Data Summary
MVD-4/5 Investigation

		Location	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
		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
		Sample 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
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	--	--	--	--	--	--	--	--	--
Chloride	NA	mg/l	--	--	--	--	--	--	--	--	--	< 0.20	< 0.20	--	--
Nitrogen, Nitrate + Nitrite, as N	NA	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	< 0.040
Sulfate, as SO4	NA	mg/l	--	--	--	--	--	--	--	--	--	< 0.30	< 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	--	--	--	< 1	--	--	--	--	--	--	--
Chloromethane	NA	ug/l	--	< 0.5	--	--	--	< 0.5	--	--	--	--	--	--	--
Tentatively Identified Compounds	NA	ug/l	--	< 0 TIC	--	--	--	< 0 TIC	--	--	--	--	--	--	--
Perfluorinated Compounds															
N-Ethyl perfluorooctanesulfonamidoacetic acid	NA	ng/l	< 1	--	--	--	< 1	--	< 1	--	< 1	--	--	< 1	--
Perfluorobutane sulfonate (PFBS)	NA	ng/l	< 0.7	--	--	--	< 0.7	--	< 0.7	--	< 0.7	--	--	< 0.7	--
Perfluorobutanoic acid (PFBA)	NA	ng/l	< 3 *	--	--	--	< 3	--	< 3	--	< 3	--	--	< 3	--
Perfluorodecanoic acid (PFDA)	NA	ng/l	< 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	--
Perfluoroheptanoic acid (PFHpA)	NA	ng/l	< 0.5 *	--	--	--	< 0.5	--	< 0.5	--	< 0.5	--	--	< 0.5	--
Perfluorohexane sulfonate (PFHxS)	NA	ng/l	< 1 *	--	--	--	< 1	--	< 1	--	< 1	--	--	< 1	--
Perfluorohexanoic acid (PFHxA)	NA	ng/l	< 0.5 *	--	--	--	< 0.5	--	< 0.5	--	< 0.5	--	--	< 0.5	--
Perfluorononanoic acid (PFNA)	NA	ng/l	< 0.6	--	--	--	< 0.6	--	< 0.6	--	< 0.6	--	--	< 0.6	--
Perfluorooctane sulfonate (PFOS)	NA	ng/l	< 2	--	--	--	< 2	--	< 2	--	< 2	--	--	< 2	--
Perfluorooctanoic acid (PFOA)	NA	ng/l	< 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	--
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l	**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	--
Perfluoroundecanoic acid (PFUnA)	NA	ng/l	< 1 *	--	--	--	< 1	--	< 1	--	< 1 *	--	--	< 1	--

Table 5
QA/QC Blank Sample Data Summary
MVD-4/5 Investigation

	Location	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
	Sample 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
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	< 0.040	< 0.040	--	--	--	--	--	--	--	--	--	--
Sulfate, as SO4	NA	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Metals														
Calcium	Total	mg/l	--	--	**0.0448 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	--	--	--	--	--	--	**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	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	**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

Table 5
QA/QC Blank Sample Data Summary
MVD-4/5 Investigation

		Location	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC	QC
		Date	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 Type	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank
Parameter	Total or Dissolved	Units												
General Parameters														
Alkalinity, bicarbonate, as CaCO3	NA	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, total, as CaCO3	NA	mg/l	--	--	**3.5 j**	**3.3 j**	**3.3 j**	--	--	--	**2.6 j**	--	--	--
Chloride	NA	mg/l	< 0.20	< 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	--	--	--	--	--	< 0.30
Metals														
Calcium	Total	mg/l	--	--	--	--	--	--	**0.0495 j**	< 0.0382	--	--	--	--
Magnesium	Total	mg/l	--	--	--	--	--	--	**0.0460 j**	< 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	< 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	--	--	--	--	--	--	--	--	--	--	--	--
Perfluorobutanoic acid (PFBA)	NA	ng/l	--	--	--	--	--	--	--	--	--	--	--	--
Perfluorodecanoic acid (PFDA)	NA	ng/l	--	--	--	--	--	--	--	--	--	--	--	--
Perfluorododecanoic acid (PFDoA)	NA	ng/l	--	--	--	--	--	--	--	--	--	--	--	--
Perfluoroheptanoic acid (PFHpA)	NA	ng/l	--	--	--	--	--	--	--	--	--	--	--	--
Perfluorohexane sulfonate (PFHxS)	NA	ng/l	--	--	--	--	--	--	--	--	--	--	--	--
Perfluorohexanoic acid (PFHxA)	NA	ng/l	--	--	--	--	--	--	--	--	--	--	--	--
Perfluorononanoic acid (PFNA)	NA	ng/l	--	--	--	--	--	--	--	--	--	--	--	--
Perfluorooctane sulfonate (PFOS)	NA	ng/l	--	--	--	--	--	--	--	--	--	--	--	--
Perfluorooctanoic acid (PFOA)	NA	ng/l	--	--	--	--	--	--	--	--	--	--	--	--
Perfluoropentanoic acid (PFPeA)	NA	ng/l	--	--	--	--	--	--	--	--	--	--	--	--
Perfluorotetradecanoic acid (PFTA / PFTeDA)	NA	ng/l	--	--	--	--	--	--	--	--	--	--	--	--
Perfluorotridecanoic acid (PFTrDA)	NA	ng/l	--	--	--	--	--	--	--	--	--	--	--	--
Perfluoroundecanoic acid (PFUnA)	NA	ng/l	--	--	--	--	--	--	--	--	--	--	--	--

Table 5
QA/QC Blank Sample Data Summary
MVD-4/5 Investigation

		Location	QC	QC	QC	QC	QC	QC	QC	QC	QC	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
		Sample Type	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Lab Blank	Rinsate Blank	Rinsate Blank
Parameter	Total or 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

Table 5
QA/QC Blank Sample Data Summary
MVD-4/5 Investigation

		Location	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
		Sample Type	Rinsate Blank	Rinsate Blank	Rinsate Blank	Rinsate Blank	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 j**	**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-AP05		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	1/18/2017		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 - 14.5 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
pH	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

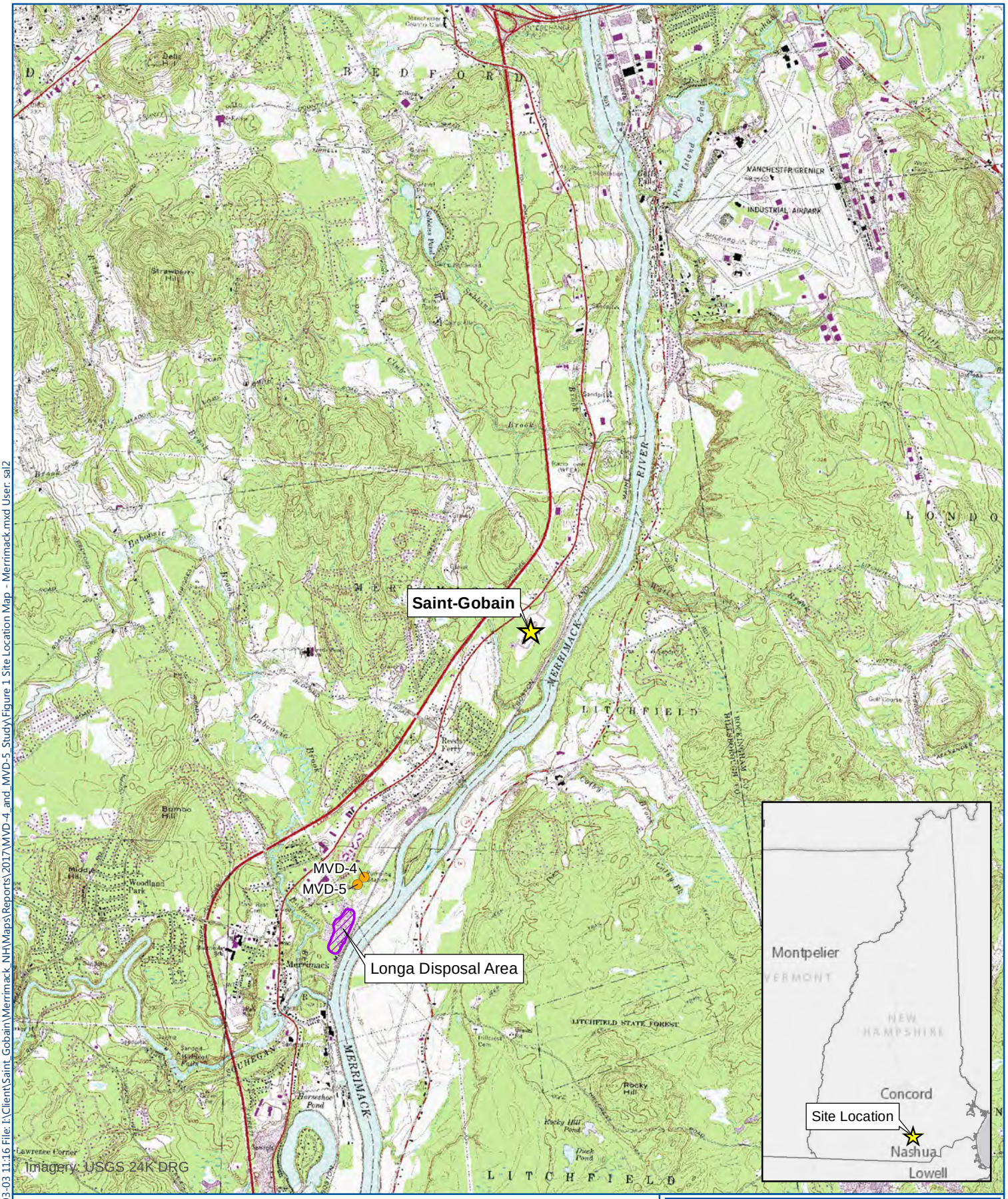
Parameter	t = 0 min	t = 10 min	t = 20 min	t = 30 min
pH	5.78	5.69	5.74	5.66
Temperature (°C)	10.7	10.7	10.8	10.9
Oxidation Reduction Potential (mV)	180.2	168.2	172.8	177.2
Dissolved oxygen (mg/L)	6.36	5.51	5.43	4.83
Turbidity (NTU)	10.15	1.48	0.23	0.19
Specific conductance (µS/cm)	628.8	562.1	630.7	630.1

Table 10

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

Sample Boring	Number of Samples	Sample Depths (bgs)				
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



Facility Location

MVD Wells

Longa Disposal Area

N

0 4,000

Feet

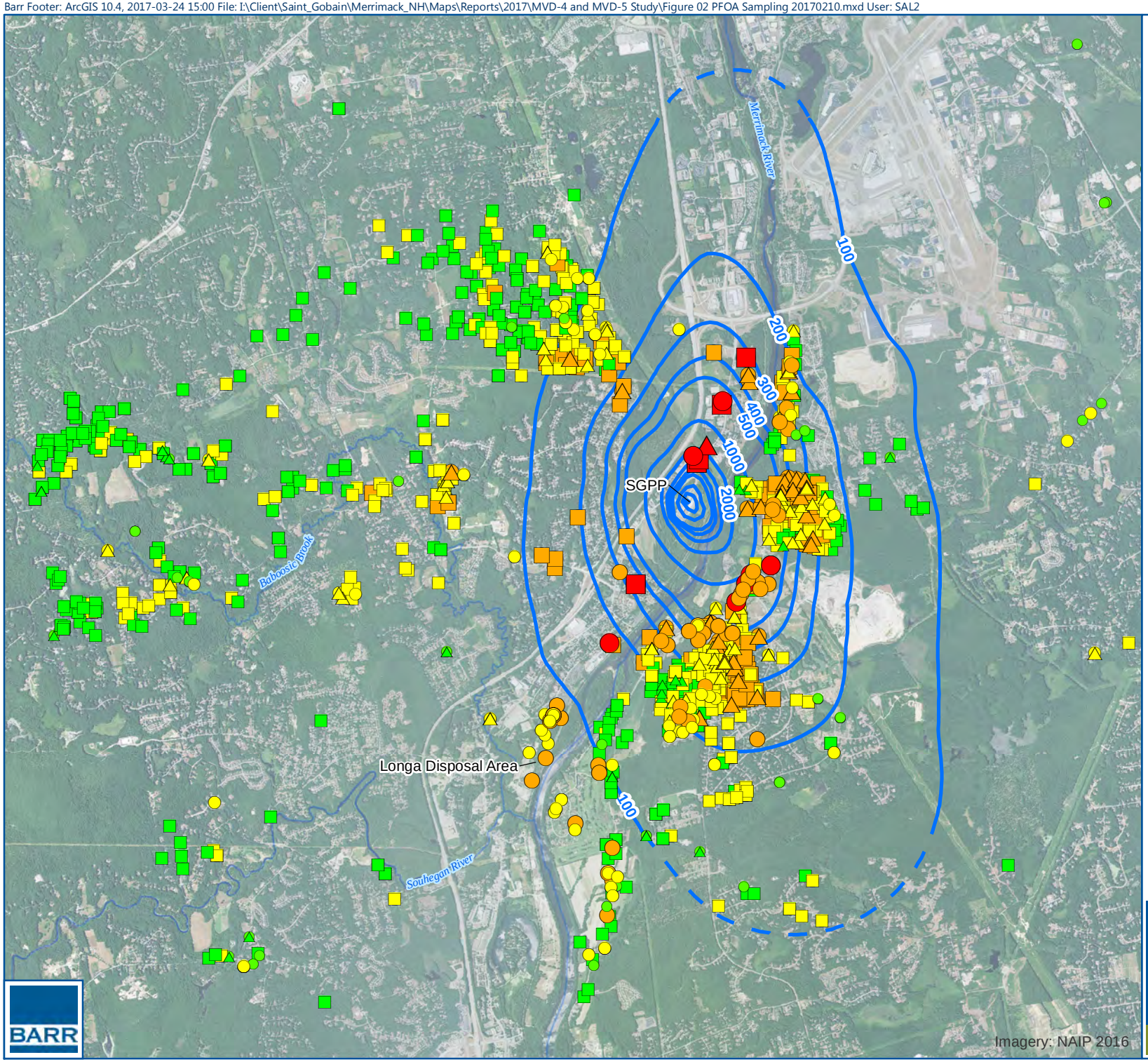
BARR

SITE LOCATION
Merrimack, NH
Saint-Gobain

FIGURE 1

Barr Footer: ArcGIS 10.4, 2017-03-03 11:16 File: I:\Client\Saint_Gobain\Merrimack_NH\Maps\Reports\2017\MVD-4_and_MVD-5_Study\Figure 1 Site Location Map - Merrimack.mxd User: sal2

Barr Footer: ArcGIS 10.4, 2017-03-24 15:00 File: I:\Client\Saint_Gobain\Merrimack_NH\Maps\Reports\2017\MVD-4 and MVD-5 Study\Figure 02 PFOA Sampling 20170210.mxd User: SAL2



PFOA (ppt)

- > 400
- 71 - 400
- 11 - 70
- < 10

Aquifer

- Bedrock
- Overburden
- Unknown

Preliminary Annual Average Air Deposition ($g/m^2/year*10^{-6}$) (dashed where inferred)

N

0 5,000

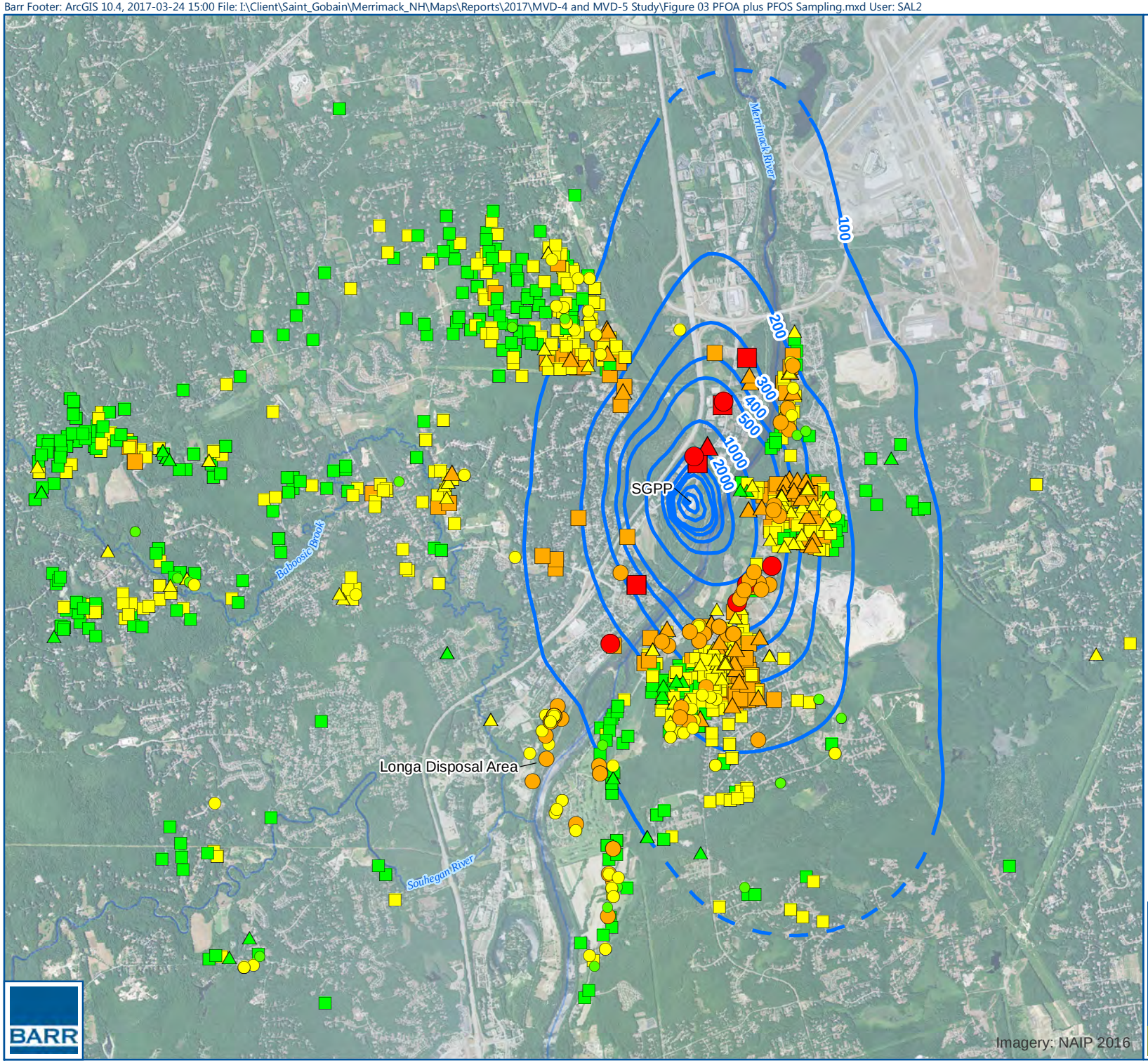
Feet

PFOA MONITORING RESULTS
NHDES, 3/9/2016 - 1/2/2017
Merrimack, New Hampshire
Saint-Gobain

FIGURE 2

BARR

Barr Footer: ArcGIS 10.4, 2017-03-24 15:00 File: I:\Client\Saint_Gobain\Merrimack_NH\Maps\Reports\2017\MVD-4 and MVD-5 Study\Figure 03 PFOA plus PFOS Sampling.mxd User: SAL2



PFOA + PFOS (ppt)

- > 400
- 71 - 400
- 11 - 70
- < 10

Aquifer

- Bedrock
- Overburden
- Unknown

Preliminary Annual Average Air Deposition ($g/m^2/year*10^{-6}$) (dashed where inferred)

N

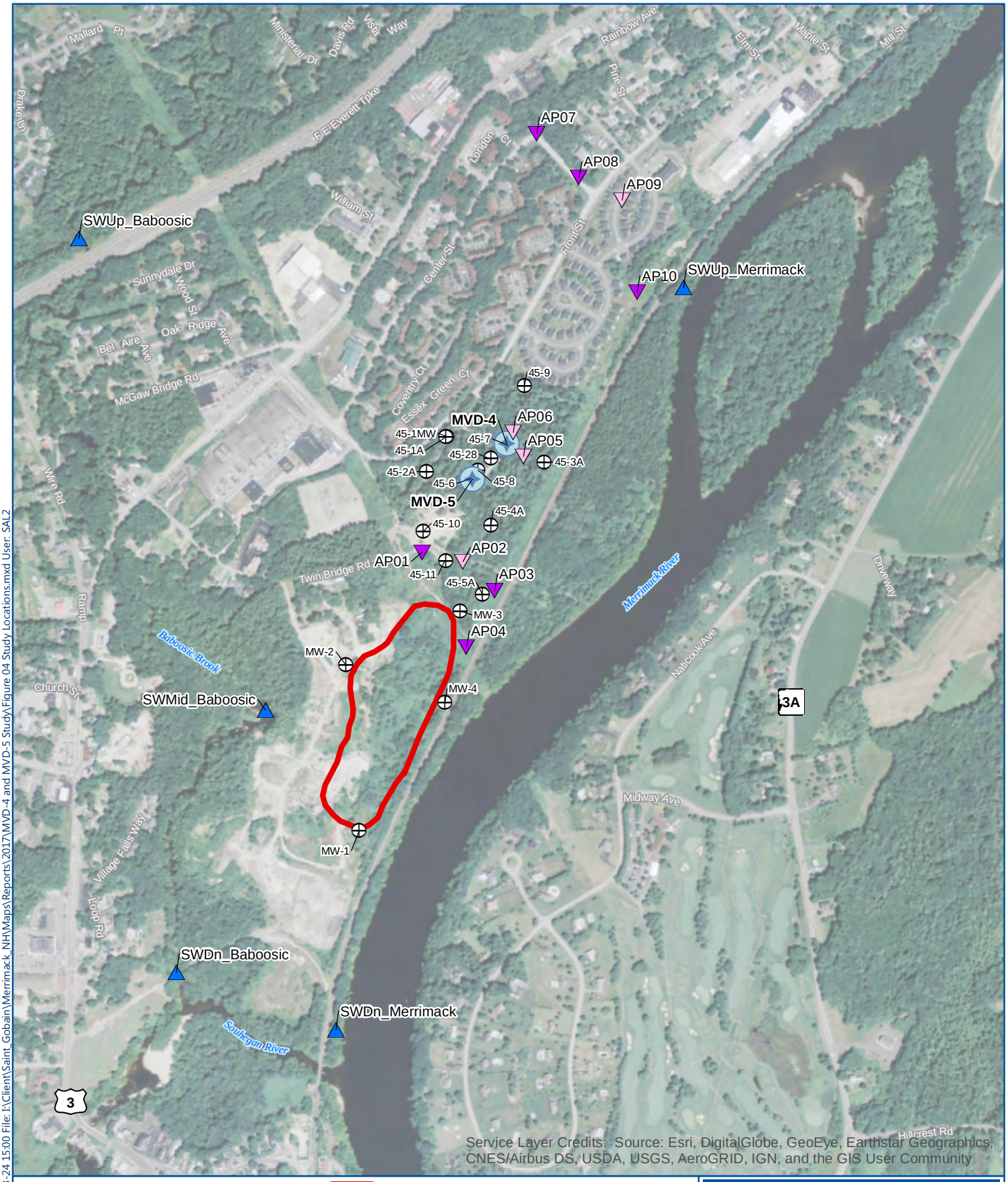
0 5,000

Feet

PFOA + PFOS MONITORING RESULTS
NHDES, 3/9/2016 - 1/2/2017
Merrimack, New Hampshire
Saint-Gobain

FIGURE 3

BARR



Aquifer Profile

Aquifer Profile with Soil Sample

Surface Water Sampling/ Gauging Location

MVD Pumping Well

Monitoring Well

Longa Disposal

N

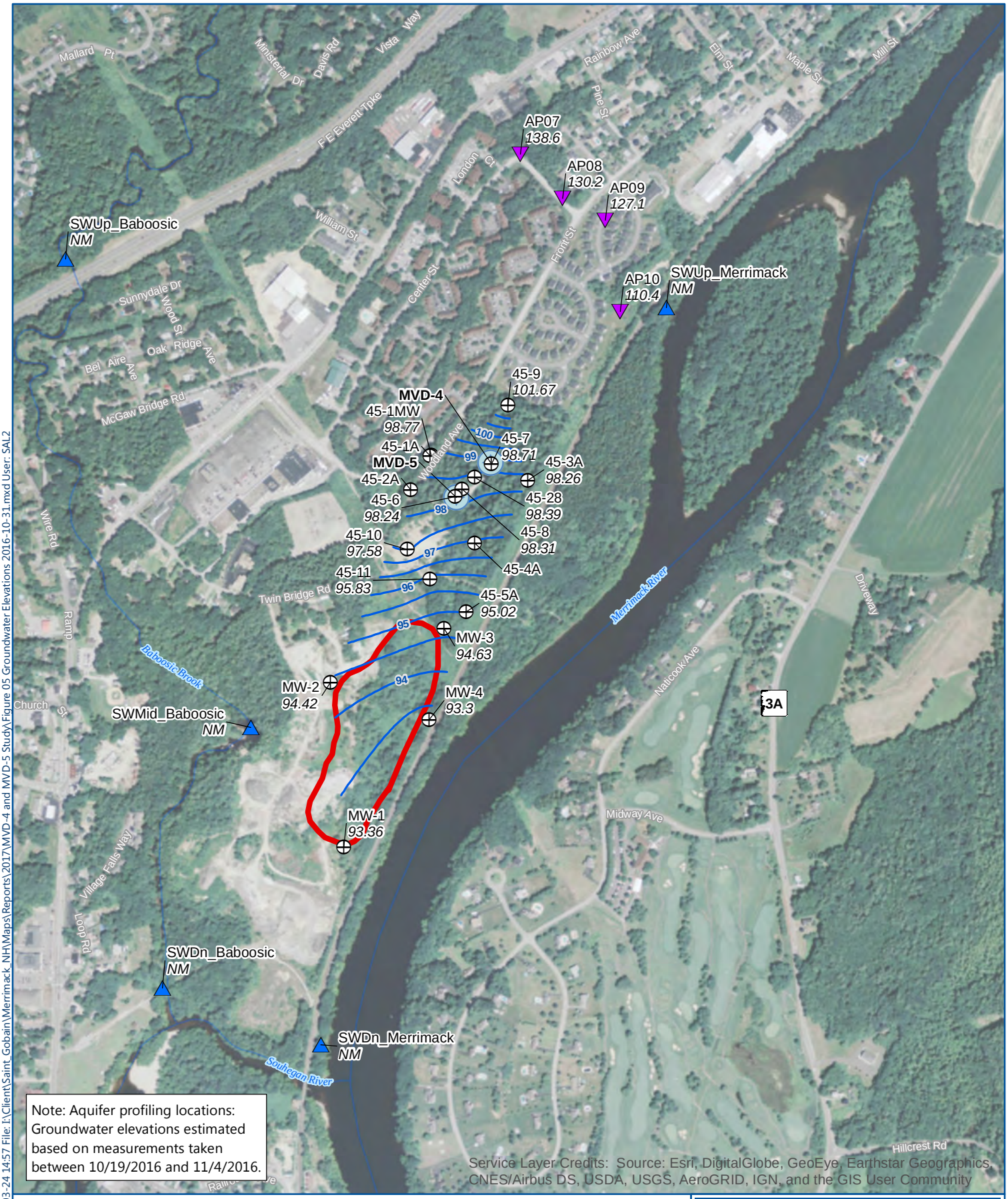
0 800

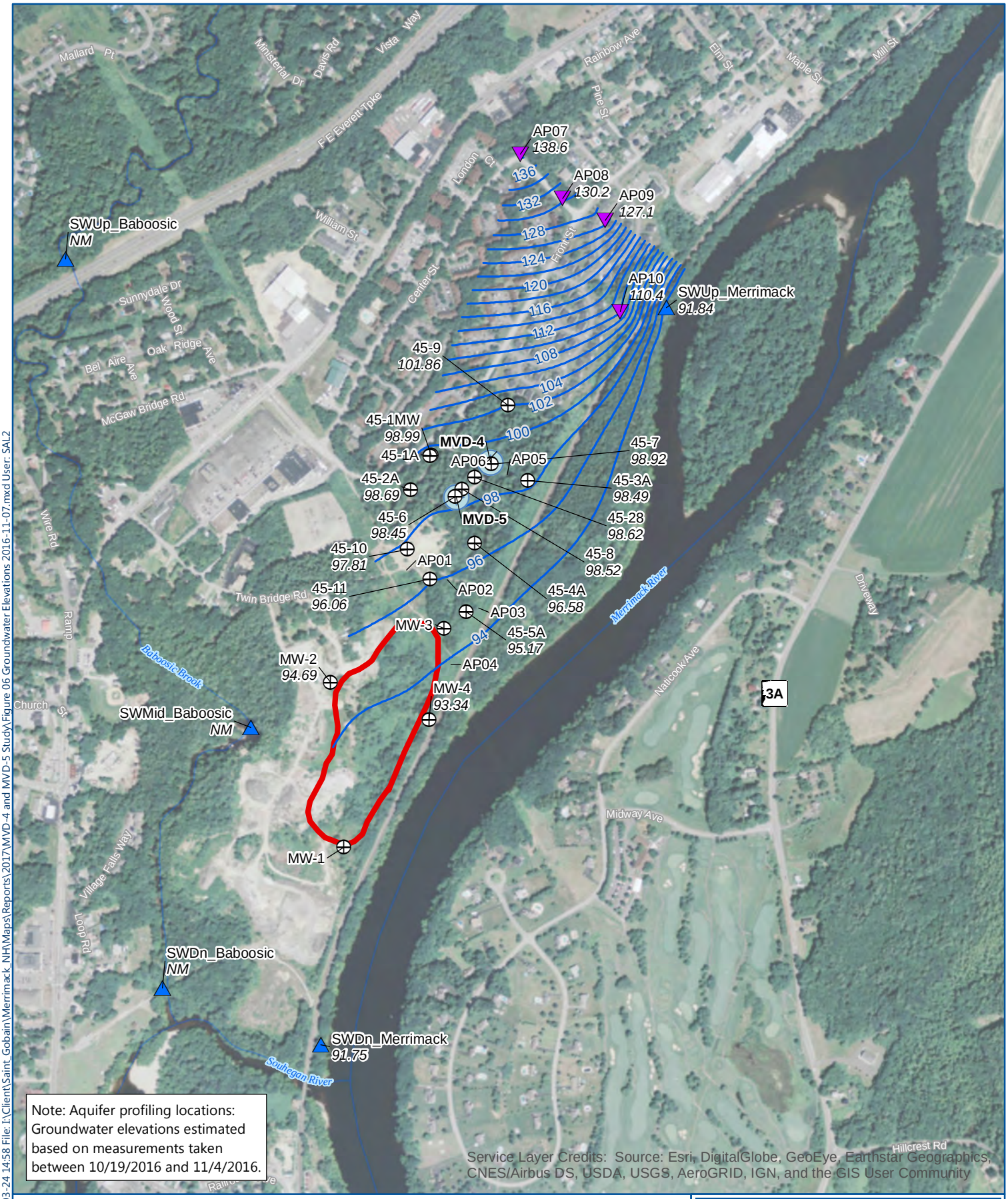
Feet

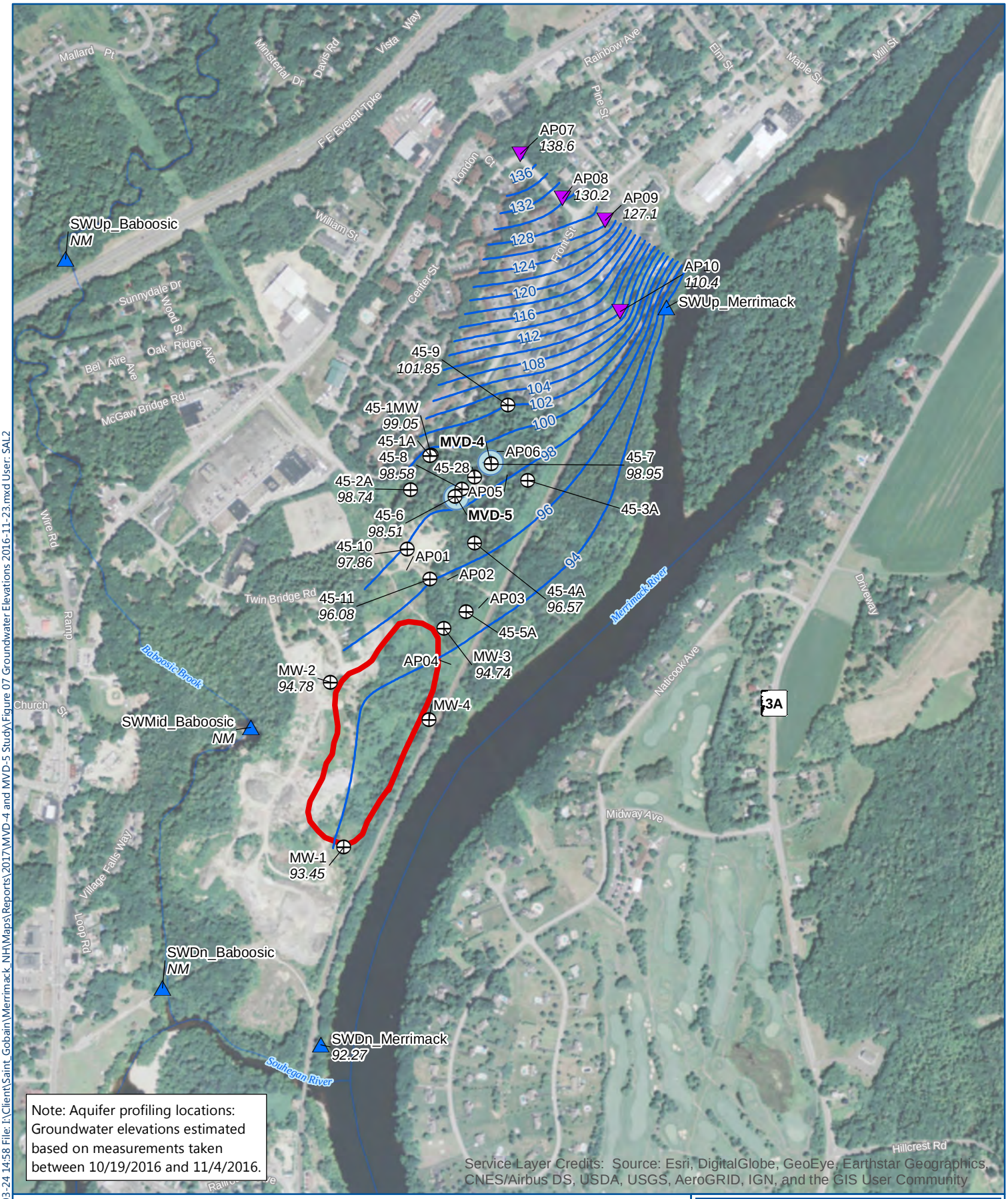
BARR

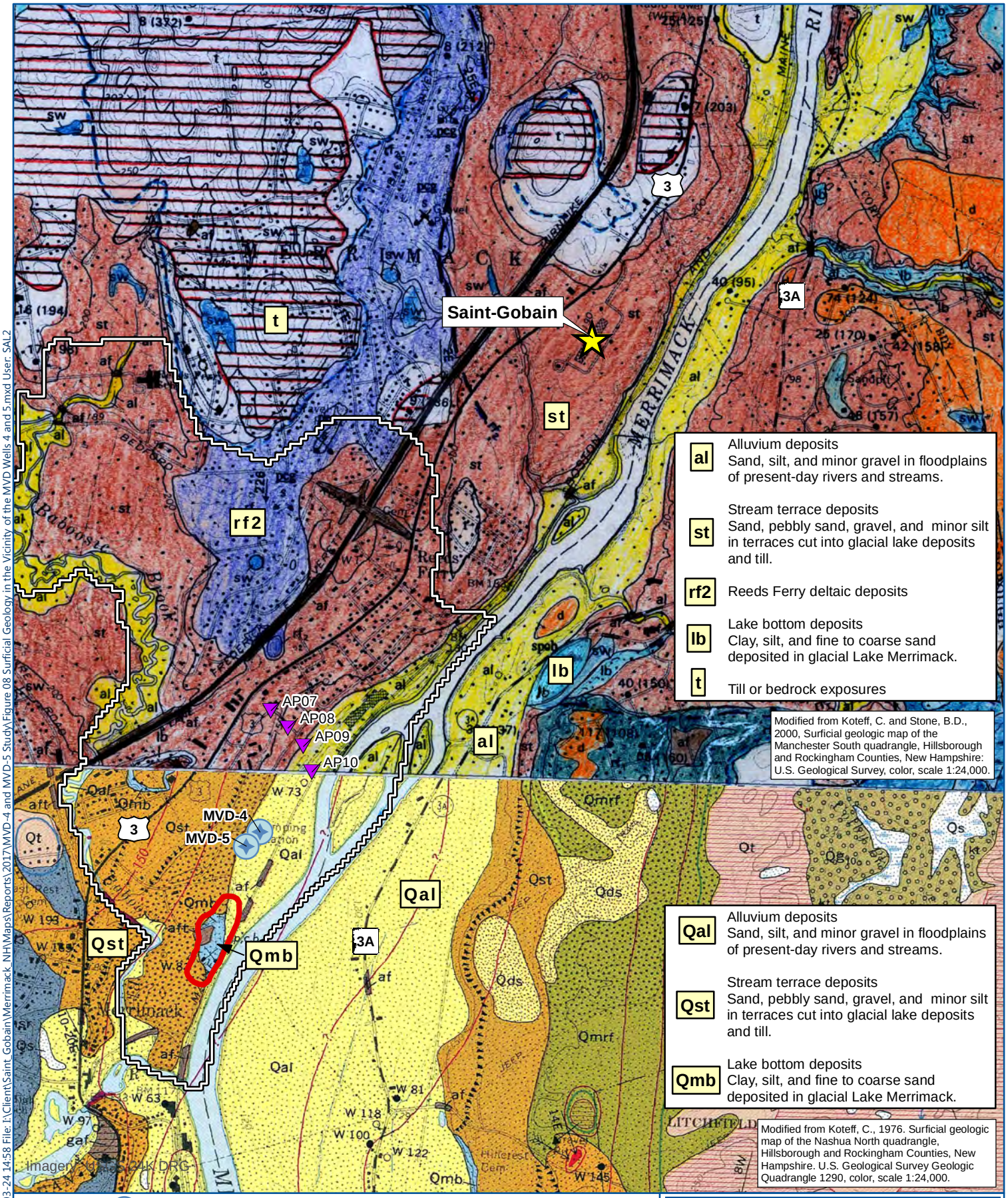
STUDY LOCATIONS
WELLS MVD-4 AND MVD-5
Merrimack, New Hampshire
Saint-Gobain

FIGURE 4

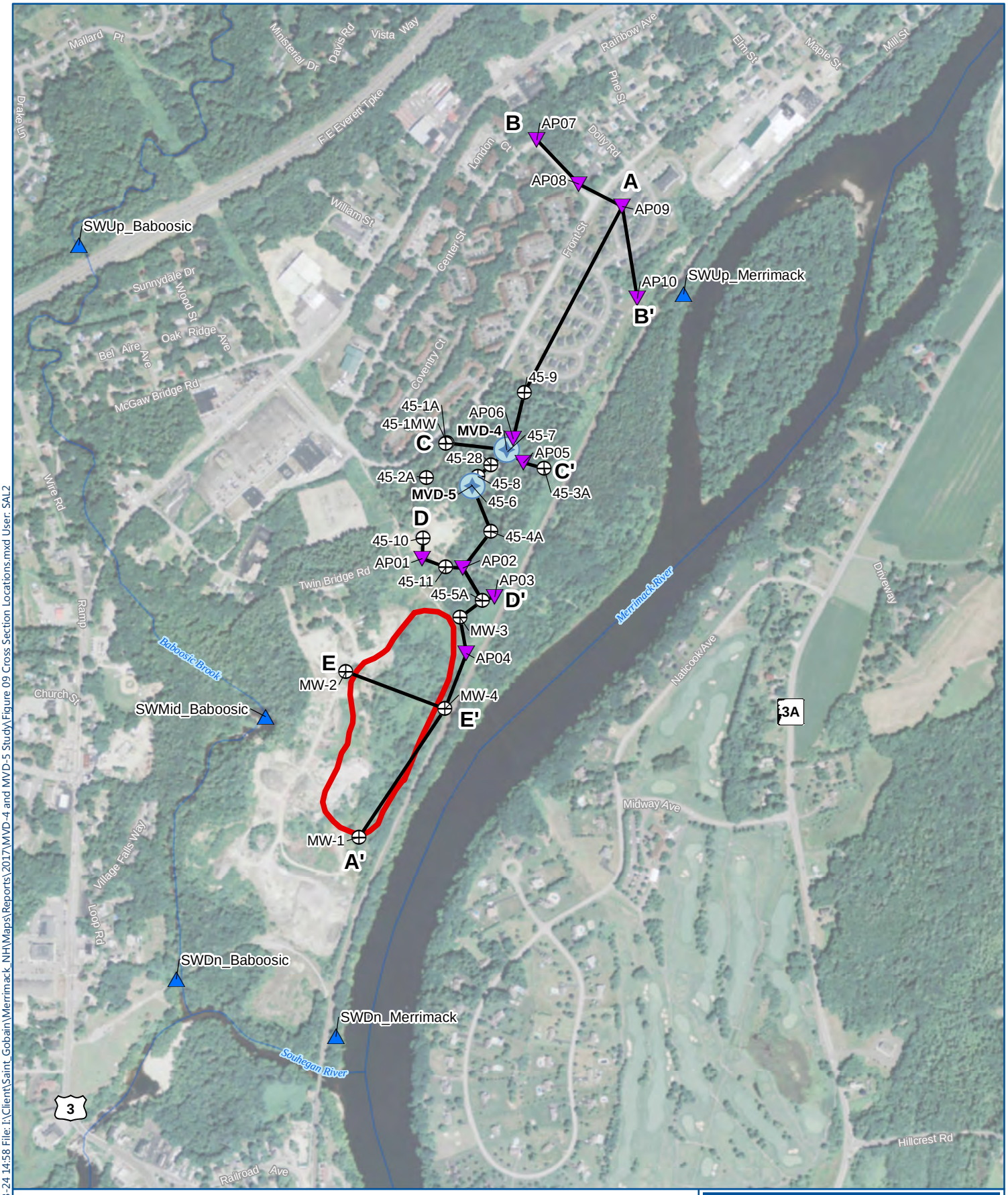

AP07
138.6
AP08
130.2
AP09
127.1
AP10
110.4
SWUp_Baboosic
NM
SWUp_Merrimack
NM
45-9
101.67
MVD-4
45-1MW
98.77
45-1A
MVD-5
45-2A
45-7
98.71
45-3A
98.26
45-6
98.24
45-28
98.39
45-8
98.31
45-10
97.58
45-4A
45-11
95.83
45-5A
95.02
MW-3
94.63
MW-2
94.42
MW-4
93.3
MW-1
93.36
SWMid_Baboosic
NM
SWDn_Baboosic
NM
SWDn_Merrimack
NM
100
99
98
97
96
95
94
Merrimack River
Baboosic Brook
Souhegan River
Twin Bridge Rd
McGaw Bridge Rd
Church St
Midway Ave
Hillcrest Rd
Naticook Ave
Driveway
Ramp
Wire Rd
Village Falls Way
Loop Rd
Sunnydale Dr
Wood St
Oak Ridge Ave
Bel Aire Ave
Mallard Pt
Ministerial Dr
Davis Rd
Vista Way
F E Everett Tpke
London Ct
William St
Center St
Front St
Pine St
Rainbow Ave
Elm St
Maple St
Mill St
Woodland Ave
3A
Note: Aquifer profiling locations: Groundwater elevations estimated based on measurements taken between 10/19/2016 and 11/4/2016.
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Monitoring Well
Aquifer Profiling Location
River/Stream Gauge
MVD Pumping Well
Groundwater Elevation Contour (October 31, 2016)
Longa Disposal Area
N
0
800
Feet
BARR
GROUNDWATER ELEVATIONS
OCTOBER 31, 2016
Merrimack, New Hampshire
Saint-Gobain
FIGURE 5
Barr Footer: ArcGIS 10.4, 2017-03-24 14:57 File: I:\Client\Saint_Gobain\Merrimack_NH\Maps\Reports\2017\MVD-4 and MVD-5 Study\Figure 05 Groundwater Elevations 2016-10-31.mxd User: SAL2

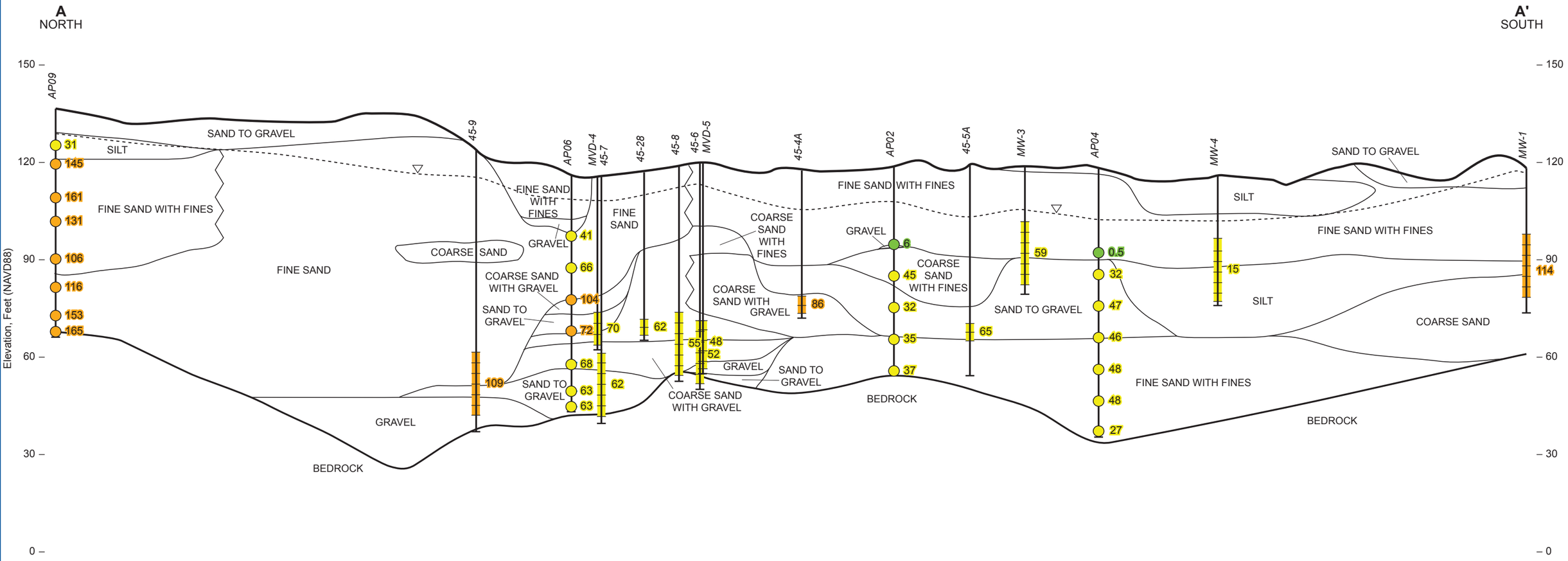

AP07
138.6
AP08
130.2
AP09
127.1
AP10
110.4
SWUp_Baboosic
NM
SWUp_Merrimack
91.84
45-9
101.86
45-1MW
98.99
45-1A
MVD-4
AP06
AP05
45-7
98.92
45-2A
98.69
45-3A
98.49
MVD-5
45-6
98.45
45-28
98.62
45-10
97.81
AP01
45-8
98.52
45-11
96.06
AP02
45-4A
96.58
AP03
MW-3
45-5A
95.17
MW-2
94.69
AP04
MW-4
93.34
SWMid_Baboosic
NM
MW-1
SWDn_Baboosic
NM
SWDn_Merrimack
91.75
136
132
128
124
120
116
112
108
104
102
100
98
96
94
Mallard Pt
Ministerial Dr
Davis Rd
Vista Way
F E Everett Tpke
London Ct
Rainbow Ave
Pine St
Elm St
Maple St
Mill St
William St
Front St
Center St
Sunnydale Dr
Wood St
Oak Ridge Ave
Bel Aire Ave
McGaw Bridge Rd
Wire Rd
Ramp
Twin Bridge Rd
Baboosic Brook
Church St
Village Falls Way
Loop Rd
Souhegan River
Merrimack River
Naticook Ave
Midway Ave
Driveway
Hillcrest Rd
3A
Note: Aquifer profiling locations: Groundwater elevations estimated based on measurements taken between 10/19/2016 and 11/4/2016.
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Monitoring Well
Aquifer Profiling Location
River/Stream Gauge
MVD Pumping Well
Groundwater Elevation Contour (November 7, 2016)
Longa Disposal Area
N
0
800
Feet
BARR
GROUNDWATER ELEVATIONS
November 7, 2016
Merrimack, New Hampshire
Saint-Gobain
FIGURE 6
Barr Footer: ArcGIS 10.4, 2017-03-24 14:58 File: I:\Client\Saint_Gobain\Merrimack_NH\Maps\Reports\2017\MVD-4 and MVD-5 Study\Figure 06 Groundwater Elevations 2016-11-07.mxd User: SAL2


AP07
138.6
AP08
130.2
AP09
127.1
AP10
110.4
SWUp_Baboosic
NM
SWUp_Merrimack
45-9
101.85
45-1MW
99.05
45-1A
MVD-4
45-8
45-28
AP06
45-7
98.95
45-2A
98.74
AP05
45-3A
45-6
98.51
MVD-5
45-10
97.86
AP01
AP02
45-11
96.08
AP03
45-4A
96.57
45-5A
AP04
MW-3
94.74
MW-2
94.78
MW-4
SWMid_Baboosic
NM
MW-1
93.45
SWDn_Baboosic
NM
SWDn_Merrimack
92.27
136
132
128
124
120
116
112
108
104
102
100
98
96
94
Mallard Pt
Ministerial Dr
Davis Rd
Vista Way
F E Everett Tpke
Rainbow Ave
Elm St
Maple St
Mill St
Pine St
London Ct
William St
Front St
Center St
Sunnydale Dr
Wood St
Oak Ridge Ave
Bel Aire Ave
McGaw Bridge Rd
Wire Rd
Ramp
Twin Bridge Rd
Baboosic Brook
Church St
Village Falls Way
Loop Rd
Merrimack River
Souhegan River
Naticook Ave
Midway Ave
Driveway
Hillcrest Rd
3A
Note: Aquifer profiling locations: Groundwater elevations estimated based on measurements taken between 10/19/2016 and 11/4/2016.
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Monitoring Well
Aquifer Profiling Location
River/Stream Gauge
MVD Pumping Well
Groundwater Elevation Contour (November 23, 2016)
Longa Disposal Area
N
0
800
Feet
BARR
GROUNDWATER ELEVATIONS
November 23, 2016
Merrimack, New Hampshire
Saint-Gobain
FIGURE 7
Barr Footer: ArcGIS 10.4, 2017-03-24 14:58 File: I:\Client\Saint_Gobain\Merrimack_NH\Maps\Reports\2017\MVD-4 and MVD-5 Study\Figure 07 Groundwater Elevations 2016-11-23.mxd User: SAL2



Barr Footer: ArcGIS 10.4, 2017-03-24 14:58 File: I:\Client\Saint_Gobain\Merrimack_NH\Maps\Reports\2017\MVD-4 and MVD-5 Study\Figure 08 Surficial Geology in the Vicinity of the MVD Wells 4 and 5.mxd User: SAL2


B
AP07
AP08
A
AP09
AP10
B'
SWUp_Baboosic
SWUp_Merrimack
45-9
45-1A
45-1MW
AP06
MVD-4
C
45-7
45-28
AP05
C'
45-2A
45-8
MVD-5
45-6
45-3A
D
45-10
45-4A
AP01
AP02
45-11
AP03
45-5A
D'
MW-3
AP04
E
MW-2
MW-4
E'
SWMid_Baboosic
MW-1
A'
SWDn_Baboosic
SWDn_Merrimack
Mallard Pt
Ministerial Dr
Davis Rd
Vista Way
Rainbow Ave
Elm St
Maple St
Mill St
Pine St
Dolly Rd
London Ct
F.E.Everett Tpke
Drake Ln
William St
Center St
Front St
Sunnydale Dr
Wood St
Oak Ridge Ave
Bel Aire Ave
McGaw Bridge Rd
Coventry Ct
Wire Rd
Ramp
Twin Bridge Rd
Baboosic Brook
Church St
Village Falls Way
Loop Rd
Railroad Ave
Merrimack River
Naticook Ave
Midway Ave
Hillcrest Rd
Driveway
3
3A
Aquifer Profiling Location
Surface Water Sampling/ Gauging Location
MVD Pumping Well
Monitoring Well
Cross Section Location
Longa Disposal Area
N
0
800
Feet
BARR
CROSS SECTION LOCATIONS
WELLS MVD-4 AND MVD-5
Merrimack, New Hampshire
Saint-Gobain
FIGURE 9
Barr Footer: ArcGIS 10.4, 2017-03-24 14:58 File: I:\Client\Saint_Gobain\Merrimack_NH\Maps\Reports\2017\MVD-4 and MVD-5 Study\Figure 09 Cross Section Locations.mxd User: SAL2



NOTES

The depicted geology is based on the results of a three-dimensional model created using Earth Volumetric Studio™ (EVS) software. The model was cut at the specificed cross section and the geological results were interpreted and simplified for inclusion in this figure.

LEGEND

- Geologic Contact
- Inferred Geologic Contact
- Approximate Water Table
- Monitoring Well Screen
- Soil Boring / Monitoring Well
- 62 — Groundwater Sample Location and Concentration (ppt)

Dissolved-phase PFOA+PFOS Concentration (ppt)

- 71-400
- 11-70
- <10

0 300 450

Approximate Horizontal Scale in Feet
10X Vertical Exaggeration

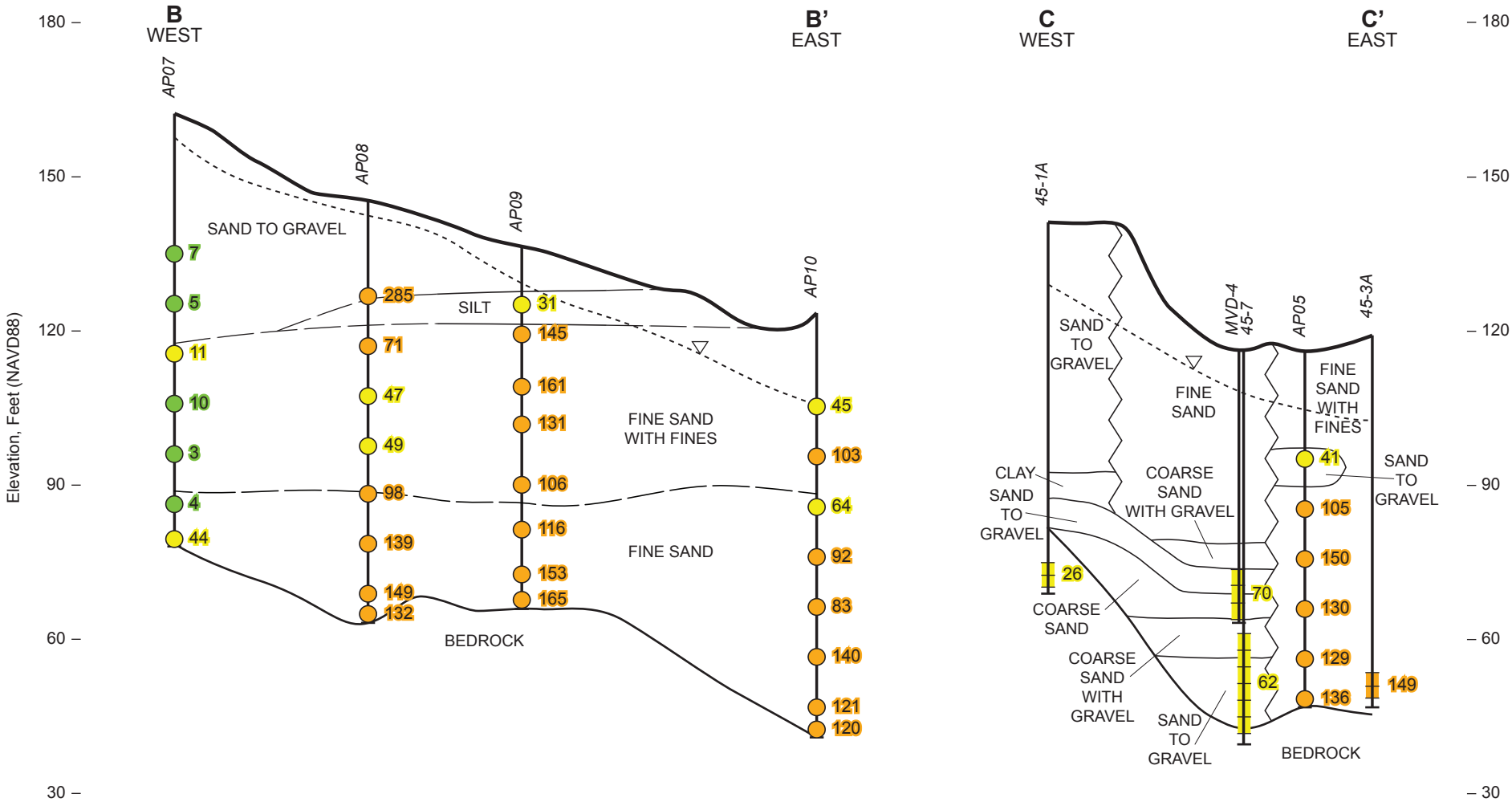
CROSS SECTION A-A' WITH GEOLOGY AND DISSOLVED-PHASE PFOA+PFOS

Merrimack, NH
Saint-Gobain

FIGURE 10

BARR

\\barr.com\projects\Mpls\32 NY\42\32421001 PFOA Fate and Transport\WorkFiles\Merrimack\MVD_Wells_Longa_Disposal_AreaInvestigation\



NOTES

The depicted geology is based on the results of a three-dimensional model created using Earth Volumetric Studio™ (EVS) software. The model was cut at the specificed cross-section and the geological results were interpreted and simplified for inclusion in this figure.

LEGEND

- Geologic Contact
- Inferred Geologic Contact
- Approximate Water Table
- Monitoring Well Screen
- Soil Boring / Monitoring Well
- 62 — Groundwater Sample Location and Concentration (ppt)

Dissolved-phase PFOA+PFOS Concentration (ppt)

- 70-400
- 11-70
- <10

0 300 450

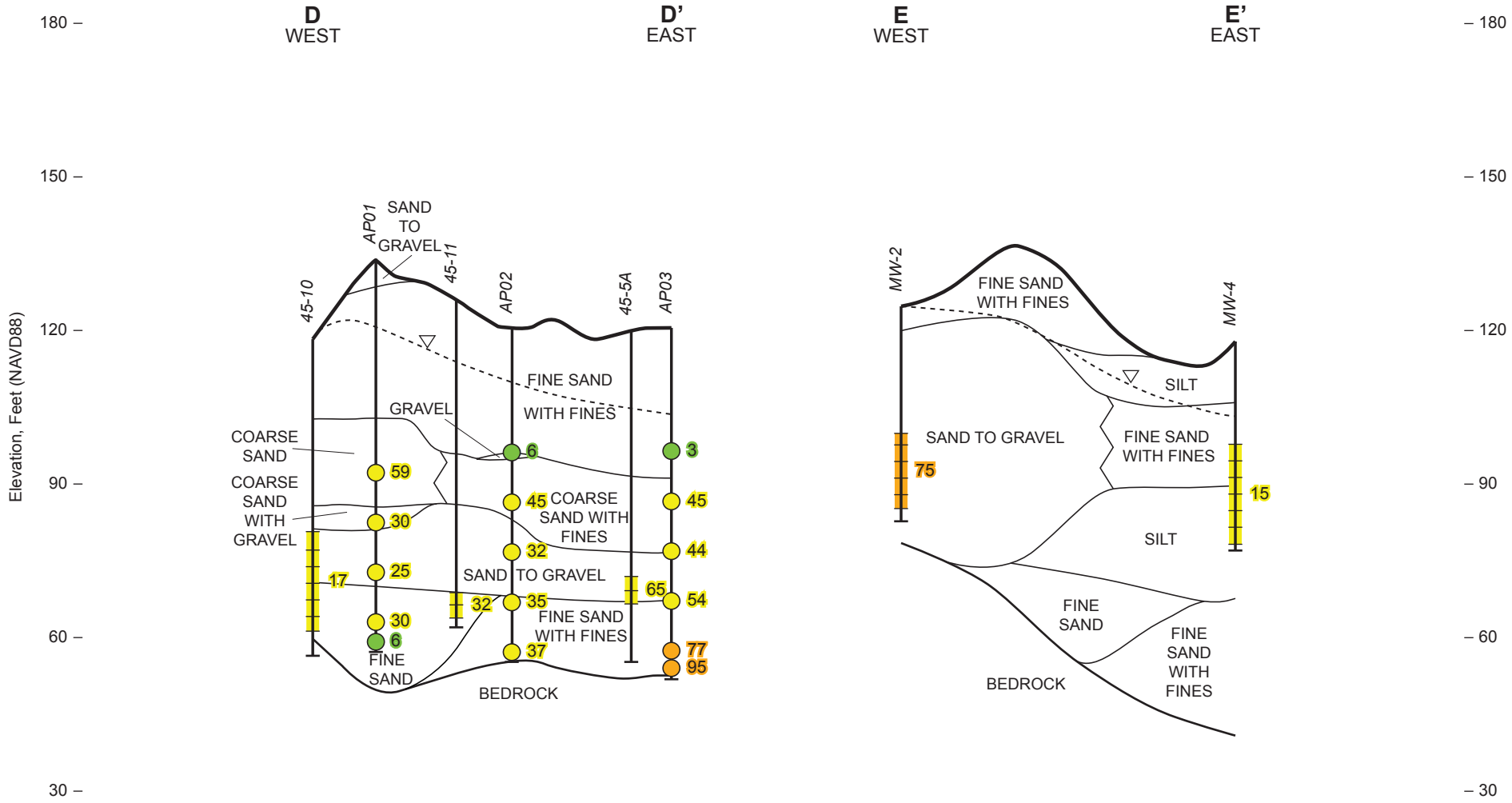
Approximate Horizontal Scale in Feet
10X Vertical Exaggeration

CROSS SECTIONS B-B' & C-C' WITH GEOLOGY AND DISSOLVED-PHASE PFOA+PFOS

Merrimack, NH
Saint-Gobain

FIGURE 11

BARR



NOTES

The depicted geology is based on the results of a three-dimensional model created using Earth Volumetric Studio™ (EVS) software. The model was cut at the specificed cross-section and the geological results were interpreted and simplified for inclusion in this figure.

LEGEND

- Geologic Contact
- Inferred Geologic Contact
- Approximate Water Table
- Monitoring Well Screen
- Soil Boring / Monitoring Well
- 62 — Groundwater Sample Location and Concentration (ppt)

Dissolved-phase PFOA+PFOS Concentration (ppt)

- 71-400
- 11-70
- <10

0 300 450

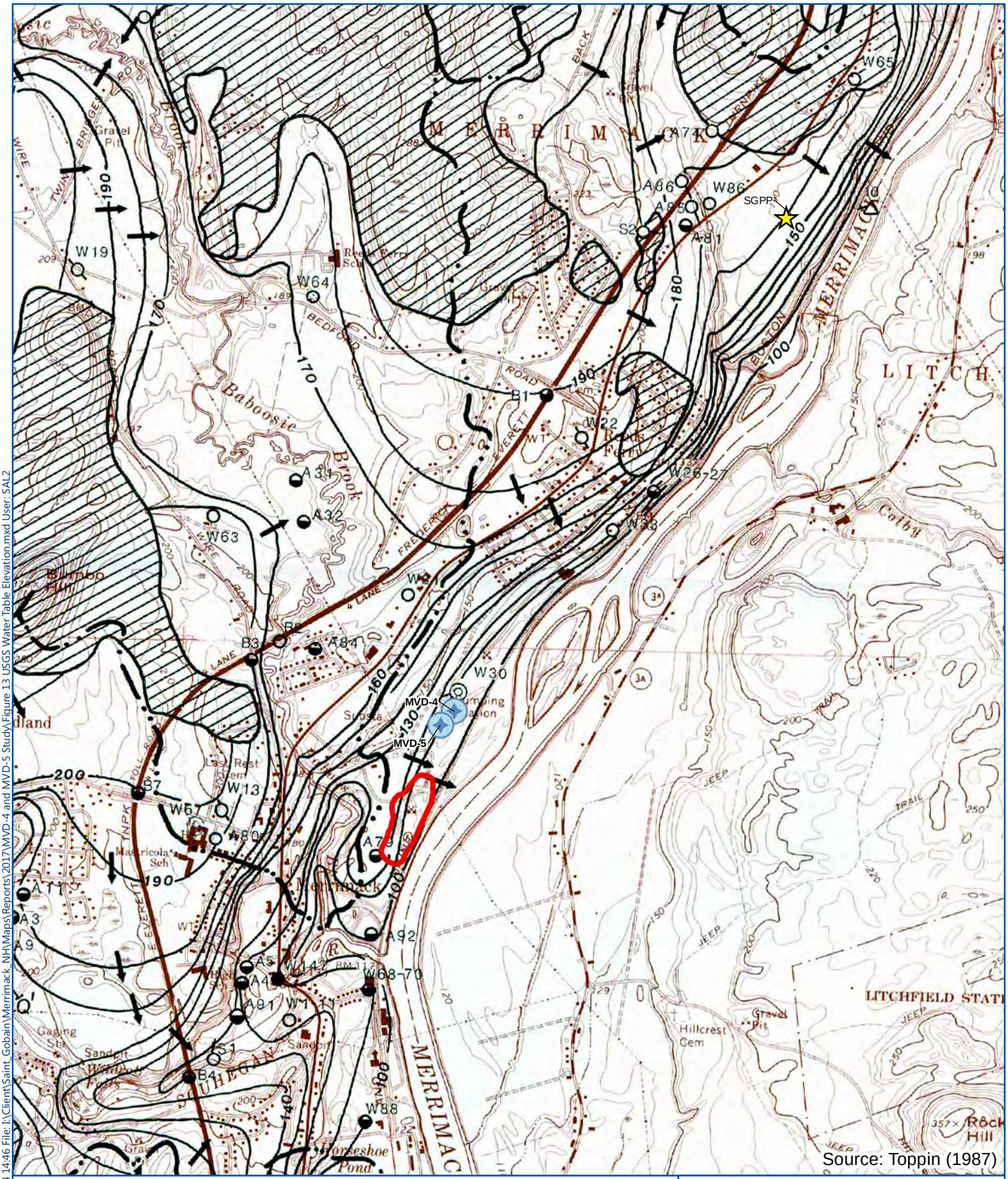
Approximate Horizontal Scale in Feet
10X Vertical Exaggeration

CROSS SECTIONS D-D' & E-E' WITH GEOLOGY AND DISSOLVED-PHASE PFOA+PFOS

Merrimack, NH
Saint-Gobain

FIGURE 12

BARR



Facility Location
MVD Pumping Well
Longa Disposal Area
TILL AND (OR) BEDROCK
CONTACT BETWEEN STRATIFIED DRIFT AND TILL AND (OR) BEDROCK
SURFACE-WATER DRAINAGE DIVIDE
SPRING
WATER-TABLE CONTOUR--Shows altitude of water table. Contour interval 10 feet. National Geodetic Vertical Datum of 1929. Arrows show generalized direction of ground-water flow.

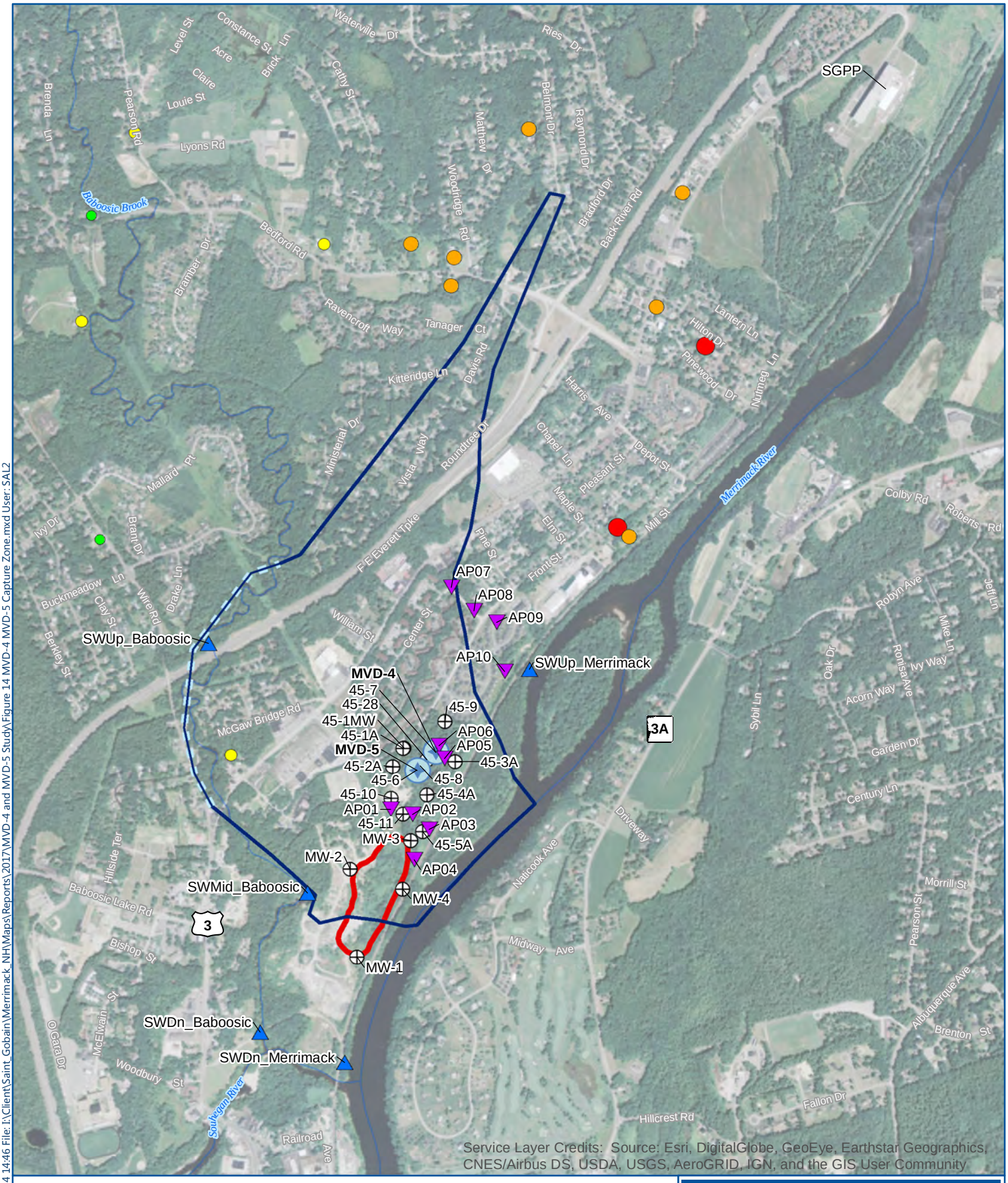
N

0 2,000
Feet

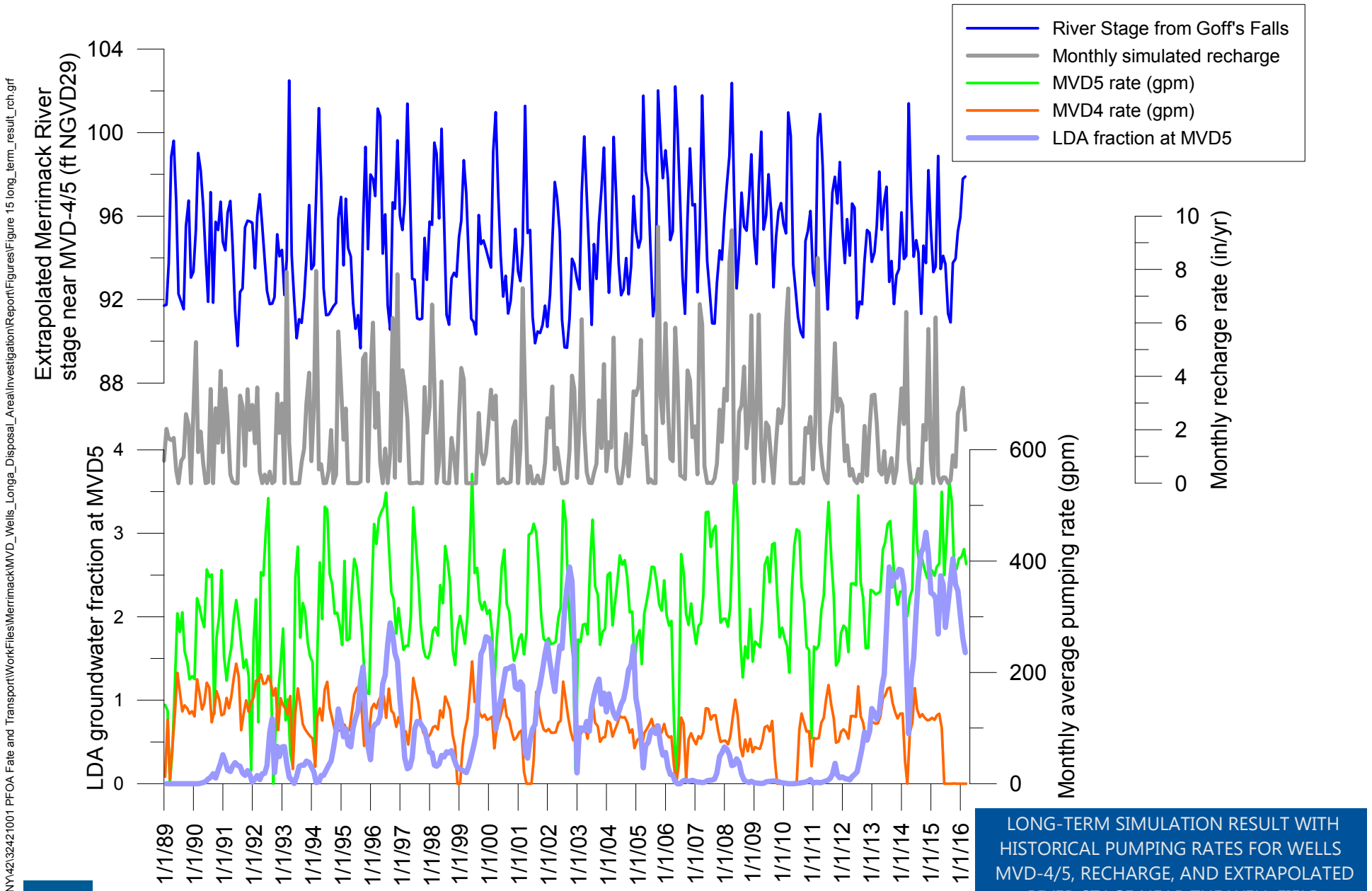
BARR

WATER TABLE ELEVATION NEAR MVD-4 AND MVD-5
Merrimack, New Hampshire
Saint-Gobain

FIGURE 13



Barr Footer: ArcGIS 10.4, 2017-03-24 14:46 File: I:\Client\Saint_Gobain\Merrimack_NH\Maps\Reports\2017\MVD-4 and MVD-5 Study\Figure 14 MVD-4 MVD-5 Capture Zone.mxd User: SAL2



P:\Mpls\32 NY\42\32421001 PFOA Fate and Transport\WorkFiles\Merrimack\MVD_Wells_Longa_Disposal_AreaInvestigation\Report\Figures\Figure 15 long_term_result_rch.grf

BARR

LONG-TERM SIMULATION RESULT WITH HISTORICAL PUMPING RATES FOR WELLS MVD-4/5, RECHARGE, AND EXTRAPOLATED RIVER STAGE NEAR THE WELL FIELD
Merrimack, New Hampshire
Saint-Gobain

Figure 15

P:\Mpls\32 NY\42\32421001 PFOA Fate and Transport\WorkFiles\Merrimack\MVD_Wells_Longa_Disposal_Area\Investigation\Data Processing and Visuals\Profiles\merrimack_profiles_prelim_v10_20170209_AP01-AP06.grf

AP01 AP02 AP03 AP04 AP05 AP06

Ground Surface
Water Level at Time of Geoprobe® Sampling
Water Level at Time of Waterloo APS® Sampling
Geoprobe® Refusal Elevation
Proposed Sample Not Collected
Geoprobe® Groundwater Sample
Waterloo APS® Groundwater Sample
Soil Chemistry Sample
Soil Grain Size Sample

PFOA Concentration (water, ng/L; soil, ng/g)
Sum of Sulfur-containing PFCs (water, ng/L; soil, ng/g)
- Perfluorobutanesulfonate
- Perfluorohexanesulfonate
- Perfluoro-octanesulfonate
- NEtFOSAA
- NMeFOSAA

Elevation (feet NAVD88)

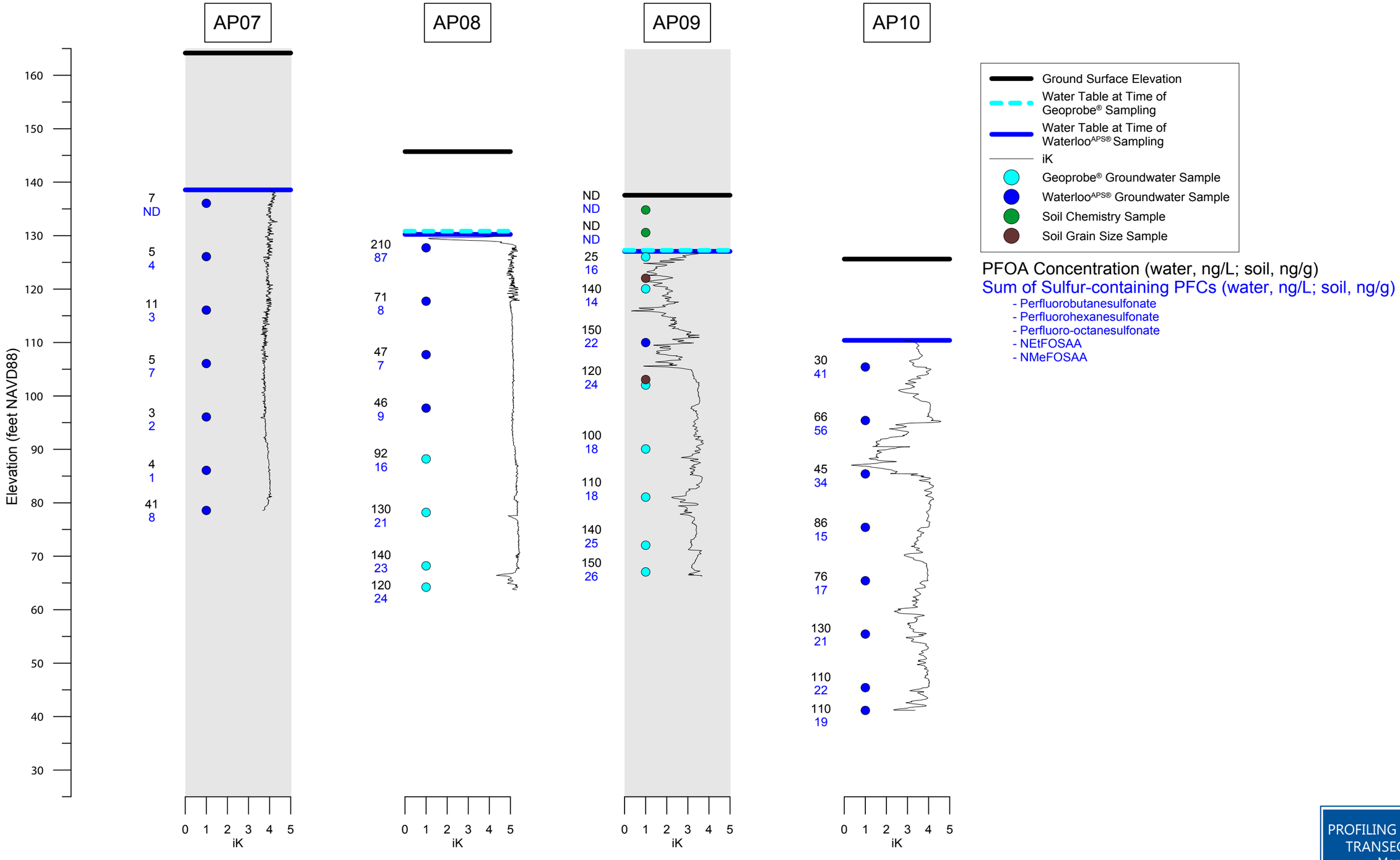
AP01: 59 / 2; 30 / 3; 25 / 4; 30 / 6; 6 / 2
AP02: 0.35 / ND; 0.27 / ND; 0.29 / ND; ND / ND; ND / ND; 6 / 2; 45 / 9; 32 / 7; 35 / 8; 37 / 8
AP03: 3 / ND; 45 / 6; 44 / ND; 54 / ND; 77 / 4; 95 / 8
AP04: 0.5 / ND; 29 / 5; 44 / 9; 42 / 11; 44 / 12; 45 / 11; 27 / 6
AP05: 5.2 / 1.4; ND / ND; ND / ND; 39 / 7; 100 / 15; 140 / 21; 120 / 21; 120 / 19; 130 / 17
AP06: ND / ND; ND / ND; 41 / ND; 54 / 12; 97 / 12; 65 / 12; 62 / 10; 63 / ND; 63 / 4

iK

BARR

PROFILING RESULTS
AP01 THROUGH AP06
Merrimack, NH
Saint Gobain

FIGURE 16



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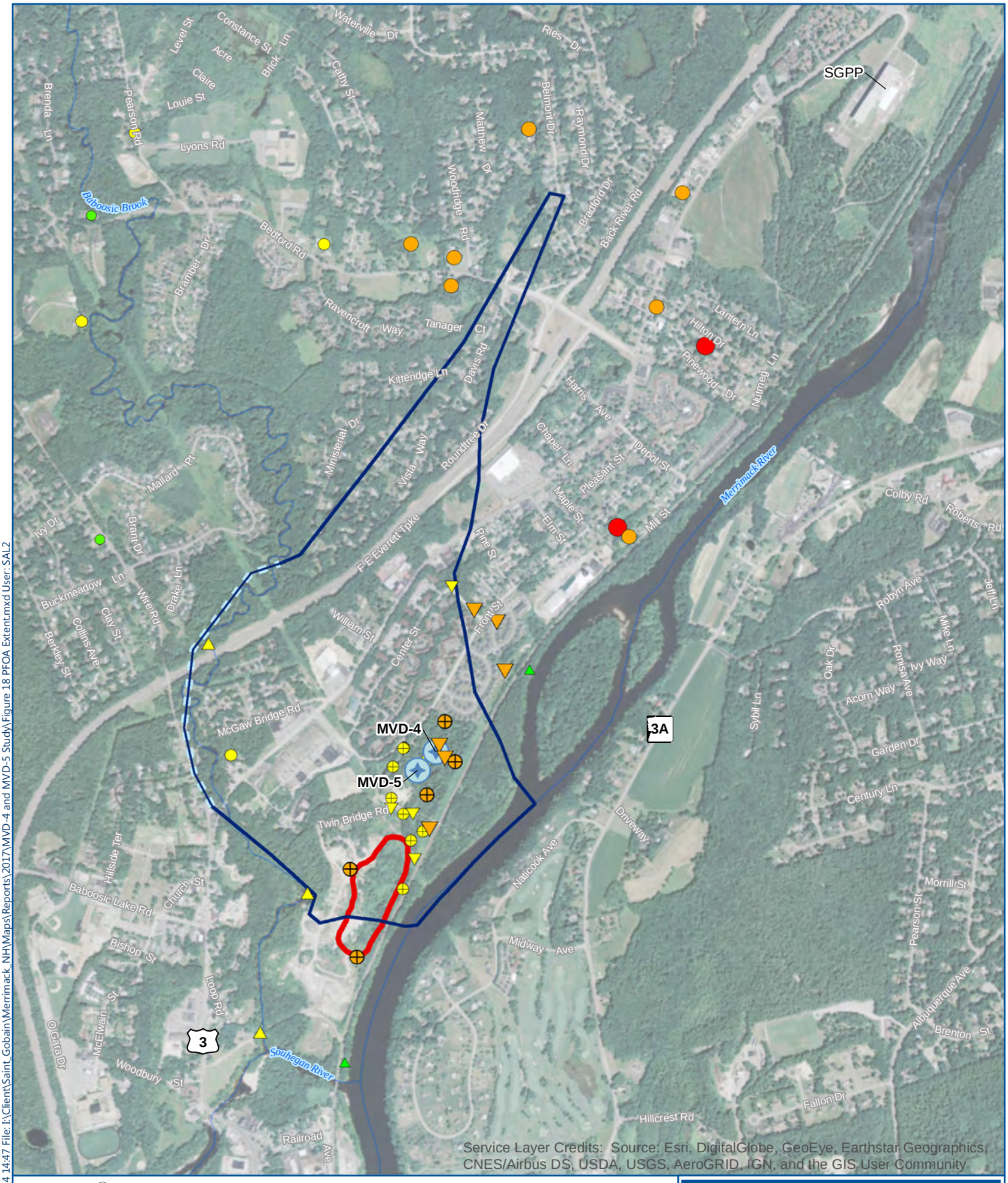
BARR

PROFILING RESULTS ALONG TRANSECT AP07-AP10
Merrimack, NH
Saint Gobain

FIGURE 17



NHDES Sampling Location
Aquifer Profiling Location
Surface Water Sample/Gauging Location
Monitoring Well
MVD Pumping Well
MVD-4/5 Modeled Summer Capture Area in Model
Capture Zone Extends West of Model Domain in This Area

PFOA Concentration (ppt)
> 400
71 - 400
11 - 70
< 10
Longa Disposal Area

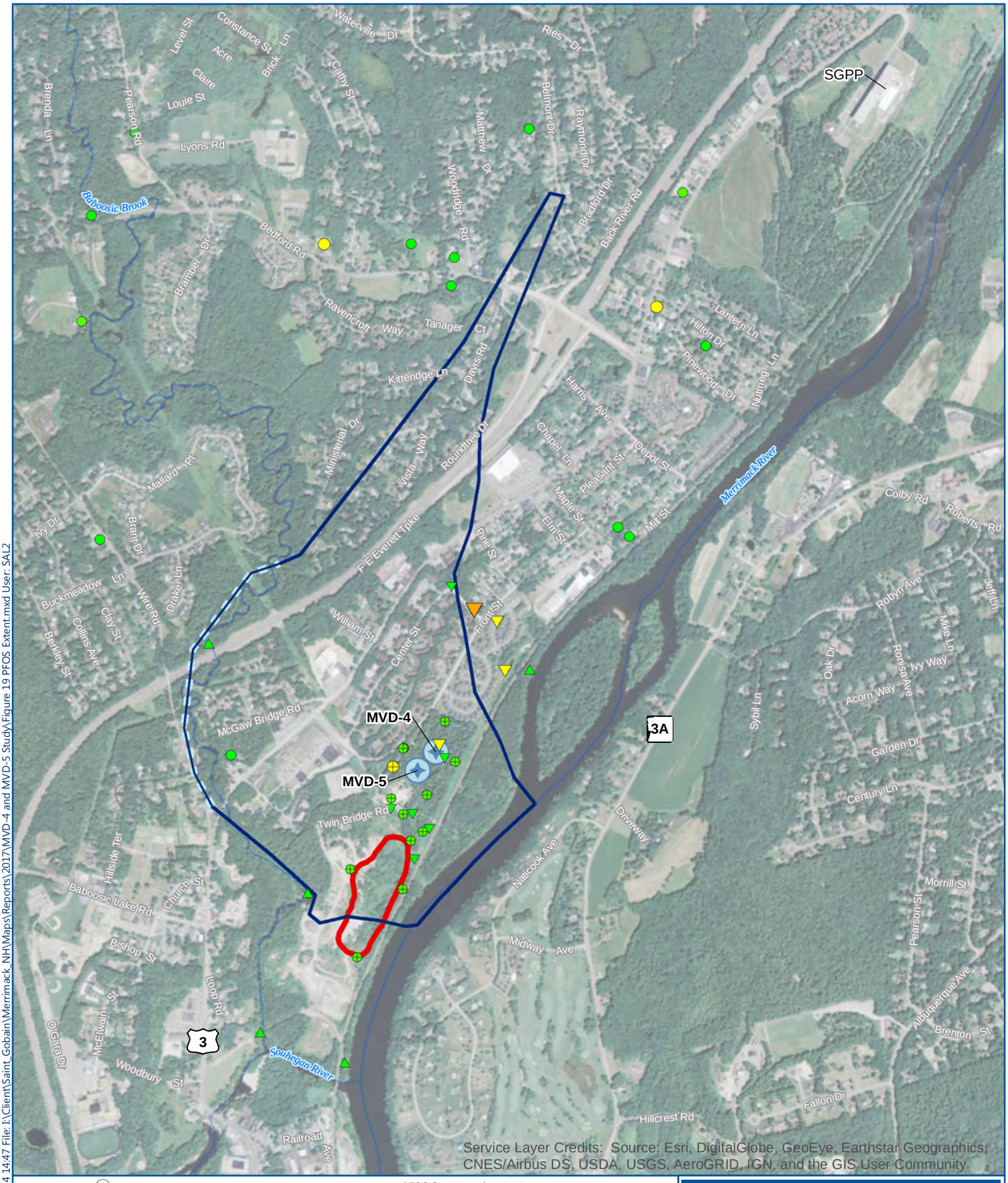
N

0 1,500
Feet

BARR

PFOA GROUNDWATER CONCENTRATIONS
WELLS MVD-4 AND MVD-5
Merrimack, New Hampshire
Saint-Gobain

FIGURE 18



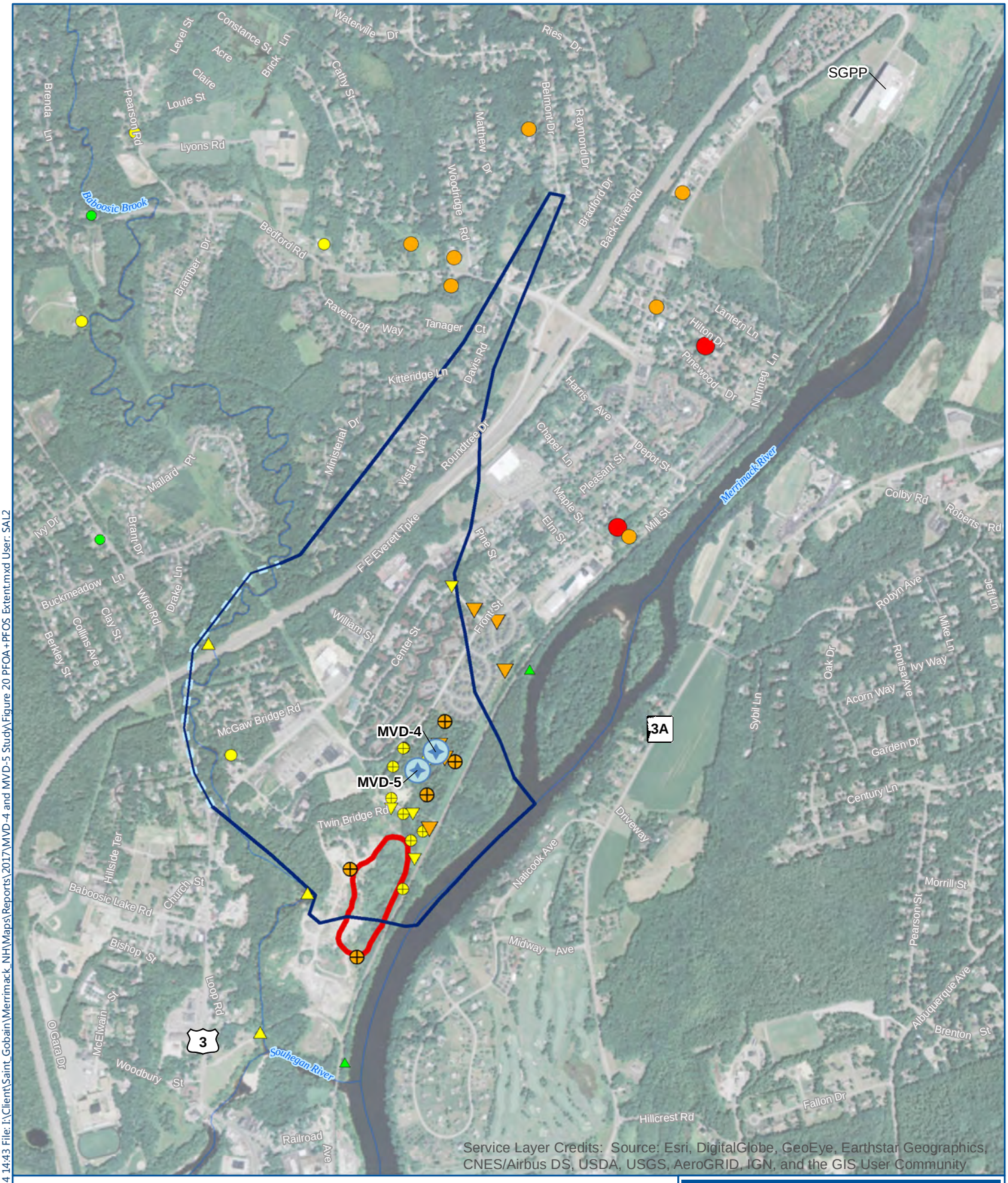
NHDES Sampling Location
Aquifer Profiling Location
Surface Water Sample/Gauging Location
Monitoring Well
MVD Pumping Well
MVD-4/5 Modeled Summer Capture Area in Model
Capture Zone Extends West of Model Domain in This Area

PFOS Concentration (ppt)
> 400
71 - 400
11 - 70
< 10
Longa Disposal Area

N
0 1,500
Feet

PFOS GROUNDWATER CONCENTRATIONS
WELLS MVD-4 AND MVD-5
Merrimack, New Hampshire
Saint-Gobain

FIGURE 19



NHDES Sampling Location
Aquifer Profiling Location
Surface Water Sample/Gauging Location
Monitoring Well
MVD Pumping Well
MVD-4/5 Modeled Summer Capture Area in Model
Capture Zone Extends West of Model Domain in This Area

PFOA+PFOS Concentration (ppt)
> 400
71 - 400
11 - 70
< 10
Longa Disposal Area

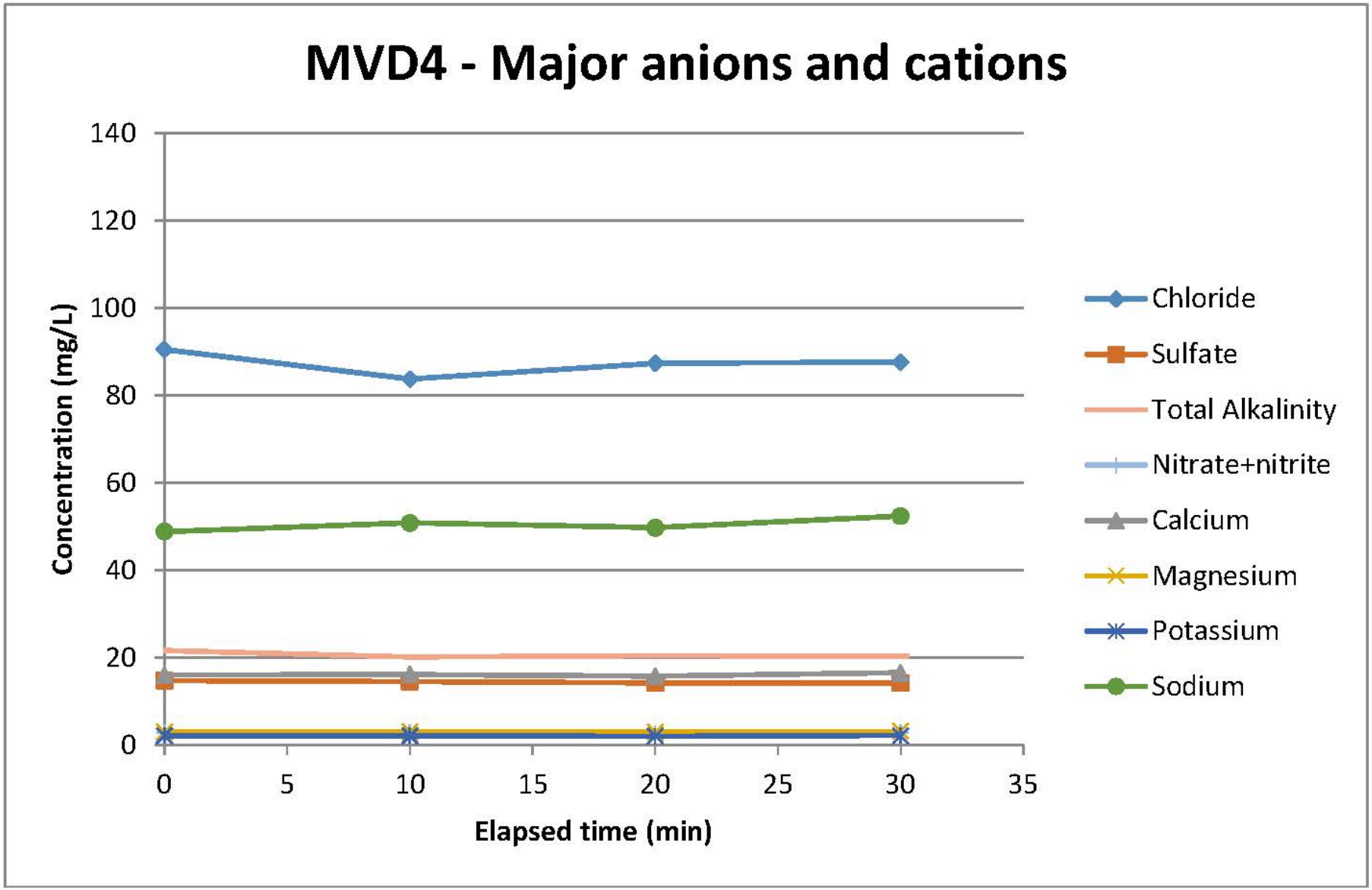
N

0 1,500
Feet

BARR

PFOA+PFOS GROUNDWATER CONCENTRATIONS
WELLS MVD-4 AND MVD-5
Merrimack, New Hampshire
Saint-Gobain

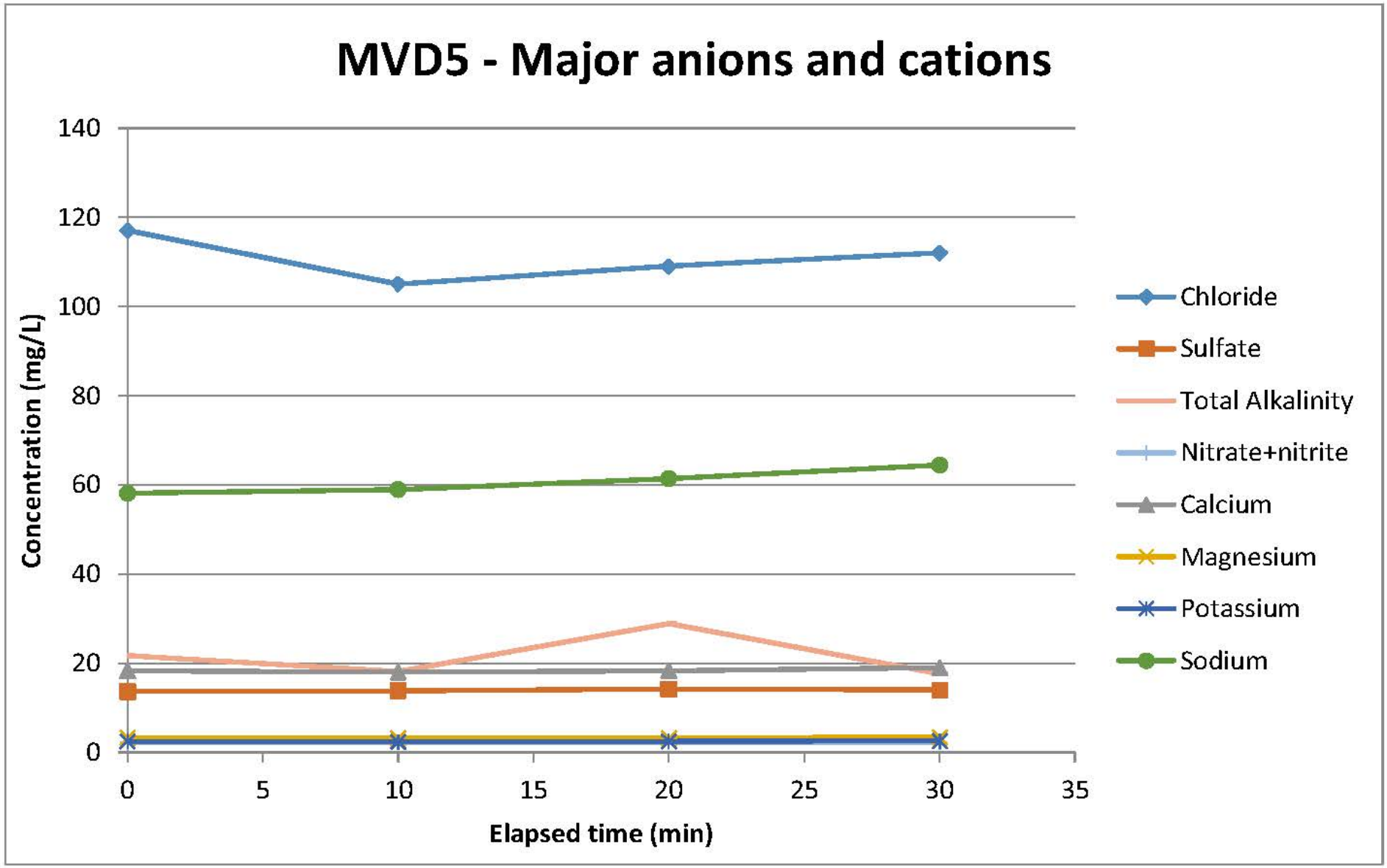
FIGURE 20



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

FIGURE 21

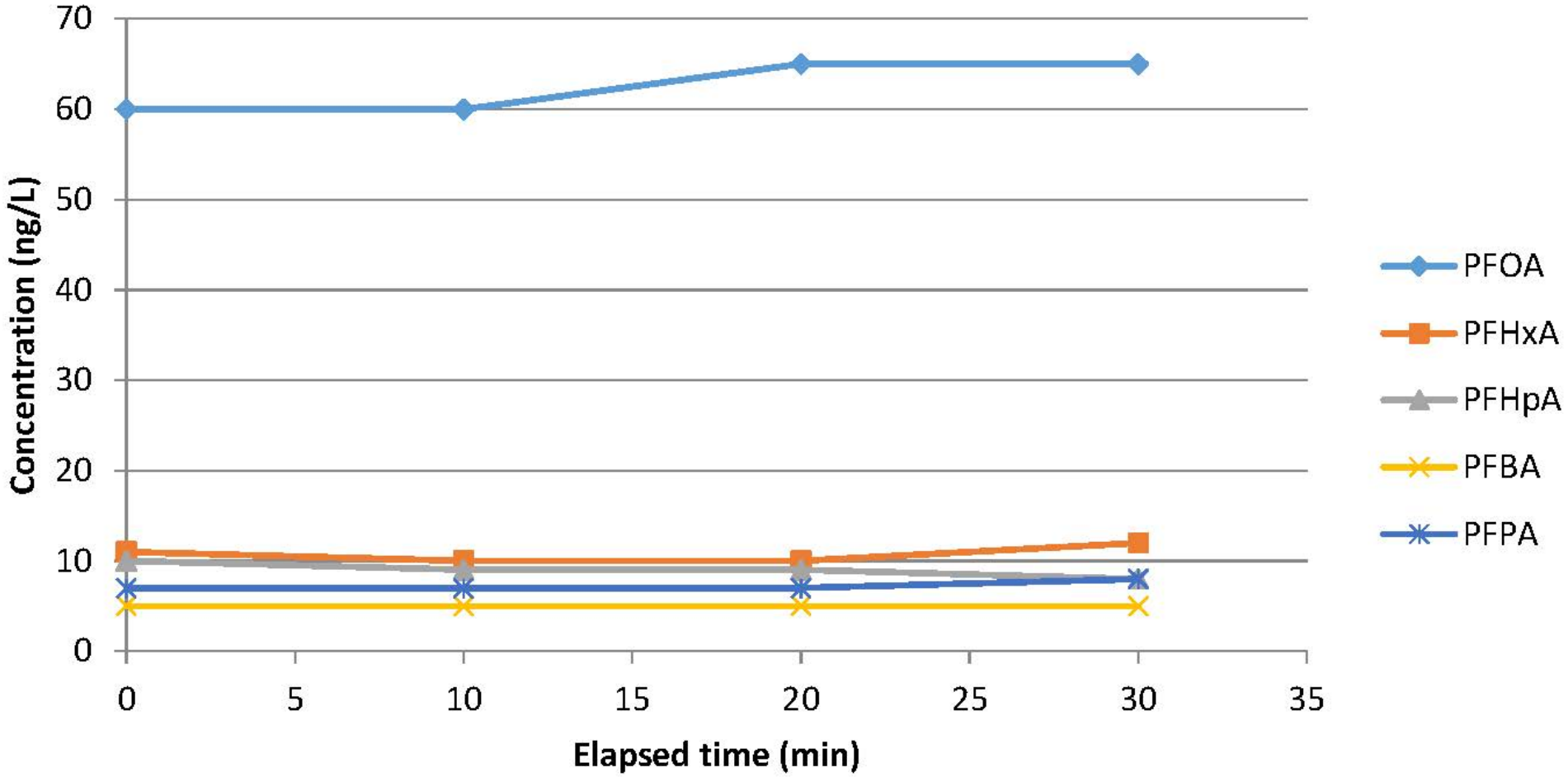
BARR



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

FIGURE 22

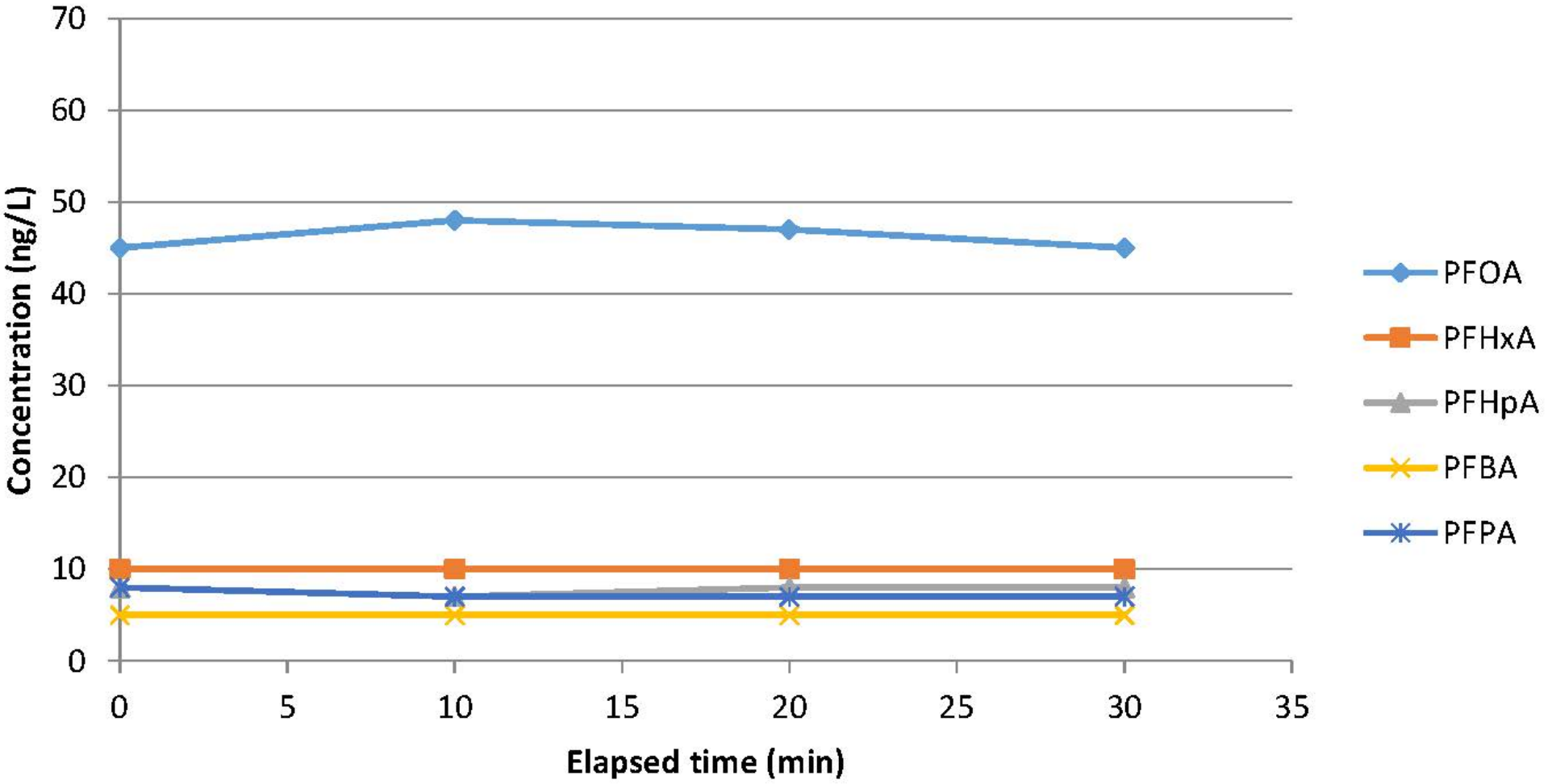
BARR



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

FIGURE 23

BARR



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

FIGURE 24

BARR

Appendix A

Aquifer Profiling and Sampling Methods

CASCADE
DRILLING | TECHNICAL SERVICES

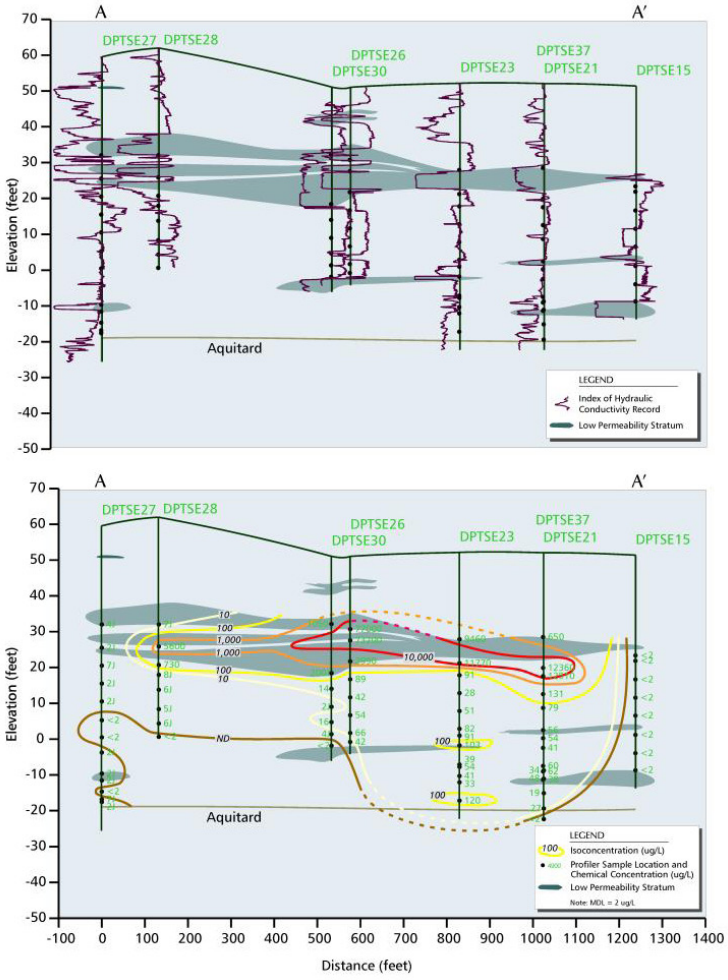
Waterloo APS TM

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, real-time 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_K allowed the investigator to identify and sample sand lenses with in a clay unit that serve as major contaminant transport pathways.

Waterloo APS™
ADVANCED PROFILING SYSTEM

425-527-9700 | communications@cascade-env.com | www.cascade-env.com

CASCADE
DRILLING | TECHNICAL SERVICES

WATERLOO APS TM

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 TM 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.

Multiple Models for Various Hydrogeologic Conditions

Waterloo APS TM 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.

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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:
    - Noise Levels
    - Heavy equipment (drill rigs or direct push rigs) hazards
    - Overhead utility hazards
    - Underground utility hazards
    - Traffic/ motor vehicle hazards
    - Hazards associated with exposure to various chemicals
    - Slip, trip and fall hazards
    - Pinch point hazards
    - Compressed gas hazards
    - Fire hazards from hot work (e.g., grinding)
    - 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

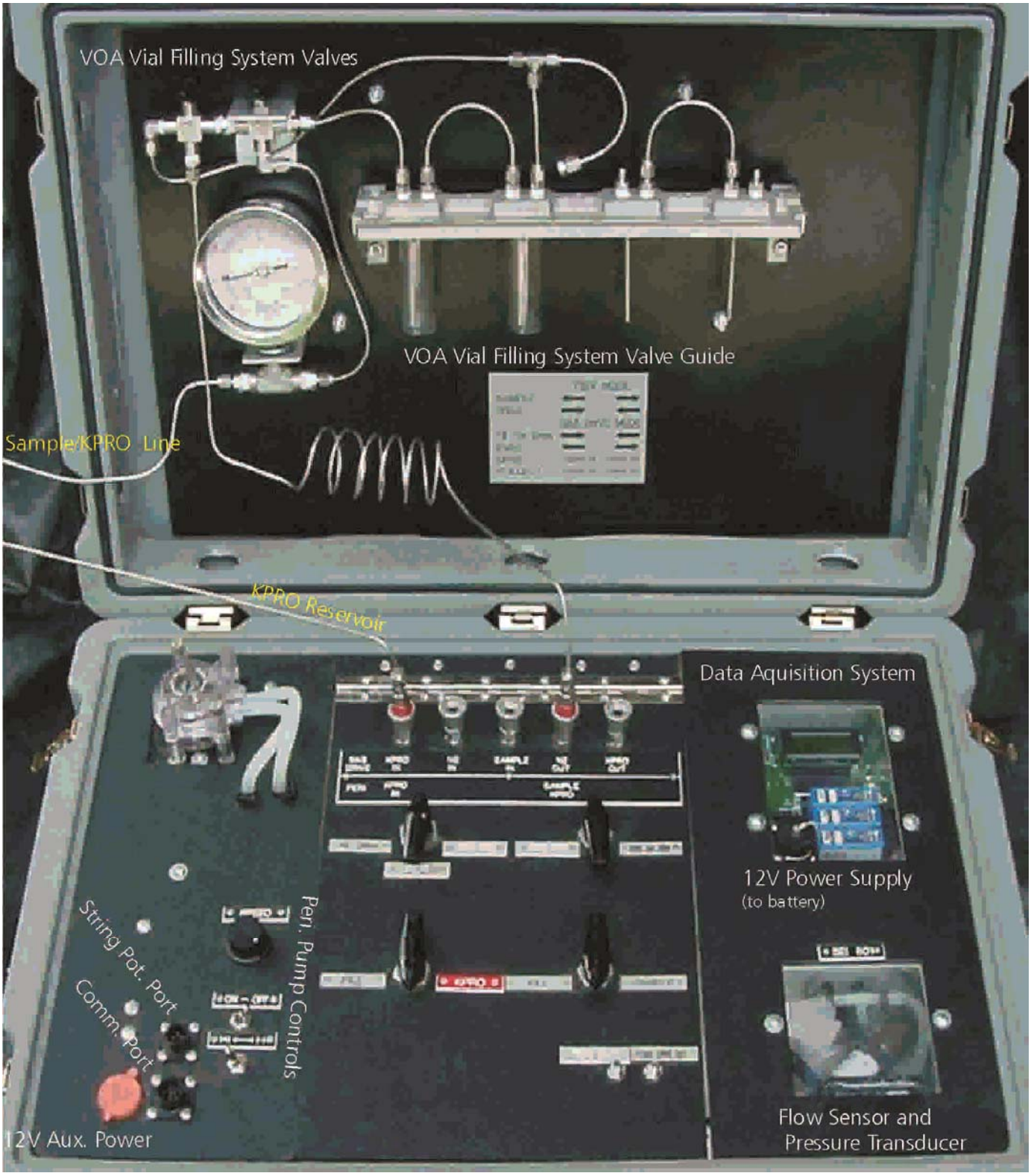
tip contains 6 plates. The plates have a slightly different design than the smaller tips in that the entire plate is more or less a sampling port. The groundwater is obtained using either a peristaltic pump or a gas-drive system (see Figure 4.1 for a schematic of these two profiler configurations).

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:

1. Set up of the KPRO box and associated equipment
2. Tip / Pump assembly
3. Adding rod and tubing
4. Drive the tool and acquire index of hydraulic conductivity data
5. Purge water from the system and obtain physico-chemical data from the Sonde water quality monitoring system
6. 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 stand-alone 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.
3. 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.

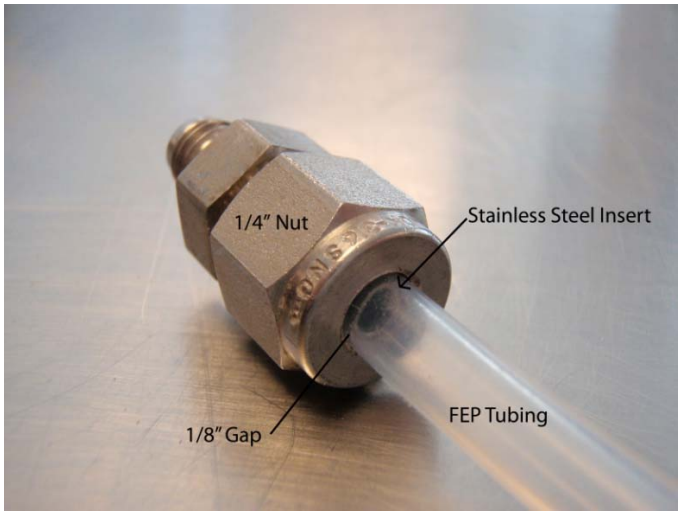
4.4 Tip and Pump Assembly for Peristaltic and Gas Drive Modes

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 $^{9}/_{16}$" open ended socket, tighten the ¼" nut until there is approximately $^{1}/_{8}$" vertical gap between the top of the steel insert and the nut as shown in the following photo:



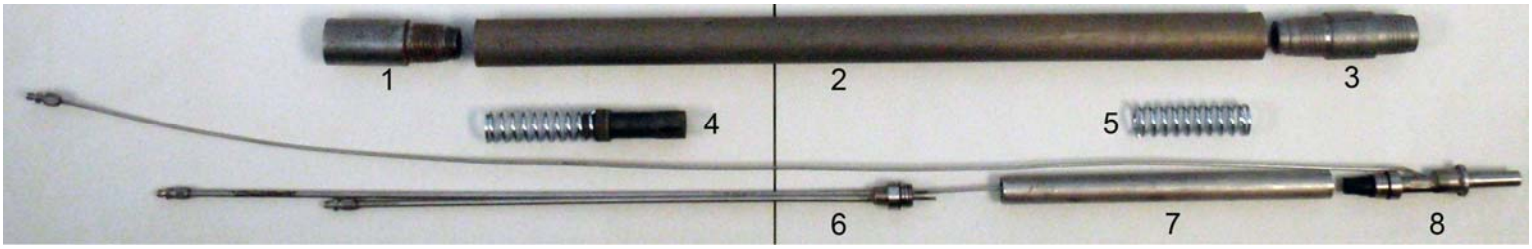
5. For the other end of the FEP, slide on another ¼" SwageLok nut and ¼" nylon ferrule. Insert the end of the FEP into a ¼ "to $^{1}/_{8}$" SwageLok® reducer. Using a ½" and $^{9}/_{16}$" wrench, tighten the nut as before. Be careful to keep the FEP seated tightly into the fitting while tightening.

   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 $^{1}/_{8}$ 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

1. Wrap the NPT threads of the ¼- inch NPT thread 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 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 ¼" stainless steel tube ("piston"). To attach the piston, slip a ¼" swage nut and ¼" steel ferrule onto one end of the piston. Insert this end into the ¼" 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
2. Pump Housing – Middle
3. Pump Housing – Bottom
4. Top Spring with plastic bushing
5. Bottom Spring
6. Pump Body - top. Sample line is the middle tube and nitrogen is the short
7. Pump Body – middle
8. 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.

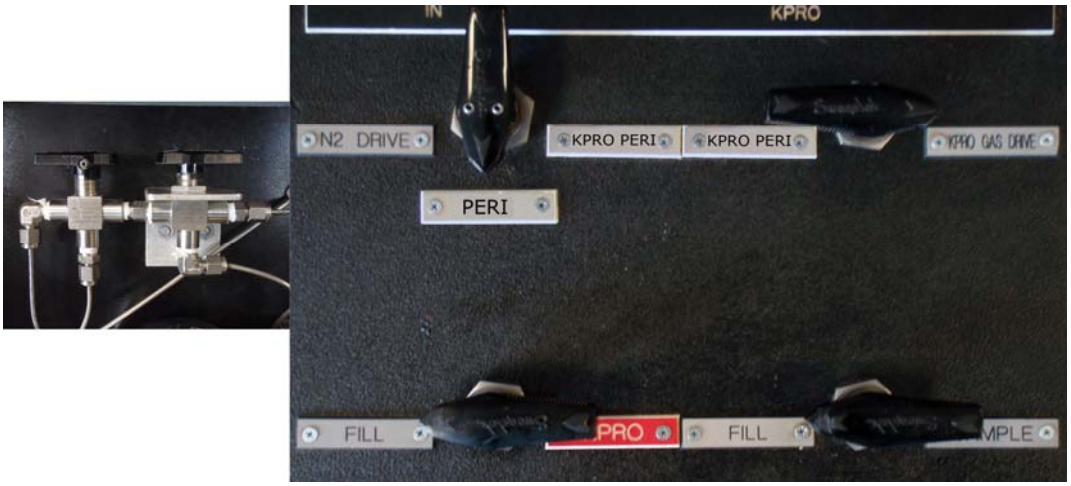
11. Take the profiler tip and slide the ¼-inch stainless steel tube up into the receptacle in the pump bottom. Screw the tip onto the pump housing.

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.

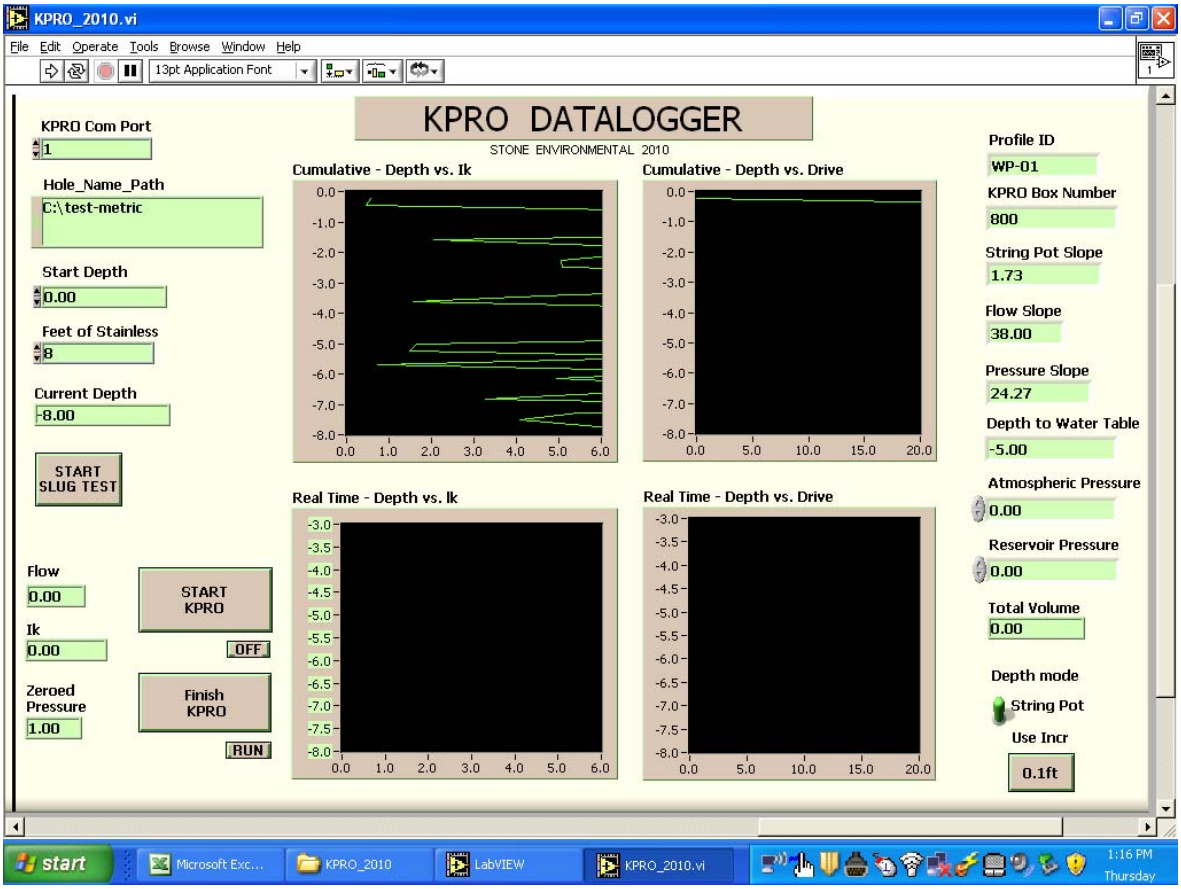
14. Add a 20-foot length of stainless steel tubing to each tube fitting leading from the pump.
15. Slide a 5' drill rod over the stainless steel tubing and screw it into the pump.
16. Tighten all joints by firmly by standing on the pipe wrench. To do this put one pipe wrench so that it is resting on 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

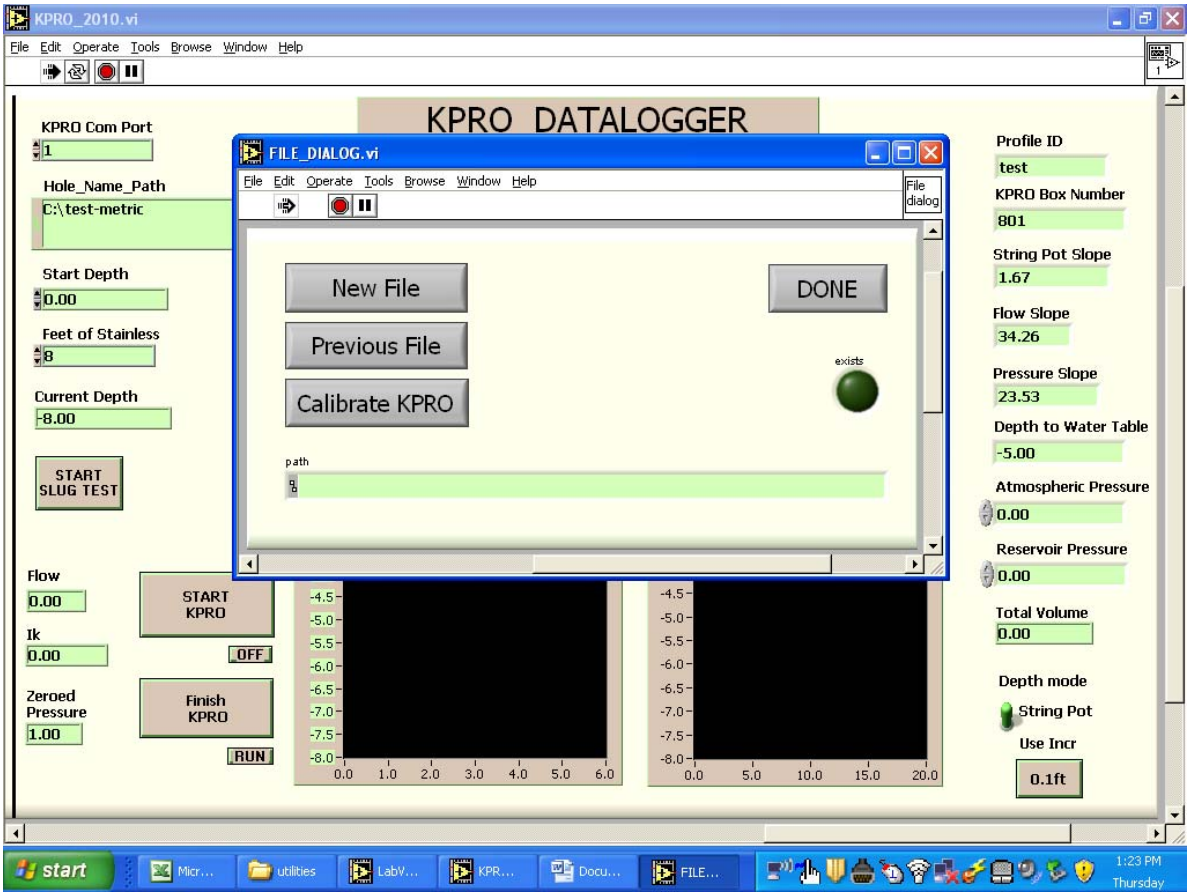
3. Make sure that the correct COM port is provided for the KPRO box before starting the program and correct it if necessary. The text box for the COM port is located at the top left of the above figure. The COM port located at the back of the computer is COM1.

   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.

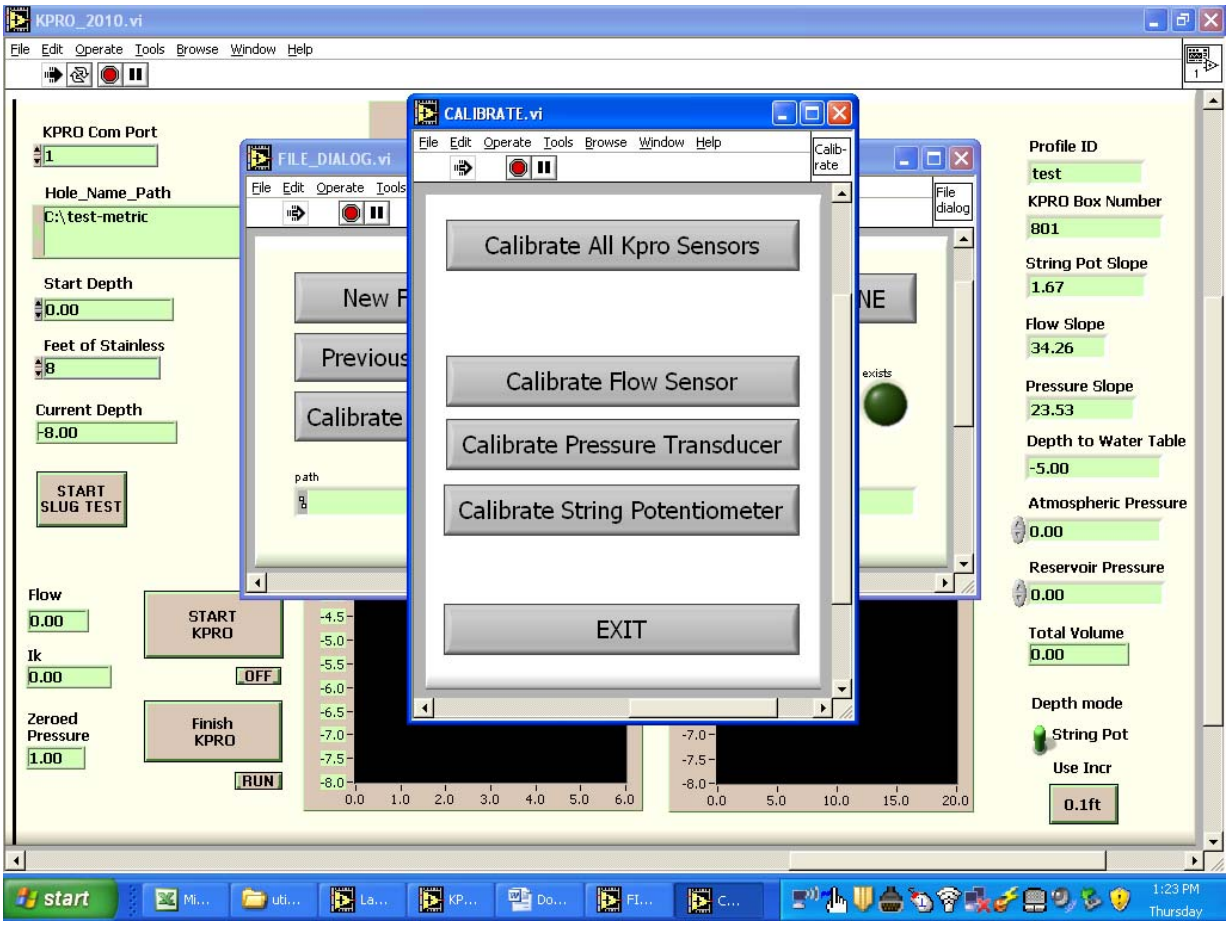
6. A window opens and prompts you to enter the profile ID. Enter the ID and select the enter button. The following screen will load.



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.

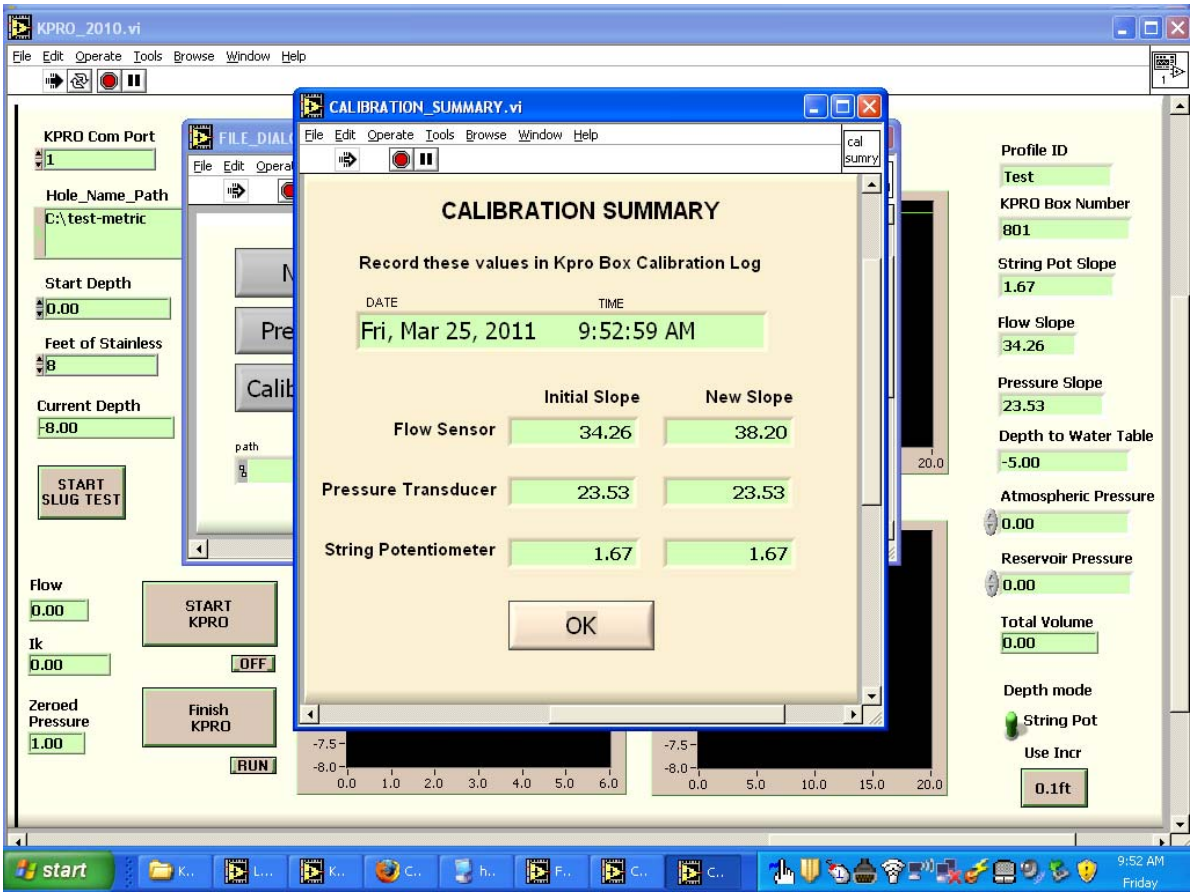
8. The next screen allows you to calibrate all of the sensors or each individual sensor (string pot, flow and pressure).



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:

GROUNDWATER PROFILE LOG

STONE ENVIRONMENTAL INC

Client: ERM (Started / Completed)

Profile Location: APS-018

Dates: 5/27/2010 5/28/2010

KPRO Box Serial # / Acquisition Laptop: 808/ Rasc7

Gas Drive or Peri Pump: Gas

Location: Plainville, CT

Troll Serial #: o2k0934 YSI

Atmospheric Pressure: 34.89

SEI #: 092193-R

Drilling 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

				PHYSICOCHEMICAL PARAMETERS				
Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pH	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

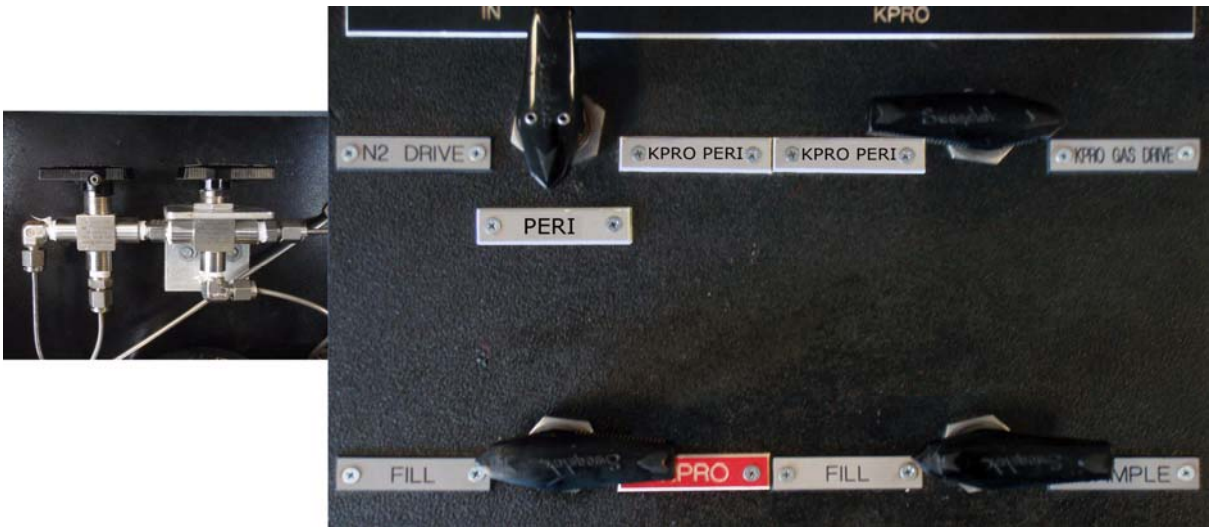
4.6 Drive the Profiler/Acquire I_k data for both Peristaltic and Gas Drive Modes

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.

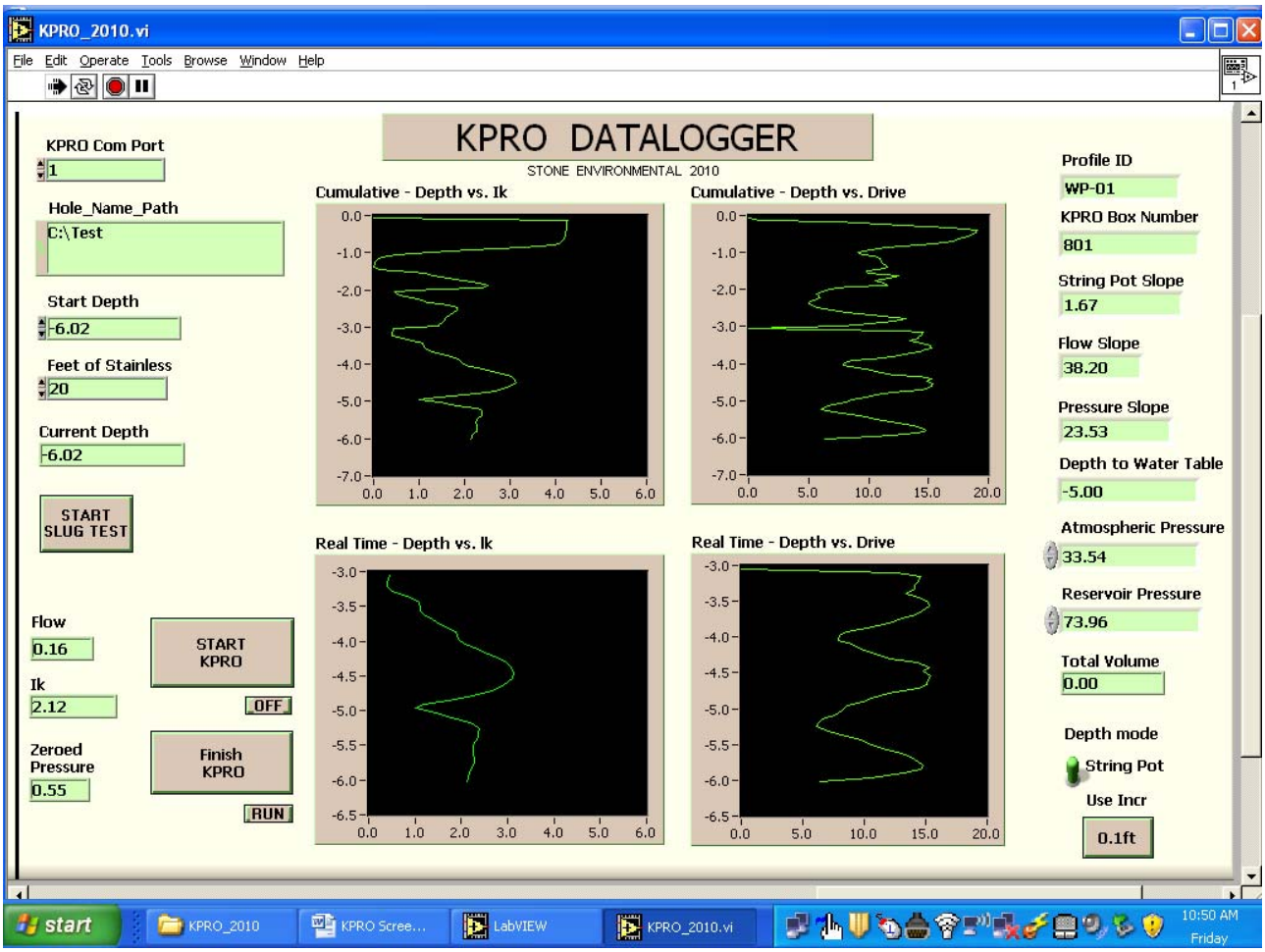
4. When the flow value stabilizes click on the Start KPRO bottom at the bottom of the KPRO software. Make sure that the string put is extended and the head of the drill rig is resting fully on the slip cap before starting the software. The software will not read the depth correctly if it is started before 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.

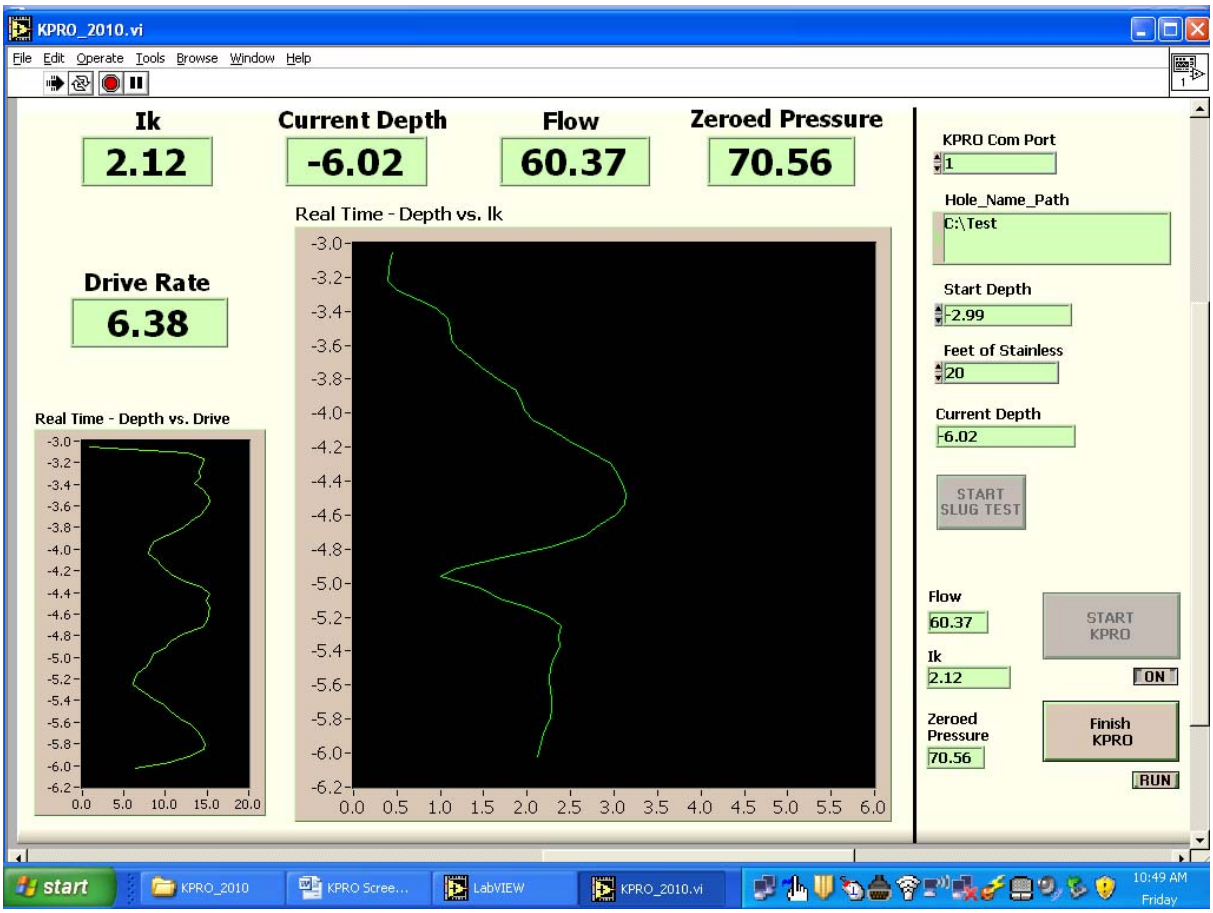
   Notes on the string pot: 1. The KPRO software only records data while the string pot is moving. 2. If during a drive the driller needs to lift the probe, there is no need to stop the KPRO software. The software will only record data once the string pot has moved past the last recorded depth.

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.

I_k and Sample Attempt Log

STONE ENVIRONMENTAL INC

Client:	ERM			Profile Location:	APS-018
Date:	5/27/2010	KPRO Box Serial #:	808/ Rasc7	Gas Drive or Peri Pump:	Gas
Location:	Plainville, CT	Troll Serial #:	o2k0934 YSI	Atmospheric Pressure:	34.89
SEI #:	092193-R	Drilling Contractor:	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.

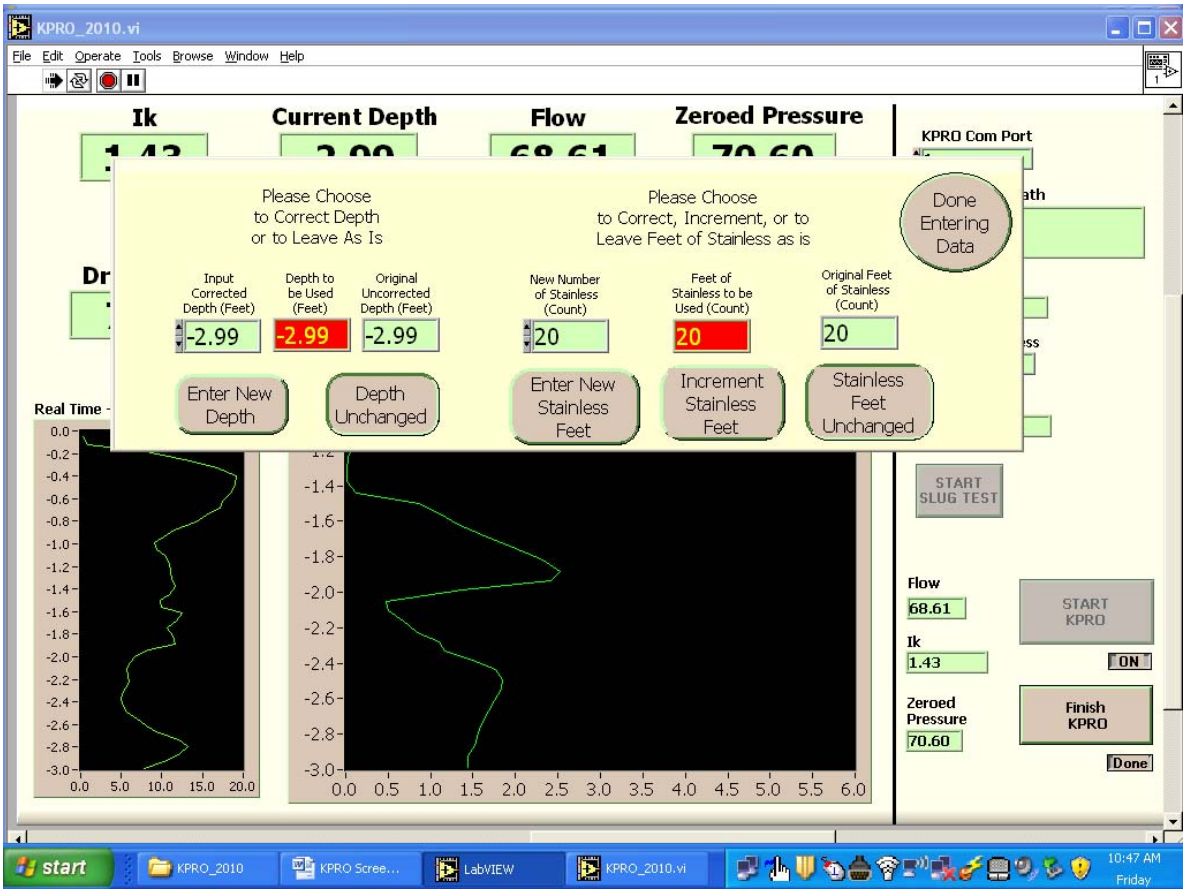
It will take experience to get a feel for which intervals will yield fast samples and which will not. The I_k and flow are a good indication as to which samples will be fast or slow but remember that the flow decreases with the amount of stainless tubing that is

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.

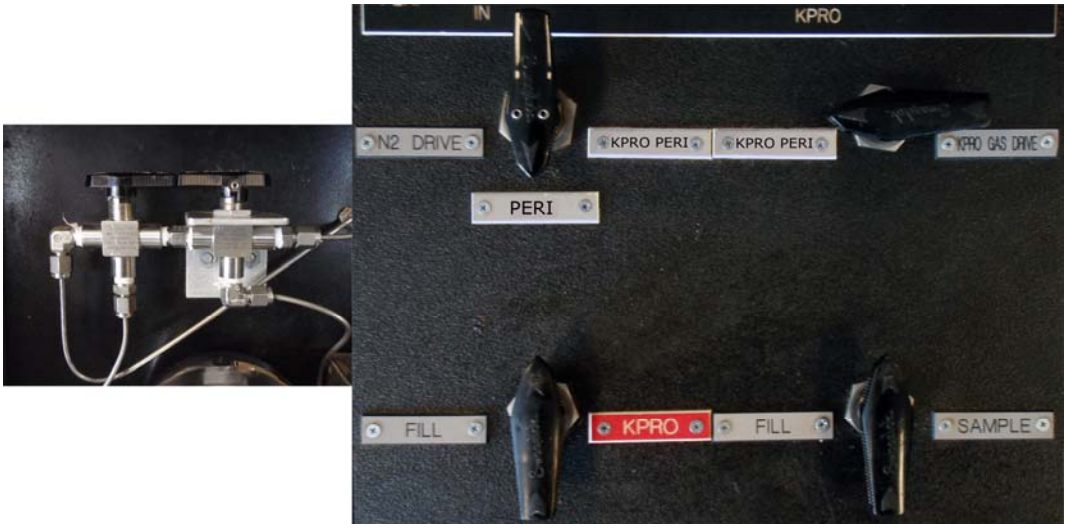
14. Double click on the appropriate Sonde water quality monitoring system icon on the notebook computer desktop (Ecowatch for the YSI, Win-Situ for the Troll, and HydraS3 LT for the Hydrolab). Instructions on how to operate the specific software for each Sonde can be found in SEI SOP 5.27.*n* (Hydro 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

3. Observe the vacuum gauge. A vacuum should build toward -30 inches of mercury
4. 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.
5. 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.
6. 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).
7. 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.

PARAMETER EQUILIBRATION LOG

STONE ENVIRONMENTAL INC

Client: ERM

Profile Location: APS-018

Date: 5/27/2010
Location: Plainville, CT
SEI #: 092193-R
Sampler(s): VLD

KPRO Box Serial #: 808/ Rasc7
Troll Serial #: o2k0934 YSI
Drilling Contractor: Platform
Depth to Water: -17.2818182

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

				PHYSICOCHEMICAL PARAMETERS								
Depth (ft)	Head (ft)	Time	Volume Purged (mL)	SC (uS/cm)	SC %Change	DO (PPM)	DO %Change	pH	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

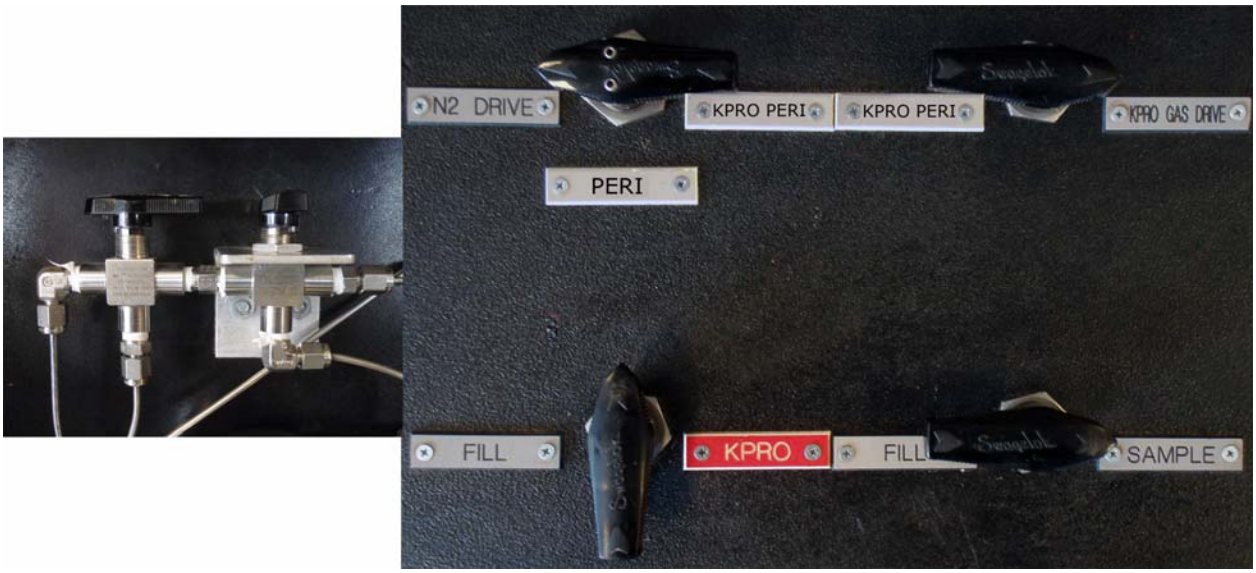
situations the sampler can collect the sample before these values have stabilized as long as Specific Conductance and pH are stable.

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.

2. 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".

4. 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:

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

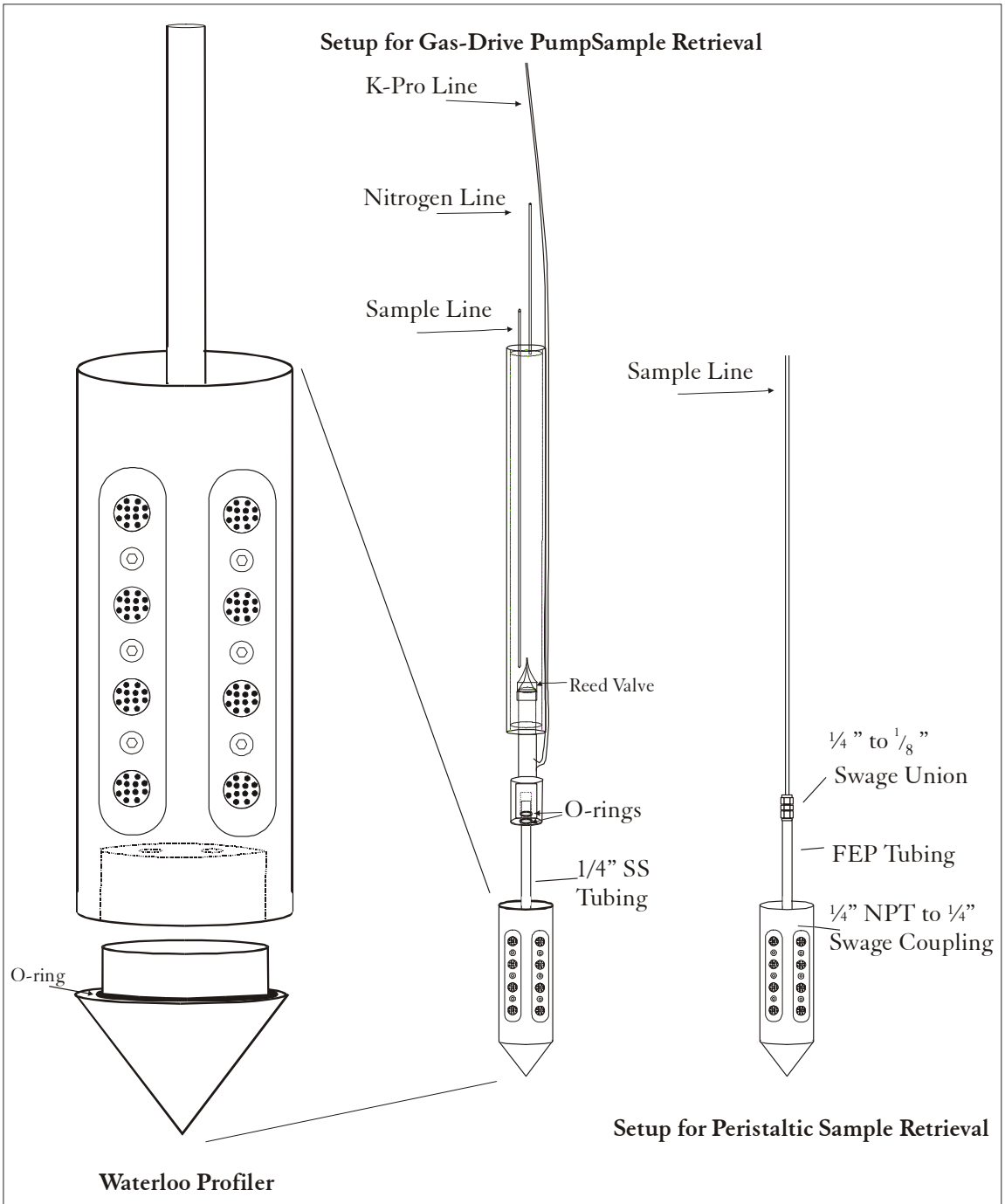


FIGURE 4.1: Schematic of Waterloo profiler with Gas-Drive and Peristaltic Retrieval Systems
SOP #10-5-0: *GROUNDWATER PROFILING AND KPRO TESTING*

Source: I:\\GLP\SOP\SEI_SOPs\CH10_EnvDrill\current\10-5-0 Figure 4.1
7-10-02 dtv

STONE ENVIRONMENTAL INC

9.0 AUTHORIZATION

Revised by: _____ Date: 1/6/2016

Vincent DeLeone, Waterloo APS Service Leader

Approved by: _____ Date: 6 JAN 2016

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
  - o 60 X 60
  - o 100X 100
- _ 1½" Geoprobe X 1¾" Rope crossover (for hooking to grout pump swivel)

KPRO TESTING BOX AND RELATED EQUIPMENT

- _ String Pot
  - _ Com Cable (2)
  - _ Quick Clamp
- _ Compressed N_2 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-N_2 side (2)
  - o 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
- _ ¼″ SS Tubing (10)
- _ ¼″ NPT male to ¼″ compression fitting
- _ ¼″ Ferrules, SS

PERI MODE TIP ASSEMBLY

- _ FEP Tubing (1/4″ OD X 3/16 ID)
- _ ¼″ NPT male to ¼″ compression fitting
- _ Ferrules, Nylon
- _ Barbed inserts for FEP Tubing, SS (3/16 OD)
- _ ¼″ 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
  - _ Extra Bulb
- _ Chair
- _ Fan (optional)
- _ Padlock with Long Hasp
- _ 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)
- _ Cotton liner Gloves (4-6 pairs)
- _ Leather Work Gloves
- _ Safety Glasses
- _ Hardhats (1 per person + spare)
- _ Hearing Protection

_ Tyvek Suits
_ Emergency Eyewash
_ First Aid Kit
_ Compressed Air Horn
_ Respirator and Cartridges
_ Spill Kit
_ Spare absorbent Pads
_ Fire Extinguisher
_ Flashlight

HAND TOOLS AND POWER EQUIPMENT

_ 7/16" Wrenches (4)
_ Pipe Wrenches, 2, 24"
_ Open Ended Wrenches, Standard, Full Set
_ Screw Drivers, Regular and Phillips
_ Impact Wrench
_ Oil Filter Wrench (suitable to
_ Allen Wrenches, Standard and Metric
_ Crescent Wrench
_ Socket Set, Standard, Full Set
_ 9/16" Socket, Open Ended for removing fittings from Profile Tip
_ Taps for Profiler Tip Screws
_ Tap Handle
_ Torx Bits, T-25
_ Picks, Full Set
_ Pliers, Standard, Needle Nose, and Channel Lock
_ Vise Grips
_ Wire Strippers
_ Electrical Multi-meter
_ Soldering Iron
_ Tin Snips
_ SS Screen Hole Punch
_ Files
_ Utility Knife
_ Extra Blades
_ Tubing Cutter
_ Sledge Hammer, 3lb
_ Butane Lighter
_ Electric Drill
_ Drill Bits, Full Set
_ Carbide Bit for Reaming SS Tubing
_ Angle Grinder

ADDITIONAL WINTER GEAR

_ Pipe Insulation
_ Heat Tape
_ Propane Heaters
_ Kerosene Heaters

SWAGE BOX

_ Ferrules
-1/4" Nylon
-1/8" Stainless Steel
-1/4"Stainless Steel
_ Extra Profiler Tip Plates (4)
_ O-Rings for K-pro Reservoir (large and small)
_ Hose Clamps
_ 1/8" Elbows
-Barb/NPT fittings
-Compression/NPT fittings
_ Spare Pressure Transducer
_ Spare Flow Meter
_ ¼" to ¼" Barb Plastic-NPT
_ ¼" to ¼" Barb Plastic T's
_ 1/4 " in-line Filters
_ Spare 5-way valve
_ Spare 3-way valve
-¼" NPT
-1/8" NPT
_ 1/8" SS tube Caps
_ Extra Regulators
- 100 psi
- 300psi
_ Extra pressure gauge
_ Screws for tip (3/8" #10/32, flathead T-25)
_ Quick disconnect for stainless (4)

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)
_ Oil Pan
_ 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

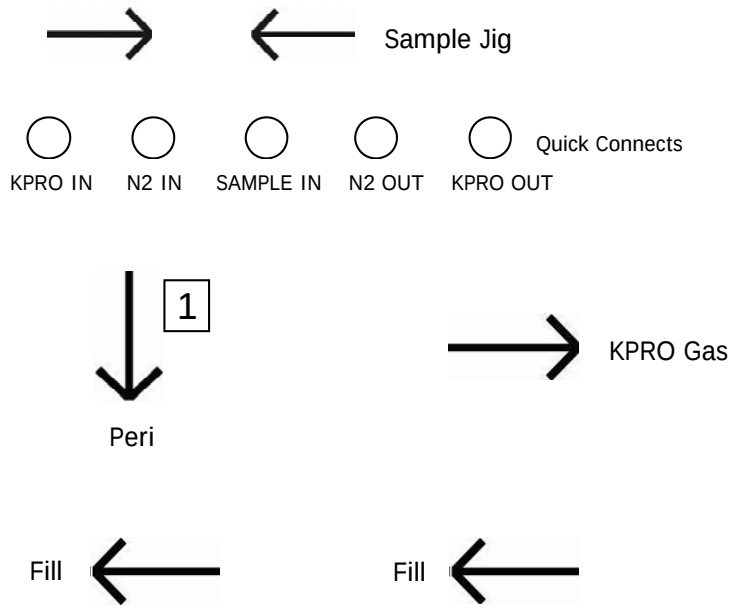
(In addition to the equipment listed above)

ATTACHMENT 2

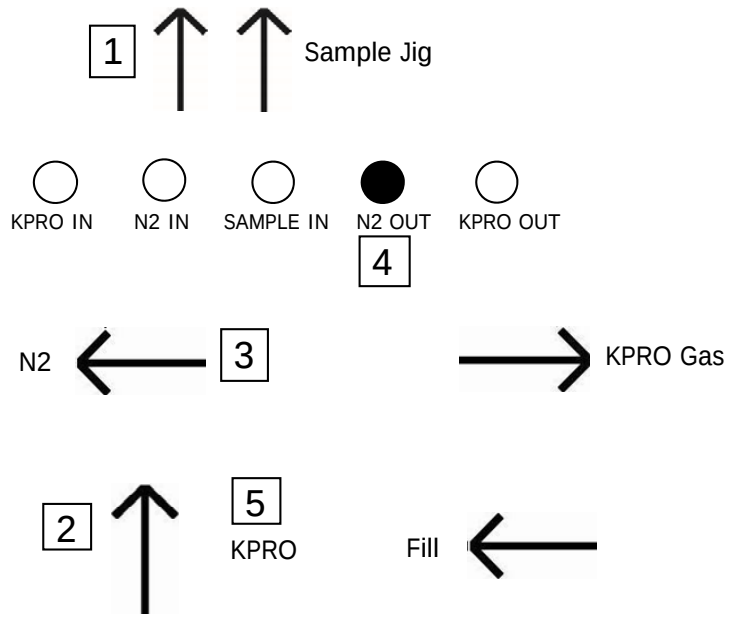
KPRO Quick Reference Guide

Gas Drive Quick Reference Guide

Filling For Drive / Pressure Testing the Pump



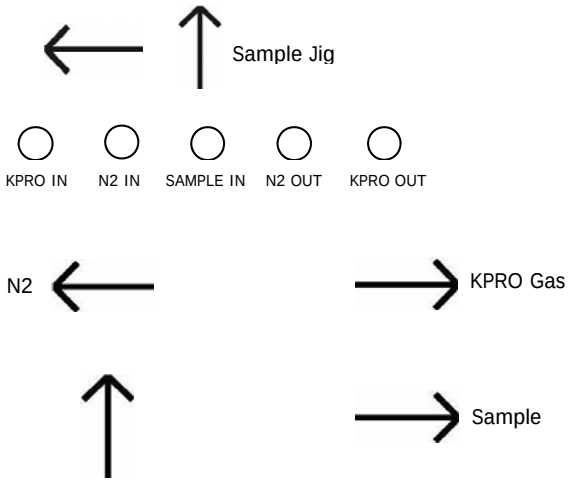
1. Connect the pump to the harness.
2. Arrange the valves as shown. Always turn the 5-way valve clockwise (the top left valve on the bottom, labeled as 1).
3. Make sure that the regulator on the nitrogen tank that supplies the nitrogen to the "N2 IN" is set to the pressure the pump will be used at (to find the pressure, halve the depth, so for 400 feet set the regulator at 200 psi).
4. Turn on the peristaltic pump.
5. 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.
6. Let the water flow out until there are no air bubbles and you get a steady stream.



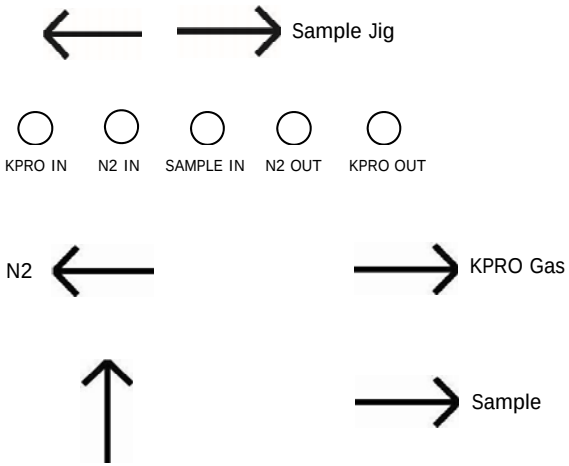
1. Lock off the valves on the sample jig by turning them towards the back (perpendicular to the tubing).
2. Turn off the flow by turning the bottom left valve one quarter turn (which may be to the right or left depending on how the valve was installed.
3. Turn on the nitrogen by turning the top left 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" quick 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./
5. If the pump holds pressure, reconnect the N2 out and turn the flow on by turning the bottom left valve one quarter turn clockwise to "KPRO".

Sampling / Purging The Pump

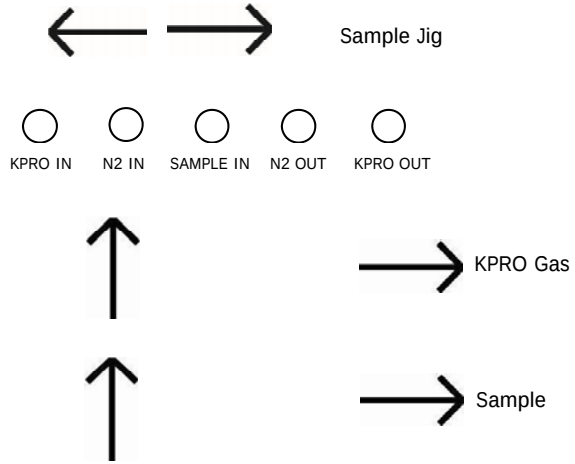
1. After driving to the sample depth and hitting the "Finish" button on the KPRO software, arrange the valves as shown below by turning the left valve on the sample jig to the left and the bottom right valve one half turn clockwise to "Sample". Make sure the Peri pump is on. The Peri pump will help the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



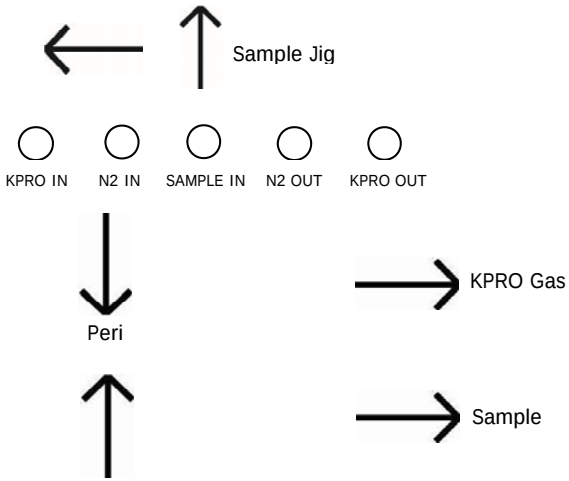
2. Since the pump is already pressurized, turn the right valve on the sample jig so it is facing to the right. This will allow the nitrogen to push the water up from the pump through the sample jig. You should see the VOAs begin to fill. The pressure on the gauge will drop and stabilize.



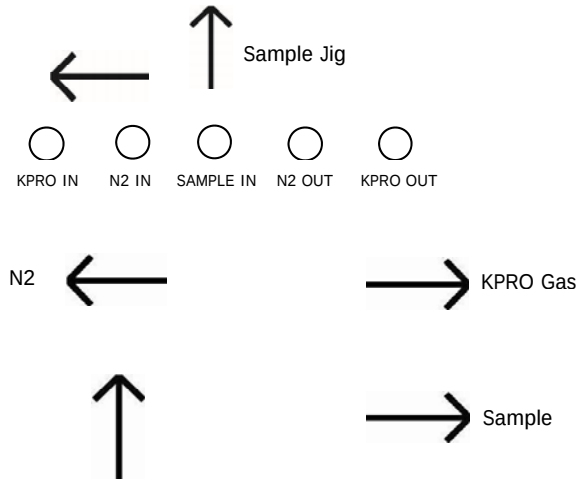
3. Keep a close eye on the pressure gauge. When the pressure gauge starts to move up, turn the top left valve a quarter turn clockwise. This will vent the nitrogen, which will make a hissing sound.



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	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.
	Wiring harness inside Kpro box not connected/ or is loose	Double check that the wiring harness inside the Kpro box is securely connected to the enclosure.
	Computer assigns higher com port for serial card	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.
	Bad data cable	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.
	Computer is not reading the serial card (dual or single)	Insert the serial com card and click on the socket card icon on the 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.
No power to enclosure	Blown Fuse	The fuses are located inside the top compartment of the 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 Malfunction	String pot reads intermittently	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.
	String pot not reading during drive	Make sure that the string pot is extended before pressing the "Start 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.

	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-caled 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	Loose connection / bad switch	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.
Pump head will not spin but pump motor is on	Broken spindle	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	Should be on "Kpro Peri" during drive, need to switch to "Peri" when pulling sample.
	Worn out silicon tubing	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.
	Peri pump on reverse	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.
	Check if problem is in sample jig or other stainless	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.
	If leak is in sample jig:	
	Loose fittings	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.
	No o-rings or bad o-rings	There are special quad o-rings that are located in the bottle holder. 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

Symptom	**Possible Problem**	**Solution**
No inflow of sample water	No Flow during whack. Pressurize pump then open sample jig, but no water flows.	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	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.
Silicon tubing pops off peri pump	Leaky 5-way valve	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.
	Replacing 5-way valve	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.

Profiling Problems

Peristaltic Mode

Symptom	Possible Problem	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.
	Silty layer	If the profiling tip is in lower-Ik zone, it can take a while for the head 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 Ik 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 clogged 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 back	Tip is slightly encased with soil	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.
	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	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.
	Kpro line is clogged	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.
		See above.
Pump loses pressure during drive	Leaky fitting / reed valve, reed valve silted up / pressure set to high	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 Ik. Another clue to this is if you cannot pull a sample and the Ik 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 Ik 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	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.
Nitrogen Line	Pump does not fill	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.
Unclogging Lines	Kpro Line	1) Isolate zero-headspace sampling apparatus by pointing the two valves handles, located above pressure gauge, inward towards each other. 2) Place “KPRO out” quick connect into “Nitrogen Out” quick connect slot. 3) Turn nitrogen/peri valve to “Gas Drive” position, which will allow nitrogen flow down the KPRO line and out into the formation. 4) 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. 5) 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.
	Nitrogen Line and Sample Line	1) Isolate zero-headspace sampling apparatus by pointing the two valves handles, located above pressure gauge, inward towards each other. 2) 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. 3) 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.
		4) 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.

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	1. Make sure the unit has Power. 2. 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.

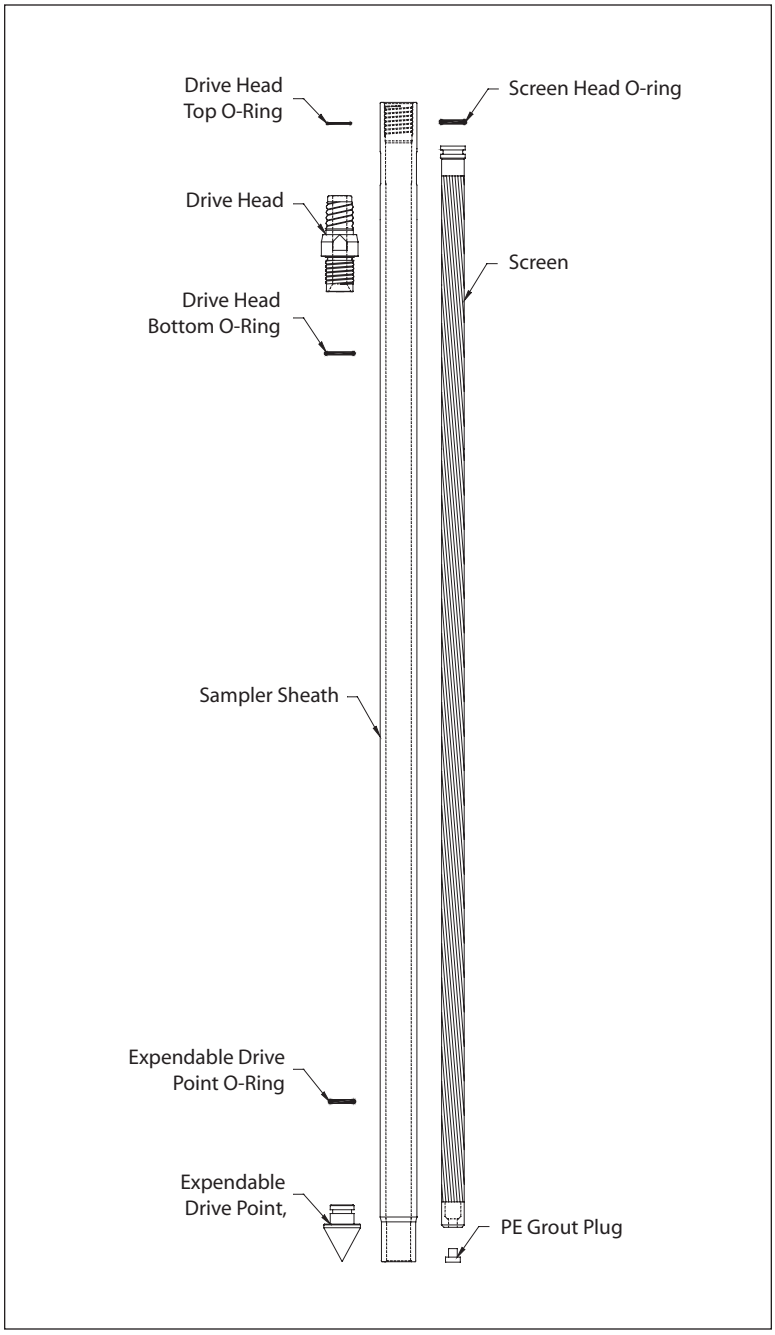
DO NOT USE GASOLINE IN THEM !!!

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

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.*

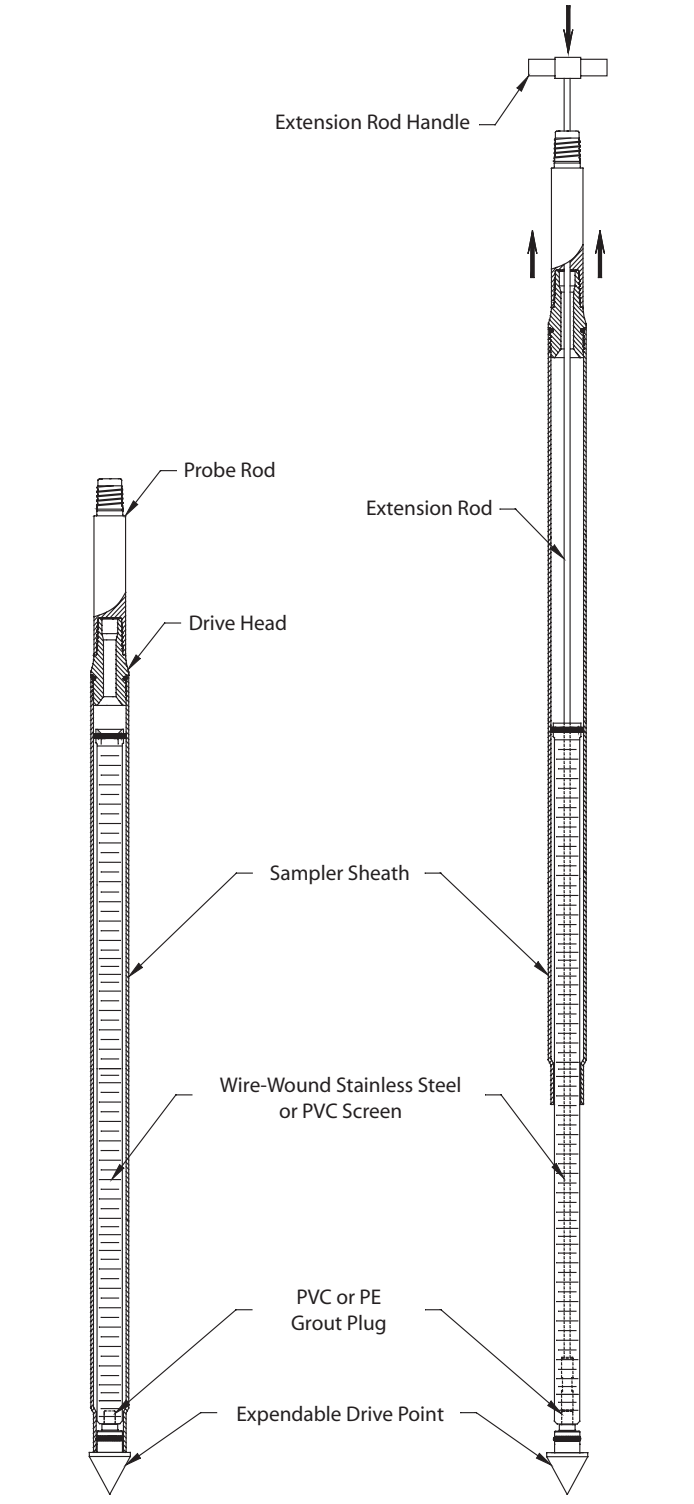


FIGURE 2.1
Screen Point 16 Groundwater Sampler

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 Sheath	15187
SP16 Drive Head, 0.5-inch bore, 1.5-inch rods*	18307
SP16 O-ring Service Kit, 1.5-inch rods *(includes 4 each of the O-ring packets below)*	15844
O-rings for Top of SP16 Drive Head, 1.5-inch rods only (Pkt. of 25)	*15389*
O-rings for Bottom of SP16 Drive Head (Pkt. of 25)	*13196*
O-rings for GW1520 Screen Head (Pkt. of 25)	*GW1520R*
O-rings for SP16 Expendable Drive Point (Pkt. of 25)	*GW1555R*
Screen, Wire-Wound Stainless Steel, 4-Slot*	GW1520
Grout Plugs, PE (Pkg. of 25)	GW1552K
Expendable Drive Points, steel, 1.625-inch OD (Pkg. of 25)*	GW1555K
Screen Point 16 Groundwater Sampler Kit, 1.5-inch Probe Rods *(includes 1 each of: 15187, 18307, 15844, GW1520, GW1535, GW1540, GW1555K, and GW1552K)*	15770

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	15090
Probe Rod, 1.5-inch x 60-inch*	11121

Extension Rods and Extension Rod Accessories	**Part Number**
Screen Push Adapter	GW1535
Grout Plug Push Adapter	GW1540
Extension Rod, 60-inch*	10073
Extension Rod Coupler	AT68
Extension Rod Handle	AT69
Extension Rod Jig	AT690
Extension Rod Quick Link Coupler, pin	AT695
Extension Rod Quick Link Coupler, box	AT696

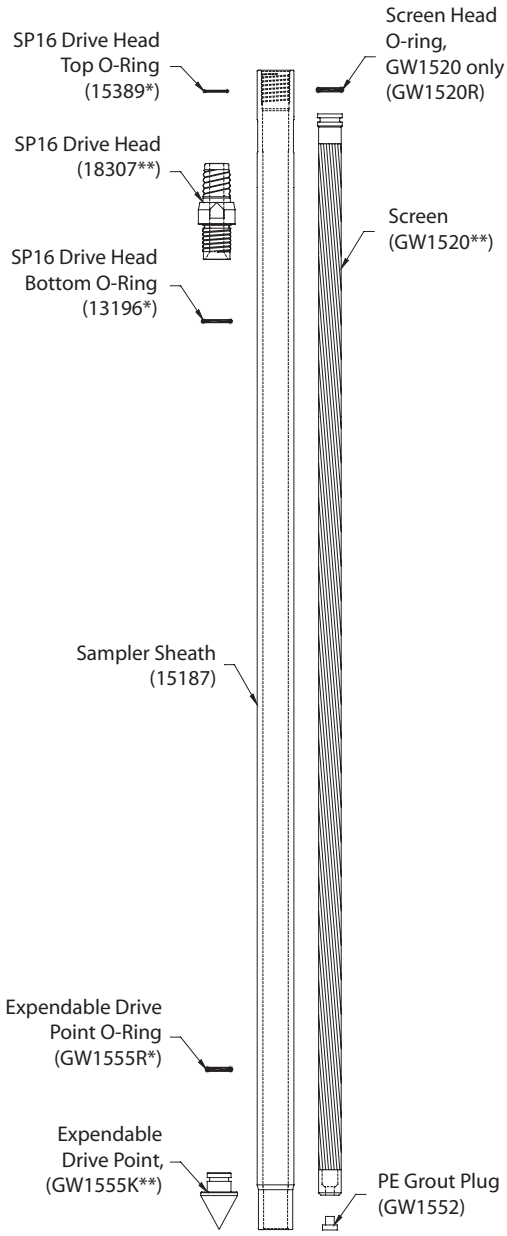
Grout Accessories	**Part Number**
Grout Nozzle, for 0.375-inch OD tubing	GW1545
High-Pressure Nylon Tubing, 0.375-inch OD / 0.25-inch ID, 100-ft. (30 m)	11633
Grout Machine, self-contained*	GS1000
Grout System Accessories Package, 1.5-inch rods	GS1015

Groundwater Purging and Sampling Accessories	**Part Number**
Polyethylene Tubing, 0.375-inch OD, 500 ft.*	TB25L
Check Valve Assembly, 0.375-inch OD Tubing*	GW4210
Water Level Meter, 0.438-inch OD Probe, 100 ft. cable*	GW2000
Mechanical Bladder Pump**	MB470
Mini Bailer Assembly, stainless steel	GW41

Additional Tools	**Part Number**
Adjustable Wrench, 6.0-inch	FA200
Adjustable Wrench, 10.0-inch	FA201
Pipe Wrenches	NA

* 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.



* Included in the SP16 O-ring Service Kit (15844)
** Part numbers show most common tool configuration. See Appendix A for alternative parts.

FIGURE 3.1
SP16 Sampler Parts

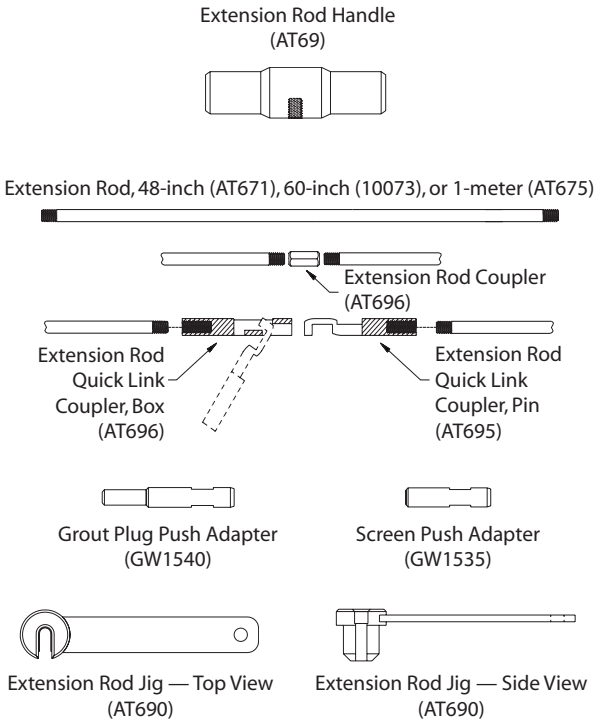


FIGURE 3.2
Geoprobe® Extension Rods and Accessories

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.

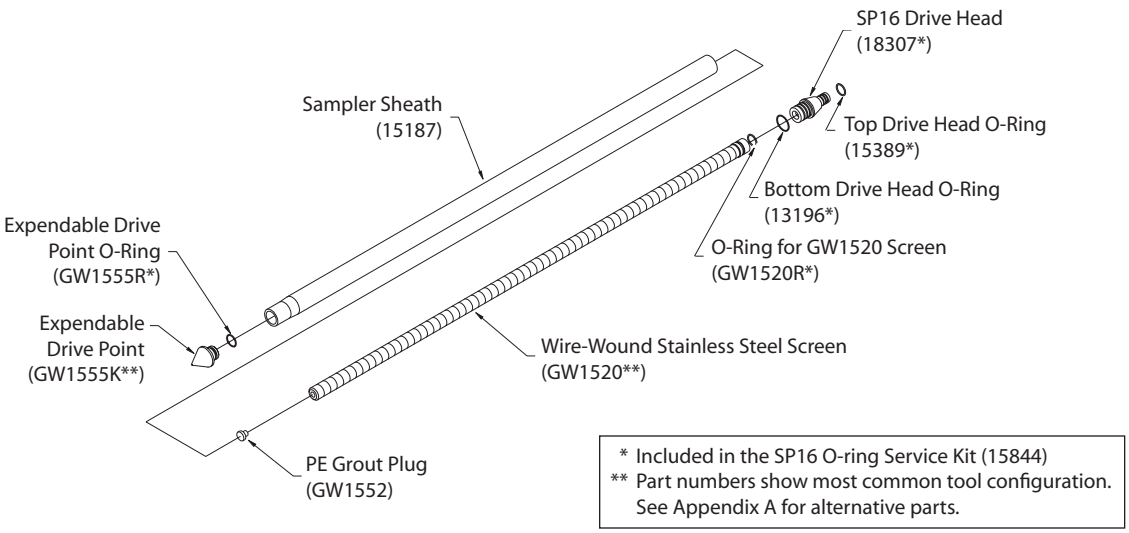


FIGURE 4.1
Screen Point 16 Groundwater Sampler Assembly

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.

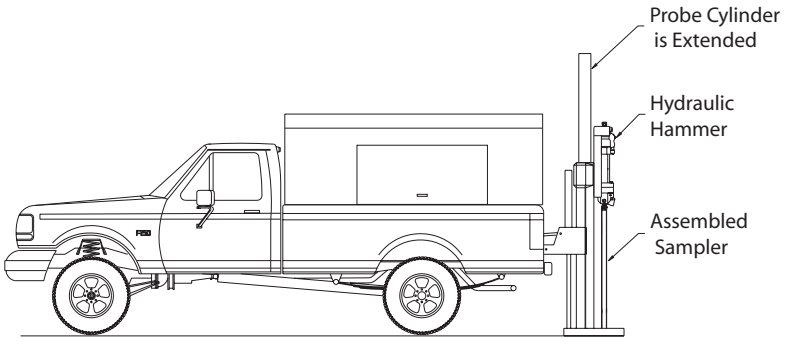


FIGURE 4.2
Screen Point 16 Groundwater Sampler in Driving Position

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.

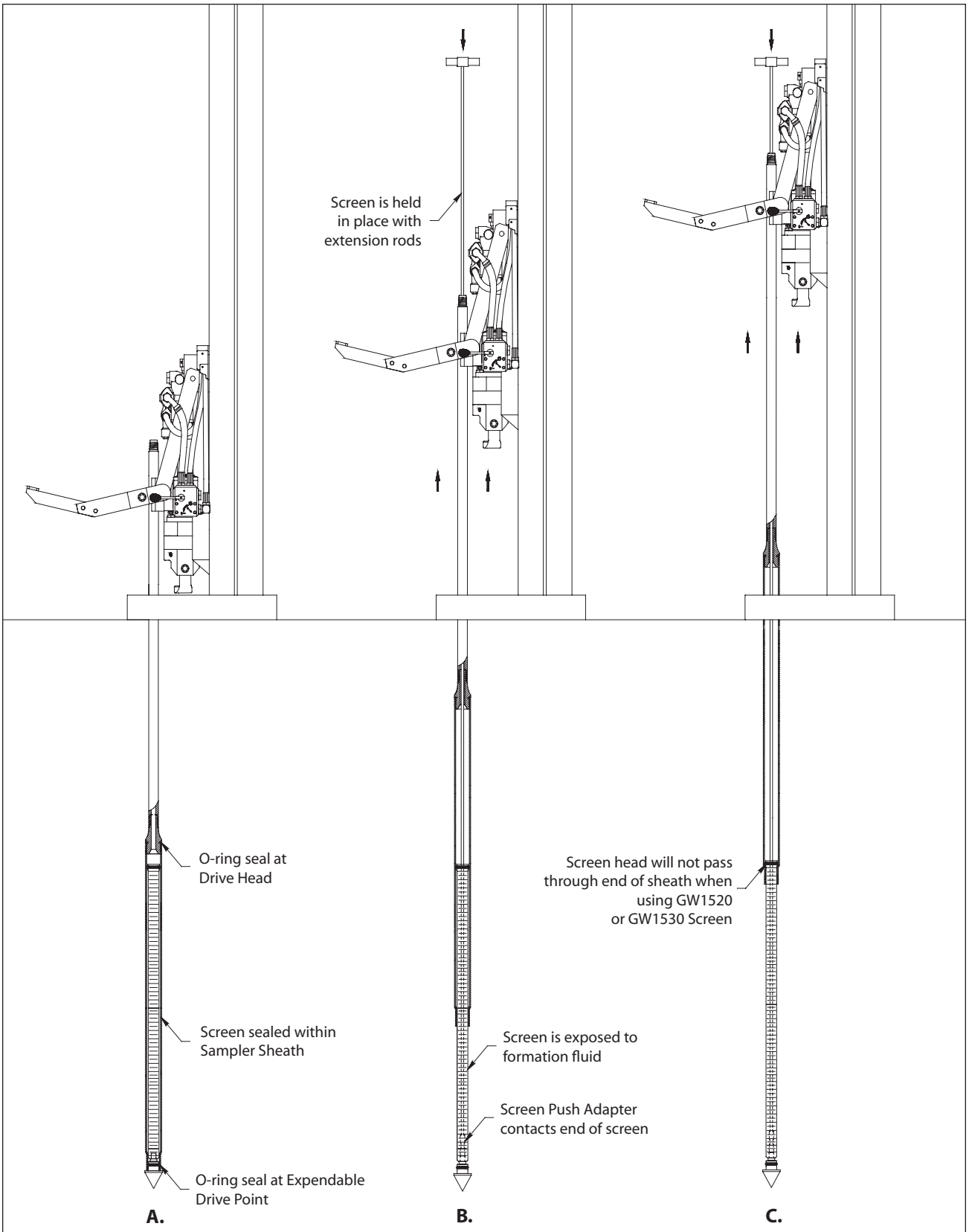


FIGURE 4.3
Screen Deployment for SP16 Sampler

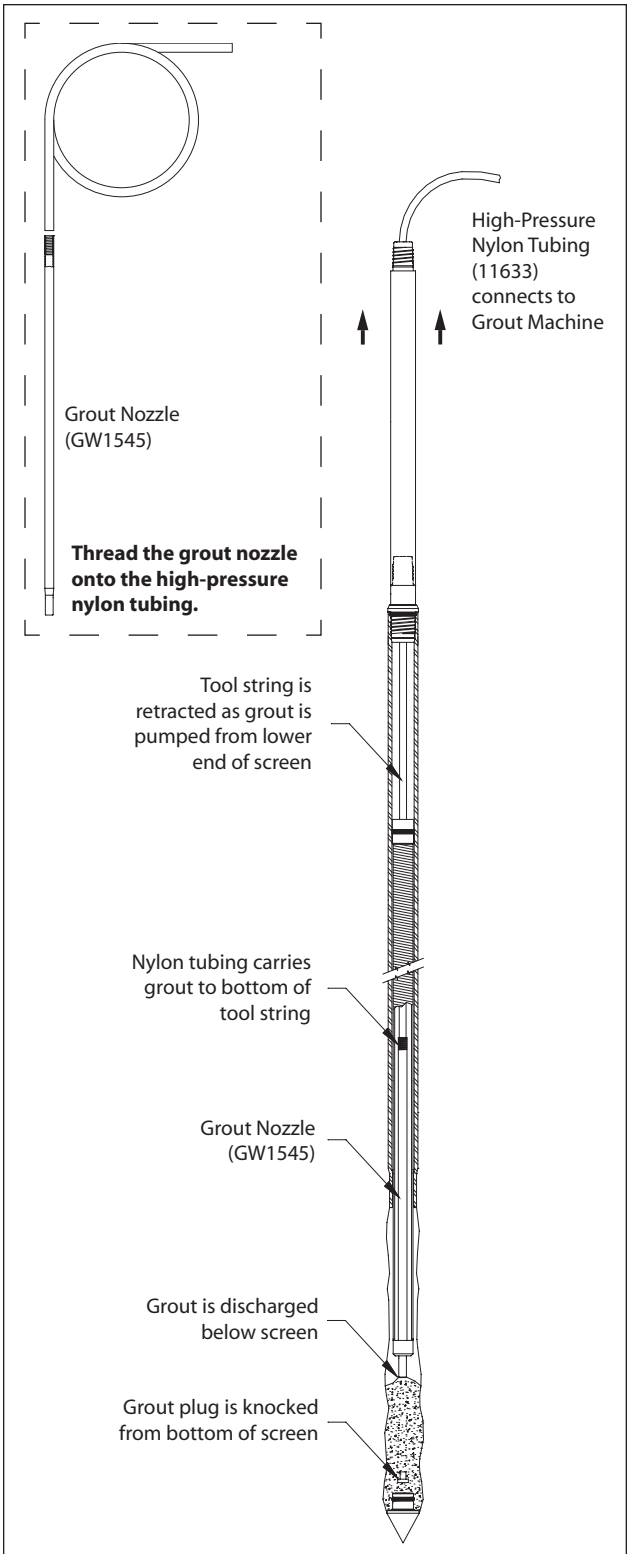


FIGURE 4.4
Grouting the SP16 Sampler With a GW1520 or GW1530 Screen

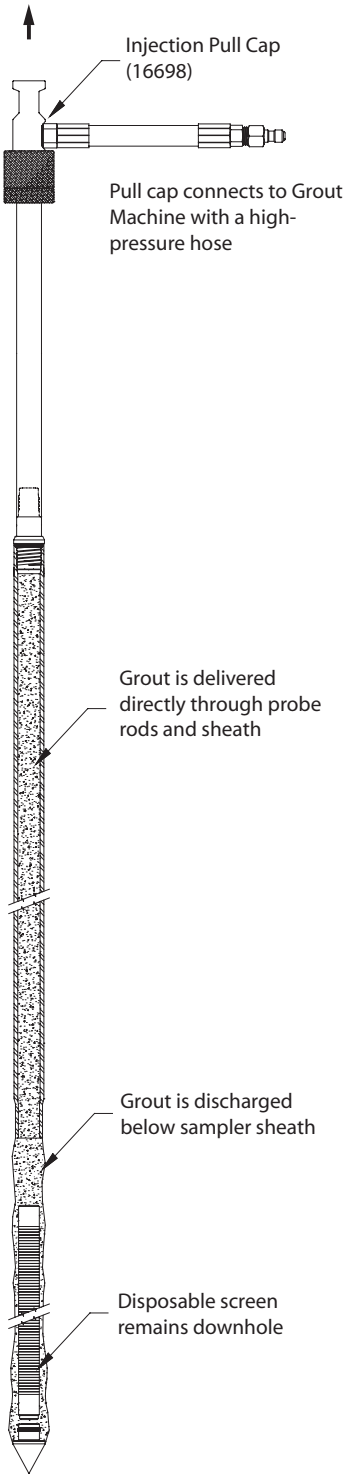


FIGURE 4.5
Grouting the SP16 Sampler With a 16089 Disposable Screen

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

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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	**Part Number**
SP16 Drive Head, 0.625-inch bore, 1.5-inch rods	15188
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	TB37L
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	GW2001
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	GS500

Probe Rods, Extension Rods, and Accessories	**Part Number**
Probe Rod, 1.5-inch x 1-meter	17899
Probe Rod, 1.5-inch x 48-inch	13359
Drive Cap, 1.5-inch rods (for GH40 Series Hammer)	15590
Rod Grip Pull Handle, 1.5-inch Probe Rods (for GH40 Series Hammer)	GH1555
Extension Rod, 48-inch	AT671
Extension Rod, 1-meter	AT675

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®.

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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 recharge-dominated 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
1	NA	04/28/2003 21:25:26	7.524	20	Last cycling of pump in MVD5; MVD4 not logged at this time - likely also 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

[1]SP – 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

Scenario Description	Rates (gpm)		
	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

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

[2]Inactive – 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

Well/Soil boring	Measured head (ft NAVD 88)	Modeled head (ft NAVD 88)	Residual (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	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)					
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 the south induced by pumping	54	0.12	GHBs representing underflow 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 the south induced by pumping	54	0.12	GHBs representing underflow 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 the south	0	0.00	GHBs representing underflow 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.

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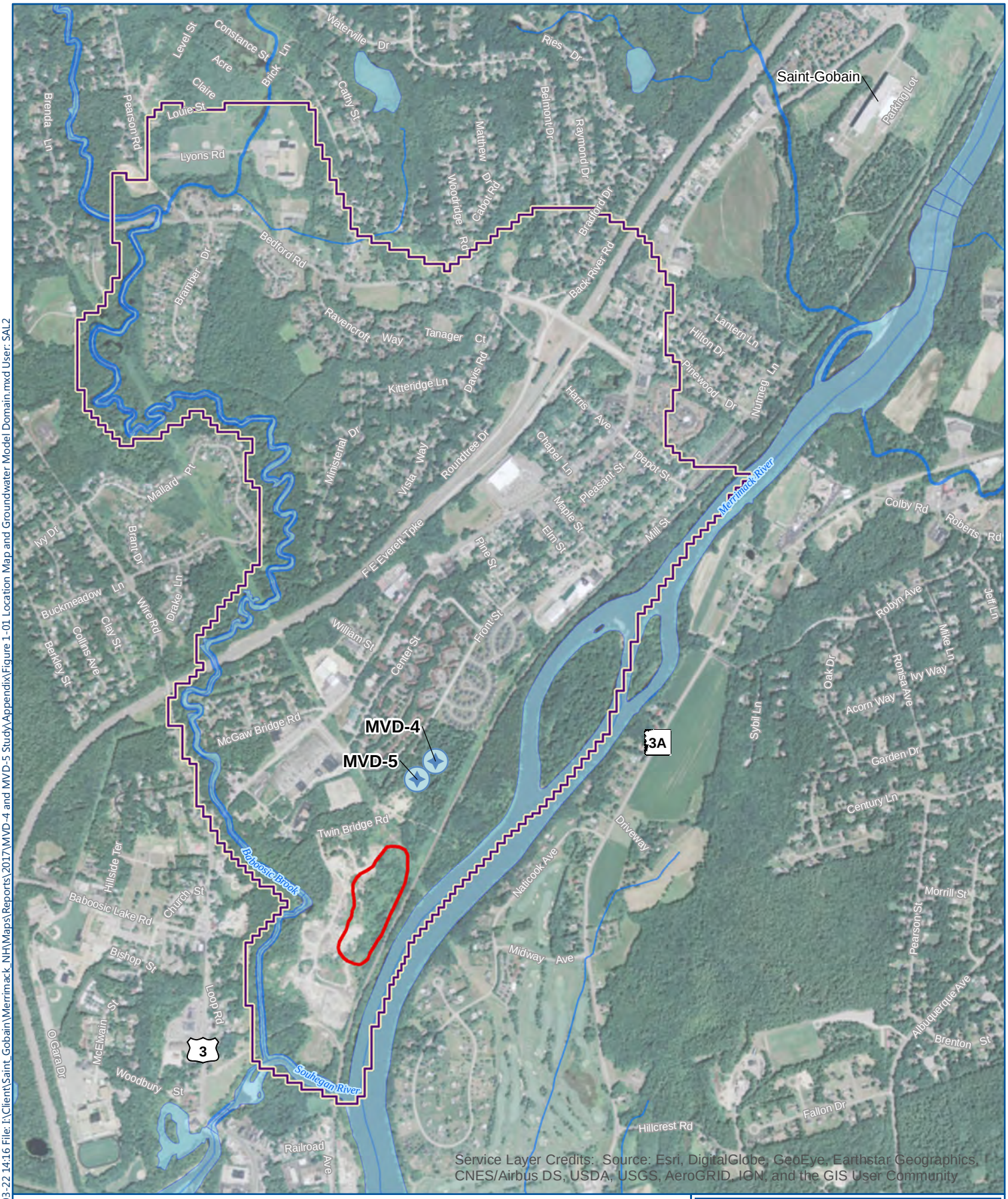
Figures



Well Location

Groundwater Model Domain

Longa Disposal Area

N

0 1,500

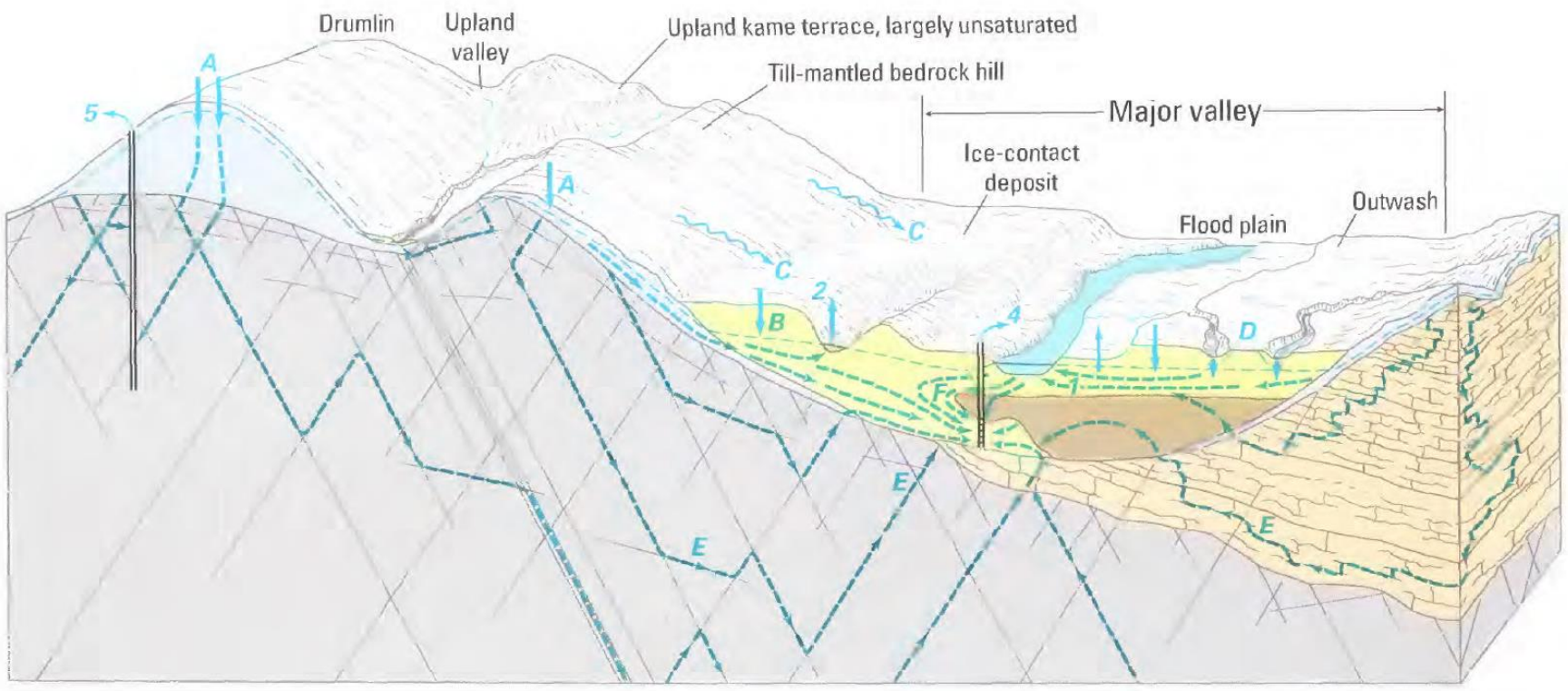
Feet

LOCATION MAP AND GROUNDWATER MODEL DOMAIN

Merrimack, New Hampshire

Saint-Gobain

FIGURE 1-1



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

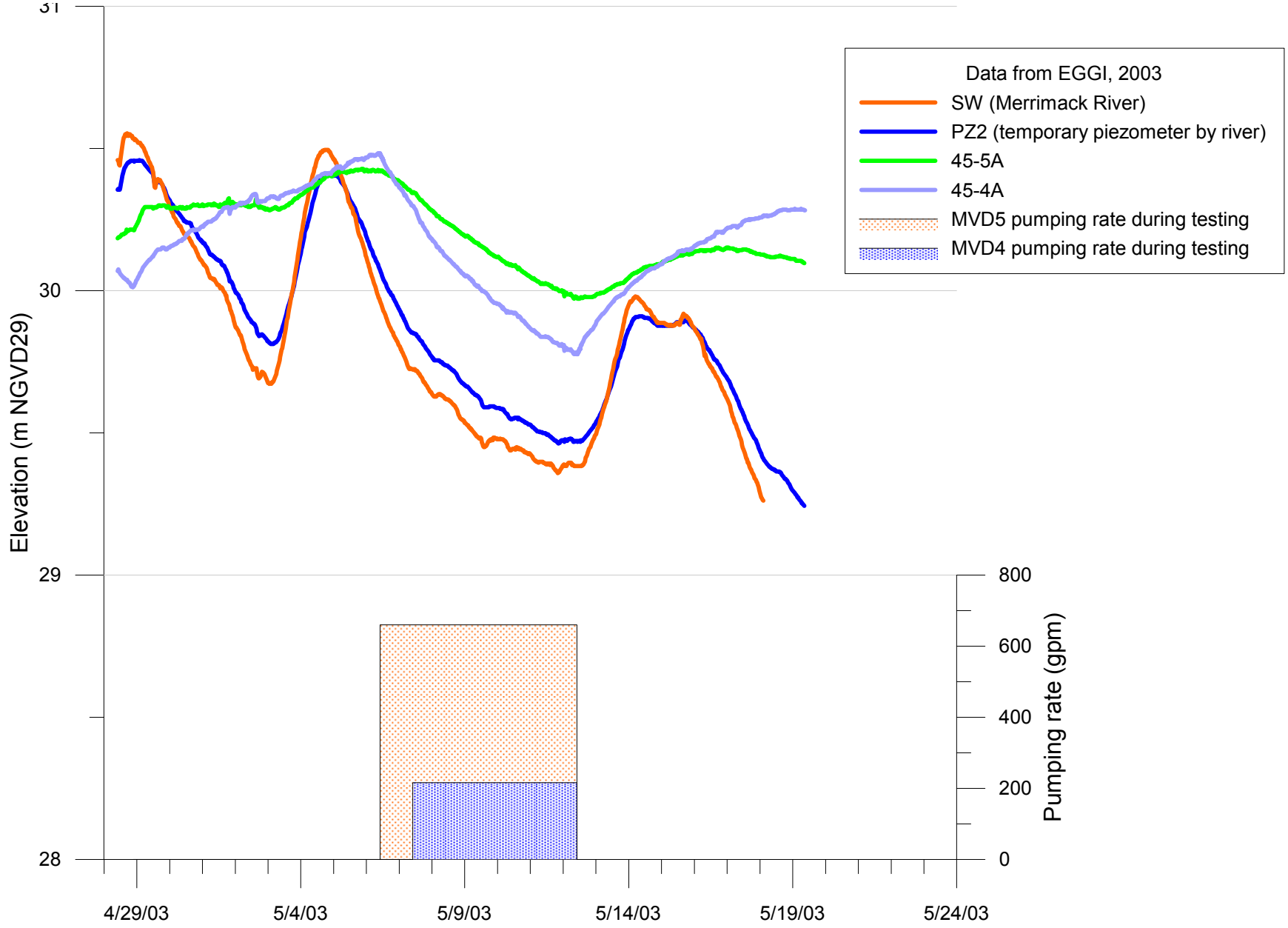
1 - Seepage to river. **2** - Ground-water evapotranspiration where the water table is shallow. **3** - Underflow downvalley through stratified drift (not shown). **4** - Pumpage from wells screened in stratified drift. **5** - Pumpage from bedrock wells

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



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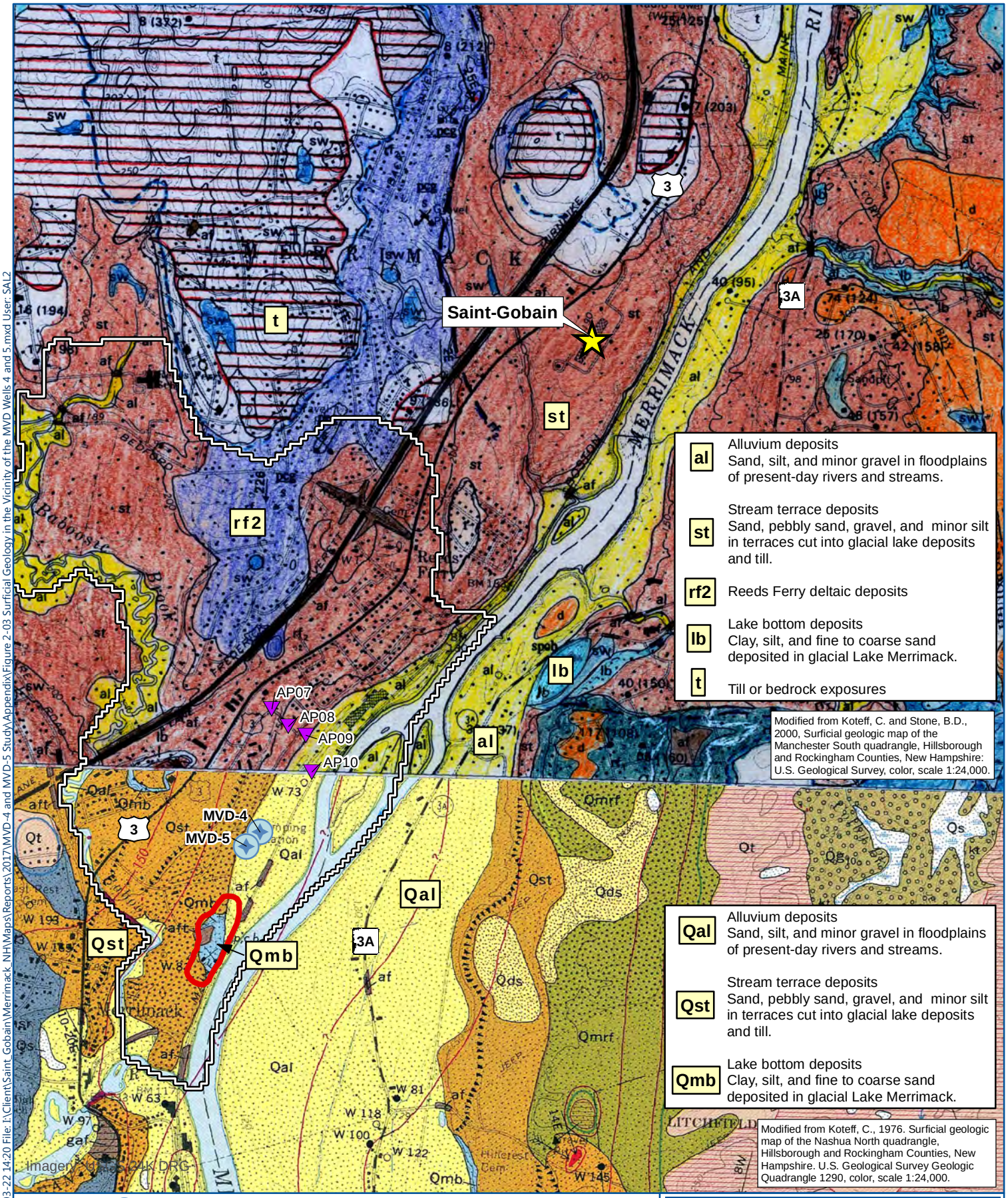
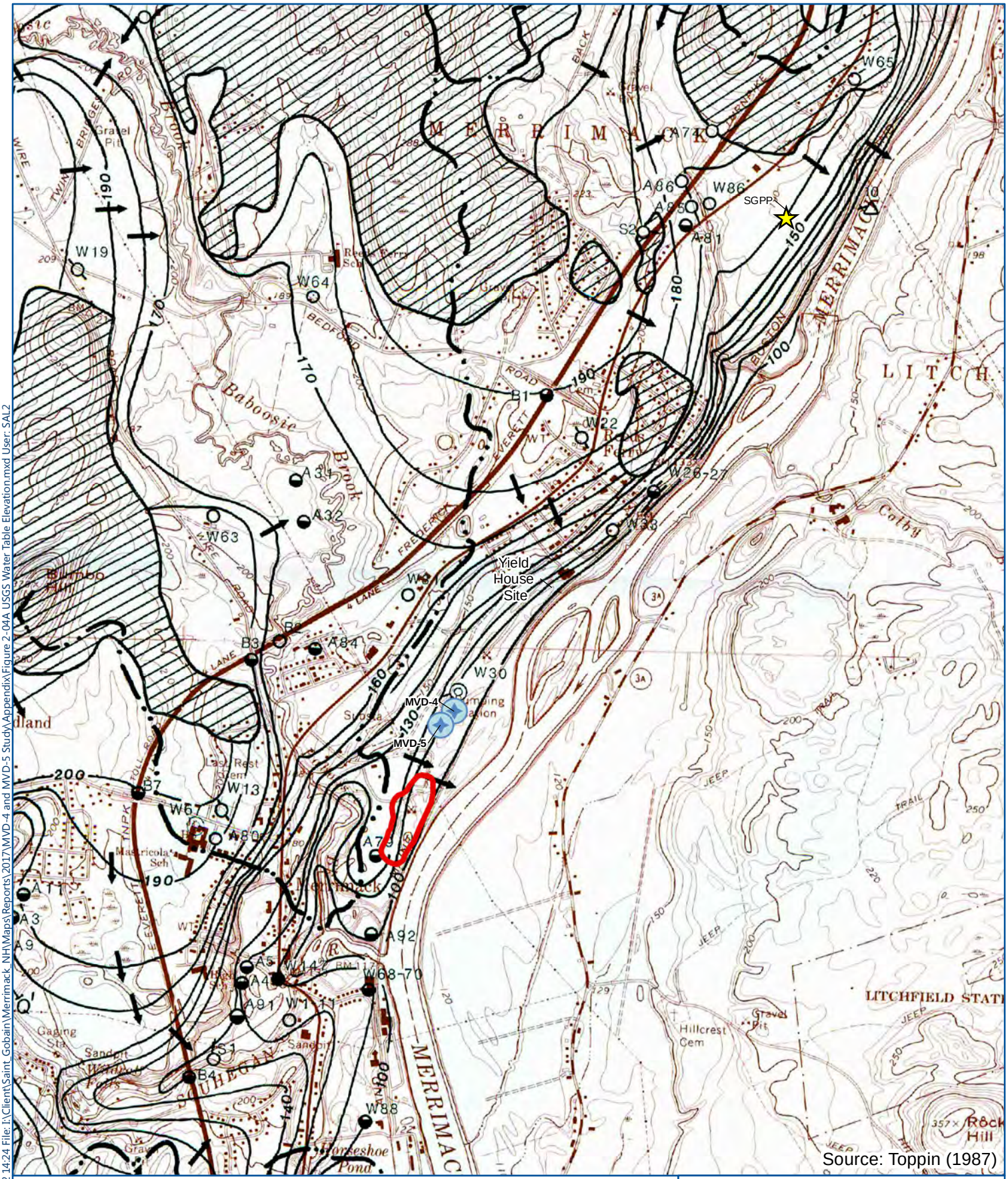
BARR

SELECTED HYDROGRAPHS FROM EGGI, 2003

Figure 2-2



Barr Footer: ArcGIS 10.4, 2017-03-22 14:20 File: I:\Client\Saint_Gobain\Merrimack_NH\Maps\Reports\2017\MVD-4 and MVD-5 Study\Appendix\Figure 2-03 Surficial Geology in the Vicinity of the MVD Wells 4 and 5.mxd User: SAL2



Facility Location

MVD Pumping Well

Longa Disposal Area

TILL AND (OR) BEDROCK

CONTACT BETWEEN STRATIFIED DRIFT AND TILL AND (OR) BEDROCK

SURFACE-WATER DRAINAGE DIVIDE

SPRING

WATER-TABLE CONTOUR--Shows altitude of water table. Contour interval 10 feet. National Geodetic Vertical Datum of 1929. Arrows show generalized direction of ground-water flow.

N

0 2,000

Feet

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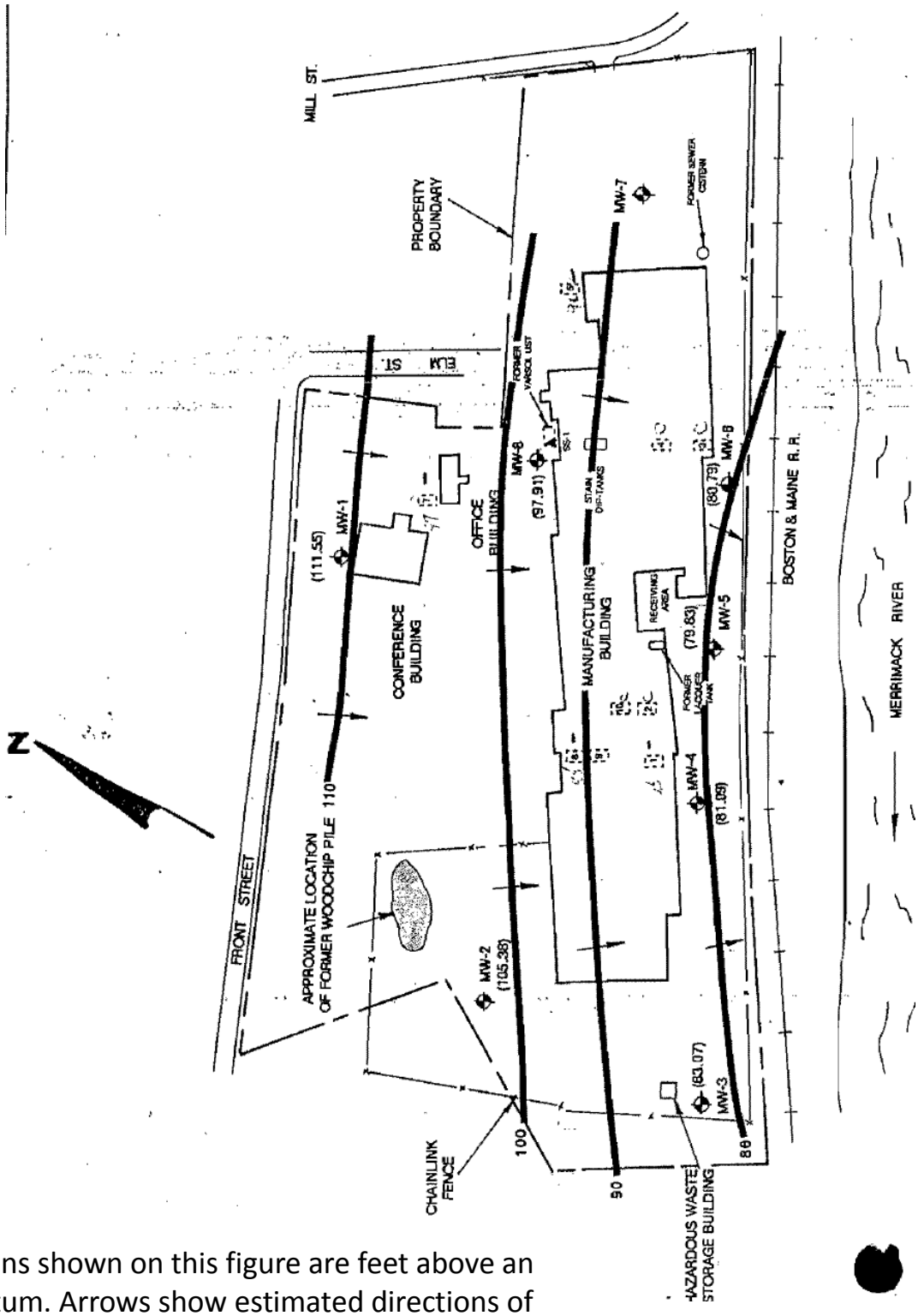
WATER TABLE ELEVATION NEAR MVD-4 AND MVD-5

Merrimack, New Hampshire

Saint-Gobain

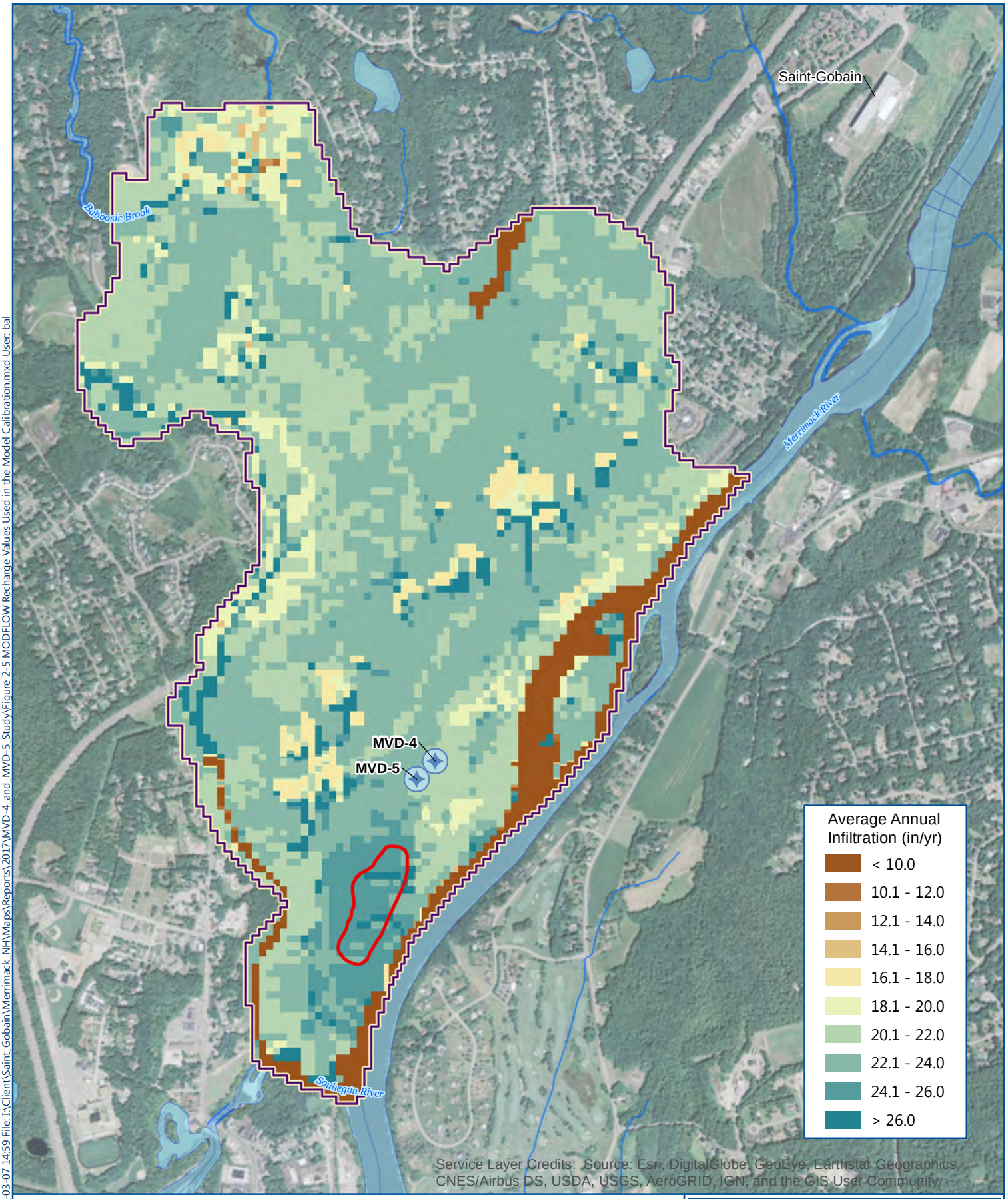
FIGURE 2-4A



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



MVD Pumping Well

MODFLOW Model Domain

Longa Disposal Area

N

0 1,500

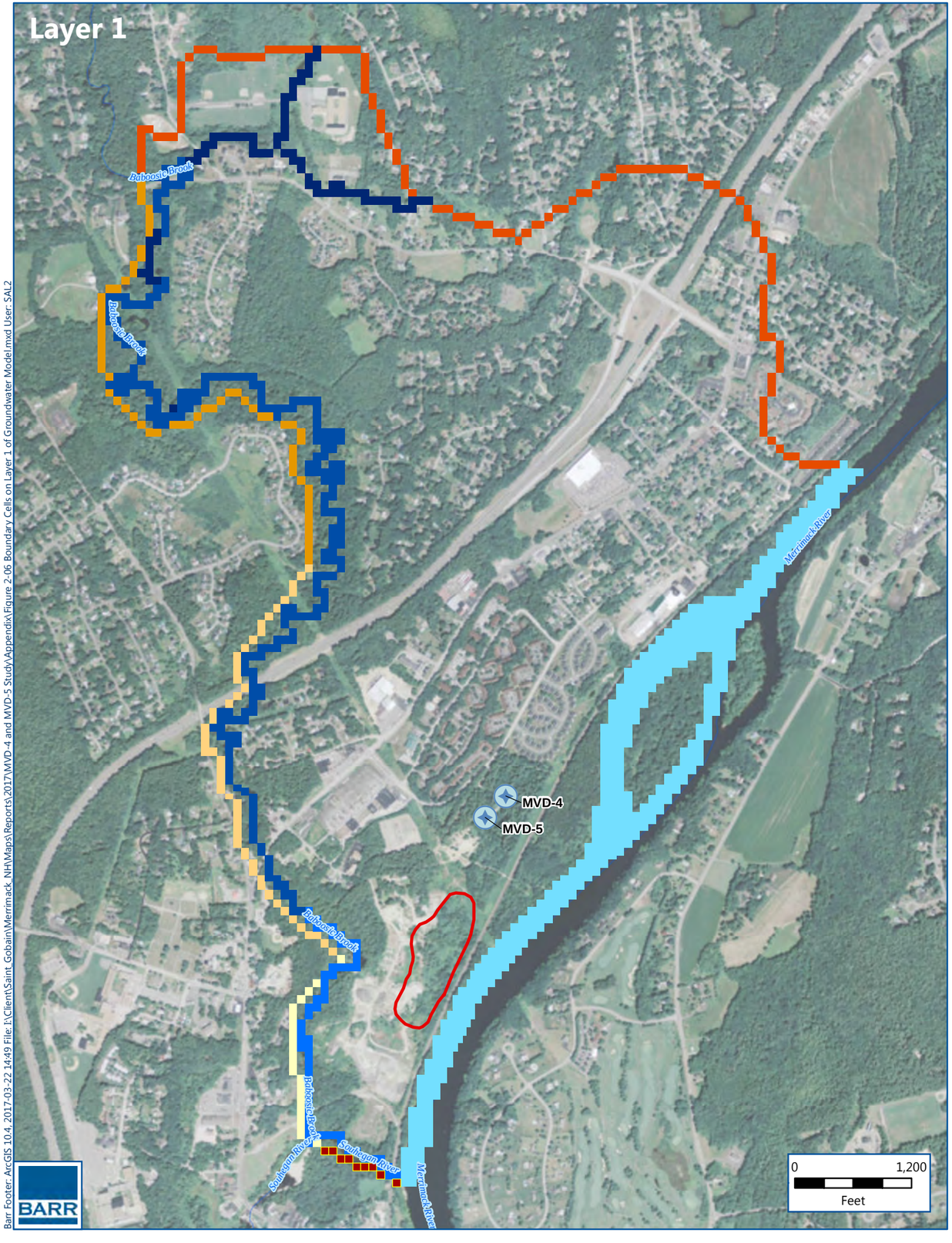
Feet

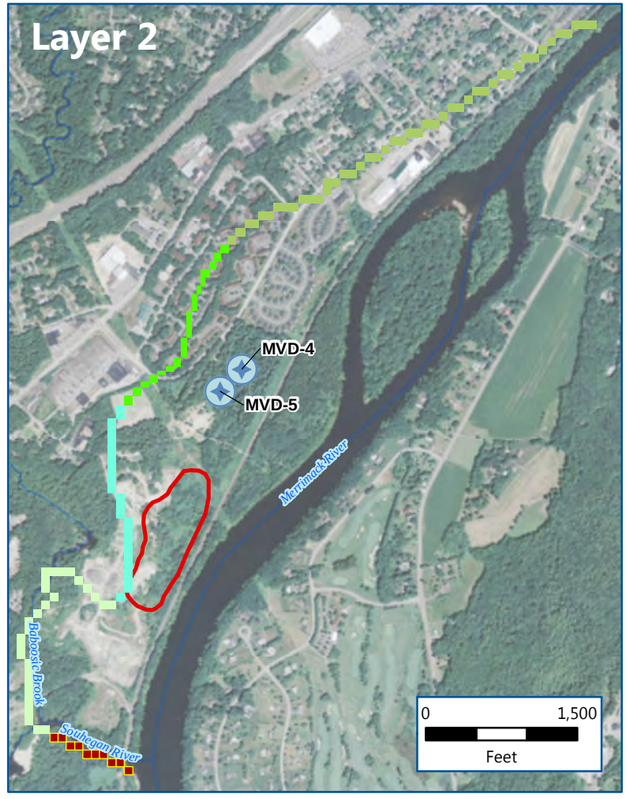
MODFLOW RECHARGE VALUES USED IN THE MODEL CALIBRATION

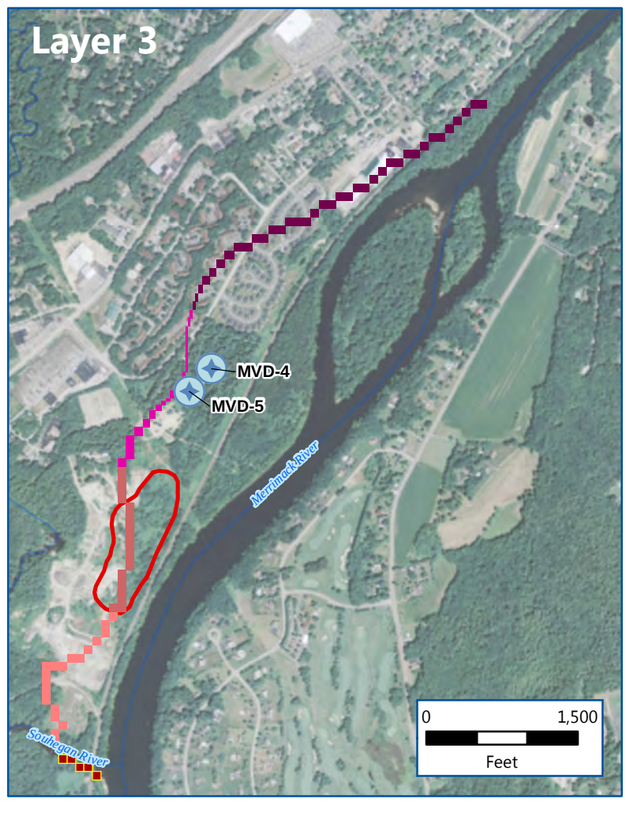
Merrimack, New Hampshire

Saint-Gobain

FIGURE 2-5







Monitoring

Longa Disposal

General Head Boundary Cells Representing Flux to or From The Model Domain

Layer 1

River Cells Representing Perennial Streams (colored by reach)

Reach

- Reach 1
- Reach 2
- Reach 3

Drain Cells Representing Intermittent Streams

Well Cells Representing Flux From Outside The Model Domain

- Zone 1
- Zone 2
- Zone 3
- Zone 4

Layer 2

Well Cells Representing Flux From Outside The Model Domain

- Zone 5
- Zone 6
- Zone 7
- Zone 8

Layer 3

Well Cells Representing Flux From Outside The Model Domain

- Zone 9
- Zone 10
- Zone 11
- Zone 12

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

N

BOUNDARY CELLS ON LAYERS 1, 2 AND 3
OF THE GROUNDWATER MODEL
Merrimack, New Hampshire
Saint-Gobain

FIGURE 2-6

BARR

Barr Footer: ArcGIS 10.4, 2017-03-22 14:49 File: I:\Client\Saint_Gobain\Merrimack_NH\Maps\Reports\2017\MVD-4 and MVD-5 Study\Appendix\Figure 2-06 Boundary Cells on Layer 1 of Groundwater Model.mxd User: SAL2

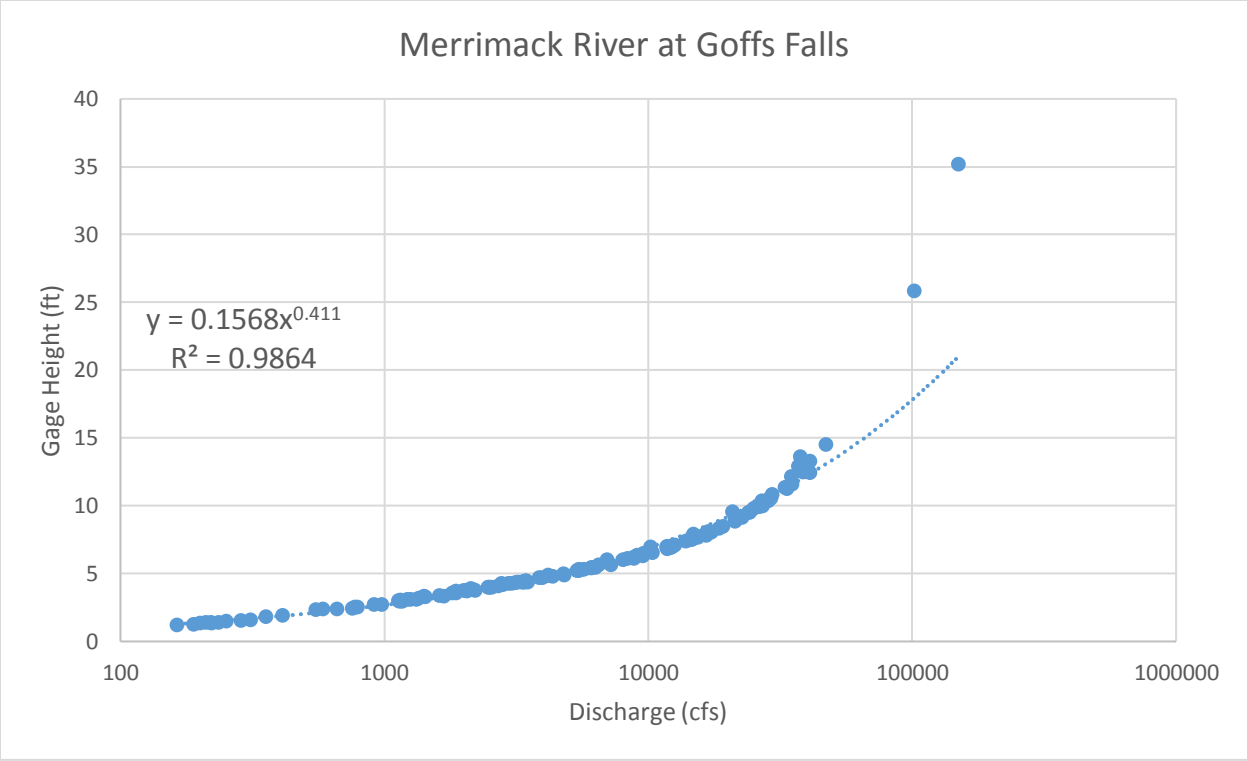


Figure 2-7
Rating Curve for the Merrimack River at Goffs Falls
Merrimack, NH
Saint-Gobain

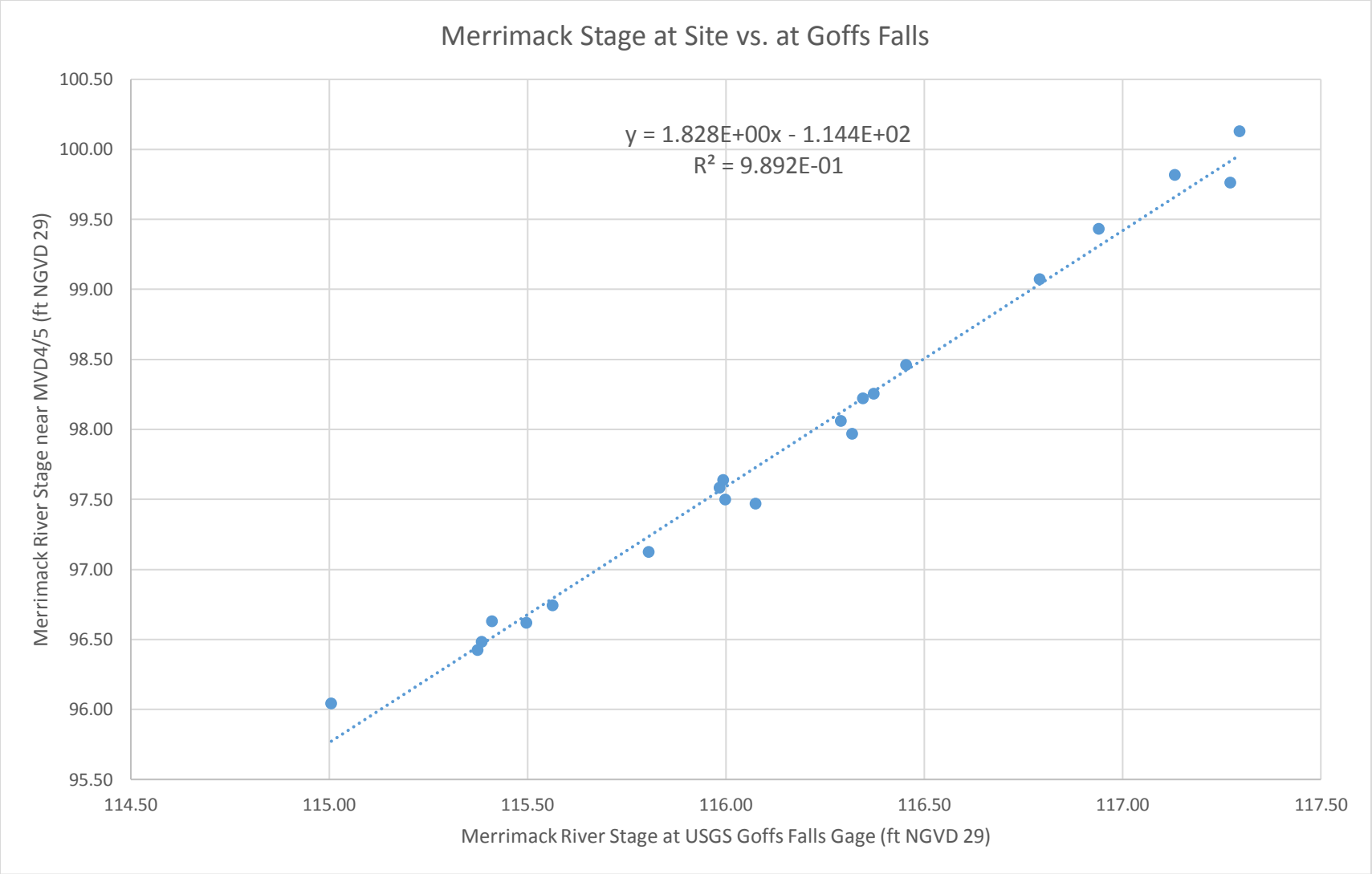
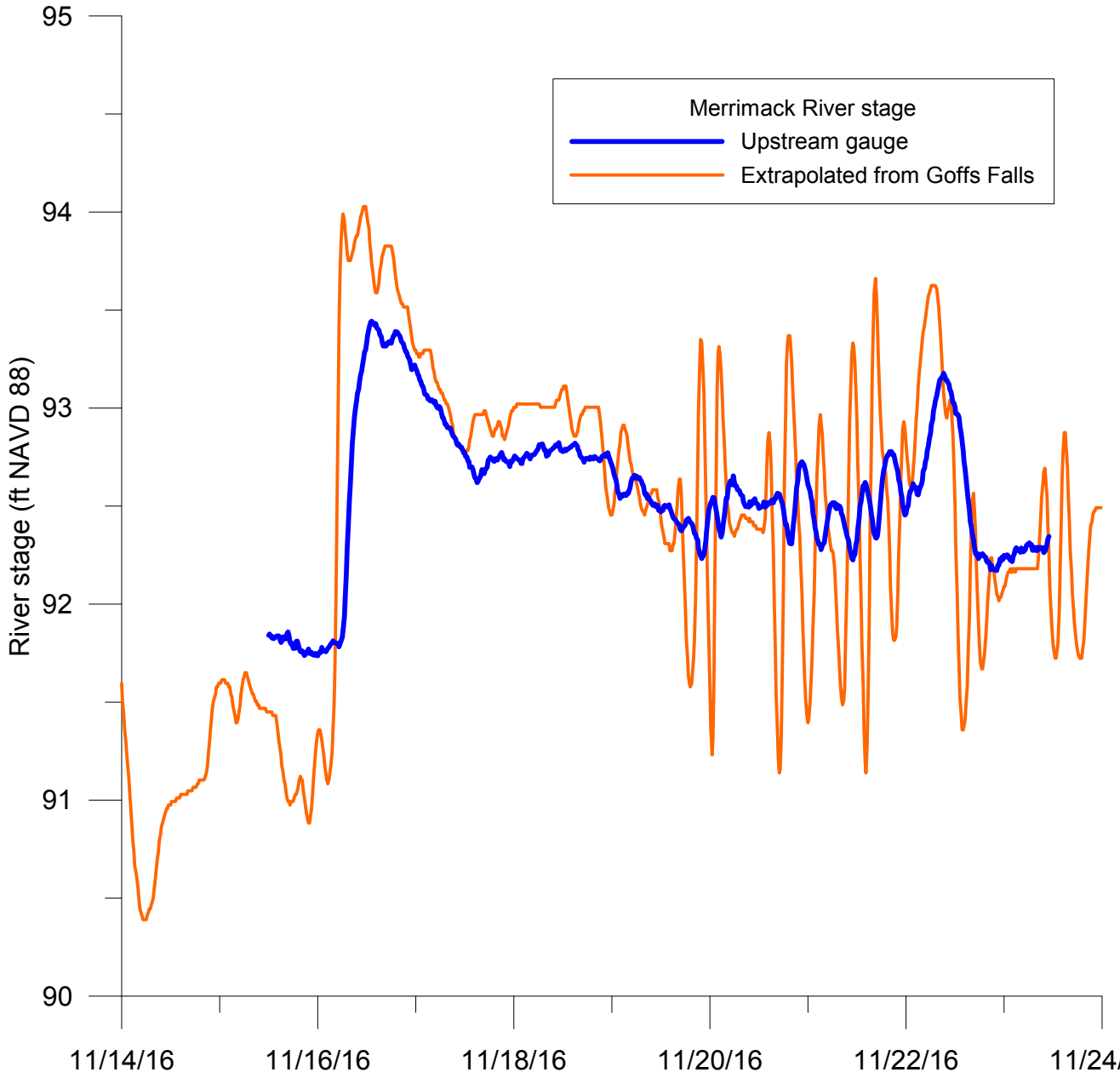


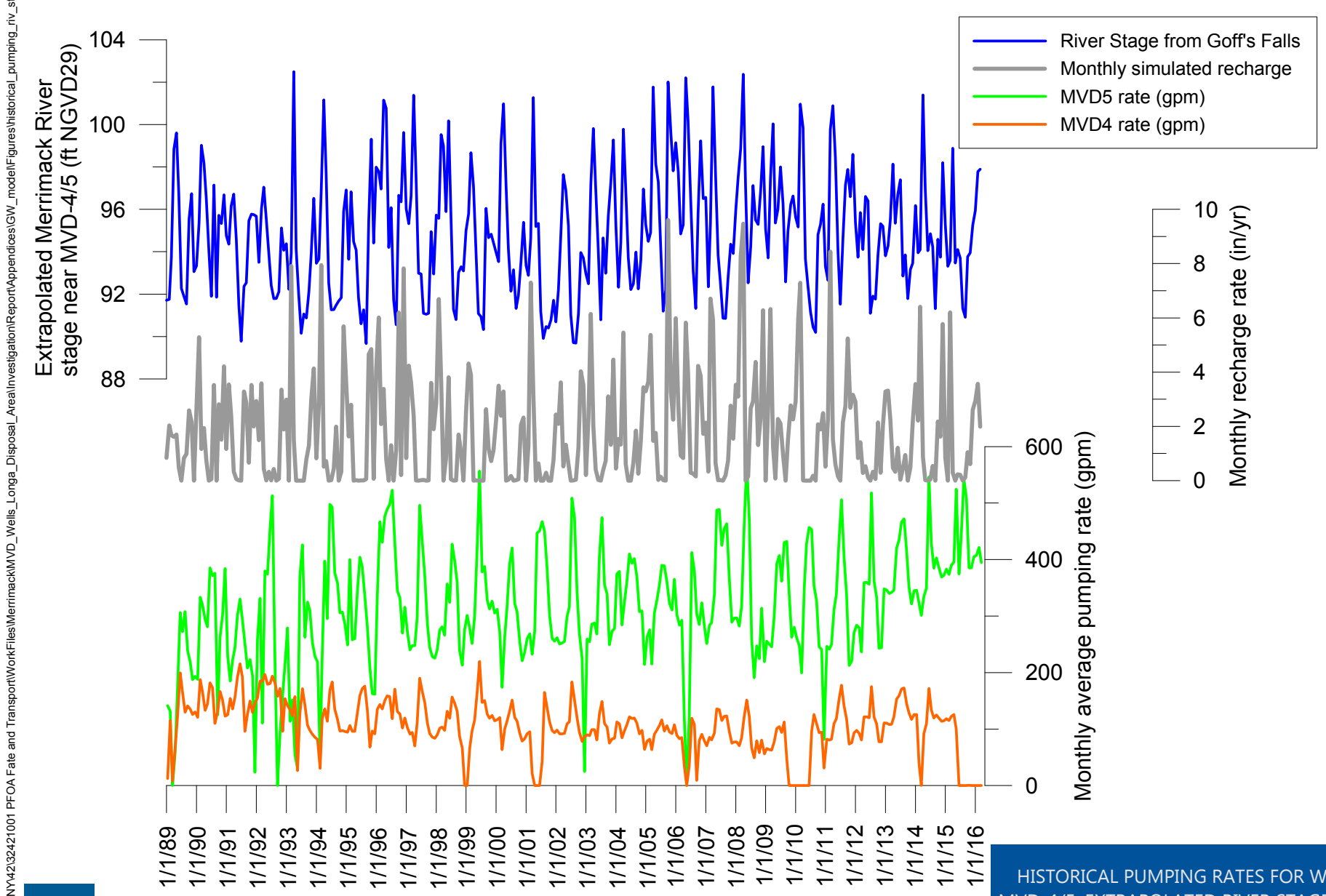
Figure 2-8
Scatter plot of estimated Merrimack River stage at MVD-4/5 vs. the stage at Goffs Falls
Merrimack, NH
Saint-Gobain



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

Figure 2-9

P:\Mpls\32 NY\42\32421001 PFOA Fate and Transport\WorkFiles\Merrimack\MVD_Wells_Longa_Disposal_Area\Investigation\Report\Appendices\GW_model\Figures\goff_extrap_to_mvd45_2016.grf



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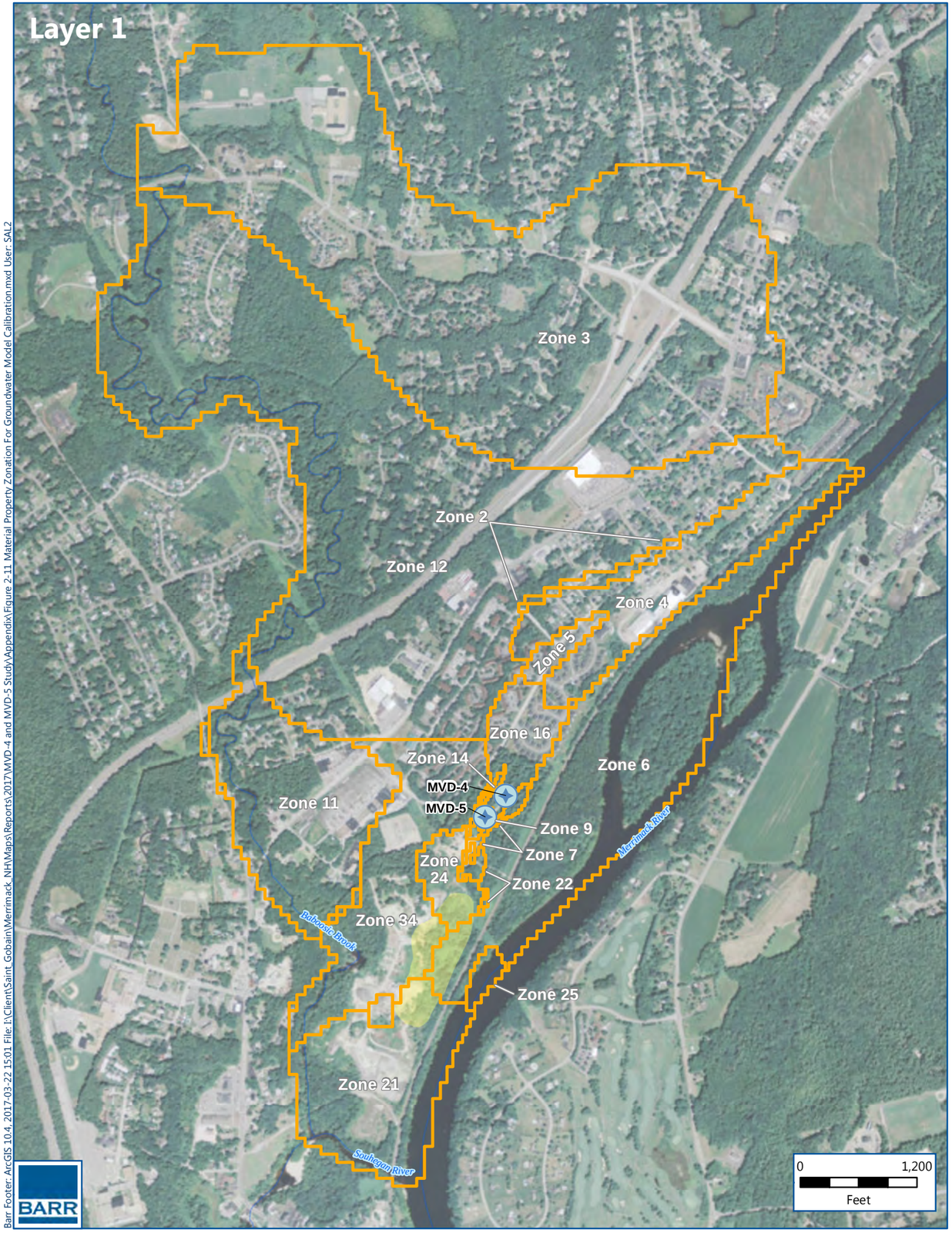
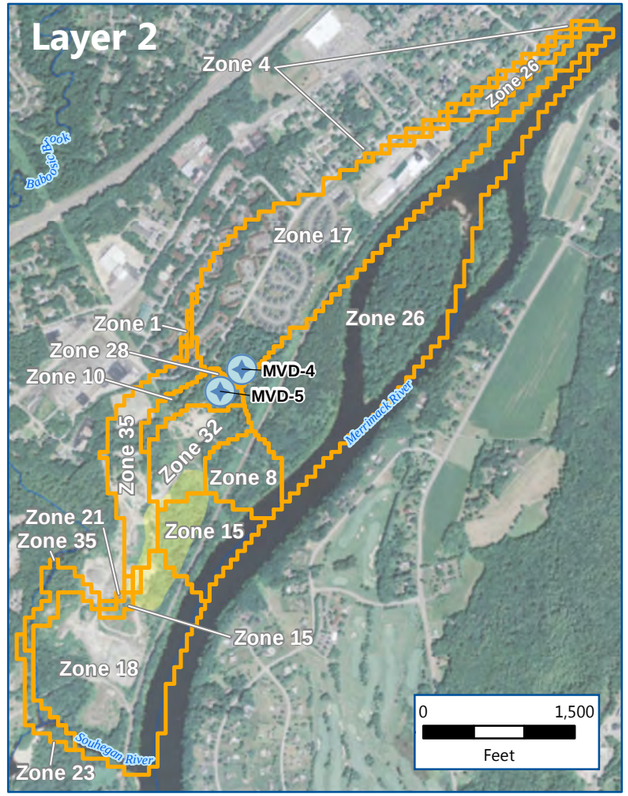
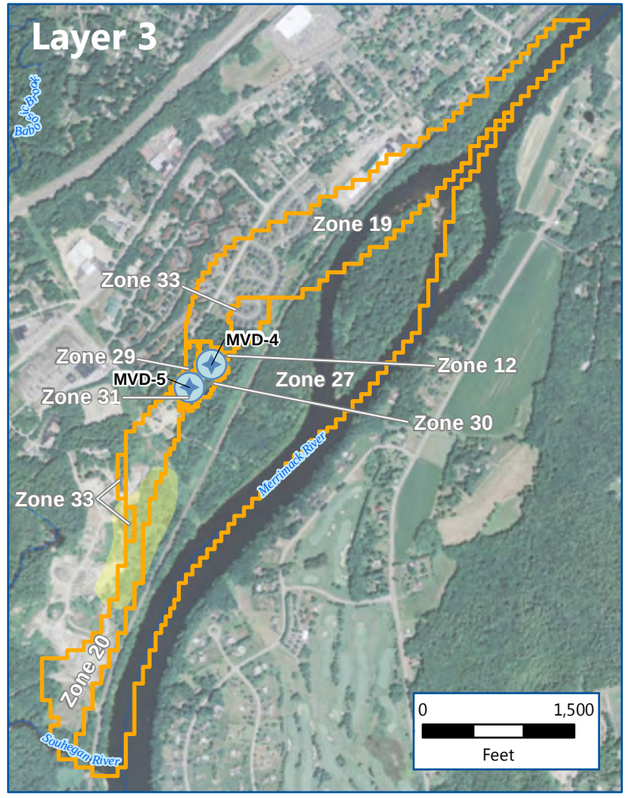
BARR

HISTORICAL PUMPING RATES FOR WELLS MVD-4/5, EXTRAPOLATED RIVER STAGE NEAR THE WELL FIELD, AND MONTHLY RECHARGE RATES, 1989 THROUGH FEBRUARY 2016

Figure 2-10







MVD Pumping Well

Zone Boundary

Longa Disposal Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

MATERIAL PROPERTY ZONATION FOR THE GROUNDWATER MODEL CALIBRATION
Merrimack, New Hampshire
Saint-Gobain

FIGURE 2-11

Barr Footer: ArcGIS 10.4, 2017-03-22 15:01 File: I:\Client\Saint_Gobain\Merrimack_NH\Maps\Reports\2017\MVD-4 and MVD-5 Study\Appendix\Figure 2-11 Material Property Zonation For Groundwater Model Calibration.mxd User: SAL2

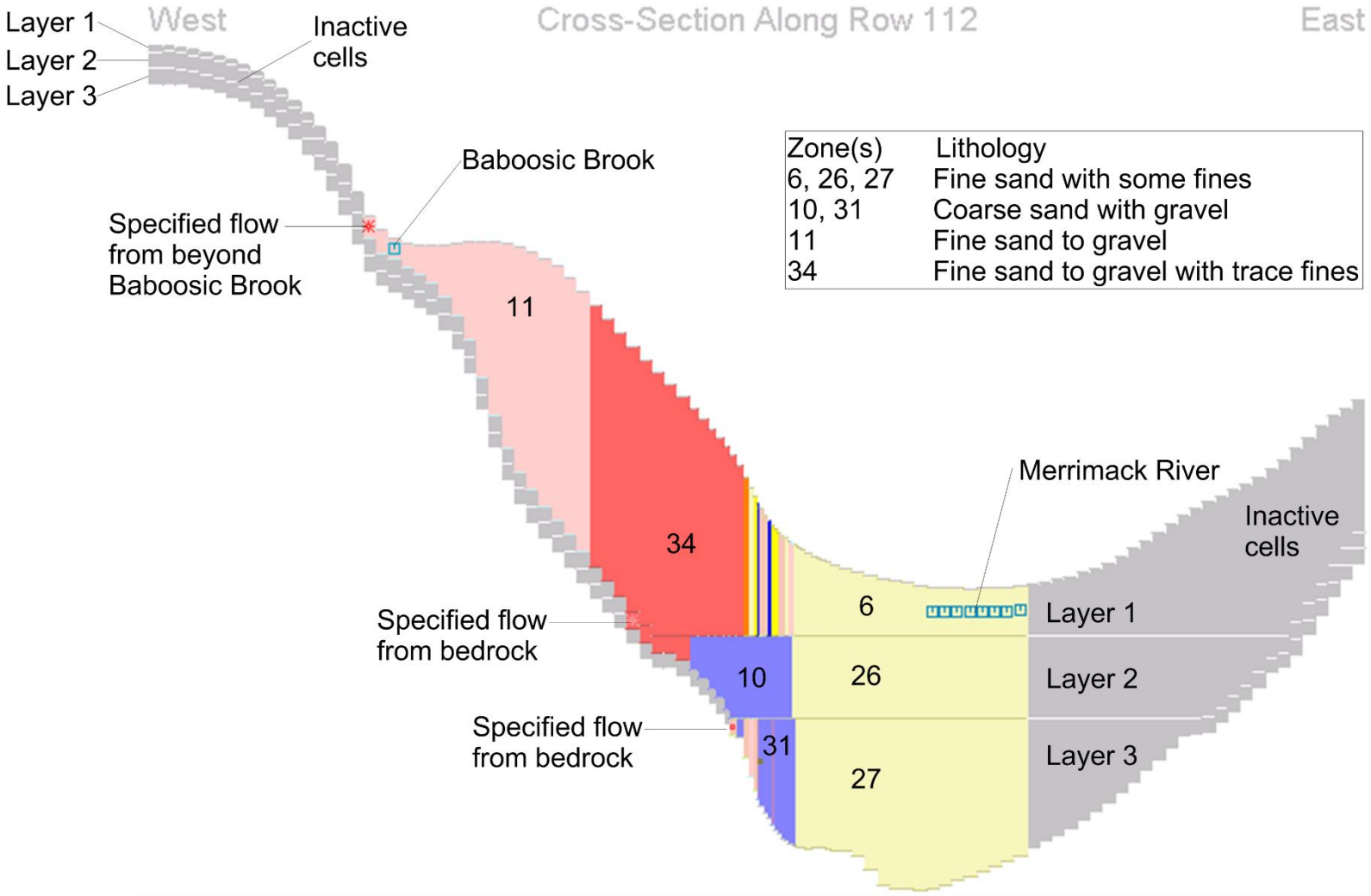
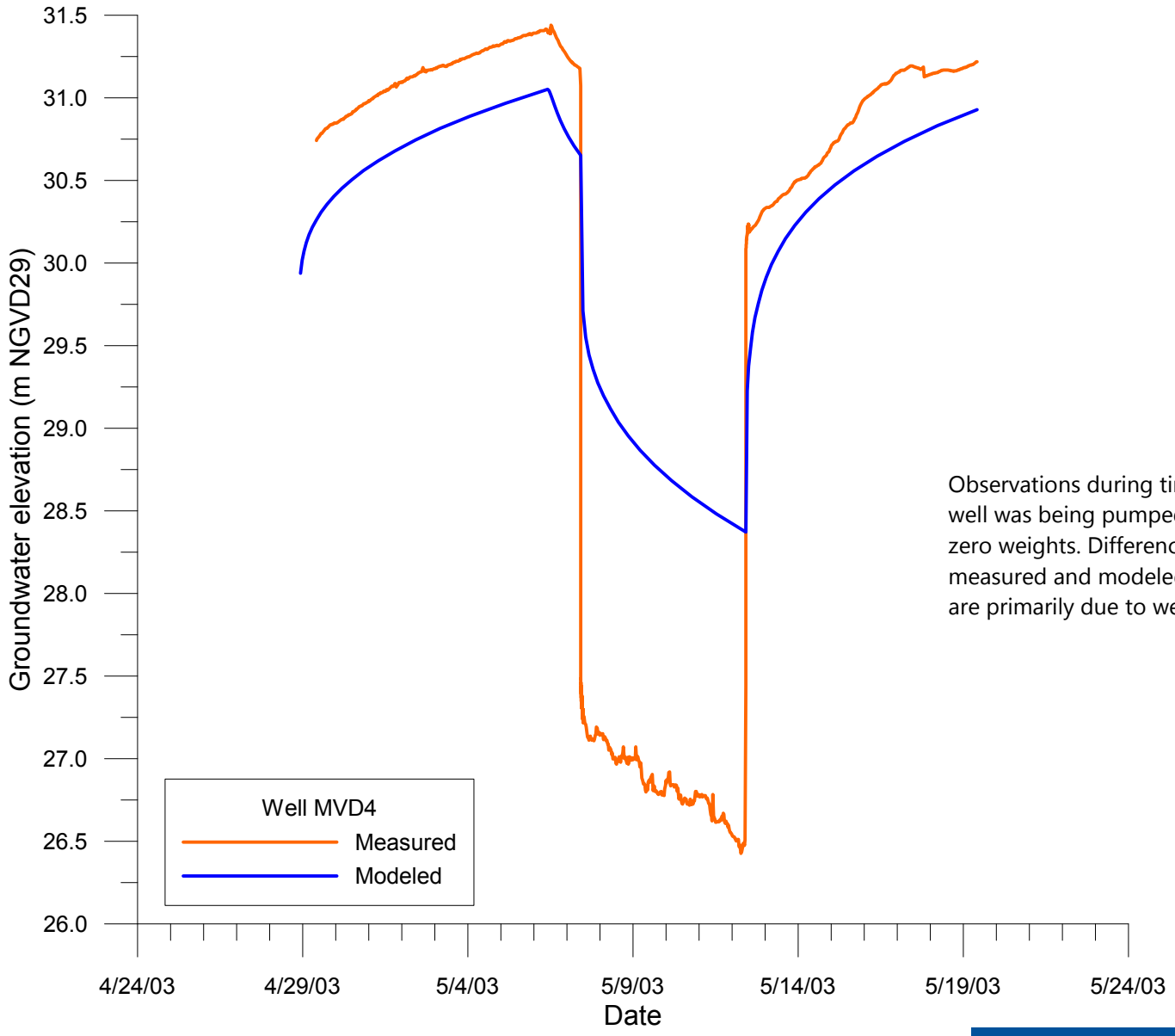


Figure 2-12
Cross section through the MVD-4/5 Model Showing the Layering, Boundary Conditions, and Lithologies
Merrimack, NH
Saint-Gobain



Observations during times when this well was being pumped were assigned zero weights. Differences between the measured and modeled pumping levels are primarily due to well loss

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

Figure 3-1

P:\Mpls\32 NY\42\32421001 PFOA Fate and Transport\WorkFiles\Merrimack\MVD_Wells_Longa_Disposal_Area\Investigation\Modeling\mvd45_synoptic_3\mvd4_data.grf

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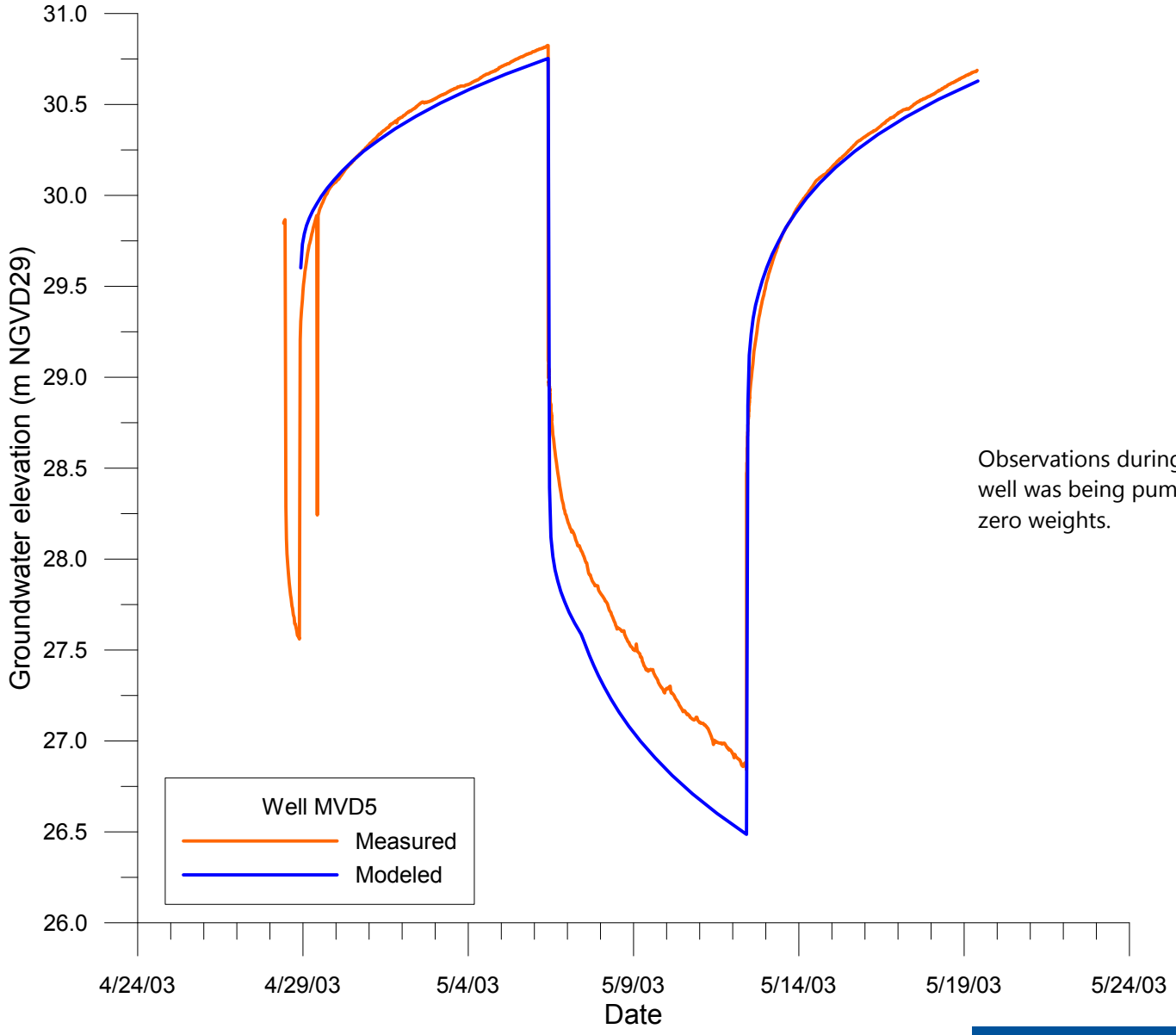

Observations during times when this well was being pumped were assigned zero weights.

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

Figure 3-2

P:\Mpls\32 NY\42\32421001 PFOA Fate and Transport\WorkFiles\Merrimack\MVD_Wells_Longa_Disposal_Area\Investigation\Modeling\mvd45_synoptic_3\mvd5_data.grf

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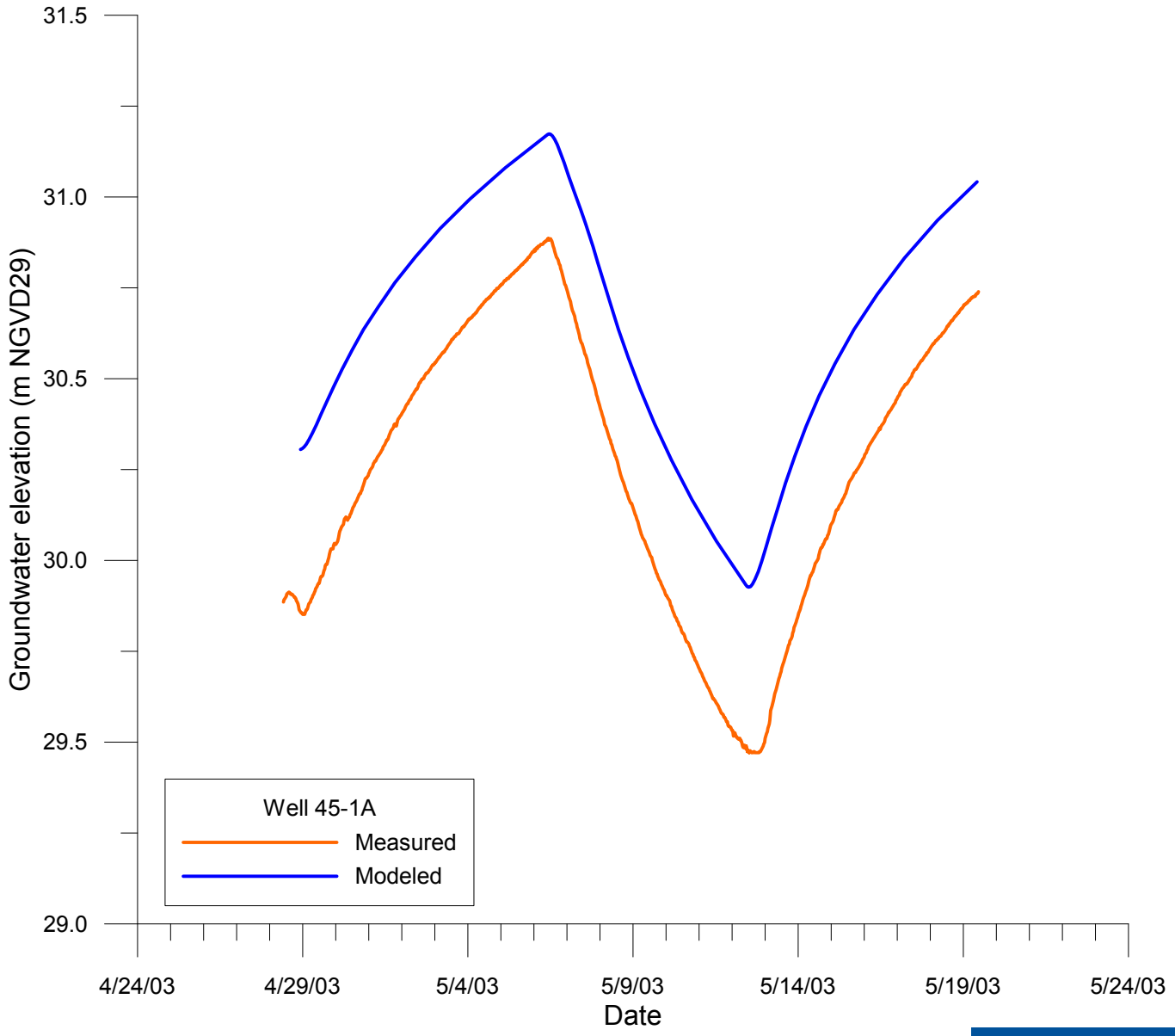

COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL 45-1A DURING THE 2003 AQUIFER TESTING

Figure 3-3

P:\Mpls\32 NY\42\32421001 PFOA Fate and Transport\WorkFiles\Merrimack\MVD_Wells_Longa_Disposal_AreaInvestigation\Modeling\mvd45_synoptic_3\mw1a_data.grf

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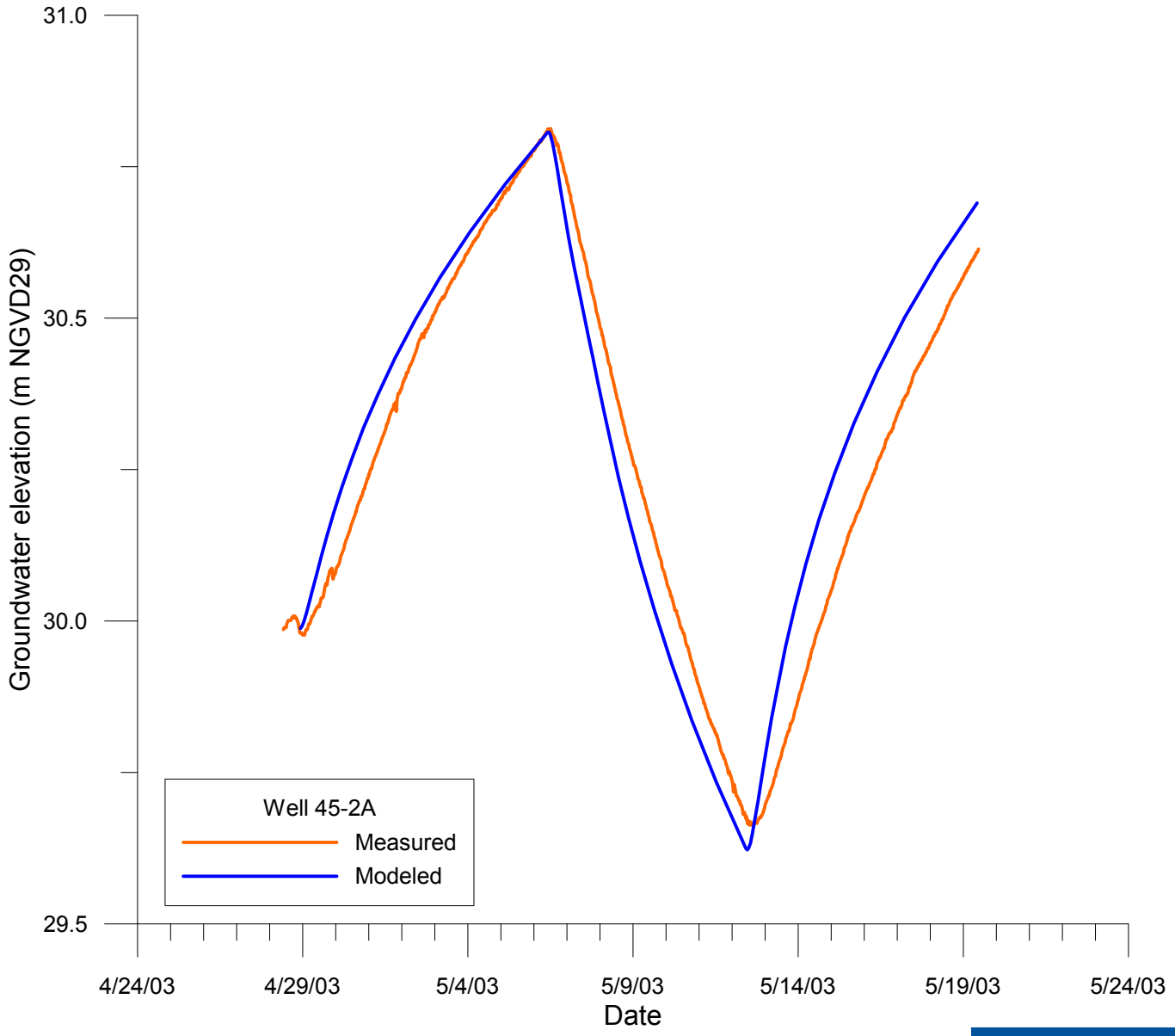

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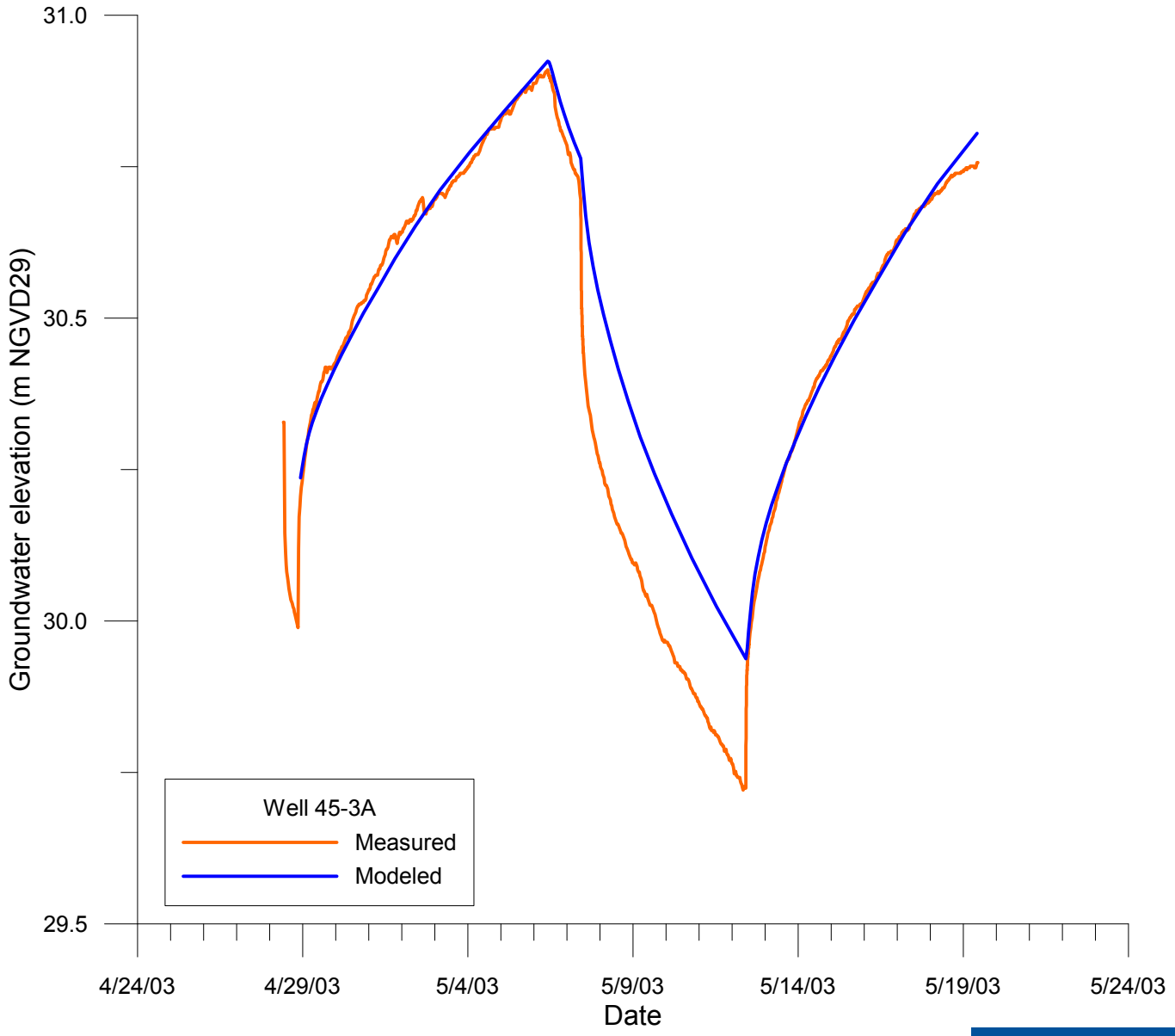
COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL 45-2A DURING THE 2003 AQUIFER TESTING

Figure 3-4



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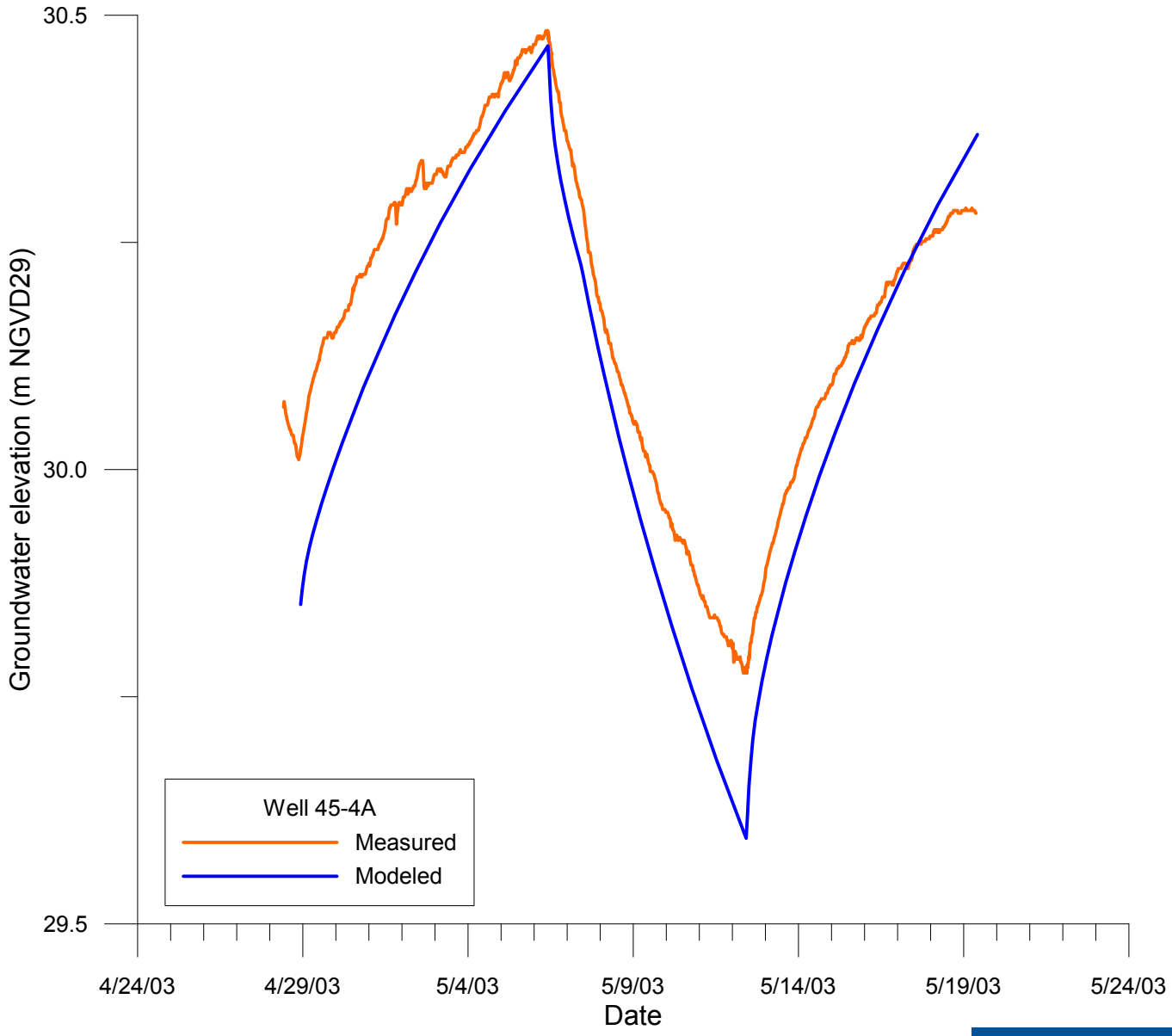
COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL 45-3A DURING THE 2003 AQUIFER TESTING

Figure 3-5



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

Figure 3-6

P:\Mpls\32 NY\42\32421001 PFOA Fate and Transport\WorkFiles\Merrimack\MVD_Wells_Longa_Disposal_AreaInvestigation\Modeling\mvd45_synoptic_3\mw4a_data.grf

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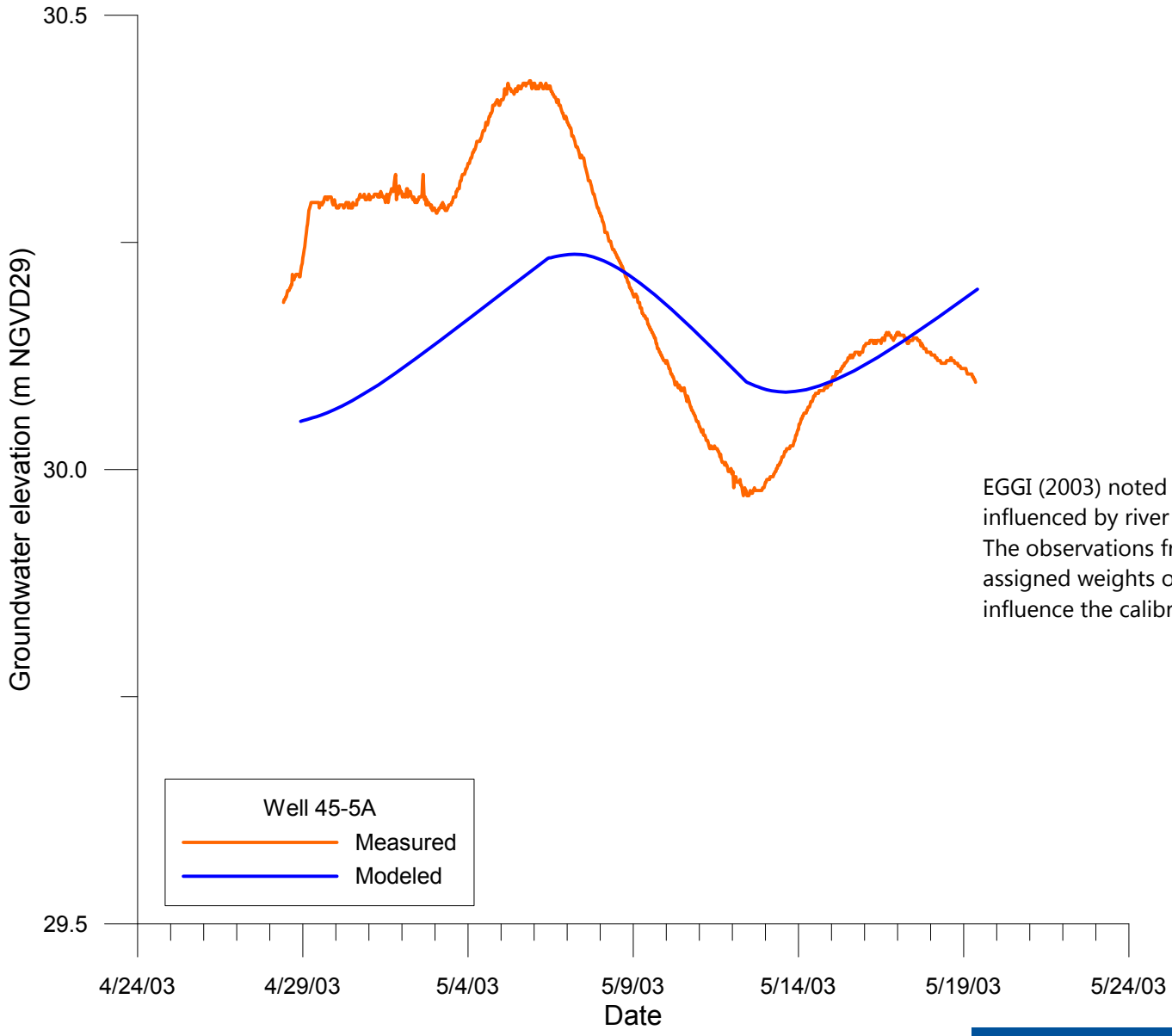

EGGI (2003) noted that this well was influenced by river stage variations. The observations from this well were assigned weights of zero, so did not influence the calibration.

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

Figure 3-7

P:\Mpls\32 NY\42\32421001 PFOA Fate and Transport\WorkFiles\Merrimack\MVD_Wells_Longa_Disposal_Area\Investigation\Modeling\mvd45_synoptic_3\mw5a_data.grf

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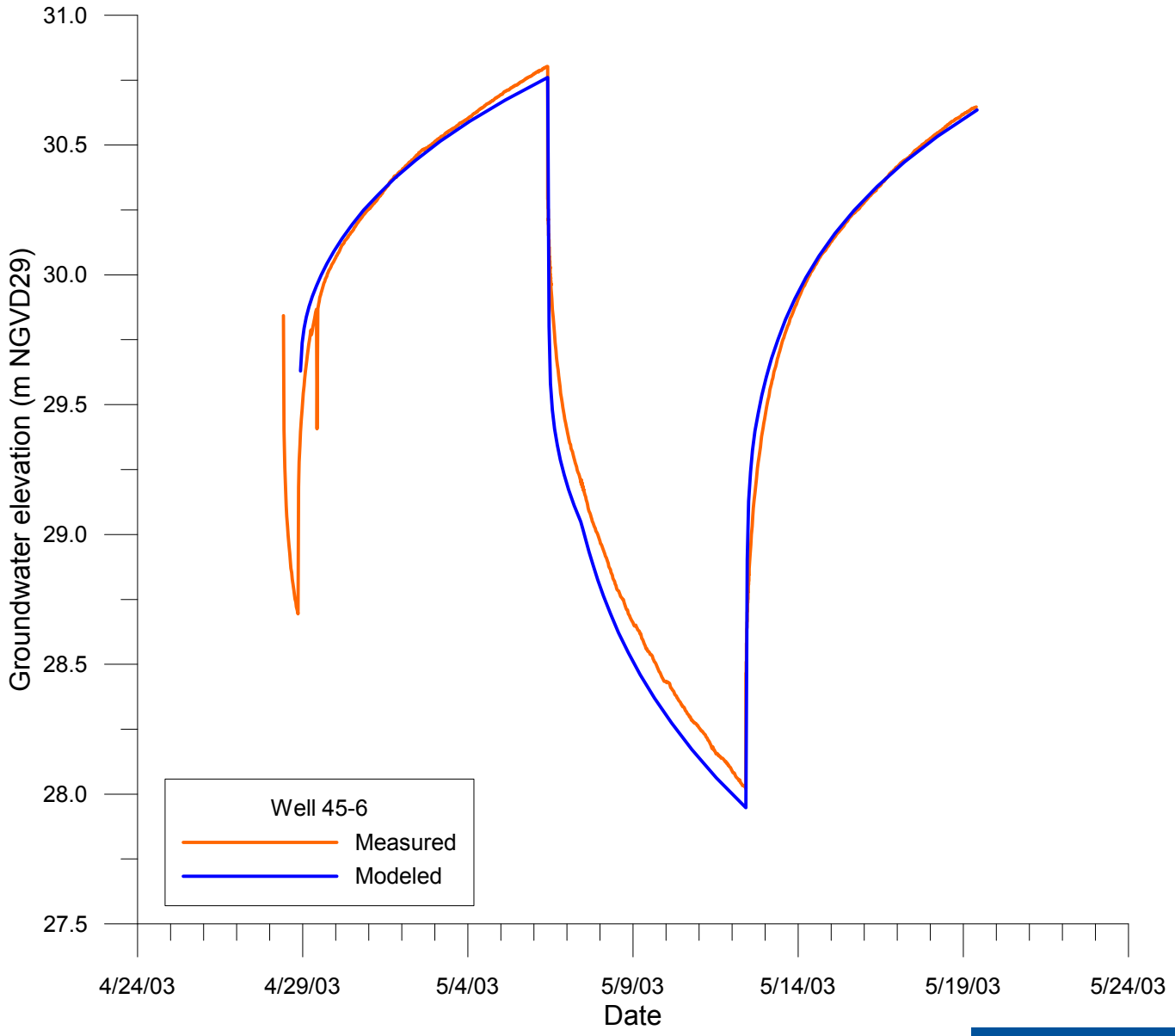

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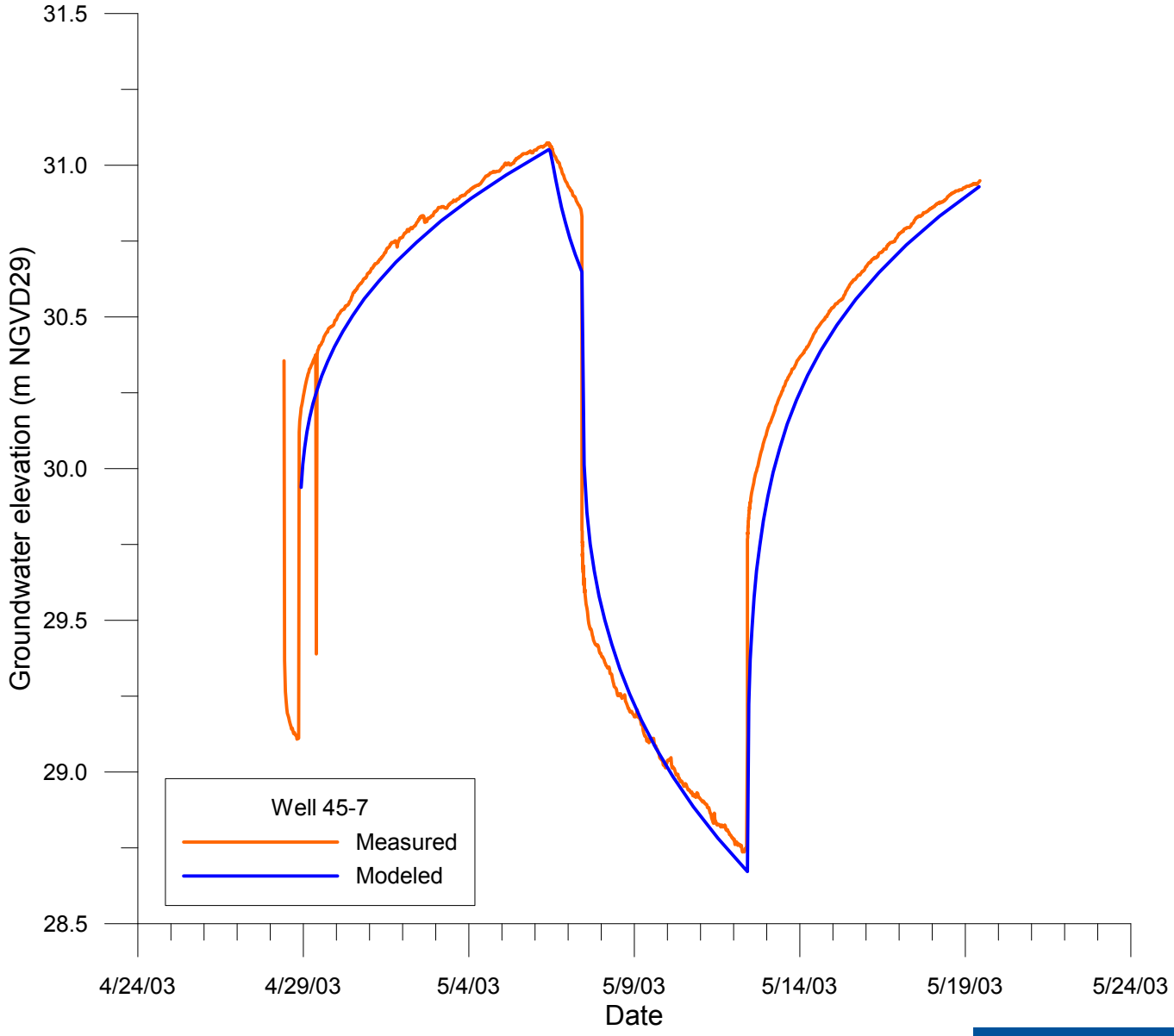
COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL 45-6 DURING THE 2003 AQUIFER TESTING

Figure 3-8



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

Figure 3-9

P:\Mpls\32 NY\42\32421001 PFOA Fate and Transport\WorkFiles\Merrimack\MVD_Wells_Longa_Disposal_Area\Investigation\Modeling\mvd45_synoptic_3\mw7_data.grf

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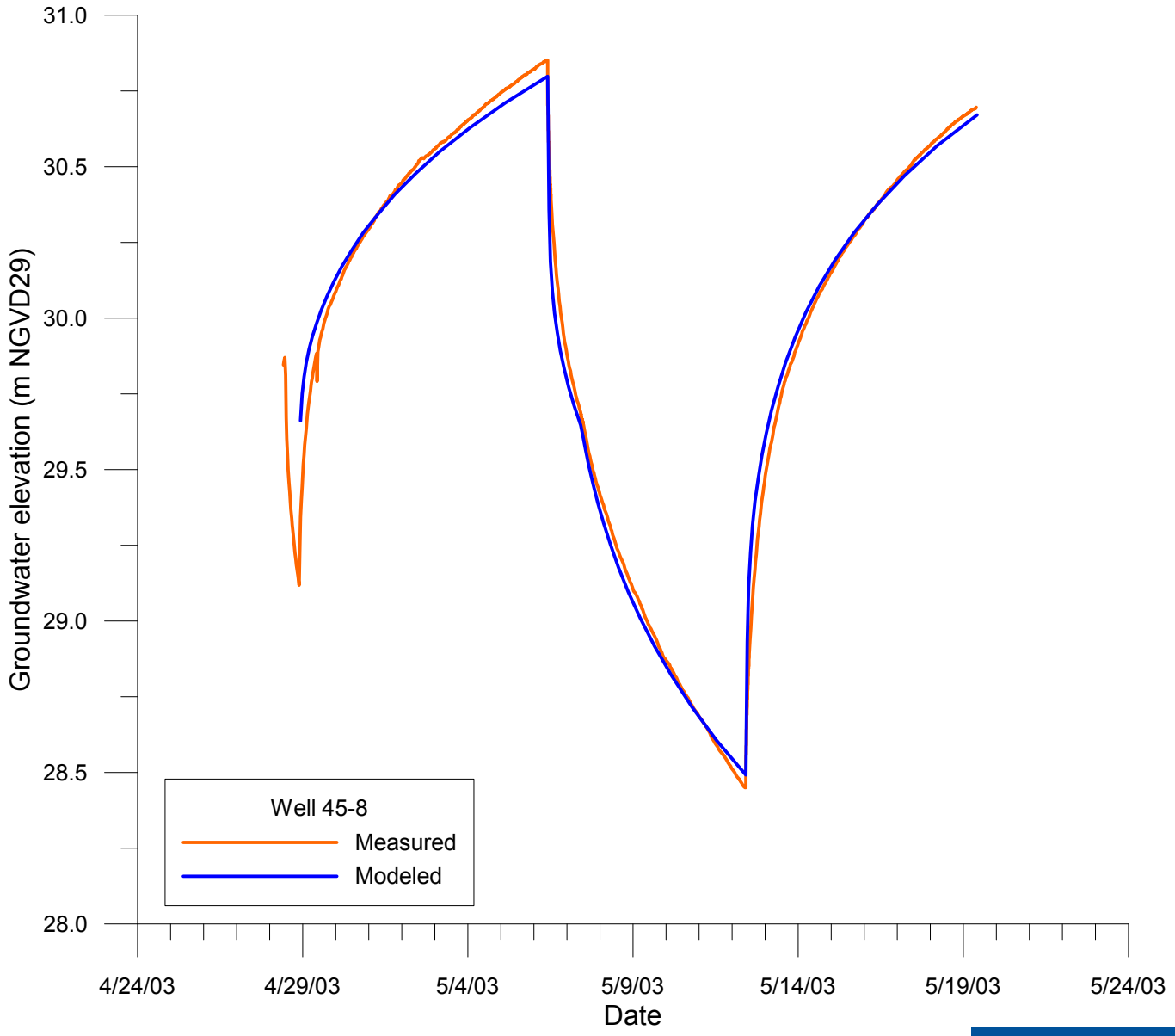

COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL 45-8 DURING THE 2003 AQUIFER TESTING

Figure 3-10

P:\Mpls\32 NY\42\32421001 PFOA Fate and Transport\WorkFiles\Merrimack\MVD_Wells_Longa_Disposal_Area\Investigation\Modeling\mvd45_synoptic_3\mw8_data.grf

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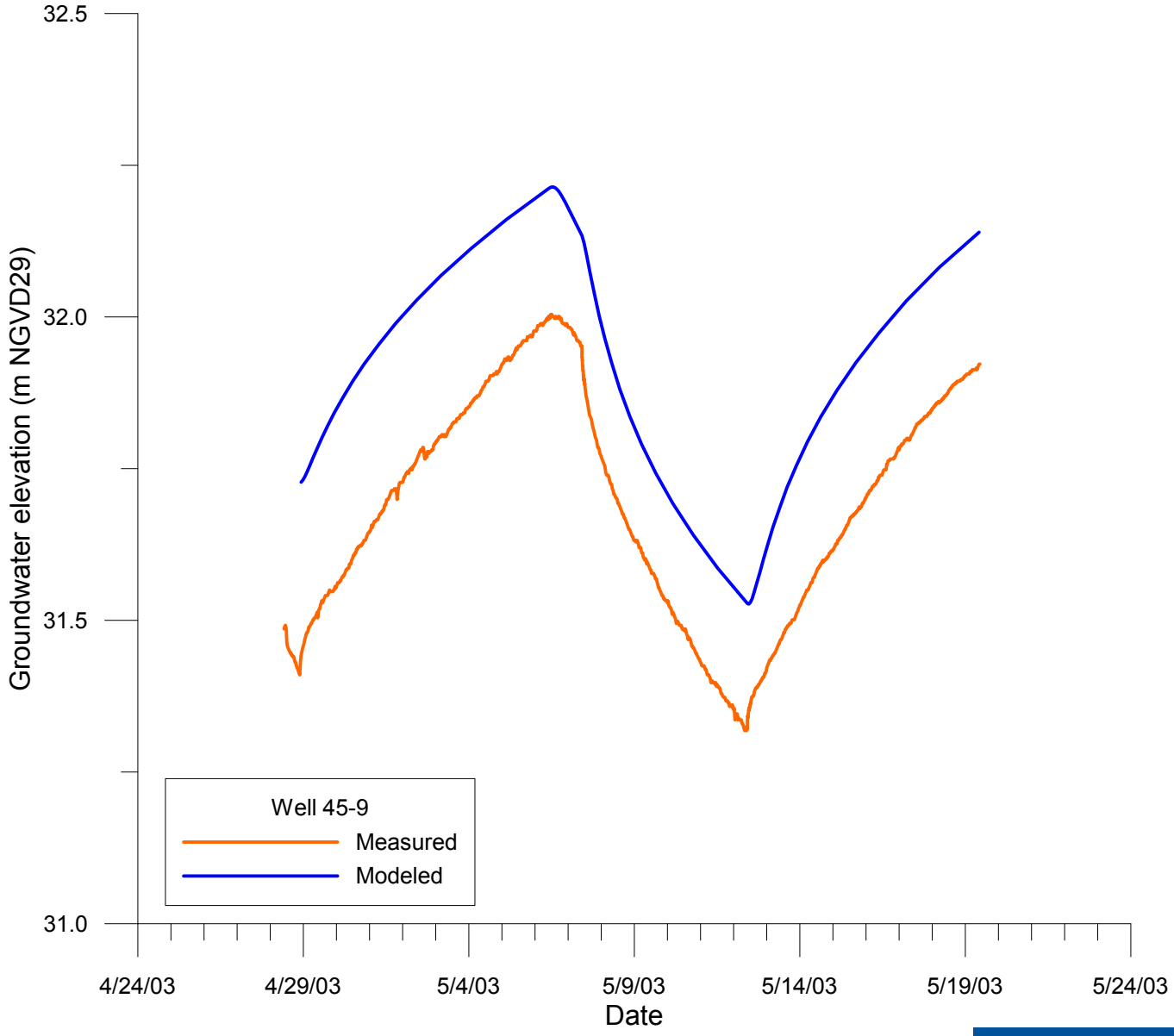

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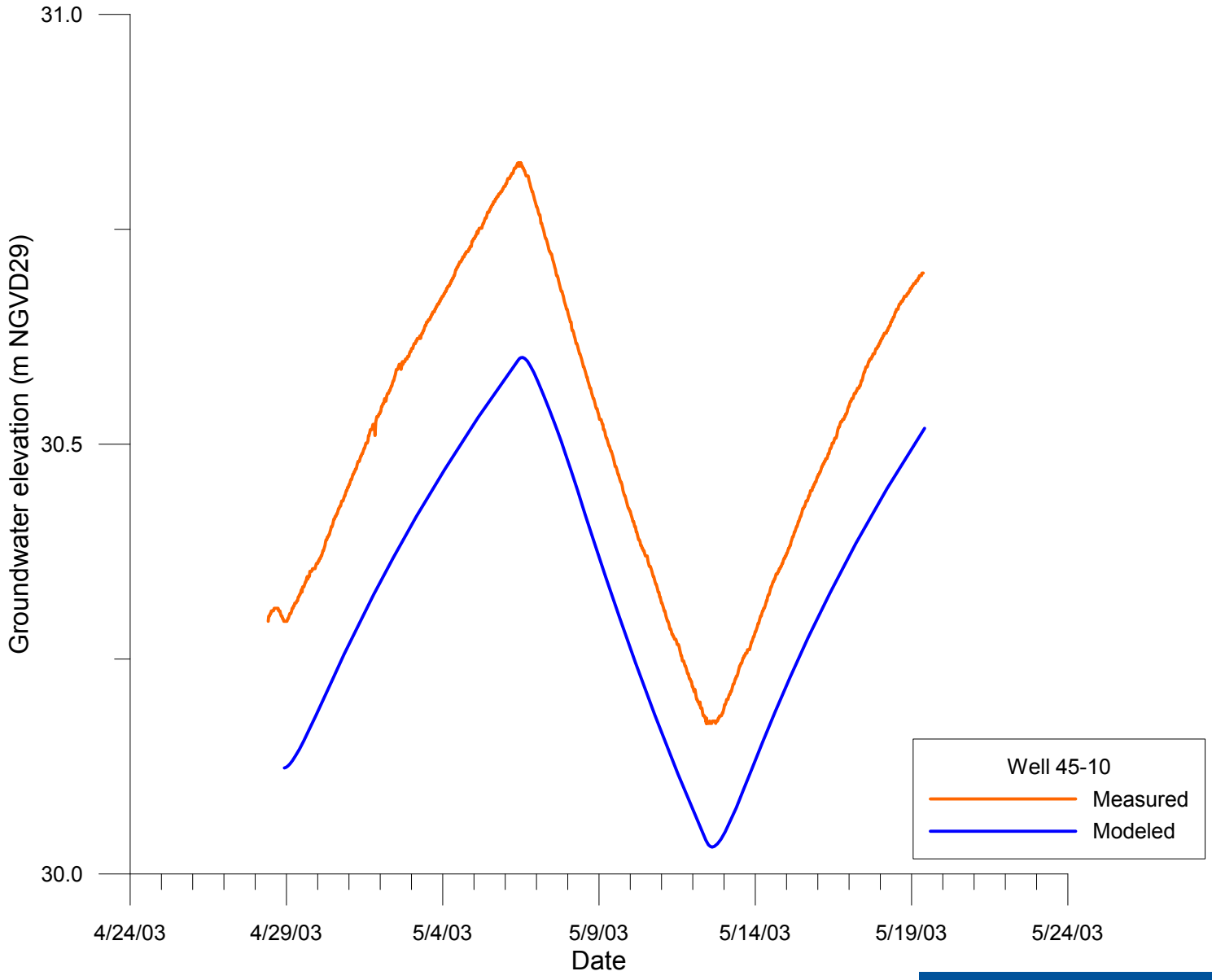
BARR

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

Figure 3-11



COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL 45-10 DURING THE 2003 AQUIFER TESTING

Figure 3-12

P:\Mpls\32 NY\42\32421001 PFOA Fate and Transport\WorkFiles\Merrimack\MVD_Wells_Longa_Disposal_Area\Investigation\Modeling\mvd45_synoptic_3\mw10_data.grf

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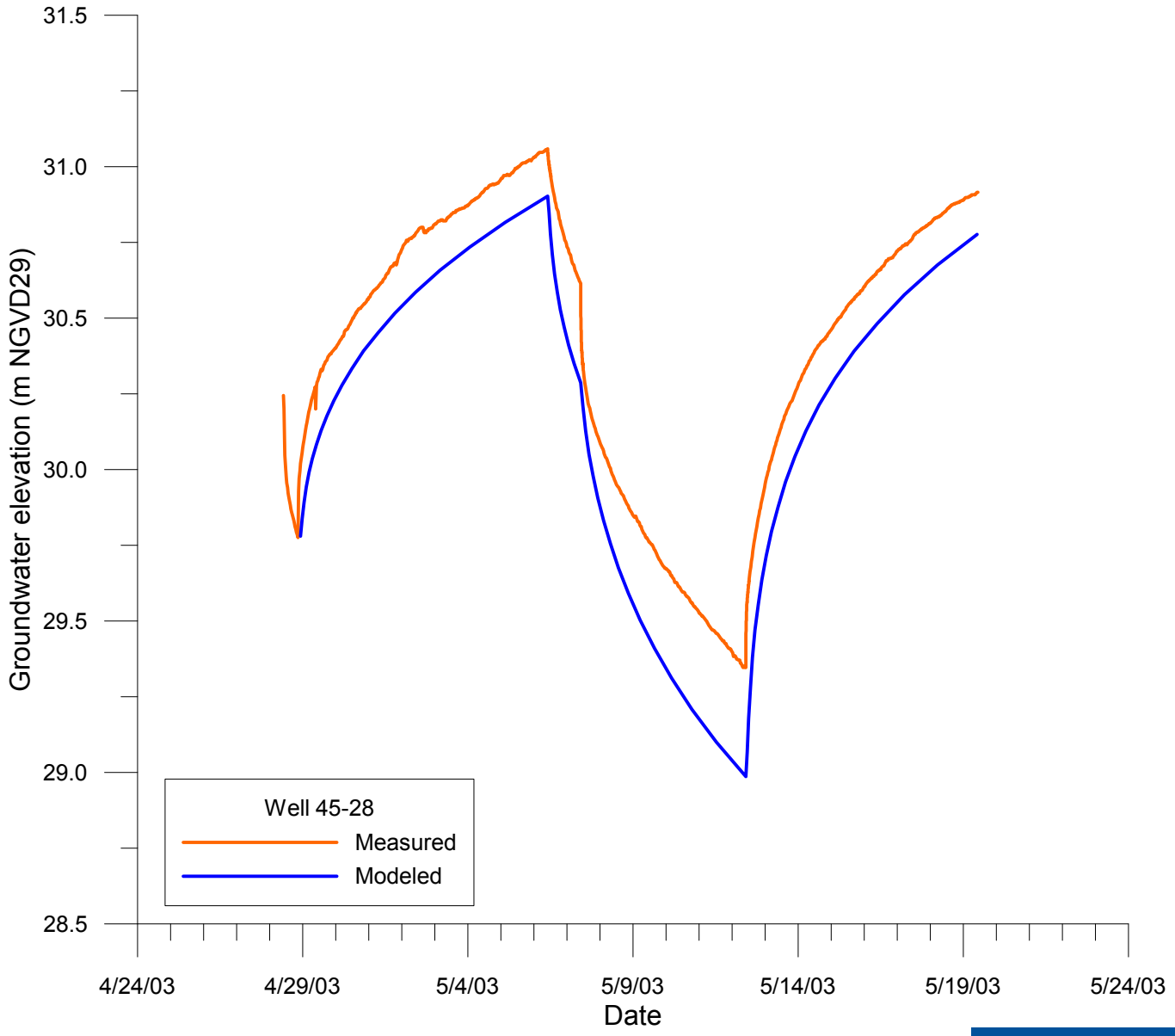

COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS IN WELL 45-28 DURING THE 2003 AQUIFER TESTING

Figure 3-13

P:\Mpls\32 NY\42\32421001 PFOA Fate and Transport\WorkFiles\Merrimack\MVD_Wells_Longa_Disposal_Area\Investigation\Modeling\mvd45_synoptic_3\mw28_data.grf

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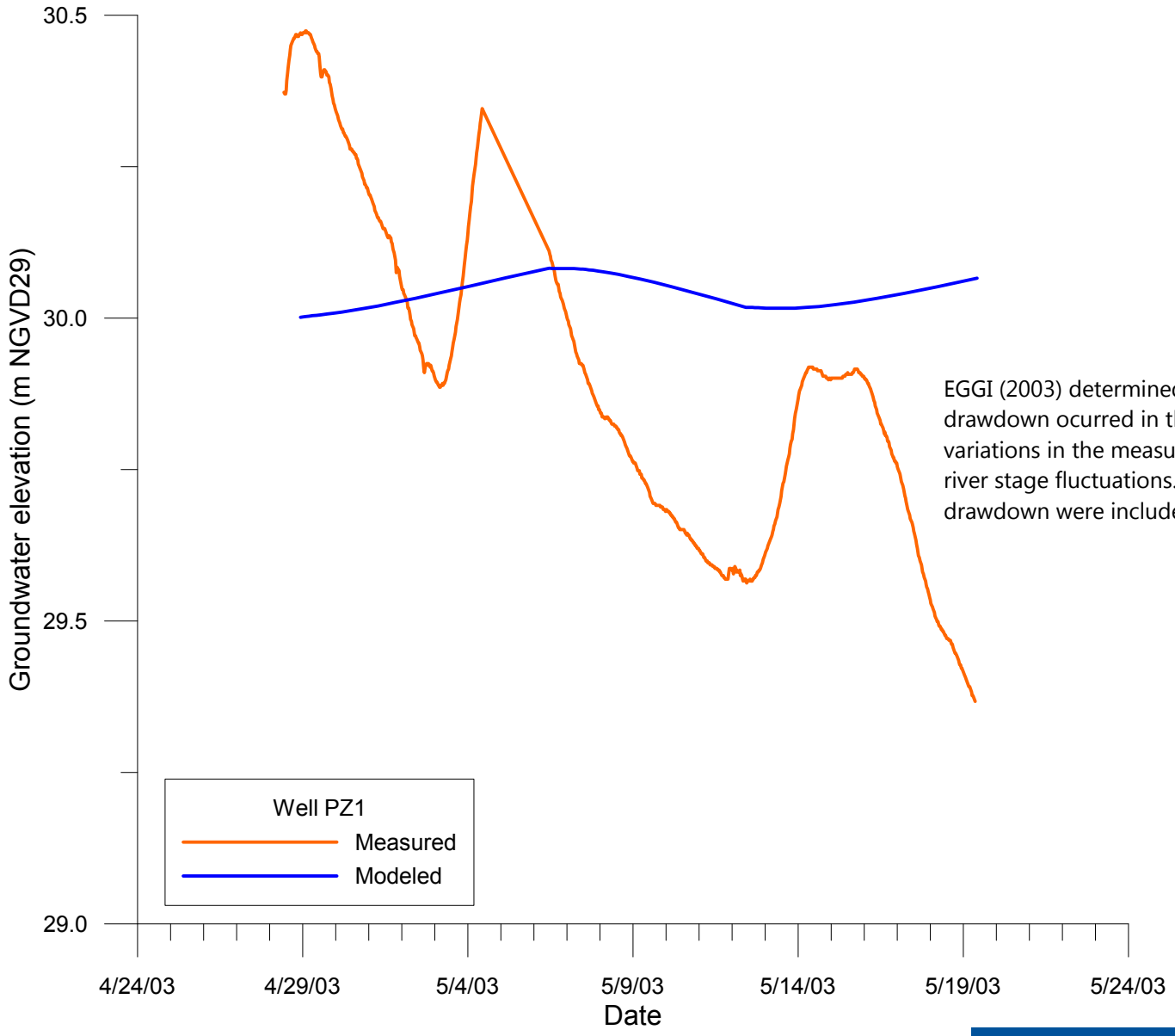

EGGI (2003) determined that no measureable drawdown ocurred in this piezometer. The variations in the measured data were due to river stage fluctuations. Observations of zero drawdown were included in the calibration.

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

Figure 3-14

P:\Mpls\32 NY\42\32421001 PFOA Fate and Transport\WorkFiles\Merrimack\MVD_Wells_Longa_Disposal_AreaInvestigation\Modeling\mvd45_synoptic_3\pz1_data.grf

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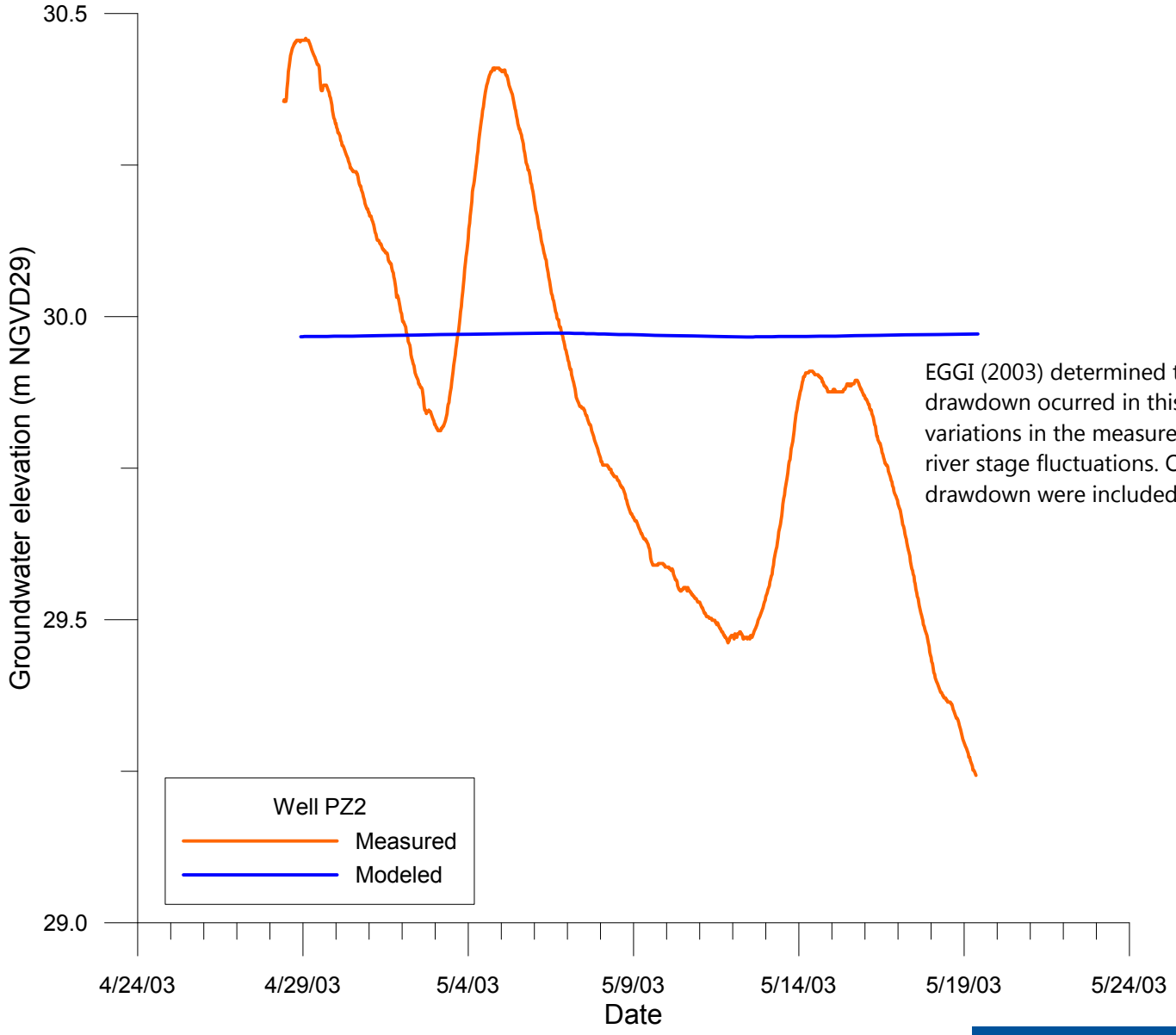

EGGI (2003) determined that no measureable drawdown ocurred in this piezometer. The variations in the measured data were due to river stage fluctuations. Observations of zero drawdown were included in the calibration.

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

Figure 3-15

P:\Mpls\32 NY\42\32421001 PFOA Fate and Transport\WorkFiles\Merrimack\MVD_Wells_Longa_Disposal_AreaInvestigation\Modeling\mvd45_synoptic_3\pz2_data.grf

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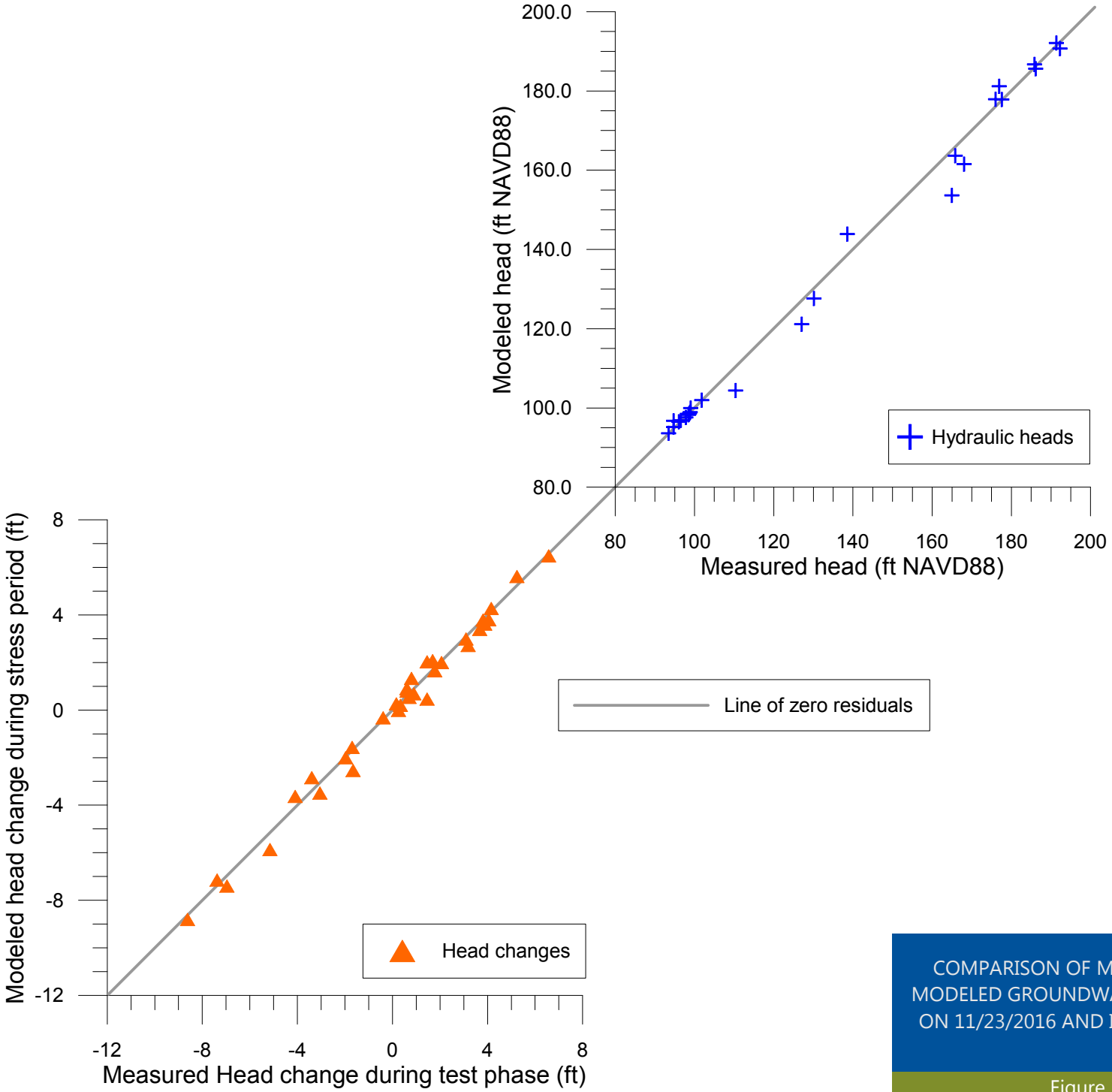

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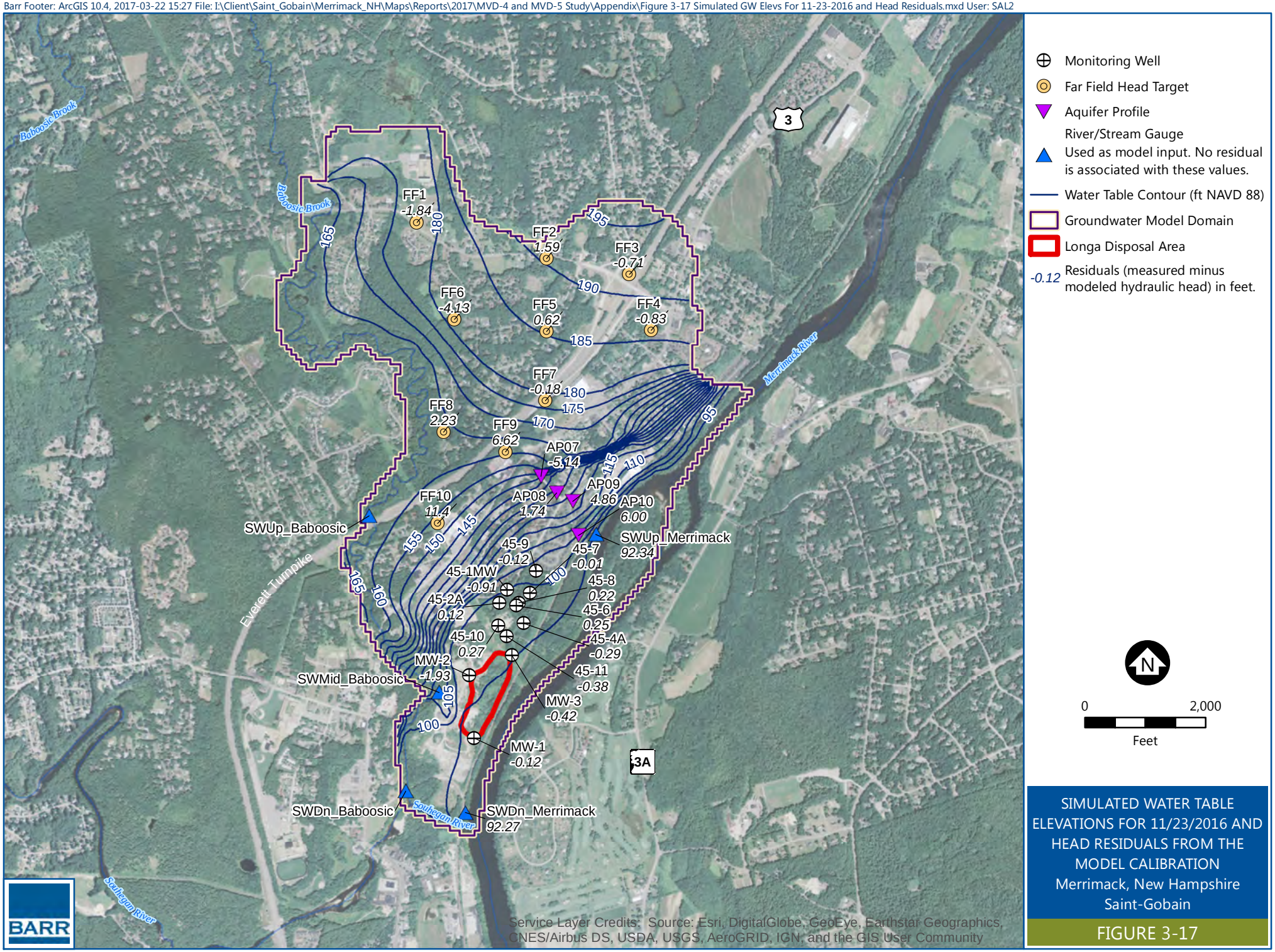
COMPARISON OF MEASURED AND MODELED GROUNDWATER ELEVATIONS ON 11/23/2016 AND IN THE FAR FIELD

Figure 3-16

Barr Footer: ArcGIS 10.4, 2017-03-22 15:27 File: I:\Client\Saint_Gobain\Merrimack_NH\Maps\Reports\2017\MVD-4 and MVD-5 Study\Appendix\Figure 3-17 Simulated GW Elevs For 11-23-2016 and Head Residuals.mxd User: SAL2



SIMULATED WATER TABLE ELEVATIONS FOR 11/23/2016 AND HEAD RESIDUALS FROM THE MODEL CALIBRATION
Merrimack, New Hampshire
Saint-Gobain

FIGURE 3-17

LONG-TERM AVERAGE PUMPING CONDITIONS

SUMMER PUMPING CONDITIONS

MVD-4/MVD-5 Well Locations
Monitoring Well
Far Field Head Target
Aquifer Profiling Location
River/Stream Gauge
Groundwater Model Domain
Longa Disposal Area

Long-Term Average Pumping Conditions

MVD-4/5 Modeled Capture Area in Model Domain at Long-term Average Pumping Rates

Capture Zone Extends West of Model Domain in This Area

Long-Term Average Pumping Heads (ft NAVD 88)

Minimum contour of 97.5 ft NAVD88 used to show the closed contour around wells MVD 4/5

Summer Pumping Conditions

MVD-4/5 Modeled Summer Capture Area in Model Domain

Capture Zone Extends West of Model Domain in This Area

Summer Pumping Heads (ft NAVD 88)

0 1,500 3,000
Feet

SIMULATED WATER TABLE ELEVATIONS FOR THE LONG-TERM AVERAGE AND SUMMER PUMPING SCENARIOS
Merrimack, New Hampshire
Saint-Gobain

FIGURE 3-18

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Barr Footer: ArcGIS 10.4.1, 2017-03-23 10:12 File: I:\Client\Saint_Gobain\Merrimack_NH\Maps\Reports\2017\MVD-4 and MVD-5 Study\Appendix\Figure 3-18 Simulated Water Table Elevations for the Long Term Average.mxd User: bal

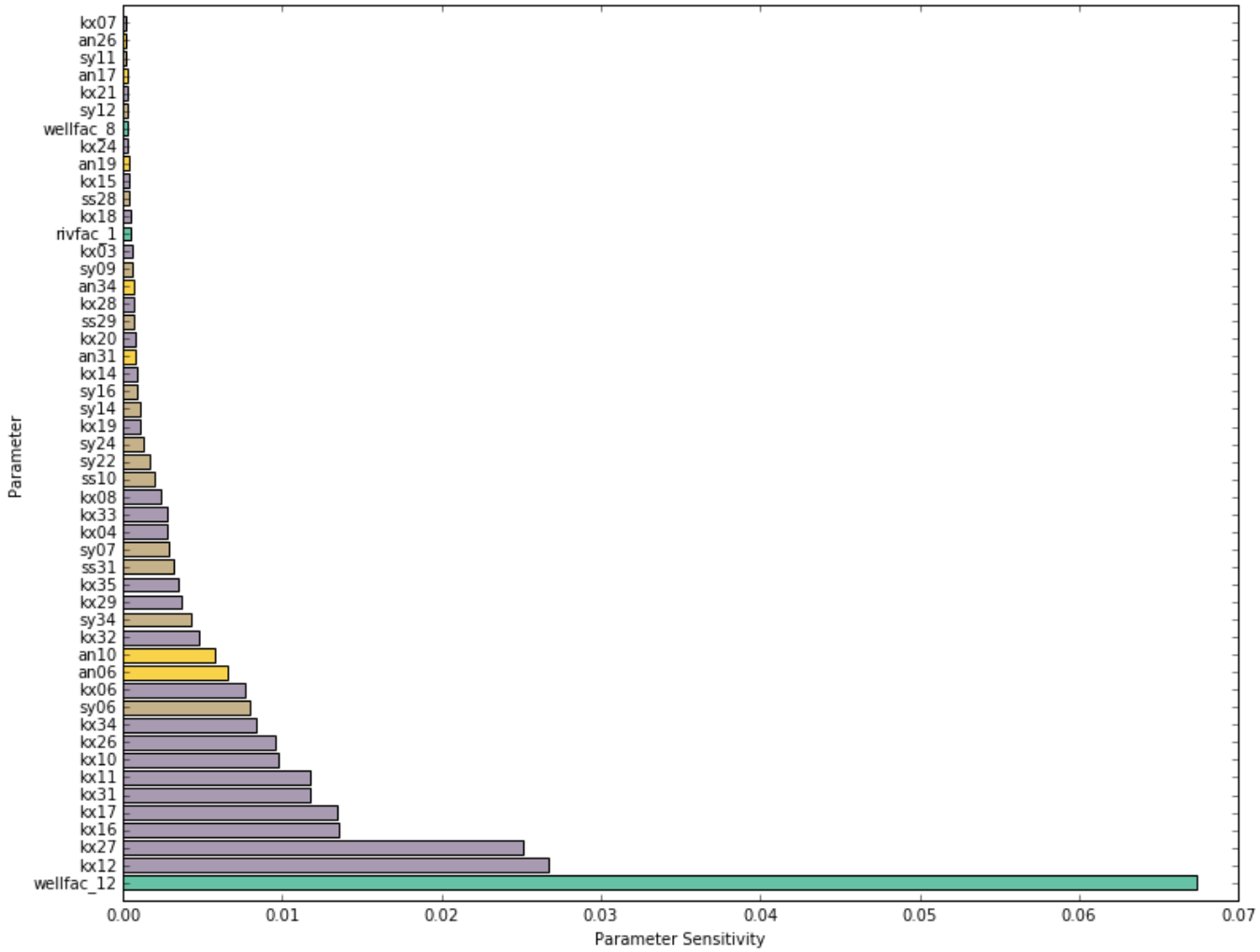


Figure 3-19

Summary of Parameter Sensitivities from the Model Calibration

Merrimack, NH

Saint-Gobain

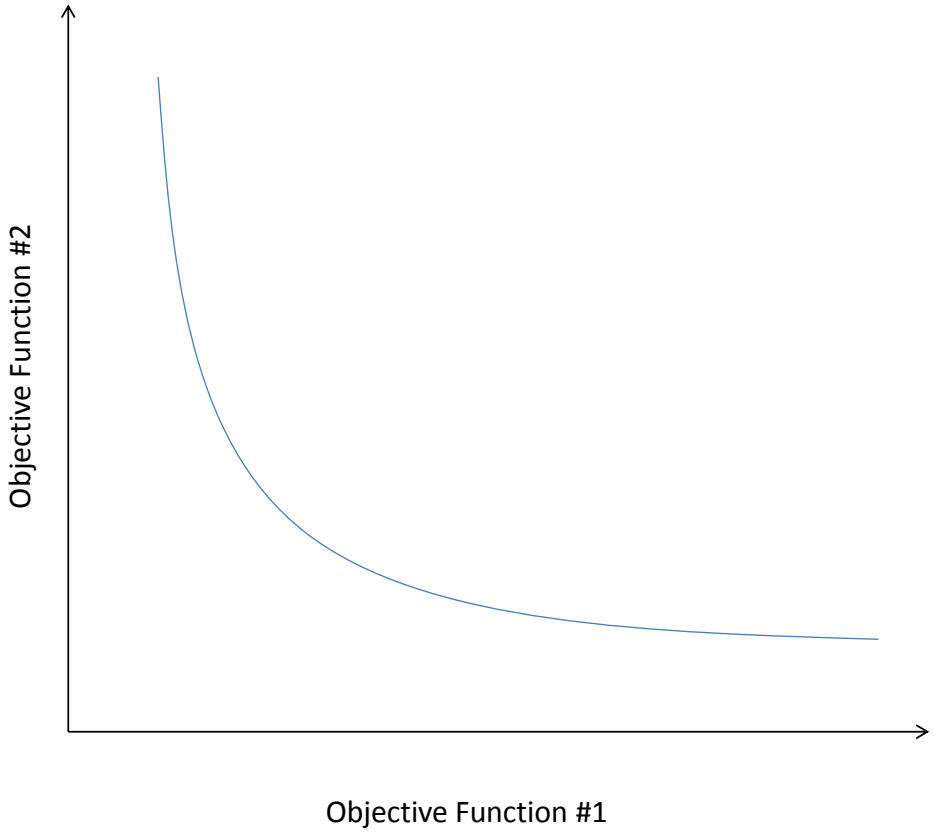


Figure 4-1
Idealized Pareto Front
Merrimack, NH
Saint-Gobain

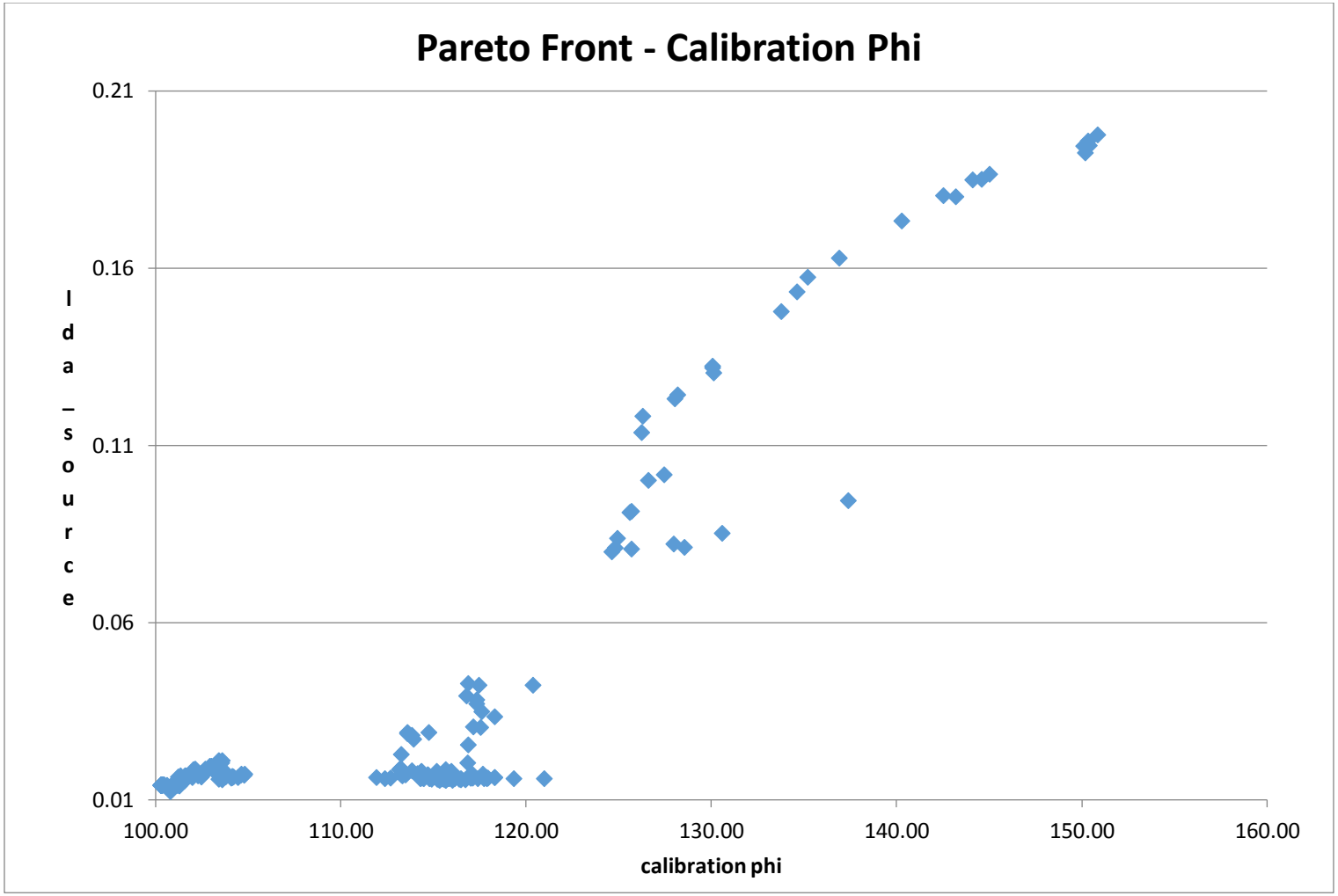


Figure 4-2
Pareto front for percentage of water pumped from MVD-4 and MVD-5 that originated under LDA
Merrimack, NH
Saint-Gobain

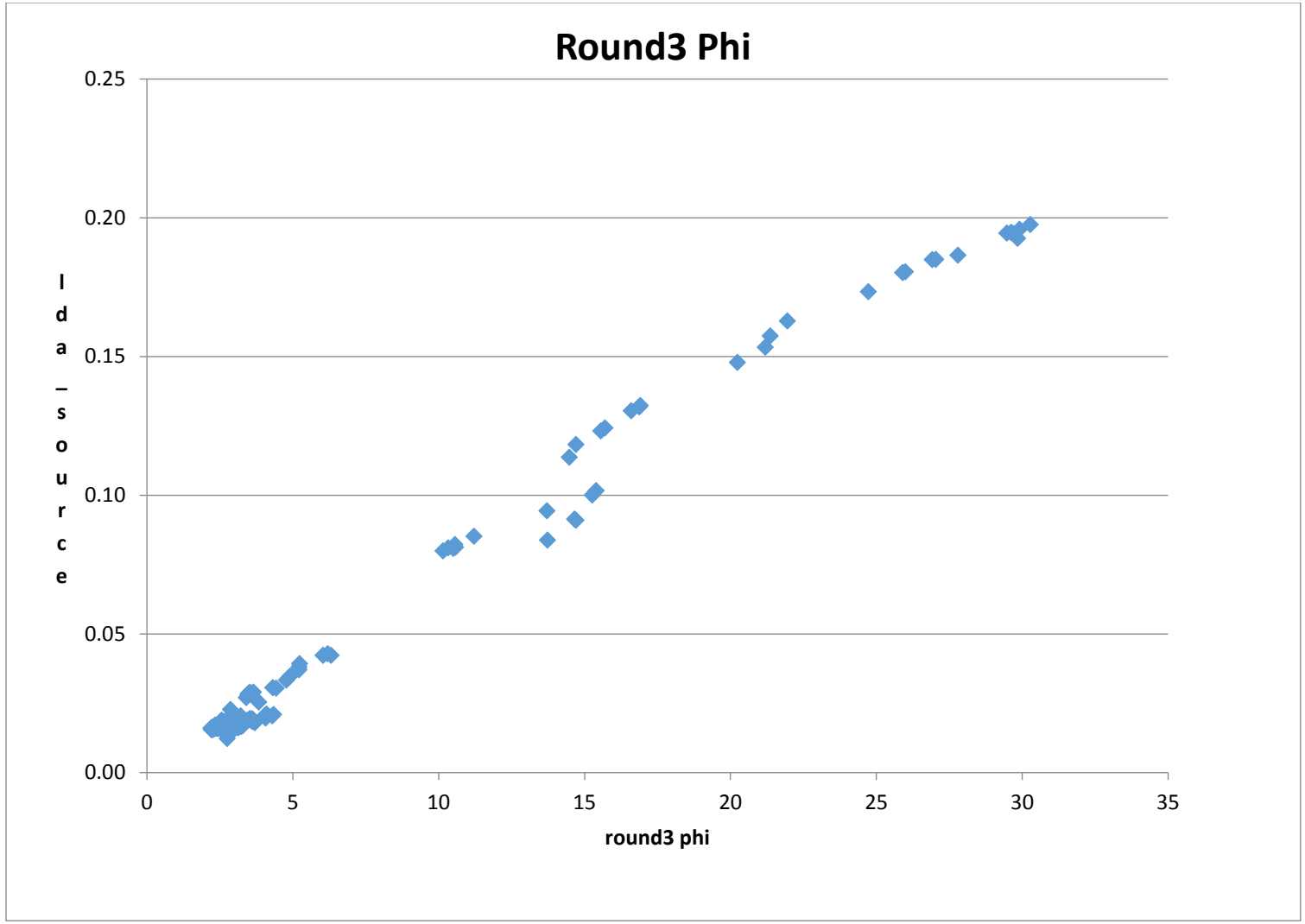
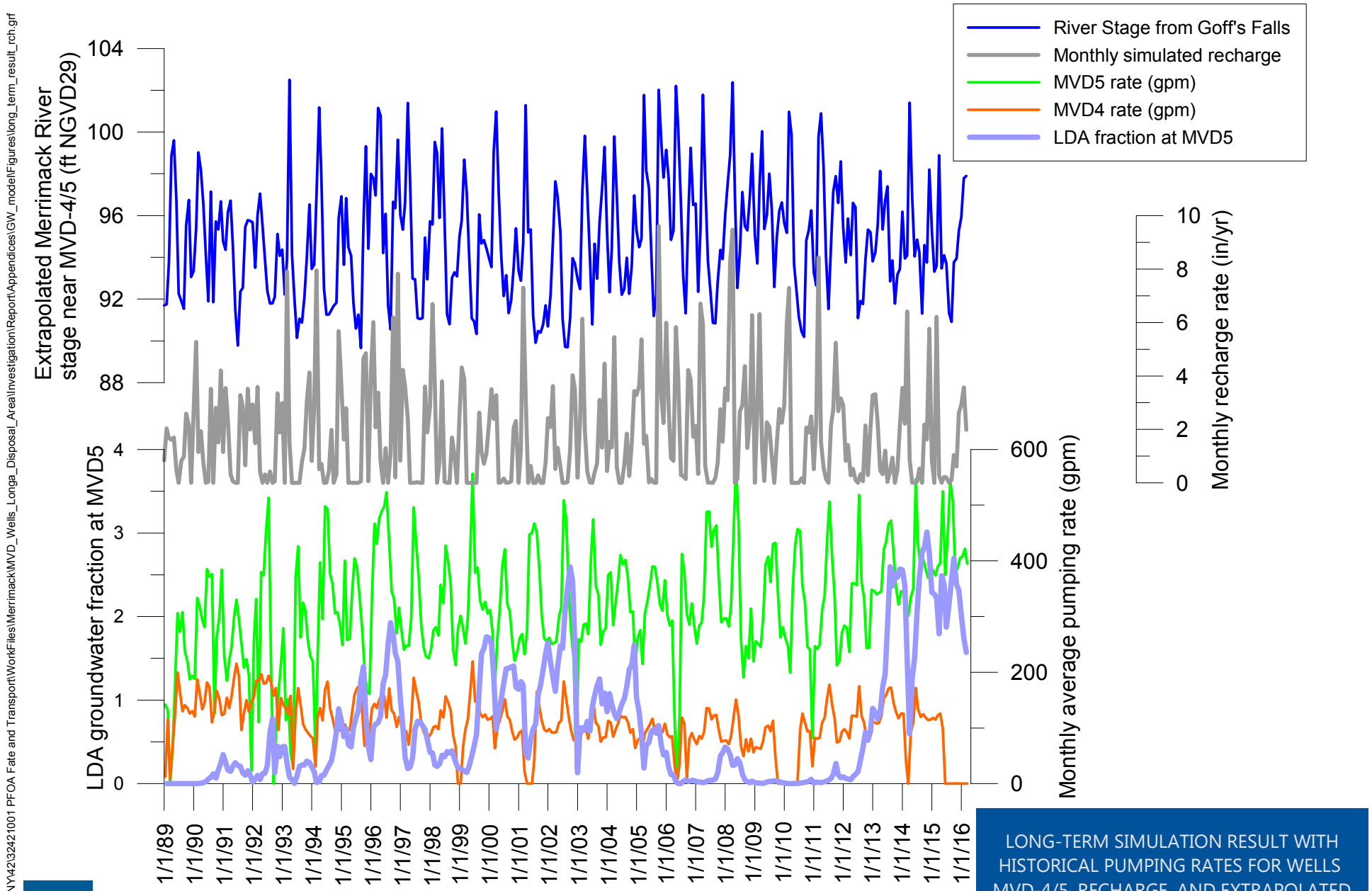


Figure 4-3
Round3 component of the calibration objective function
Merrimack, NH
Saint-Gobain



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LONG-TERM SIMULATION RESULT WITH HISTORICAL PUMPING RATES FOR WELLS MVD-4/5, RECHARGE, AND EXTRAPOLATED RIVER STAGE NEAR THE WELL FIELD USING CALIBRATION PARAMETER VALUES

Figure 4-4

Attachments

Attachment 1. Summary of observations used in the model calibration

Observation	Name	Group	Measured	Modelled	Residual	Weight
Synoptic and aquifer profiling groundwater elevation data (m NGVD 29)						
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
Groundwater elevation data from 2003 aquifer testing (EGGI, 2003; m NGVD 29)						
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

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 drawdown in the two temporary piezometers based on the 2003 aquifer testing (EGGI, 2003; 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
Groundwater elevation changes 2003 aquifer testing (EGGI, 2003; meters)						
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

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 Name	Parameter Group	Sensitivity	Rank	Lithology/Description
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
Specific storage parameters 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
Other parameters by layer 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 Name	Parameter Group	Sensitivity	Rank	Lithology/Description
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	welfac	5.78E-04	46	Vertical hydraulic conductivity of the Merrimack River bed
rivfac_2	welfac	1.57E-05	96	Vertical hydraulic conductivity of Baboosic Brook bed near MVD-4/5
rivfac_3	welfac	4.31E-05	77	Vertical hydraulic conductivity of Baboosic Brook bed in the far field
ghbfac_1	welfac	<1.52E-09	115	Underflow conductance multiplier on Merrimack alluvium at the downstream end of the model domain

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

Definition	Layer	Direction[1]	m^3/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	In	297.01	54.488	0.1214

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

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

Definition	Layer	Direction[1]	m^3/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 layers	1,2,3	In	297.03	54.491	0.121406

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

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

Definition	Layer	Direction[1]	m^3/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 layers	1,2,3	Out	659.59	121.004	0.269599

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

[2]Net 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

C.T. MALE ASSOCIATES

STREAM WATER SAMPLING LOG

DATE: 11/7/16

PROJECT NO: 16.6126

SAMPLING PERSONNEL: Jacob Dysart

Justin Campbell

PROJECT NAME: SGPP-Merrimack

PROJECT LOCATION: Merrimack, NH

SAMPLING LOCATION: Merrimack Downstream

SG2-SWDn@Merr-161107

SAMPLE COLLECTION TIME: 1515

DEPTH OF STREAM AT SAMPLING POINT: 1.95 ft.

WIDTH OF STREAM: ~300 ft.

STREAM VELOCITY: Low

WATER LEVEL AT MEASURING POINT: 2.14 ft.

OBSERVATIONS: COLOR Clear, ODOR None

SHEEN None, TURBIDITY 0.89 NTU

OTHER ~~224.9 mV ORP~~ JD

FIELD PARAMETERS: pH ~~7.00~~ 7.99

TEMPERATURE 7.9 °C

CONDUCTIVITY 0.115 mS/cm (Specific Conductance)

OTHER 224.9 mV ORP ; DO: ~~7.4 mg~~ (SD) 8.49 mg/L

NOTES: Depth to water 2.14 ft. from top of pipe

C.T. MALE ASSOCIATES

STREAM WATER SAMPLING LOG

DATE: 11/07/16 PROJECT NO: 16.6126

SAMPLING PERSONNEL: Jonathan Dippel PROJECT NAME: SEPP - Merrimack

~~SG2-SWDn-BAB-161107~~ Justin Campbell PROJECT LOCATION: Merrimack, NH

SAMPLING LOCATION: Babcock Downstream

SG2-SWDn-BAB-161107

SAMPLE COLLECTION TIME: 1540

DEPTH OF STREAM AT SAMPLING POINT: 0.9 ft

WIDTH OF STREAM: ~30 ft.

STREAM VELOCITY: moderate

WATER LEVEL AT MEASURING POINT: 3.82 ft. above top pipe

OBSERVATIONS: COLOR clear, ODOR NONE

SHEEN NONE, TURBIDITY 0.36 NTU

OTHER

FIELD PARAMETERS: pH 6.36

TEMPERATURE 7.0°C

CONDUCTIVITY 0.387 mS/cm (SPC) specific conductance

OTHER ORP = 222.7 mV DO = 8.96 mg/L

NOTES: water level at surveyed bolt the was 0.19 ft.

C.T. MALE ASSOCIATES

STREAM WATER SAMPLING LOG

DATE: 11/7/16

PROJECT NO: 16.6126

SAMPLING PERSONNEL: Jonathan Dippert
Justin Campbell

PROJECT NAME: SGPP - Merrimack

PROJECT LOCATION: Merrimack, NH

SAMPLING LOCATION: Mid Babcock
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 slight yellow tint, ODOR NONE
SHEEN NONE, TURBIDITY 0.29 NTU
OTHER

FIELD PARAMETERS: pH 6.55
TEMPERATURE 6.8 °C
CONDUCTIVITY 0.391 mS/cm (specific conductance)
OTHER ORP = 203.7 mV; DO = 10.24

NOTES: Field Duplicate Collected at this location.

C.T. MALE ASSOCIATES

DAILY CALIBRATION RECORD

PROJECT: SGPP - ~~McCaffrey Street~~ Merrimack

LOCATION: ~~Hoosick Falls, NY~~ Merrimack, NH

CTM PROJECT NO.: ~~14.4756~~ 16.6126

DATE: 11/7/16

EQUIPMENT (Make, Model, and Serial #)	TIME	STANDARD (Concentration)	METER READING	CALIBRATED or BUMP TEST	CALIBRATED BY
LaMotte 2020We - 18247	12:30	0.0, 1.0, 10.0 NTU	-0.00, 1.33, 9.98	Calibrated	RH
- FA00438			0.00, 0.98, 9.94		JC
- FA01463			-0.44, 1.01, 10.04		JC
YSI Quatro 4M FA00878	12:45	DO 100%	104.1		RH
		pH 4, 7, 10	3.96, 6.97, 9.92		RH
		Cond. 7.0 mS/cm	6.72		RH
		ORP 220 mV	220.		RH
YSI Quatro 4M FA00416	13:00	DO 100%	104.4		RH
		pH 4, 7, 10	4.26, 7.17, 10.21		RH
		Cond. 7.0	6.80		RH
		ORP 220	219.1		RH
YSI 4M Pro Plus FA00373	13:45	DO 100%	103.0		RH
		pH 4, 7, 10	4.00, 7.11, 10.21		RH
		Cond. 7.0	7.0		RH
		ORP 220	218.1		RH

C.T. MALE ASSOCIATES

DAILY CALIBRATION RECORD

PROJECT: SGPP - ~~McGaffrey Street~~ Merrimack

CTM PROJECT NO.: 16.6126 ~~14.4756~~

LOCATION: ~~Hoosick Falls, NY~~ Merrimack, NH

DATE: 11/7/16

EQUIPMENT (Make, Model, and Serial #)	TIME	STANDARD (Concentration)	METER READING	CALIBRATED or BUMP TEST	CALIBRATED BY
LaMotte 2020WE-18247	1630	0.0, 1.0, 10.0 NTU	0.01, 1.21, 10.2	Bump	LC
-PAD 0438			0.10, 1.15, 10.1		
-PAD 1463			0.06, 1.17, 10.5		
YSI Quatro 4M PAD0878	1645	DO 100%	99.8%	Bump	LC
		pH 4, 7, 10	4.05, 7.2, 10.1		
		cond. 7.0 mS/cm	7.17		
		ORP 220 mV	218		
YSI Quatro 4M PAD0416	1705	DO 100%	101	Bump	LC
		cond 7.0 mS/cm	7.12		
		pH 4, 7, 10	4.02, 7.1, 9.98		
		ORP 220 mV	226		
YSI Quatro 4M PAD 0873	1720	DO 100 %	102%	Bump	LC
		cond. 7.0 mS/cm	6.5		
		pH 4, 7, 10	3.98, 7.02, 10.12		
		ORP 220 mV	223		

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C.T. MALE ASSOCIATES

STREAM WATER SAMPLING LOG

DATE: 11/8/16 PROJECT NO: 16.6126

SAMPLING PERSONNEL: Jonathan Dippel PROJECT NAME: SGRP Merrimack

Justin Campbell PROJECT LOCATION: Merrimack, NH

SAMPLING LOCATION: Upstream Babcock

SG2 - SWUpBab - 161108

SAMPLE COLLECTION TIME: 0910

DEPTH OF STREAM AT SAMPLING POINT: 1.17 ft.

WIDTH OF STREAM: ~35 ft.

STREAM VELOCITY: very slow

WATER LEVEL AT MEASURING POINT: 2.70 ft.

OBSERVATIONS: COLOR Clear, ODOR None

SHEEN None, TURBIDITY 0.70 NTU

OTHER

FIELD PARAMETERS: pH 7.82

TEMPERATURE 5.7°C

CONDUCTIVITY 0.705 SPC mS/cm; 444.6 Cond. mS/cm

OTHER ORP: 162.1 mV DO: 9.04 mg/L

NOTES: Collected MS/MSD at this location.

C.T. MALE ASSOCIATES

STREAM WATER SAMPLING LOG

DATE: 11/8/16 PROJECT NO: 16.6126

SAMPLING PERSONNEL: Jonathan Dippert PROJECT NAME: SGPP-Merrimack

Justin Campbell PROJECT LOCATION: Merrimack, NH

SAMPLING LOCATION: Upstream Merrimack

SG2-SWUpMerr-161108

SAMPLE COLLECTION TIME: ~~0910~~ 1030

DEPTH OF STREAM AT SAMPLING POINT: ~~1.17 ft~~ 1.29 ft

WIDTH OF STREAM: ~~~35 ft~~ ~150 ft

STREAM VELOCITY: ~~very slow~~ moderate

WATER LEVEL AT MEASURING POINT: ~~2.70 ft.~~ 2.69 ft

OBSERVATIONS: COLOR ~~CLEAR~~ Clear, ODOR ~~NONE~~ none

SHEEN ~~NONE~~ none, TURBIDITY ~~0.70 NTU~~ 1.50 NTU

OTHER

FIELD PARAMETERS: pH ~~7.82~~ 7.21 SU

TEMPERATURE ~~5.7°C~~ 7.4 °C

CONDUCTIVITY ~~0.705 SPC mS/cm~~; ~~4444.6 Cond. µS/cm~~

OTHER ORP: ~~162.1 mV~~ DO: ~~9.04 mg/L~~

NOTES: Conductivity: 128.4 µS/cm (Spec. Cond: 0.193 mS/cm)

ORP: 155.0 mV DO: 9.71 mg/L

Water Level @ surveyed bathe: 0.48 ft

Groundwater Services Field Log

DATE: 11-08-2016 PROJECT NAME: SGPP- Merrimack

PROJECT NO.: 16.6126 PROJECT LOCATION: Merrimack, NH

SAMPLING PERSONNEL: Justin Campbell

MONITORING WELL ID#: 45-4A NOTES TAKEN BY: JC

DEPTH TO WATER: 22.90 FROM: Top of pipe BAILER ID:

DEPTH TO BOTTOM: 44.8 FROM: Top of pipe BAILER: NEW DISPOSABLE

WATER COLUMN HEIGHT: 21.90 BAILER: STAINLESS STEEL

OTHER

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

WELL CASING DIAMETER

WELL VOLUME: GALLONS

VOLUMES PURGED: 6.0 GALLONS PURGE METHOD: peristaltic pump

TIME STARTED: 1140 ; TIME FINISHED: 12:35

OBSERVATIONS: COLOR Slightly cloudy ; ODOR Iron smell

SHEEN NONE ; TURBIDITY 8.16

OTHER

WATER RECOVERY HEIGHT: 23.01 ; RECOVERY TIME IN MINUTES: 55

FIELD PARAMETERS: pH 6.09 , TEMPERATURE 10.9

CONDUCTIVITY 568.2 , OTHER ORP= 27.2 mV

DO = 6.78 mg/L

SAMPLE COLLECTION TIME: 12:35

NOTES: Tubing set at 42.1 feet

Groundwater Services Field Log

DATE: 11-02-2016 PROJECT NAME: SGPP-MER

PROJECT NO.: 16.6126 PROJECT LOCATION: Merrimack, NH

SAMPLING PERSONNEL: Justin Campbell

MONITORING WELL ID#: 45-9 NOTES TAKEN BY: JC

DEPTH TO WATER: 27.15 FROM: ~~Top PVC~~ JC BAILER ID:

DEPTH TO BOTTOM: 82.90 FROM: BAILER: NEW DISPOSABLE

WATER COLUMN HEIGHT: 55.75 BAILER: STAINLESS STEEL

OTHER

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

WELL CASING DIAMETER

WELL VOLUME: GALLONS

VOLUMES PURGED: 4.5 GALLONS PURGE METHOD: peristaltic pump

TIME STARTED: 1500 ; TIME FINISHED: 1545

OBSERVATIONS: COLOR Clear ; ODOR NONE

SHEEN NONE ; TURBIDITY 0.29

OTHER

WATER RECOVERY HEIGHT: 27.16 ; RECOVERY TIME IN MINUTES: 45

FIELD PARAMETERS: pH 5.39 , TEMPERATURE 10.7

CONDUCTIVITY 496.5 , OTHER ORP: 223.1 mV

DO = 7.36 mS/cm

SAMPLE COLLECTION TIME: 1545

NOTES: Tubing set @ 56 feet

Groundwater Services Field Log

DATE: 11/8/2016 PROJECT NAME: SGPP - Memmack

PROJECT NO.: 16.6126 PROJECT LOCATION: _____

SAMPLING PERSONNEL: Lorene Cameron

MONITORING WELL ID#: MER-45-8 NOTES TAKEN BY: L. CAMERON

DEPTH TO WATER: 23.83 FROM: _____ BAILER ID: _____

DEPTH TO BOTTOM: 68.67 FROM: _____ BAILER: NEW DISPOSABLE

WATER COLUMN HEIGHT: 44.84 BAILER: STAINLESS STEEL _____

OTHER _____

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

WELL CASING DIAMETER

WELL VOLUME: _____ GALLONS

VOLUMES PURGED: 3.0 GALLONS PURGE METHOD: peristaltic pump

TIME STARTED: 0945 ; TIME FINISHED: 1045

OBSERVATIONS: COLOR clear ; ODOR none

SHEEN none ; TURBIDITY 4.65

OTHER _____

WATER RECOVERY HEIGHT: _____ ; RECOVERY TIME IN MINUTES: _____

FIELD PARAMETERS: pH 5.56 , TEMPERATURE 10.3°C

CONDUCTIVITY (mS) 852 . OTHER DO (mg/L) 4.02

ORP (mV) 241.7

SAMPLE COLLECTION TIME: 1030

NOTES: Tubing set @ 56'

Groundwater Services Field Log

DATE: 11/8/2016 PROJECT NAME: SCPP-Merrimack

PROJECT NO.: 16.6126 PROJECT LOCATION: _____

SAMPLING PERSONNEL: Larene Cameron

MONITORING WELL ID#: MER45-6 NOTES TAKEN BY: L. CAMERON

DEPTH TO WATER: 25.05 FROM: _____ BAILER ID: _____

DEPTH TO BOTTOM: 71.92 FROM: _____ BAILER: NEW DISPOSABLE

WATER COLUMN HEIGHT: 46.87 BAILER: STAINLESS STEEL _____

OTHER _____

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

WELL CASING DIAMETER

WELL VOLUME: 2.0 GALLONS

VOLUMES PURGED: _____ GALLONS PURGE METHOD: Parastaltic Pump

TIME STARTED: 1330 ; TIME FINISHED: 1415

OBSERVATIONS: COLOR clear ; ODOR none

SHEEN none ; TURBIDITY 3.51

OTHER _____

WATER RECOVERY HEIGHT: _____ ; RECOVERY TIME IN MINUTES: _____

FIELD PARAMETERS: pH 5.65 , TEMPERATURE 12.3

CONDUCTIVITY (µS) 893 , OTHER DO(mg/L) 3.60

ORP(mV) 231.9

SAMPLE COLLECTION TIME: 1415

NOTES: Tubing set @ 45'

Groundwater Services Field Log

DATE: 11/8/2016 PROJECT NAME: SCPP-Mem mac

PROJECT NO.: 16.6126 PROJECT LOCATION:

SAMPLING PERSONNEL: Ryan Hubbard

MONITORING WELL ID#: MW45-7 NOTES TAKEN BY: R. Hubbard

DEPTH TO WATER: 19.69 ft FROM: TPVC BAILER ID: N/A

DEPTH TO BOTTOM: 76.25 ft FROM: TPVC BAILER: NEW DISPOSABLE

WATER COLUMN HEIGHT: 55.56 ft BAILER: STAINLESS STEEL N/A

OTHER

CONVERSION FACTORS LINEAR FEET TO GALLONS

WELL CASING DIAMETER

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 PURGED: 2.0 GALLONS PURGE METHOD: Peristaltic Pump

TIME STARTED: 1520 ; TIME FINISHED: 1610

OBSERVATIONS: COLOR clear ; ODOR none

SHEEN none ; TURBIDITY 7.73 NTU

OTHER

WATER RECOVERY HEIGHT: ft ; RECOVERY TIME IN MINUTES: mi

FIELD PARAMETERS: pH 5.98 SU , TEMPERATURE 11.3 °C

CONDUCTIVITY 588 µS , OTHER DO (mg/L) 5.1

ORP (mV) 175.

SAMPLE COLLECTION TIME: 1620

NOTES: Tubing set @ 65.5'

C.T. MALE ASSOCIATES

DAILY CALIBRATION RECORD

PROJECT: SGPP - ~~McCaffrey Street~~ Merrimack

LOCATION: ~~Hoosick Falls, NY~~ Merrimack, NH well field

CTM PROJECT NO.: 14.4756

DATE: 11/8/16

EQUIPMENT (Make, Model, and Serial #)	TIME	STANDARD (Concentration)	METER READING	CALIBRATED or BUMP TEST	CALIBRATED BY
LaMotte FA00438	7:15	Turbidity 0, 1, 10	2.13, 1.01, 9.92	Calib.	LC
LaMotte FA 01436		" " "	0.01, 1.09, 9.17	" "	LC
YSI ProPlus FA00273		DO 100%	100.1 %	" "	RH
		pH 4, 7, 10	3.94, 7.01, 10.10	" "	RH
		Cond. 7.00 mS/cm	6.93 mS/cm	" "	RH
		ORP 220 mV	218.4 mV	" "	RH
YSI Quatro 4M FA02278		DO 100%	98.2	" "	LC
		pH 4, 7, 10	3.99, 6.97, 10.02	" "	LC
		Cond 7.00 mS/cm	~~6.99~~ 7.18 mS/cm	" "	LC
		ORP 220 mV	2200 mV	" "	LC
LaMotte FA 15247		Turbidity 0, 1, 10	-0.01, 1.04, 9.71	" "	JC
YSI Quatro 4M FA00416		pH 4, 7, 9	4.00, 6.94, 10.01	" "	JC
		DO 2.	98.6	" "	JC
		Cond 7.00 mS/cm	7.04	" "	JC
		ORP 220 mV	218.6	" "	JC

C.T. MALE ASSOCIATES

DAILY CALIBRATION RECORD

PROJECT: SGPP - ~~McCaffrey Street~~ Merrimack

CTM PROJECT NO.: 14.4756

LOCATION: ~~Hoosick Falls, NY~~ Merrimack, NH

DATE: 11/8/16

EQUIPMENT (Make, Model, and Serial #)	TIME	STANDARD (Concentration)	METER READING	CALIBRATED or BUMP TEST	CALIBRATED BY
LaMotte FA00438	1200	Turbidity 0, 1, 10	0.10, 1.2, 10.06	BUMP	LC
LaMotte FA01436	1210	Turbidity 0, 1, 10	0.02, 1.1, 09.98	BUMP	LC
YSI ProPlus FA00373	1215	DO 100%	99.8%	BUMP	JC
		pH 4, 7, 10	4.05, 7.1, 10.02	BUMP	JC
		Cond 7.00 mS/cm	6.95		
		ORP 220 mV	222		
YSI Quatro FA00878	1230	DO 100%	101.2	BUMP	JC
		pH 4, 7, 10	3.98, 7.03, 10.2		
		Cond. 7.00 mS/cm	7.10		
		ORP 220 mV	221.0		
YSI Quatro FA00416	1242	DO 100%	100.2	BUMP	JC
		pH 4, 7, 10	4.1, 7.02, 10.11		
		Cond 7.00 mS/cm	6.95		
		ORP 220 mV	221.2		

Groundwater Services Field Log

DATE: 11-09-2016 PROJECT NAME: SCPP-MERRIMACK

PROJECT NO.: 160126 PROJECT LOCATION: Merrimack, NH

SAMPLING PERSONNEL: Justin Campbell

MONITORING WELL ID#: 45-3A NOTES TAKEN BY: JC

DEPTH TO WATER: 22.96 FROM: Top Metal pipe/casing BAILER ID:

DEPTH TO BOTTOM: *31.95 FROM: BAILER: NEW DISPOSABLE

WATER COLUMN HEIGHT: 8.99 BAILER: STAINLESS STEEL

OTHER

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

WELL CASING DIAMETER

WELL VOLUME: 4 JC GALLONS

VOLUMES PURGED: 4.5 GALLONS PURGE METHOD: peristaltic pump

TIME STARTED: 0920 ; TIME FINISHED: 1015

OBSERVATIONS: COLOR cloudy to slight tint ; ODOR IRON

SHEEN NONE ; TURBIDITY 15.4

OTHER small dark particles floating in water

WATER RECOVERY HEIGHT: 23.50 ; RECOVERY TIME IN MINUTES: 55

FIELD PARAMETERS: pH 6.67 , TEMPERATURE 10.4

CONDUCTIVITY 547 , OTHER ORP = -125.6 DO = 0.84 mg/L

SAMPLE COLLECTION TIME: 10:15

NOTES: *Water level meter stopped at 48.48 feet, Potential blockage here and at approx 30 feet.

Groundwater Services Field Log

DATE: 11-09-2016 PROJECT NAME: SGPP-Merrimack

PROJECT NO.: 16.6126 PROJECT LOCATION: Merrimack, NH

SAMPLING PERSONNEL: Justin Campbell

MONITORING WELL ID#: 1MW NOTES TAKEN BY: JC

DEPTH TO WATER: 45.35 FROM: BAILER ID:

DEPTH TO BOTTOM: 3 FROM: BAILER: NEW DISPOSABLE

WATER COLUMN HEIGHT: BAILER: STAINLESS STEEL

OTHER

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

WELL CASING DIAMETER

WELL VOLUME: GALLONS

VOLUMES PURGED: 6.0 GALLONS PURGE METHOD: Bladder Pump

TIME STARTED: 1445 ; TIME FINISHED: 1550

OBSERVATIONS: COLOR Rust orange ; ODOR Slight sulfur sm

SHEEN None ; TURBIDITY 16.7

OTHER

WATER RECOVERY HEIGHT: ; RECOVERY TIME IN MINUTES: 65

FIELD PARAMETERS: pH 5.68 , TEMPERATURE 11.1

CONDUCTIVITY 1220 , OTHER DO(mg/L) 1.92

ORP(mV) 34.1

SAMPLE COLLECTION TIME: 1550

NOTES:

Groundwater Services Field Log

DATE: 11/9/16 PROJECT NAME: SCPP-Merrimack

PROJECT NO.: 16.6126 PROJECT LOCATION: _____

SAMPLING PERSONNEL: R Hubbard

MONITORING WELL ID#: LNG-MW-4 NOTES TAKEN BY: R Hubbard

DEPTH TO WATER: 25.42 ft FROM: TPVC BAILER ID: N/A

DEPTH TO BOTTOM: 40.03 ft FROM: TPVC BAILER: NEW DISPOSABLE

WATER COLUMN HEIGHT: 14.61 ft BAILER: STAINLESS STEEL N/A

OTHER _____

CONVERSION FACTORS LINEAR FEET TO GALLONS

WELL CASING DIAMETER			
	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 PURGED: 1.75 GALLONS PURGE METHOD: Parastaltic Pump

TIME STARTED: 1530 ; TIME FINISHED: 1620

OBSERVATIONS: COLOR clear ; ODOR none

SHEEN none ; TURBIDITY 9.86 NTU

OTHER _____

WATER RECOVERY HEIGHT: _____ ft ; RECOVERY TIME IN MINUTES: _____ mi

FIELD PARAMETERS: pH 6.46 SU , TEMPERATURE 11.3 °C

CONDUCTIVITY 466.7 µS , OTHER DO (mg/L) 0.4

ORP (mV) -26.8

SAMPLE COLLECTION TIME: 1630

NOTES: Tubing set @ 30'

Groundwater Services Field Log

DATE: 11/9/16 PROJECT NAME: SGPP-Merrimack

PROJECT NO.: 116.6126 PROJECT LOCATION:

SAMPLING PERSONNEL: L. CAMERON

MONITORING WELL ID#: MER-45-SA NOTES TAKEN BY: L. CAMERON

DEPTH TO WATER: 26.29 ft FROM: TPVC BAILER ID: N/A

DEPTH TO BOTTOM: 52.98 ft FROM: TPVC BAILER: NEW DISPOSABLE

WATER COLUMN HEIGHT: 26.69 ft BAILER: STAINLESS STEEL N/A

OTHER

CONVERSION FACTORS LINEAR FEET TO GALLONS

WELL CASING DIAMETER

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 PURGED: GALLONS PURGE METHOD: Parastaltic Pump

TIME STARTED: 1320 ; TIME FINISHED: 1430

OBSERVATIONS: COLOR clear ; ODOR none

SHEEN none ; TURBIDITY 21.2 NTU

OTHER

WATER RECOVERY HEIGHT: ft ; RECOVERY TIME IN MINUTES: mi

FIELD PARAMETERS: pH 6.03 SU , TEMPERATURE 9.7 °C

CONDUCTIVITY 842 µS , OTHER DO (mg/L) 4.09

ORP (mV) 30.9

SAMPLE COLLECTION TIME:

NOTES: GWF001 taken here.

Groundwater Services Field Log

DATE: 11/9/16 PROJECT NAME: SCRP Menima

PROJECT NO.: 161126 PROJECT LOCATION:

SAMPLING PERSONNEL: L. CAMERON

MONITORING WELL ID#: MER45-28 NOTES TAKEN BY: L CAMERON

DEPTH TO WATER: 19.58 ft FROM: ~~TPVC~~ PVC metal casing BAILER ID: N/A

DEPTH TO BOTTOM: 52.46 ft FROM: TPVC BAILER: NEW DISPOSABLE

WATER COLUMN HEIGHT: 32.88 ft BAILER: STAINLESS STEEL N/A

OTHER

CONVERSION FACTORS LINEAR FEET TO GALLONS

WELL CASING DIAMETER

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 PURGED: 5.0 GALLONS PURGE METHOD: Bladder Pump

TIME STARTED: 1445 ; TIME FINISHED: 1550

OBSERVATIONS: COLOR slightly cloudy ; ODOR slight sulfuric smell

SHEEN NONE ; TURBIDITY 11.14 NTU

OTHER

WATER RECOVERY HEIGHT: ft ; RECOVERY TIME IN MINUTES: mi

FIELD PARAMETERS: pH 6.89 SU , TEMPERATURE 10.4 °C

CONDUCTIVITY 644 µS , OTHER ORP(mV) -251.3

DO(mg/L) 0.30

SAMPLE COLLECTION TIME: 1550

NOTES:

C.T. MALE ASSOCIATES

DAILY CALIBRATION RECORD

PROJECT: SGPP - ~~McCaffrey Street~~ Merrimack

LOCATION: ~~Hoosick Falls, NY~~ Merrimack, NH

CTM PROJECT NO.: 16.6126 ~~14.4758~~

DATE: 11/9/16

EQUIPMENT (Make, Model, and Serial #)	TIME	STANDARD (Concentration)	METER READING	CALIBRATED or BUMP TEST	CALIBRATED BY
LaMotte FA0463	0740	Turbidity 0, 1, 10	0.04, 1.01, 10.05	Cal.	JC
LaMotte FA02435	07:45	" "	-0.01, 0.78, 9.99		
YSI Quatro 4M FA01878	0745	DO %	107.3 %		
		pH 4, 7, ~~7~~ 10	4.25, 7.10, 9.99		
		Cond 7.00 ~~mS/cm~~	759 ~~mS/cm~~		
		ORP 220 mV	220.6 mV		
LaMotte 18247	0755	Turbidity, 0, 1, 10	3.02, 1.03, 9.98		
YSI Quatro 4M FA04416	0755	DO %	99.6		
		pH 4, 7, 10	3.85, 7.01, 10.18		
		ORP 220 mV	216.5		
		Cond 7.00 mS/cm	7.01 mV		
YSI Pro Plus FA00373	8:05	DO %	103.4 %		
		pH 4, 7, 10	4.11, 7.01, 10.05		
		Cond 7.00 mS/cm	6.96		
		ORP 220 mV	218.1		

NOTE - Bump check of all equipment conducted @ 1145 By LC and RH

Groundwater Services Field Log

DATE: 11/10/26 PROJECT NAME: SGPP-Memmack

PROJECT NO.: 16.6126 PROJECT LOCATION: _____

SAMPLING PERSONNEL: Larene Cameron

MONITORING WELL ID#: LNGMW-1 NOTES TAKEN BY: L CAMERON

DEPTH TO WATER: 22.35 FROM: TPVC BAILER ID: _____

DEPTH TO BOTTOM: 31.57 FROM: _____ BAILER: NEW DISPOSABLE

WATER COLUMN HEIGHT: ~~22.35~~ 9.22 BAILER: STAINLESS STEEL _____

OTHER _____

WELL CASING DIAMETER

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

WELL VOLUME: _____ GALLONS

VOLUMES PURGED: 2.5 GALLONS PURGE METHOD: peristaltic pump

TIME STARTED: 1020 ; TIME FINISHED: 1105

OBSERVATIONS: COLOR Clear ; ODOR sulfur scent

SHEEN none ; TURBIDITY 1.04

OTHER _____

WATER RECOVERY HEIGHT: _____ ; RECOVERY TIME IN MINUTES: _____

FIELD PARAMETERS: pH 6.01 , TEMPERATURE 12.3°C

CONDUCTIVITY 377.1 . OTHER DO(mg/L) 5.45

ORP(mV) 177.6

SAMPLE COLLECTION TIME: 1105

NOTES: Tubing set @ 28.5'

Groundwater Services Field Log

DATE: 11/10/16 PROJECT NAME: SGPP-Merrimack

PROJECT NO.: 16.6126 PROJECT LOCATION:

SAMPLING PERSONNEL: L. CAMERON

MONITORING WELL ID#: MER-45-10 NOTES TAKEN BY: L CAMERON

DEPTH TO WATER: 18.69 ft FROM: ~~TPVC~~ Top of Metal BAILER ID: N/A

DEPTH TO BOTTOM: 58.49 ft FROM: TPVC BAILER: NEW DISPOSABLE

WATER COLUMN HEIGHT: 39.80 ft BAILER: STAINLESS STEEL N/A

OTHER

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

WELL CASING DIAMETER

WELL VOLUME: GALLONS

VOLUMES PURGED: 4.0 GALLONS PURGE METHOD:

TIME STARTED: ; TIME FINISHED:

OBSERVATIONS: COLOR clear ; ODOR none

SHEEN none ; TURBIDITY 1.85 NTU

OTHER

WATER RECOVERY HEIGHT: ft ; RECOVERY TIME IN MINUTES: mi

FIELD PARAMETERS: pH 5.70 SU , TEMPERATURE 11.7 °C

CONDUCTIVITY 974 µS , OTHER DO(mg/L) 5.09
ORP(mV) 203.1

SAMPLE COLLECTION TIME:

NOTES: MS/MSD taken here.
Tubing set @ 45'

Groundwater Services Field Log

DATE: 11-10-2016 PROJECT NAME: SG-Merrimack

PROJECT NO.: 16.6126 PROJECT LOCATION: Merrimack, NH

SAMPLING PERSONNEL: Justin Campbell

MONITORING WELL ID#: MS-2A NOTES TAKEN BY: JC

DEPTH TO WATER: 45.65 FROM: Top metal casing BAILER ID:

DEPTH TO BOTTOM: 51.78 FROM: BAILER: NEW DISPOSABLE

WATER COLUMN HEIGHT: 6.13 BAILER: STAINLESS STEEL

OTHER

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

WELL CASING DIAMETER

WELL VOLUME: GALLONS

VOLUMES PURGED: 3.5 GALLONS PURGE METHOD: Bladder Pump

TIME STARTED: 1530 ; TIME FINISHED: 1415

OBSERVATIONS: COLOR slight orange-yellow tint to ; ODOR slight organic/sulfur smell

SHEEN none ; TURBIDITY 6.87 NTU

OTHER

WATER RECOVERY HEIGHT: ; RECOVERY TIME IN MINUTES:

FIELD PARAMETERS: pH 5.82 , TEMPERATURE 10.3

CONDUCTIVITY 1270 , OTHER DO (mg/L) 7.12

ORP (mV) 120.8

SAMPLE COLLECTION TIME: 1415

NOTES:

Groundwater Services Field Log

DATE: 11/10/16 PROJECT NAME: SGPP-Memnock

PROJECT NO.: 16.6126 PROJECT LOCATION:

SAMPLING PERSONNEL: ~~Logan Knobbe~~ Justin Campbell

MONITORING WELL ID#: LNG MW-3 NOTES TAKEN BY: Justin Campbell

DEPTH TO WATER: 27.46 ~~45~~ ft FROM: ~~TPVC~~ Road metal well opening BAILER ID: N/A

DEPTH TO BOTTOM: 40.46 ft FROM: TPVC BAILER: NEW DISPOSABLE

WATER COLUMN HEIGHT: 13.0 ft BAILER: STAINLESS STEEL N/A

OTHER

WELL CASING DIAMETER

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

WELL VOLUME: GALLONS

VOLUMES PURGED: 3.0 GALLONS PURGE METHOD: Bladder pump

TIME STARTED: 1230 ; TIME FINISHED: 1315

OBSERVATIONS: COLOR clear ; ODOR none

SHEEN none ; TURBIDITY 2.91 NTU

OTHER

WATER RECOVERY HEIGHT: ft ; RECOVERY TIME IN MINUTES: mi

FIELD PARAMETERS: pH 6.01 SU , TEMPERATURE 9.8 °C

CONDUCTIVITY 627 µS , OTHER DO(mg/L) 5.71

ORP (mV) 241.2

SAMPLE COLLECTION TIME: 1315

NOTES: Bladder pump @ 39'

C.T. MALE ASSOCIATES

DAILY CALIBRATION RECORD

PROJECT: SGPP - McCaffrey Street

CTM PROJECT NO.: 14.4756

LOCATION: Hoosick Falls, NY

DATE: 11/10/16

EQUIPMENT (Make, Model, and Serial #)	TIME	STANDARD (Concentration)	METER READING	CALIBRATED or BUMP TEST	CALIBRATED BY
YSI Quatro, FA00416	0900	DO 100%	99.0%	cal.	LC
		ORP 220mV	218.7		
		pH 4,7,10	4.18, 7.07, 9.98		
		Cond 7.00mS	7.08		
FA00878	0910	DO 100%	99.6		RH
		pH 4,7,10	3.87, 6.93, 10.01		
		ORP	227.3		
		Cond 7.00mS	6.84		
FA00373	0920	DO 100%	97.8	cal	LC
		ORP 220mV	219.7		
		pH 4,7,10	4.90, 7.10, 10.09		
		Cond. 7.00mS			

Note - Bumpcheck of available YSI meters and Turbidity meters @ 1130.

Groundwater Services Field Log

DATE: 11-11-2016 PROJECT NAME: SG-Merrimack

PROJECT NO.: 16.6126 PROJECT LOCATION: Merrimack, NH

SAMPLING PERSONNEL: Justin Campbell

MONITORING WELL ID#: LNG MW-2 NOTES TAKEN BY: JC

DEPTH TO WATER: 28.21 FROM: Top PVC pipe BAILER ID:

DEPTH TO BOTTOM: 40.85 FROM: BAILER: NEW DISPOSABLE

WATER COLUMN HEIGHT: 12.64 BAILER: STAINLESS STEEL

OTHER

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

WELL CASING DIAMETER

WELL VOLUME: ~~3.5~~ GALLONS

VOLUMES PURGED: 3.5 GALLONS PURGE METHOD: Bladder Pump

TIME STARTED: 10:10 ; TIME FINISHED: 1050

OBSERVATIONS: COLOR clear ; ODOR none

SHEEN none ; TURBIDITY (NTU) 1.51

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

ORP (mV) 202.0

SAMPLE COLLECTION TIME: 1050

NOTES: water has some fine particles floating in it

Groundwater Services Field Log

DATE: 11/11/2016 PROJECT NAME: SGPP-Merrimack

PROJECT NO.: 16.6126 PROJECT LOCATION: _____

SAMPLING PERSONNEL: LC, JC

MONITORING WELL ID#: MERMS-11 NOTES TAKEN BY: LCAMERON

DEPTH TO WATER: 32.93 FROM: Top PVC BAILER ID: _____

DEPTH TO BOTTOM: 64.62 FROM: _____ BAILER: NEW DISPOSABLE

WATER COLUMN HEIGHT: 31.69 BAILER: STAINLESS STEEL _____

OTHER _____

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

WELL CASING DIAMETER

WELL VOLUME: _____ GALLONS

VOLUMES PURGED: _____ GALLONS PURGE METHOD: Bladder Pump

TIME STARTED: 1125 ; TIME FINISHED: 1205

OBSERVATIONS: COLOR _____ ; ODOR _____

SHEEN _____ ; TURBIDITY _____

OTHER _____

WATER RECOVERY HEIGHT: _____ ; RECOVERY TIME IN MINUTES: _____

FIELD PARAMETERS: pH _____ , TEMPERATURE _____

CONDUCTIVITY _____ , OTHER _____

SAMPLE COLLECTION TIME: 1205

NOTES: _____

C.T. MALE ASSOCIATES

DAILY CALIBRATION RECORD

PROJECT: SGPP ~~McCaffrey Street~~ Memmack

CTM PROJECT NO.: ~~14.4750~~ 16.6126

LOCATION: ~~Hoosick Falls, NY~~ Memmack, NH

DATE: 11/11/16

EQUIPMENT (Make, Model, and Serial #)	TIME	STANDARD (Concentration)	METER READING	CALIBRATED or BUMP TEST	CALIBRATED BY
YSI Quatro, PRO 0878	0900	DO 100 %	96.6 %	Cal.	LC
		ORP 220 mV	224.4		
		pH 4, 7, 10	4.02, 7.2, 10.1		
		Cond. 7.00 mS	7.10		
~~La Motte FA 01463~~ ~~00138~~	0900	Turbidity 0, 1, 10	0.01, 10.9, 10.02	calibrate	JC
~~La Motte 18247~~	~~1000~~	~~Turbidity 0, 1, 10~~	0.06	Cal.	

Note - Bump check of equipment conducted at 1200 after use.

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

JOB 16.6126
SHEET NO. 1 OF 1
CALCULATED BY: JD/RH DATE: 11/14/16
CHECKED BY: DATE:
SCALE

MVD-4

Time	0.0	00.0	10.0 ~~10.0~~	20.0 ~~20.0~~	30.0
pH	5.66	5.75	5.62	5.58	5.64
Conductivity (uS/cm)	367.8	407.4	410.5	409.5	408.8
Temp. (C)	10.8	10.7	10.6	10.5	10.5
ORP (mV)	179	173.1	173.7	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. Conductance (uS/cm)	503.4	561.5	566.2	565.7	564.7
Sample Time:	~~13:00~~ ~~13:35~~	13:35	13:45	13:55	14:05
Sample ID:	SG2-MVD4-00-161114		10-161114	20-161114	30-161114

Flow Rate ~~210~~ 220 to 225 gallons/minute

Duplicate at 13:45

MVD-5

Time	0.0	10.0	20.0	30.0
pH	5.78	5.69	5.74	5.66
Conductivity (uS/cm)	452.4	409.0	459.3	460.1
Temp. (C)	10.7	10.7	10.8	10.9
ORP (mV)	180.2	168.2	172.8	177.2
DO (mg/L)	6.36	5.51	5.43	4.83
Turbidity (NTU)	10.15	1.48	0.23	0.19
Sp. Conductance (uS/cm)	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	30-161114

Flow Rate 382 gallons per minute

MS/MSD at 16:00

BARR

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SLPP
Site: Merrimack Long
Project Number: 52471007.01

Well: AP-01 45-48 FT
Date: 1/10/2017
Sample Time: 1103

SAMPLING PERSONNEL

Sample Collection By: STS Other Present: NA Sampling Order: 1

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	NA (REMEDIED)
Label on well?	YES	NO	REMEDIED	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

NA

Notes:

STATIC WATER LEVEL

Depth to Water: 40.0 ft
Total Depth: 46
Total depth verified? YES (NO)

Casing diameter: 15
Water Depth: 6ft
Well Volume:

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
1026	40.0	6.0	—	V. Sandy (vf. sand) brown

Pumping Start Time: 1041
Pumping Stop Time: 1135
Total Depth: 46
Screen Length: 10ft
Depth to Top of Screen: 45
Depth to Screen Midpoint: 45.5
Notes: purged dry then sampled - watering pump by hand

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1135	—	—	—	8.9	0.068	7.73	5.53	96.3	OR
1147	—	—	—	9.5	0.067	7.04	5.96	59.8	OR
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): —
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1103 Total Stabilization Time: — Total Drawdown: —

Appearance: Cloudy Brown Odor: None Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Alkalinity
1	250 ml	glass (plastic)	yes (no)	None, HCl, (HNO3), NaOH, H2SO4	Metals
3	40 ml	(glass) plastic	yes (no)	None, (HCl) HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Chloride, Sulfate
1	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Nitrate as N
1	40 ml	(glass) plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	Nitrite as N

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO		Tubing added?	YES	NO	
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	(NA)

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SAPP
Site: Merrimack Loop a
Project Number: 23421001.01

Well: MW01 55-26
Date: 9/10/2015
Sample Time: 1421

SAMPLING PERSONNEL

Sample Collection By: SAS
Other Present: NA
Sampling Order: 2

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	NA	REMEDIED
Label on well?	YES	NO	REMEDIED	Is concrete pad in good repair?	YES	NO	NA	REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA	REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA	REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 37.8
Total Depth: 56
Total depth verified? YES (NO)

Casing diameter: 1.5
Water Depth: 18.2
Well Volume: 6.3L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time:
Pumping Stop Time: 1437
Total Depth: 56
Screen Length: 10ft
Depth to Top of Screen: 55
Depth to Screen Midpoint: 55.5
Notes: waterra pump by hand

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
1236	37.8		—	Cloudy None

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1310	—	—	—	9.6	0.625	5.53	6.00	37.3	OR
1313	—	—	—	7.9	0.624	5.91	6.09	40.0	OR
1316	—	—	—	7.2	0.634	6.06	6.12	49.3	OR
1319	—	—	—	6.7	0.669	5.86	6.20	49.6	OR
1322	—	—	—	Pump also used					
1325	—	—	—	5.9	0.641	5.89	6.23	49.7	OR
1328	—	—	—	8.3	0.648	5.30	6.25	44.9	OR
1331	—	—	—	7.0	0.658	5.49	6.27	42.7	OR
1334	—	—	—	5.6	0.642	5.15	6.29	38.3	OR
1337	—	—	—	7.0	0.627	4.14	6.33	25.1	OR
1341	—	—	—	7.1	0.638	3.76	6.35	13.1	OR
1342	—	—	—	9.3	0.617	3.46	6.42	9.2	OR
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L):
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: Total Stabilization Time: Total Drawdown:
Appearance: Odor: Duplicate Collected?:

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
	ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	
	ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	
	ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	
	ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	
	ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	
	ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	
	ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	

See page 2

FINAL INSPECTION

Barr lock in place?	YES	NO	NA	Repairs needed?	YES	NO		Tubing added?	YES	NO
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

BARR

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SLPP
Site: Merrimack Landfill
Project Number: 32427.001.01

Well: AP01 55-56
Date: 1/10/2017
Sample Time: 1421

SAMPLING PERSONNEL

Sample Collection By: SES
Other Present: NA
Sampling Order: 2

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	REMEDIED
Label on well?	YES	NO	REMEDIED	Is concrete pad in good repair?	YES	NO NA	REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO NA	REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO NA	REMEDIED

Notes: See page 1

STATIC WATER LEVEL

Depth to Water: _____
Total Depth: _____
Total depth verified? YES NO

Casing diameter: _____
Water Depth: _____
Well Volume: _____

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor

Pumping Start Time: _____
Pumping Stop Time: 1437
Total Depth: _____
Screen Length: _____
Depth to Top of Screen: _____
Depth to Screen Midpoint: _____
Notes: Watera pump by hand

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1357	—	—	—	9.3	0.629	6.3	6.33	59.2	ok
1400	—	—	—	9.9	0.621	6.44	6.53	56.1	
1403	—	—	—	10.2	0.628	6.89	6.30	64.9	
1406	—	—	—	9.9	0.631	6.26 ↔	7.20	74.2	
1409	—	—	—	9.9	0.633	7.14	6.26	71.8	
1412	—	—	—	9.4	0.629	7.20	6.24	76.6	
1415	—	—	—	9.5	0.630	6.73	6.24	70.3	
1418	—	—	—	9.9	0.625	6.74	6.26	69.9	
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): —
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1421
Total Stabilization Time: —
Total Drawdown: —

Appearance: Cloudy Brown
Odor: None
Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Alkalinity
1	250 ml	glass (plastic)	yes (no)	None, HCl, (HNO3), NaOH, H2SO4	Metals
3	40 ml	(glass) plastic	yes (no)	None, (HCl), HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Cl⁻ SO4⁻
1	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	NO3 as N
1	40 ml	(glass) plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NO3

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO
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 (NA)

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SLPP
Site: Merrimack Loop
Project Number: 23782001.01
Well: MP01
Date: 05-06-17 1/11/2017
Sample Time: 0904

SAMPLING PERSONNEL

Sample Collection By: STS
Other Present: NA
Sampling Order: 3

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	NA	REMEDIED
Label on well?	YES	NO	REMEDIED	Is concrete pad in good repair?	YES	NO	NA	REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA	REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA	REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 35.9
Total Depth: 66 ft
Total depth verified? YES NO
Casing diameter: 1.5
Water Depth: 30.1
Well Volume: 10.5L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time: 0808
Pumping Stop Time: 0921
Total Depth: 66
Screen Length: 10ft
Depth to Top of Screen: 65
Depth to Screen Midpoint: 65.5

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
0828	35.9	—	—	Cloudy, None

Notes: 4L purged before stabilization started
Wading pump

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
0829	—	—	—	9.5	0.85	4.96	5.58	89.2	OR
0842	—	—	—	9.2	0.85	4.54	5.69	80.4	OR
0845	—	—	—	9.1	0.85	4.34	5.77	78.3	OR
0849	—	—	—	8.8	0.86	4.16	5.81	75.6	OR
0851	—	—	—		0.86	4.12	5.84	74.0	OR
0854	—	—	—	9.0	0.86	4.00	5.87	72.0	OR
0857	—	—	—	8.9	0.86	4.01	5.89	72.5	OR
0900	—	—	—	8.9	0.86	3.92	5.90	72.2	OR
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): —
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 0904
Total Stabilization Time: —
Total Drawdown: —
Appearance: Slightly Cloudy, Decreased Turbidity
Odor: None
Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	Alkalinity
2	250 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	Metals, Filter lab
3	40 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	VOCs
2	40 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	Cl- SO4=
1	40 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	NO3 as N
1	40 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	NA	Repairs needed?	YES	NO	NA	Tubing added?	YES NO
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 NA

Barr Engineering Company
Low-Flow Sampling Field Log

BARR

Client: SAPP
Site: Merrimack Loop
Project Number: 23427001.01

Well: AP01
Date: 1/11/2017 75-76 Ft
Sample Time: 1151

SAMPLING PERSONNEL

Sample Collection By: STS
Other Present: N/A
Sampling Order: 4

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	NA / REMEDIED
Label on well?	YES	NO	REMEDIED	Is concrete pad in good repair?	YES	NO	NA / REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA / REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA / REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 41.1
Total Depth: 76
Total depth verified? YES NO

Casing diameter: 1.5
Water Depth: 34.9
Well Volume: 12.1L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
1035	41.1	—	—	V Cloudy Brown None
1040	—	—	—	Cloudy Orange None
~~1045~~				
1105	—	—	—	Cloudy Orange None

Pumping Start Time: 1035
Pumping Stop Time: 1224
Total Depth: 76
Screen Length: 1ft
Depth to Top of Screen: 75
Depth to Screen Midpoint: 75.5
Notes:
~~3.5L~~ 5.5L purged before stabilization started — waiting pump

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
~~1120~~	—								
1125	—	—	—	9.6	0.88	5.25	6.26	33.0	3296
1126	—	—	—	9.4	0.88	4.32	6.26	38.1	2786
1131	—	—	—	8.6	0.89	3.05	6.21	33.8	3295
1134	—	—	—	8.7	0.88	2.79	6.22	34.7	23299
1139	—	—	—	8.5	0.88	2.88	6.23	39.9	3474
1140	—	—	—	8.9	0.88	2.74	6.23	36.1	3267
1143	—	—	—	8.6	0.88	2.71	6.24	39.0	3388
1146	—	—	—	7.7	0.89	2.70	6.25	39.4	3496
				0					
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): —
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1151 Total Stabilization Time: — Total Drawdown: —
Appearance: V Cloudy Brown/Org Odor: None Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Alkalinity
2	250 ml	glass (plastic)	yes (no)	(None) HCl, (HNO3) NaOH, H2SO4	Metals, Diss
3	40 ml	(glass) plastic	yes (no)	None, (HCl) HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Cl^- $SO_4^=$
1	40 ml	(glass) plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	NO_3
1	40 ml	(glass) plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NO_2 as N

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO	(NA)	Tubing added?	YES	NO
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

BARR

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SGPP
Site: Merrimack Loop
Project Number: 3242 100 1001

Well: AP-01 79-80 ft
Date: 79-80 1/11/2017
Sample Time: 1522

SAMPLING PERSONNEL

Sample Collection By: SRJ Other Present: None Sampling Order: 5

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	N/A REMEDIED
Label on well?	YES	NO	REMEDIED	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 62.1
Total Depth: 80
Total depth verified? YES (NO)

Casing diameter: 1.5"
Water Depth: 17.9
Well Volume: 2.4L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

6L SRJ

WELL PURGING

Pumping Start Time: 1331
Pumping Stop Time: 1554
Total Depth: 80
Screen Length: 10ft
Depth to Top of Screen: 79
Depth to Screen Midpoint: 79.5

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
1258	62.1			V. Cloudy, brown none

Notes: 6L Bailed over 30 min Before Stabilization

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1409	—	—	—	10.8	0.86	4.78	5.77	135.1	
1412	—	—	—	11.0	0.87	4.51 4.57	5.85	123.5	
1415	—	—	—	11.3	0.87	4.62	5.80	117.0	
1418	—	—	—	11.6	0.87	4.72	5.92	110.0	
1421	—	—	—	11.3	0.87	4.76	5.92	106.7	
1424	—	—	—	11.1	0.87	4.54	5.90	102.7	
1427	—	—	—	11.1	0.87	4.03	5.93	99.7	
1430	—	—	—	10.8	0.87	4.17	6.00	96.8	
1433	—	—	—	11.3	0.87	4.38	5.99	94.0	
1436	—	—	—	11.9	0.87	3.87	5.99	90.0	
				CONT on Page 2					
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: Total Stabilization Time: Total Drawdown:

Appearance: Odor: Duplicate Collected?:

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
	ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	
	ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	
	ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	
	ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	
	ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	
	ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	
	ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	

See page 2

FINAL INSPECTION

Barr lock in place?	YES	NO	NA	Repairs needed?	YES	NO	
Well cap secured?	YES	NO	NA	Bolts needed?	YES	NO	NA
Well cover bolted snugly?	YES	NO	NA				

Tubing added? YES NO
Lock replaced? YES NO
Well cap replaced? YES NO

Purge 2 of 2

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SPPP **Well:** MW-01 MW-BOH
Site: Merrimack Loop **Date:** 7/11/2017
Project Number: 3247.01 **Sample Time:** 1522

SAMPLING PERSONNEL

Sample Collection By: Other Present: Sampling Order: 5

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	NA (NA) REMEDIED
Label on well?	YES	NO	REMEDIED (NA)	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: _____
Total Depth: 80 ft
Total depth verified? YES (NO)

Casing diameter: 1.5"
Water Depth: _____
Well Volume: _____

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
				Brn purge 1

Pumping Start Time: _____
Pumping Stop Time: _____
Total Depth: _____
Screen Length: _____
Depth to Top of Screen: _____
Depth to Screen Midpoint: _____
Notes:

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1447	—	—	—	10.8	0.88	6.10	6.09	75.5	
1450	—	—	—	11.1	0.88	5.07	6.13	54.6	
1453	—	—	—	10.8	0.88	6.04	6.10	65.2	
1458	—	—	—	11.2	0.88	6.03	6.09	65.7	
1501	—	—	—	11.1	0.87	6.41	6.09	71.8	
1504	—	—	—	10.8	0.88	6.24	6.01	77.1	
1507	—	—	—	10.6	0.88	6.21	6.07	66.0	
1510	—	—	—	10.3	0.88	6.28	6.07	66.3	
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): — Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1522 Total Stabilization Time: — Total Drawdown: —

Appearance: V. Cloudy brown Odor: None Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Alkalinity
2	250 ml	glass (plastic)	yes (no)	(None) HCl, (HNO3) NaOH, H2SO4	Metals, Filtered
3	40 ml	(glass) plastic	yes (no)	None, (HCl) HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Cl⁻ SO4⁻
1	40 ml	(glass) plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	NO3 ASN
1	40 ml	(glass) plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NO3

FINAL INSPECTION

Barr lock in place?	YES	NO	NA	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO
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 (NA)

BARR

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SLPP
Site: Merrimack Loop
Project Number: 23427001.01

Well: MW02 24-25ft
Date: 1/12/2017
Sample Time: 1035

SAMPLING PERSONNEL

Sample Collection By: STS
Other Present: None
Sampling Order: 6

INSPECTION

Barr lock?	YES NO	REMEDIED	
Label on well?	YES NO	REMEDIED	
Is reference mark visible?	YES NO	REMEDIED	
Notes:			

NA

Standing water present?	YES	NO	NA	REMEDIED
Is concrete pad in good repair?	YES	NO	NA	REMEDIED
Is protective casing locked and in good repair?	YES	NO	NA	REMEDIED
Is inner cap in place and properly sealing well?	YES	NO	NA	REMEDIED

STATIC WATER LEVEL

Depth to Water: 23.0ft
Total Depth: 25
Total depth verified? YES (NO)

Casing diameter: 1.5 inch
Water Depth: 2ft
Well Volume: 696mL

Volume of water per foot: 1.787
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time: 0954
Pumping Stop Time: 1103
Total Depth: 25
Screen Length: 1ft
Depth to Top of Screen: 24
Depth to Screen Midpoint: 24.5
Notes: Purged 700mL before stabilization began peristaltic

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
0954	—	—	150	Cloudy Brown None
0958	—	—	150	Cloudy Brown None
0959	—	—	110	Clear/Slt Cloudy None
1001	—	—	110	Stable

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1013	—	—	110	10.2	0.149	8.40	5.88	120.3	139
1016	—	—	110	10.4	0.151	7.88	5.91	114.6	7.37
1019	—	—	110	10.4	0.152	7.71	5.93	124.1	4.13
1022	—	—	110	9.9	0.155	7.50	5.92	115.6	5.35
1025	—	—	110	9.8	0.156	7.64	5.92	111.5	3.88
1028	—	—	110	9.9	0.156	7.29	5.92	107.9	4.79
1031	—	—	110	9.7	0.157	7.31	5.92	107.1	3.94
1034	—	—	110	9.7	0.158	7.71	5.92	106.0	2.76
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 4.3
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1037
Total Stabilization Time: 43min
Total Drawdown: —

Appearance: Clear
Odor: None
Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Alkalinity
1	250 ml	glass (plastic)	yes (no)	None, HCl, (HNO3) NaOH, H2SO4	Metals
3	40 ml	(glass) plastic	yes (no)	None, (HCl) HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Cl SO4
1	40 ml	(glass) plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	NO3 as N
1	40 ml	(glass) plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NO2

FINAL INSPECTION

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)
Bolts needed?	YES	NO	(NA)

Tubing added?	YES	NO	
Lock replaced?	YES	NO	(NA)
Well cap replaced?	YES	NO	

Barr Engineering Company
Low-Flow Sampling Field Log

BARR

Client: SCPP
Site: Merrimack Longa
Project Number: 32421001.01

Well: APO2 ~~35~~ 34.35 ft
Date: 7/12/2017
Sample Time: 1212

SAMPLING PERSONNEL

Sample Collection By: SFS
Other Present: NH
Sampling Order: 7th

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	NA	REMEDIED
Label on well?	YES	NO	REMEDIED	Is concrete pad in good repair?	YES	NO	NA	REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA	REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA	REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 23.07 ft
Total Depth: ~~35~~ 34.35
Total depth verified? YES (NO)

Casing diameter: 1.5
Water Depth: 11.28 ft
Well Volume: 4.2 L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L
1.77

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time: 1129
Pumping Stop Time: 1220
Total Depth: 35
Screen Length: 10 ft
Depth to Top of Screen: 34
Depth to Screen Midpoint: 34.5

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor	
1132	—	—	250	Cloudy Brown	None
1149	—	—	250	Clear	None

Notes: ~4.5 L purged before stabilization parameters pump

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1155	—	—	250	10.4	0.87	7.94	5.92	105.8	16.3
1158	—	—	250	10.5	0.87	7.75	5.93	112.0	14.1
(1201)	—	—	250	10.5	0.87	7.75	5.94	115.6	12.9
1204	—	—	250	10.5	0.87	7.65	5.94	117.8	11.2
1207	—	—	250	10.4	0.87	7.70	5.95	117.7	11.8
1210	—	—	250	10.4	0.87	7.63	5.95	118.8	10.4
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 8.3L
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1212
Total Stabilization Time: 43min
Total Drawdown: —

Appearance: Clear
Odor: None
Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
~~2~~ 2	250 ml	glass (plastic)	yes (no)	(None) HCl HNO3 NaOH H2SO4	PFCs
250 1	250 ml	glass (plastic)	yes (no)	(None) HCl HNO3 NaOH H2SO4	Alkalinity
250 1	250 ml	glass (plastic)	yes (no)	None HCl (HNO3) NaOH H2SO4	Metals
3	40 ml	(glass) plastic	yes (no)	None (HCl) HNO3 NaOH H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None) HCl HNO3 NaOH H2SO4	Cl-, SO4
1	40 ml	(glass) plastic	yes (no)	(None) HCl HNO3 NaOH H2SO4	NO3 as N
1	40 ml	(glass) plastic	yes (no)	None HCl HNO3 NaOH (H2SO4)	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO
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) NA

BARR

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SCPP
Site: Mississippi Loop
Project Number: 3242001.01

Well: APOL 9445FT
Date: 4/12/2017
Sample Time: 1248

SAMPLING PERSONNEL

Sample Collection By: SFS
Other Present: NA
Sampling Order: 8

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	NA REMEDIED
Label on well?	YES	NO	REMEDIED (NA)	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 23 ft
Total Depth: 45
Total depth verified? YES (NO)

Casing diameter: 1.5 inch
Water Depth: 22 ft
Well Volume: 7.6 L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

NM NM NM

Pumping Start Time: 1245
Pumping Stop Time: NR
Total Depth: 45
Screen Length: 1 ft
Depth to Top of Screen: 44
Depth to Screen Midpoint: 44.5
Notes: peristaltic pump

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
1252	—	—	250	V. Cloudy None
1258	—	—	250	Mod. Cloudy None
1310	—	—	250	Slightly Cloudy None

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1318	—	—	250	10.6	0.85	6.90	6.03	92.8	63
1321	—	—	250	10.5	0.85	7.90	6.01	96.7	81
1324	—	—	250	10.6	0.85	7.72	5.99	97.2	116.6
1327	—	—	250	10.5	0.85	7.70	5.98	105.5	87.3
1330	—	—	250	10.5	0.85	7.85	5.99	107.7	91.4
1333	—	—	250	10.5	0.85	7.97	5.98	110.4	70.6
1336	—	—	250	10.6	0.85	7.85	5.97	110.1	54.6
1339	—	—	250	10.5	0.84	8.03	5.98	111.2	61.9
1342	—	—	250	10.5	0.84	8.40	5.97	113.5	52.3
1345	—	—	250	10.4	0.84	8.41	5.94	116.7	51.3
1345	—	—	250	10.5	0.84	8.31	5.96	118.0	49.8
		Stabilization Criteria:			+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 14.4 L
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1248 Total Stabilization Time: 65 min Total Drawdown: —

Appearance: Slight Cloudy Odor: None Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Alkalinity
1	250 ml	glass (plastic)	yes (no)	(None) HCl, (HNO3) NaOH, H2SO4	Metals
3	40 ml	(glass) plastic	yes (no)	None, (HCl) HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Cl⁻ SO4⁻
1	40 ml	(glass) plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	NO3 as N
1	40 ml	(glass) plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO
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 (NA)

Barr Engineering Company
Low-Flow Sampling Field Log

BARR

Client: SCPP
Site: Merrimack Langa
Project Number: 3242P001.01

Well: ARDL 54-55 ft
Date: 1/13/2017
Sample Time: 0915

SAMPLING PERSONNEL

Sample Collection By: STS
Other Present: NA
Sampling Order: STS 1 of 9

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	(NA) REMEDIED
Label on well?	YES	NO	REMEDIED (NA)	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

Notes: Grippe 1ft screen

STATIC WATER LEVEL

Depth to Water: 22.9 — After sitting all night
Total Depth: 55
Total depth verified? YES (NO)

Casing diameter: 3.5 — 4.27
Water Depth: 32.1 — .847
Well Volume: 11.82 — 5.42 L
STS

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

previously miscalculated. Did not account for volume of steel from risers. .847 new multiplier. 1.76 old multiplier

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time: 0808
Pumping Stop Time: 0924
Total Depth: 55
Screen Length: 1ft
Depth to Top of Screen: 54
Depth to Screen Midpoint: 54.5
Notes: purged BL before stabilization peristaltic pump

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
0817	—	—	150	Solid w/ Cloudy Brown — None
0829	—	—	200	↓ — ↓
0831	—	—	200	

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
0906	—	—	200	9.4	0.88	6.41	6.10	77.0	40.4
0909	—	—	200	9.5	0.88	6.32	6.08	79.1	58.0
0912	—	—	200	9.5	0.88	6.31	6.07	83.4	90.3
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 6.60 L
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 0915 — Total Stabilization Time: 67 min — Total Drawdown: —

Appearance: Clear — Odor: None — Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	None, (HCl), HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	None, (HCl), HNO3, NaOH, H2SO4	Alkalinity
1	250 ml	glass (plastic)	yes (no)	None, HCl, (HNO3), NaOH, H2SO4	Metals
3	40 ml	(glass) plastic	yes (no)	None, (HCl), HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Cl⁻ SO4⁻
1	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	NO3 as N
1	40 ml	(glass) plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO
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)

Barr Engineering Company
Low-Flow Sampling Field Log

BARR

Client: SLPP
Site: Merrimack Landfill
Project Number: 23421001.01

Well: APD2 64-65ft
Date: 1/13/2017
Sample Time: 1244

SAMPLING PERSONNEL

Sample Collection By: STS
Other Present: NA
Sampling Order: STS 1 of 10

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	NA	REMEDIED
Label on well?	YES	NO	REMEDIED	Is concrete pad in good repair?	YES	NO	NA	REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA	REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA	REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 23.87
Total Depth: 65
Total depth verified? YES (NO)

Casing diameter: 1.5 with 1.25 O.D. inner rods
Water Depth: 42
Well Volume: 7L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time: 1049
Pumping Stop Time: 1315
Total Depth: 65
Screen Length: 14
Depth to Top of Screen: 64
Depth to Screen Midpoint: 64.5

Notes: 7L purged before stabilization readings, peristaltic pump

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
1128	—	—	80	Cloudy, Brown None

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1236	—	—	80	7.3	1.10	4.01	6.24	STS 5 83.9	3547
1239	—	—	80	7.4	1.11	4.01	6.25	52.7	2916
1242	—	—	80	7.6	1.10	4.02	6.25	55.9	3142
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 7.5 L
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1244
Total Stabilization Time: 115m
Total Drawdown: —

Appearance: W. Cloudy Brown
Odor: None
Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes no	(None) HCl, HNO3, NaOH, H2SO4	Alkalinity
2	250 ml	glass (plastic)	yes no	(None) HCl, (HNO3) NaOH, H2SO4	Metals
3	40 ml	(glass) plastic	yes no	None, (HCl) HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes no	(None) HCl, HNO3, NaOH, H2SO4	Cl^- SO_4^{2-}
1	40 ml	(glass) plastic	yes no	(None) HCl, HNO3, NaOH, H2SO4	NO_3 as N
1	40 ml	(glass) plastic	yes no	None, HCl, HNO3, NaOH, (H2SO4)	NO_2

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO	(NA)	Tubing added?	YES	NO	
Well 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	

BARR

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SAPP
Site: Merrimack Landfill
Project Number: 23421661.01

Well: AP03 68-69 ft
Date: 1/16/17
Sample Time: 1422

SAMPLING PERSONNEL

Sample Collection By: SKS
Other Present: NA
Sampling Order: 11

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	(NA) REMEDIED
Label on well?	YES	NO	REMEDIED (NA)	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 24.0 ft
Total Depth: 69 ft
Total depth verified? YES (NO)

Casing diameter: 1.5
Water Depth: 45
Well Volume: 1 L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time: 1214
Pumping Stop Time: NR
Total Depth: 69 ft
Screen Length: 10 ft
Depth to Top of Screen: 69 ft
Depth to Screen Midpoint: 68.5 ft
Notes: 11 L purge
Waterra pump

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
1214	24.0	—	150	Slt Cloudy gray None
1245	—	—	50	V. Cloudy, Brown
	Switched to Waterra			
1335	—			V Cloudy, Brown None

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1347	—	—	—	4.4	0.587	3.88	6.24	15.7	—
1350	—	—	—	9.3	0.580	4.80	6.22	38.1	—
1353	—	—	—	9.3	0.580	4.86	6.20	43.5	—
1356	—	—	—	9.2	0.578	5.17	6.18	49.9	—
1359	—	—	—	9.4	0.575	5.21	6.17	61.1	—
1404	—	—	—	9.2	0.597	5.17	6.15	57.3	—
1407	—	—	—	9.6	0.579	5.00	6.17	51.7	—
1410	—	—	—	8.5	0.575	5.12	6.15	65.9	—
1413	—	—	—	9.0	0.577	5.28	6.13	76.9	—
1416	—	—	—	9.1	0.579	5.31	6.14	73.0	—
1419	—	—	—	9.2	0.576	5.27	6.11	75.5	—
	Stabilization Criteria:				+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): ≥ 11 L
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1422
Total Stabilization Time: 60 min
Total Drawdown: —

Appearance: Cloudy
Odor: None
Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Alkalinity
2	250 ml	glass plastic	yes (no)	(None), HCl, (HNO3), NaOH, H2SO4	Metals
3	40 ml	glass plastic	yes (no)	None, (HCl), HNO3, NaOH, H2SO4	VOCs
2	40 ml	glass plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Chloride Sulfate
1	40 ml	glass plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	NO3 as N
1	40 ml	glass plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NH3

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO
Well 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

BARR

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SLPP
Site: Merrimack Landfill
Project Number: 23421001.01

Well: MP04 27-28
Date: 1/18/2017
Sample Time: 16 1553

SAMPLING PERSONNEL

Sample Collection By: SS
Other Present: NA
Sampling Order: 12

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	(NA) REMEDIED
Label on well?	YES	NO	REMEDIED (NA)	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 24.1 ft
Total Depth: 28
Total depth verified? YES (NO)

Casing diameter: 1.5
Water Depth: 3.9ft
Well Volume: 650 mL

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time: 1530
Pumping Stop Time: 1604
Total Depth: 28
Screen Length: 10ft
Depth to Top of Screen: 27
Depth to Screen Midpoint: 27.5
Notes: pumped 700 mL

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
1532	—	—	200	Cloudy, Brown, None

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1538	—	—	200	8.6	0.070	5.68	6.03	120.3	17.4
1541	—	—	200	8.8	0.068	5.76	5.86	132.8	13.2
1544	—	—	200	8.8	0.067	5.88	5.80	139.8	14.5
1547	—	—	200	8.7	0.066	5.75	5.79	143.1	15.9
1550	—	—	200	8.7	0.066	5.83	5.73	149.4	11.49
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 3.12
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1553
Total Stabilization Time: 23min
Total Drawdown: —
Appearance: Clear
Odor: None
Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Alkalinity
1	250 ml	glass (plastic)	yes (no)	None, HCl, (HNO3) NaOH, H2SO4	Metals
3	40 ml	(glass) plastic	yes (no)	None, (HCl) HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Cl⁻ SO4⁻
1	40 ml	(glass) plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	NO3
1	40 ml	(glass) plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NO3 20 N

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO
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 (NA)

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SCPP **Well:** AP04 34-3517
Site: Monticello Long a **Date:** 1/17/2017
Project Number: 23421001.01 **Sample Time:** 0917

SAMPLING PERSONNEL

Sample Collection By: SJ Other Present: NA Sampling Order: 13

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	(N/A) REMEDIED
Label on well?	YES	NO	REMEDIED (NA)	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 23.1
Total Depth: 35
Total depth verified? YES (NO)

Casing diameter: 1.3
Water Depth: 11.9 Ft
Well Volume: 2L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

1111

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
0902	—	—	350	V. Cloudy Brown None

Pumping Start Time: 0858
Pumping Stop Time: 0933
Total Depth: 35 ft
Screen Length: 1ft
Depth to Top of Screen: 34ft
Depth to Screen Midpoint: 34.5 ft
Notes:

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
0907	—	—	350	9.0	0.404	5.30	6.02	89.3	934
0910	—	—	350	8.8	0.404	5.35	6.03	92.2	861
0913	—	—	350	8.8	0.404	5.30	6.03	96.0	923
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 4.1 L
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 0917 Total Stabilization Time: 10 min Total Drawdown: —
Appearance: Clear to Cloudy Odor: None Duplicate Collected?: Yes FD01

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Alkalinity
2	250 ml	glass (plastic)	yes (no)	None, HCl, (HNO3) NaOH, H2SO4	Metals
3	40 ml	(glass) plastic	yes (no)	None, (HCl) HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Cl⁻ SO4⁻
1	40 ml	(glass) plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	NO3 045 N
	40 ml	(glass) plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO
Well 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

BARR

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SMP
Site: Merrimack Langa
Project Number: 23421001.01

Well: MPW 44-45 ft
Date: 1/17/2017
Sample Time: 1046

SAMPLING PERSONNEL

Sample Collection By: SMS
Other Present: NA
Sampling Order: 14

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	(NA) REMEDIED
Label on well?	YES	NO	REMEDIED	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

(NA)

Notes:

STATIC WATER LEVEL

Depth to Water: 25.0
Total Depth: 45
Total depth verified? YES (NO)

Casing diameter: 5 inch
Water Depth: 22 ft
Well Volume: 3.7 L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

NH III

Pumping Start Time: 1018
Pumping Stop Time: 1101
Total Depth: 45 ft
Screen Length: 1 ft
Depth to Top of Screen: 44 ft
Depth to Screen Midpoint: 44.5 ft
Notes:

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
1021	—	—	325	Cloudy Brown None
1030	—	—	325	Slight Cloudy None

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1035	—	—	325	9.3	0.700	6.17	6.10	79.7	106.2
1038	—	—	325	9.3	0.701	6.22	6.08	85.2	78.6
1041	—	—	325	9.1	0.700	6.33	6.07	90.4	78.8
1044	—	—	325	9.1	0.702	6.27	6.07	91.2	63.1
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 6.6 L
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1046 Total Stabilization Time: 28 min Total Drawdown: —

Appearance: Clear / Slight Cloudy Odor: None Duplicate Collected?: MS/MSD

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
6	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Alkalinity
1	250 ml	glass (plastic)	yes (no)	None, HCl, (HNO3) NaOH, H2SO4	Metals
9	40 ml	(glass) plastic	yes (no)	None, (HCl) HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Cl⁻ SO4⁻
1	40 ml	(glass) plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	NO3 as N
1	40 ml	(glass) plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO
Well 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

BARR

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SPPC
Site: Merrimack Loop
Project Number: 23421001.01
Well: AP04 54-53BR
Date: 1/17/2017
Sample Time: 1206

SAMPLING PERSONNEL

Sample Collection By: SPS
Other Present: NA
Sampling Order: 15

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	NA	REMEDIED
Label on well?	YES	NO	REMEDIED	Is concrete pad in good repair?	YES	NO	NA	REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA	REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA	REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 24.1
Total Depth: 55
Total depth verified? YES NO

Casing diameter: 15
Water Depth: 30.9
Well Volume: 5.2L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time: 1134
Pumping Stop Time: 1207-1217
Total Depth: 55
Screen Length: 14
Depth to Top of Screen: 54
Depth to Screen Midpoint: 54.5
Notes:

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
1138	—	—	325	Cloudy Brown None
1150	—	—	325	Clear None

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1156	—	—	325	10.4	1.13	8.31	5.92	115.7	600
1159	—	—	325	10.3	1.13	8.13	5.91	116.1	132
1202	—	—	325	10.4	1.13	7.76	5.89	118.7	120
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 7.2L
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1206 Total Stabilization Time: 32min Total Drawdown: —

Appearance: Slight Cloudy Odor: None Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	Alkalinity
2	250 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	Metals
3	40 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	VOCs
2	40 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	Cl SO4
1	40 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	NO3 as N
1	40 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	NA	Repairs needed?	YES	NO	NA	Tubing added?	YES	NO
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

Barr Engineering Company
Low-Flow Sampling Field Log

BARR

Client: SMP
Site: Moorhead
Project Number: 23421001.01

Well: MW-64-6527
Date: 1/17/2017
Sample Time: 1429

SAMPLING PERSONNEL

Sample Collection By: SJS
Other Present: NH
Sampling Order: 16

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	NA / REMEDIED
Label on well?	YES	NO	REMEDIED	Is concrete pad in good repair?	YES	NO	NA / REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA / REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA / REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 24.1
Total Depth: 65
Total depth verified? YES NO

Casing diameter: 1.5
Water Depth: 40.9
Well Volume: 6.8 L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time: 1352
Pumping Stop Time: 1437
Total Depth: 65
Screen Length: 10
Depth to Top of Screen: 64
Depth to Screen Midpoint: 64.5
Notes:

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor	
1356	—	—	300	Cloudy	None
1414	—	—	275	Cloudy	None

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1416	—	—	275	9.9	1.14	7.44	5.97	119.6	72.7
1419	—	—	275	9.9	1.15	7.42	5.96	121.3	86.5
1422	—	—	275	9.8	1.14	7.47	5.95	122.9	78.3
1425	—	—	275	9.8	1.14	7.50	5.96	124.9	81.2
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 9.3L
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1429
Total Stabilization Time: 37 min
Total Drawdown: —

Appearance: Cloudy
Odor: None
Duplicate Collected?: NO

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Alkalinity
1	250 ml	glass (plastic)	yes (no)	None, HCl, (HNO3) NaOH, H2SO4	Metals
3	40 ml	(glass) plastic	yes (no)	None, (HCl) HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Cl, SO4
1	40 ml	(glass) plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	NO3 as N
1	40 ml	(glass) plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO
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 (NA)

BARR

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SMP Well: AP04 75-74 ft
Site: Monticello Lang Date: 1/18/2017
Project Number: 32421001.01 Sample Time: 0843

SAMPLING PERSONNEL

Sample Collection By: SFS Other Present: NA Sampling Order: 17

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	NA	REMEDIED
Label on well?	YES	NO	REMEDIED	Is concrete pad in good repair?	YES	NO	NA	REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA	REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA	REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 24.1
Total Depth: 75
Total depth verified? YES NO

Casing diameter: 1.5
Water Depth: 50.9
Well Volume: 8.5L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time: 0753
Pumping Stop Time: 0857
Total Depth: 75
Screen Length: 14
Depth to Top of Screen: 74
Depth to Screen Midpoint: 74.5
Notes:

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
0811	—	—	300	Clear None
0819	—	—	300	Clear/Brown None

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
0833	—	—	300	8.8	1.16	6.55	5.91	80.6	20.6
0836	—	—	300	8.8	1.18	6.89	5.85	83.6	15.1
0839	—	—	300	8.9	1.18	6.93	5.88	86.7	14.5
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 10.3 L Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 0843 Total Stabilization Time: 50 min Total Drawdown: —

Appearance: Clear Odor: None Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass plastic	yes no	None HCl HNO3 NaOH H2SO4	PFCs
1	250 ml	glass plastic	yes no	None HCl HNO3 NaOH H2SO4	Alkalinity
1	250 ml	glass plastic	yes no	None HCl HNO3 NaOH H2SO4	Metals
3	40 ml	glass plastic	yes no	None HCl HNO3 NaOH H2SO4	VOCs
2	40 ml	glass plastic	yes no	None HCl HNO3 NaOH H2SO4	Cl⁻ SO4⁻
1	40 ml	glass plastic	yes no	None HCl HNO3 NaOH H2SO4	NO3 as N
1	40 ml	glass plastic	yes no	None HCl HNO3 NaOH H2SO4	NH3

FINAL INSPECTION

Barr lock in place?	YES	NO	NA	Repairs needed?	YES	NO	NA	Tubing added?	YES NO
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 NA

BARR

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SLPP
Site: Merrimack Loonga
Project Number: 23421001.01

Well: MW04
Date: 83.5-84.5 DL 1/18/2017
Sample Time: 1057

SAMPLING PERSONNEL

Sample Collection By: STJ Other Present: NA Sampling Order: 1B

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	REMEDIED
Label on well?	YES	NO	REMEDIED	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 53.8
Total Depth: 84.5
Total depth verified? YES NO

Casing diameter: 4.5
Water Depth: 53.8 30.5
Well Volume: 5.1L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time: 1015
Pumping Stop Time: NR
Total Depth: 84.5
Screen Length: 10
Depth to Top of Screen: 83.5
Depth to Screen Midpoint: 84
Notes: Sampled using Waterra pump

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1043	—	—	—	7.2	0.79	1.93	6.24	23.9	NR
1046	—	—	—	8.6	0.79	1.62	6.13	26.2	
1049	—	—	—	8.2	0.77	2.20	6.20	46.3	
1052	—	—	—	8.2	0.77	2.22	6.17	54.1	
1055	—	—	—	7.6	0.78	2.26	6.15	55.5	
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): ≥ 5.1L Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1057 Total Stabilization Time: 29 min Total Drawdown: —

Appearance: Cloudy Orange/Grey Odor: None Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	Alkalinity
2	250 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	Metals
3	40 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	VOCs
2	40 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	Cl⁻ SO4⁻
1	40 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	NO3 as N
	40 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	NA	Repairs needed?	YES	NO	NA	Tubing added?	YES NO
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 NA

Barr Engineering Company
Low-Flow Sampling Field Log

BARR

Client: SMP
Site: Minnesota - Long
Project Number: 3242001.01

Well: AP08 57-58 ft
Date: 4/19/2017
Sample Time: 1004

SAMPLING PERSONNEL

Sample Collection By: STJ
Other Present: NA
Sampling Order: 19

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	(NA) REMEDIED
Label on well?	YES	NO	REMEDIED (NA)	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 21.8
Total Depth: 58
Total depth verified? YES (NO)

Casing diameter: 1.5
Water Depth: 36.2
Well Volume: 6L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

INI THL!

Pumping Start Time: 0927
Pumping Stop Time: 1013
Total Depth: 58
Screen Length: 1Ft
Depth to Top of Screen: 57
Depth to Screen Midpoint: 57.5
Notes: Purged 6L before stabilized readings.

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
0939	←	—	425	Slight cloudy None

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
0942	←	—	425	10.3	0.493	7.30	5.67	148.3	152
0955	—	—	425	10.1	0.492	6.94	5.68	150.3	52.5
0958	—	—	425	10.1	0.489	6.99	5.66	159.2	19.6
1001	—	—	425	10.2	0.489	7.01	5.65	158.9	14.6
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 9 8L
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1004 Total Stabilization Time: 27 min Total Drawdown: —

Appearance: Clear w/ particulates Odor: None Duplicate Collected?: MS/MSD

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
6	250 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Alkalinity
1	250 ml	glass (plastic)	yes (no)	None, HCl, (HNO3), NaOH, H2SO4	Metals
3	40 ml	(glass) plastic	yes (no)	None, (HCl), HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Cl⁻ SO4⁻
1	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	NO3 as N
1	40 ml	(glass) plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO
Well 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

BARR

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SCPP
Site: Merrimack Energy
Project Number: 37421B01.01

Well: MW03 (67-637)
Date: 1/19/2017
Sample Time: 1208

SAMPLING PERSONNEL

Sample Collection By: STJ Other Present: MA Sampling Order: 20

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	NA (NW) REMEDIED
Label on well?	YES	NO	REMEDIED	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 21.8
Total Depth: 68
Total depth verified? YES (NO)

Casing diameter: 1.5
Water Depth: 46.2
Well Volume: 27.76

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time: 1131
Pumping Stop Time: NR
Total Depth: 68
Screen Length: 10
Depth to Top of Screen: 67
Depth to Screen Midpoint: 67.5
Notes:

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
1136	—	—	400	Slight Cloudy/Milky None
1152	—	—	375	Clear None

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1200	—	—	375	10.0	0.595	5.91	5.71	138.4	22.2
1203	—	—	375	9.9	0.595	5.80	5.72	134.2	26.1
1206	—	—	375	9.9	0.595	5.79	5.71	133.6	35.8
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 10 L Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1208 Total Stabilization Time: 35 min Total Drawdown: —

Appearance: Slight Cloudy Odor: None Duplicate Collected?: Yes FD03

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None) HCl HNO3 NaOH H2SO4	PPCs
1	250 ml	glass (plastic)	yes (no)	(None) HCl HNO3 NaOH H2SO4	Alkalinity
1	250 ml	glass (plastic)	yes (no)	None HCl (HNO3) NaOH H2SO4	Metals
3	40 ml	(glass) plastic	yes (no)	None (HCl) HNO3 NaOH H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None) HCl HNO3 NaOH H2SO4	Cl- SO4
1	40 ml	(glass) plastic	yes (no)	(None) HCl HNO3 NaOH H2SO4	NO3 as N
1	40 ml	(glass) plastic	yes (no)	None HCl HNO3 NaOH (H2SO4)	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO
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 (NA)

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SLPP **Well:** APOB 77-78 BR
Site: Merrimack Longa **Date:** 1/19/2017
Project Number: 32421001.01 **Sample Time:** 1433

SAMPLING PERSONNEL

Sample Collection By: SH Other Present: NA Sampling Order: 21

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	(NA) REMEDIED
Label on well?	YES	NO	REMEDIED (NA)	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 20.1 ft
Total Depth: 78
Total depth verified? YES (NO)

Casing diameter: 1.5
Water Depth: 57.9
Well Volume: 9.62

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
1347	—	—	350	Slight cloudy, None
1412			350	Slightly clear None

Pumping Start Time: 1340
Pumping Stop Time: 1410
Total Depth: 78
Screen Length: 10 ft
Depth to Top of Screen: 77
Depth to Screen Midpoint: 72.5
Notes:

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1422	—	—	350	9.6	0.613	6.75	5.86	128.8	327
1425	—	—	350	9.6	0.613	6.32	5.79	137.9	27.1
1428	—	—	350	9.8	0.612	6.26	5.76	139.3	20.5
1431	—	—	350	9.8	0.613	6.23	5.75	140.5	~~2.5~~ 28.3
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 12.8 L Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1433 Total Stabilization Time: 73 min Total Drawdown: —

Appearance: Clear w/ particles Odor: None Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None) HCl HNO3 NaOH H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None) HCl HNO3 NaOH H2SO4	Alkalinity
1	250 ml	glass (plastic)	yes (no)	None HCl (HNO3) NaOH H2SO4	Metals
3	40 ml	(glass) plastic	yes (no)	None (HCl) HNO3 NaOH H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None) HCl HNO3 NaOH H2SO4	Cl- SO4
1	40 ml	(glass) plastic	yes (no)	(None) HCl HNO3 NaOH H2SO4	NO3 as N
1	40 ml	(glass) plastic	yes (no)	None HCl HNO3 NaOH (H2SO4)	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO
Well 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

Barr Engineering Company
Low-Flow Sampling Field Log

BARR

Client: SMP - Merrimack
Site: Merrimack Loop
Project Number: 32421001.01

Well: MW06 ~~B3-B4~~ B1-B2R
Date: 1/20/2017
Sample Time: 0918

SAMPLING PERSONNEL

Sample Collection By: STS
Other Present: NA
Sampling Order: 22

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	NA	REMEDIED
Label on well?	YES	NO	REMEDIED	Is concrete pad in good repair?	YES	NO	NA	REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA	REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA	REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 14.9
Total Depth: 82
Total depth verified? YES NO

Casing diameter: 1.5 inch
Water Depth: 67.1
Well Volume: 11.2L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time: 0831
Pumping Stop Time: 0926
Total Depth: 82
Screen Length: 14ft
Depth to Top of Screen: 81
Depth to Screen Midpoint: 81.5
Notes:

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
0838	—	—	425	Cloudy Gray, None
0904	—	—	310	Cloudy Gray, None

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
0910	—	—	310	9.7	0.71	4.59	6.07	46.5	26
0913	—	—	310	9.8	0.71	4.56	6.06	50.5	95.2
0916	—	—	310	9.7	0.71	4.50	6.05	55.4	72.3
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 11.5
Purge Water Disposal: Onsite

SAMPLE COLLECTION

Sample Time: 0918
Total Stabilization Time: 47min
Total Drawdown: —
Appearance: Slightly Cloudy Gray
Odor: None
Duplicate Collected?: NO

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	Alkalinity
2	250 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	Metals
3	40 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	VOCs
2	40 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	Cl- SO4-
1	40 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	NO3 as N
1	40 ml	glass plastic	yes no	None, HCl, HNO3, NaOH, H2SO4	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	NA	Repairs needed?	YES	NO	NA	Tubing added?	YES NO
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 NA

Barr Engineering Company
Low-Flow Sampling Field Log

BARR

Client: SCPP **Well:** AP01 11-12 Ft
Site: Merrimack Landfill **Date:** 1/20/2017
Project Number: 32421001.01 **Sample Time:** 1224

SAMPLING PERSONNEL

Sample Collection By: SJT Other Present: NA Sampling Order: 23

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	NA REMEDIED
Label on well?	YES	NO	REMEDIED	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 10.4
Total Depth: 12.0
Total depth verified? YES NO

Casing diameter: 15 inch
Water Depth: 1.6 ft
Well Volume: 2 Gal

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time: 1159
Pumping Stop Time: 1423
Total Depth: 12Ft
Screen Length: 1 Ft
Depth to Top of Screen: 11 Ft
Depth to Screen Midpoint: 11.5 Ft
Notes: purged dry, pump cannot slow enough for constant flow. Purge and sample

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
1210	10.4	—	—	Cloudy Brown None

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1218	—	—	—	7.0	0.452	9.36	6.29	110.5	1534
1230	Pump	water to	fill containers	until	dry. Wait	10 min	then pump	again.	
1238									
1249									
1254									
1259									
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 0.3L Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1224 Total Stabilization Time: 30 min Total Drawdown: —

Appearance: Cloudy Brown Odor: None Duplicate Collected?: ND

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Alkalinity
2	250 ml	glass (plastic)	yes (no)	(None), HCl, (HNO3), NaOH, H2SO4	Metals
3	40 ml	(glass) plastic	yes (no)	None, (HCl), HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Cl⁻ SO4⁻
1	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	NO3 Ag N
1	40 ml	(glass) plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	(NO)		Tubing added?	YES NO
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) NA

BARR

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SLPP
Site: Minnemacke Lodge
Project Number: 3242T001.01

Well: AP09 17-1647
Date: 1/23/2017
Sample Time: 0842

SAMPLING PERSONNEL

Sample Collection By: STJ Other Present: NA Sampling Order: 24

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	NA REMEDIED
Label on well?	YES	NO	REMEDIED NA	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 10.9
Total Depth: 19
Total depth verified? YES (NO)

Casing diameter: 1.5
Water Depth: 7.1
Well Volume: 1.2 L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

111

Pumping Start Time: 0805
Pumping Stop Time: 0857
Total Depth: 18
Screen Length: 10
Depth to Top of Screen: 17
Depth to Screen Midpoint: 17.5
Notes:

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor	
0811	-	-	115	Cloudy	None

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
0823	-	-	115	8.0	0.626	2.19	6.49	-23.7	865
0826	-	-	Pump Stop, not dry						
0832	-	-	115	7.2	0.627	3.13	6.54	-12.2	467
0835	-	-	115	7.4	0.627	3.12	6.55	-5.7	45.4
0838	-	-	115	8.2	0.626	3.04	6.55	-4.8	43.2
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 2.2 L Purge Water Disposal: Drums

SAMPLE COLLECTION

Sample Time: 0842 Total Stabilization Time: 27 min Total Drawdown: -

Appearance: Slight Cloudy to Clear Odor: None Duplicate Collected?: NO

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Alkalinity
1	250 ml	glass (plastic)	yes (no)	None, HCl, (HNO3), NaOH, H2SO4	Metals
3	40 ml	(glass) plastic	yes (no)	None, (HCl), HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Cl- SO4
1	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	NO3 as N
1	40 ml	(glass) plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	NA	Repairs needed?	YES	NO	NA	Tubing added?	YES NO
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 NA

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SAPP **Well:** MW09 35-36 BR
Site: Merrimack Loop **Date:** 4/28/2017
Project Number: 3242 00101 **Sample Time:** 1057

SAMPLING PERSONNEL

Sample Collection By: JTJ Other Present: NA Sampling Order: 25

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	(NA) REMEDIED
Label on well?	YES	NO	REMEDIED (NA)	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 10.3
Total Depth: 36
Total depth verified? YES (NO)

Casing diameter: 1.5
Water Depth: 25.7
Well Volume: 4.3 L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time: 1032
Pumping Stop Time: 1103
Total Depth: 36
Screen Length: 10ft
Depth to Top of Screen: 35
Depth to Screen Midpoint: 35.5
Notes:

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
1038	—	—	440	Cloudy Orange Brown None
1046	—	—	375	SL. Cloudy None

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1049	—	—	375	10.6	0.532	7.75	5.81	152.5	72.6
1052	—	—	375	10.5	0.534	7.70	5.78	155.6	66.5
1055	—	—	375	10.5	0.532	7.72	5.76	157.8	64.2
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 0.6 L Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1057 Total Stabilization Time: 25 min Total Drawdown: —
Appearance: SL. Cloudy Odor: None Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	150 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Alkalinity
1	250 ml	glass (plastic)	yes (no)	None, HCl, (HNO3), NaOH, H2SO4	Metals
3	40 ml	(glass) plastic	yes (no)	None, (HCl), HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Cl⁻ SO4⁻
1	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	NO3 as N
1	40 ml	(glass) plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO (NA)
Well 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

BARR

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SCPP
Site: Mennimuck Landfill
Project Number: 23427.081.001

Well: MP09 47-48ft
Date: 1/23/2017
Sample Time: 1242

SAMPLING PERSONNEL
Sample Collection By: SPS
Other Present: NA
Sampling Order: 26

INSPECTION
Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	NA	REMEDIED
Label on well?	YES	NO	REMEDIED	Is concrete pad in good repair?	YES	NO	NA	REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA	REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA	REMEDIED

Notes:

STATIC WATER LEVEL
Depth to Water: 15
Total Depth: 48
Total depth verified? YES NO

Casing diameter: 1.5
Water Depth: 33
Well Volume: 5.5L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS
Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING
Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
1223	—	—	500	V. Cloudy, brown / None
1225	—	—	500	Sl. Cloudy / None

Pumping Start Time: 1220
Pumping Stop Time: 1247
Total Depth: 48
Screen Length: 1ft
Depth to Top of Screen: 47
Depth to Screen Midpoint: 47.5
Notes:

WELL STABILIZATION
Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1233	—	—	500	9.8	0.485	8.05	5.72	173.0	13.4
1236	—	—	500	9.8	0.485	7.87	5.70	177.5	10.84
1239	—	—	500	9.7	0.484	8.05	5.67	180.1	11.50
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 8.5L
Purge Water Disposal: Drum

SAMPLE COLLECTION
Sample Time: 1247
Total Stabilization Time: 22 min
Total Drawdown: —
Appearance: Clear
Odor: 1242 None
Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Alkalinity
1	250 ml	glass (plastic)	yes (no)	None, HCl, (HNO3), NaOH, H2SO4	Metals
3	40 ml	(glass) plastic	yes (no)	None, (HCl), HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Cl⁻ SO4⁻
1	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	NO3 as N
1	40 ml	(glass) plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NO2

FINAL INSPECTION
Barr lock in place?	YES	NO	NA	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO
Well 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

BARR

Barr Engineering Company
Low-Flow Sampling Field Log

Client: SAPP
Site: Merrimack Loop
Project Number: 32421001.01

Well: MP09 56-57ft
Date: 1/23/2017
Sample Time: 1419

SAMPLING PERSONNEL

Sample Collection By: SJT
Other Present: NA
Sampling Order: 27

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	NA (REMEDIED)
Label on well?	YES	NO	REMEDIED (NA)	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 18.7
Total Depth: 57
Total depth verified? YES (NO)

Casing diameter: 1.5
Water Depth: 38.3
Well Volume: 6.41

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time: 1353
Pumping Stop Time: 1425
Total Depth: 57
Screen Length: 1ft
Depth to Top of Screen: 56
Depth to Screen Midpoint: 56.5
Notes:

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor	
1356	—	—	460	V. Cloudy brown	None
1359	—	—	450	Sl. Cloudy	None
1408	—	—	450	Clear	None

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1414	—	—	450	10.1	0.497	7.63	5.69	171.2	11.4
1414	—	—	450	10.0	0.498	6.6769	5.68	172.8	10.82
1417	—	—	450	9.9	0.498	7.67	5.67	173.7	12.7
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 9.12
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1419
Total Stabilization Time: 26 min
Total Drawdown: —

Appearance: Clear
Odor: None
Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Alkalinity
1	250 ml	glass (plastic)	yes (no)	None, HCl, (HNO3), NaOH, H2SO4	Metals
3	40 ml	(glass) plastic	yes (no)	None, (HCl) HNO3, NaOH, H2SO4	VOCs
2	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	Cl-, SO4
1	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, H2SO4	NO3 as N
1	40 ml	(glass) plastic	yes (no)	(None), HCl, HNO3, NaOH, (H2SO4)	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO
Well 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

Barr Engineering Company
Low-Flow Sampling Field Log

BARR

Client: SLPP
Site: Minnemacke Lounge
Project Number: 52421001.01

Well: APOC4 C5-C6
Date: 1/23/2017
Sample Time: 1611

SAMPLING PERSONNEL

Sample Collection By:
Other Present:
Sampling Order: 2B

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	(NA) REMEDIED
Label on well?	YES	NO	REMEDIED (NA)	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 17.8
Total Depth: 66
Total depth verified? YES (NO)

Casing diameter: 15
Water Depth: 46.2
Well Volume: 8L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
1540	-	-	450	V. Cloudy / None
1543	-	-	400	Clear / None

Pumping Start Time: 1536
Pumping Stop Time: 1619
Total Depth: 66
Screen Length: 1ft
Depth to Top of Screen: 65
Depth to Screen Midpoint: 65.5
Notes:

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1558	-	-	400	9.7	0.86	7.06	5.79	166.3	11.5
1601	-	-	400	9.8	0.86	7.73	5.76	165.1	10.03
1604	-	-	400	9.7	0.86	6.59	5.78	164.9	1.2
1607	-	-	400	9.7	0.86	6.59	5.77	165.9	6.59
1610	-	-	400	9.8	0.86	6.57	5.77	165.4	11.45
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 12.8L
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1611
Total Stabilization Time: 35 min
Total Drawdown:

Appearance: Clear
Odor: None
Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	PFCs
1	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Alkalinity
1	250 ml	glass (plastic)	yes (no)	None, HCl, (HNO3) NaOH, H2SO4	Metals
3	40 ml	glass (plastic)	yes (no)	None, (HCl) HNO3, NaOH, H2SO4	VOCs
2	40 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Cl⁻ SO4⁻
1	40 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	NO3 as N
1	40 ml	glass (plastic)	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	NA	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO
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 (NA)

Barr Engineering Company
Low-Flow Sampling Field Log

BARR

Client: SGPP
Site: Merrimack - Longa
Project Number: 32172100.01

Well: AP09 70-71 ft
Date: 1/25/2017
Sample Time: 1038

SAMPLING PERSONNEL

Sample Collection By: STS
Other Present: NA
Sampling Order: 29

INSPECTION

Barr lock?	YES	NO	REMEDIED	Standing water present?	YES	NO	(NA) REMEDIED
Label on well?	YES	NO	REMEDIED (NA)	Is concrete pad in good repair?	YES	NO	NA REMEDIED
Is reference mark visible?	YES	NO	REMEDIED	Is protective casing locked and in good repair?	YES	NO	NA REMEDIED
				Is inner cap in place and properly sealing well?	YES	NO	NA REMEDIED

Notes:

STATIC WATER LEVEL

Depth to Water: 19.1
Total Depth: 71
Total depth verified? YES (NO)

Casing diameter: 1.5
Water Depth: 52.9
Well Volume: 8.6L

Volume of water per foot:
1" well: 155 mL
2" well: 617 mL
4" well: 2.47 L

HISTORIC EVENTS

Date	Total Depth	Water Level	Total Drawdown	Pumping Rate	Stabilization Time	Volume Purged	Purged Dry?

WELL PURGING

Pumping Start Time: 0942
Pumping Stop Time: NR
Total Depth: 71
Screen Length: 10ft
Depth to Top of Screen: 70
Depth to Screen Midpoint: 70.5
Notes:

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Appearance/Odor
0946	—	—	350	V. Cloudy Brown None
0956	"	—	300	Cloudy Brown None
0903	"	—	250	Cloudy Brown None
0912	"	—	400	SAA New Bottle SAA

WELL STABILIZATION

Time	Water Level (feet)	Drawdown (feet)	Pumping Rate (ml/min)	Temp (°C)	Spec Conductance (mS/cm)	Diss Oxy (mg/l)	pH (S.U.)	ORP (mV)	Turbidity (NTU)
1018	—	—	400	10.4	1.03	3.88	6.13	25.2	626
1021	"	"	400	10.2	1.03	4.02	6.11	34.0	672
1024	"	"	400	10.5	1.02	4.13	6.10	41.3	620
1027	"	"	400	10.3	1.02	4.40	6.08	48.6	637
1030	"	"	400	10.2	1.02	4.43	6.07	48.3	125
1035	"	"	400	10.2	1.02	4.46	6.06	51.5	148
Stabilization Criteria:					+/- 3%	+/- 10% or ≤ 0.5	+/- 0.1 Units	+/- 10 mV	+/- 10% or ≤ 5

Total Volume Purged (L): 14.8L
Purge Water Disposal: Drum

SAMPLE COLLECTION

Sample Time: 1038
Total Stabilization Time: 56 min
Total Drawdown: —

Appearance: Cloudy
Odor: None
Duplicate Collected?: No

NO./BOTTLES:	SIZE:	TYPE:	FILTERED:	PRESERVATIVE:	PARAMETER:
2 3	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	VFCs
1	250 ml	glass (plastic)	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Alkalinity
2	250 ml	glass (plastic)	yes (no)	(None) HCl, (HNO3) NaOH, H2SO4	Metals
3	40 ml	glass plastic	yes (no)	None, (HCl) HNO3, NaOH, H2SO4	VOCs
2	40 ml	glass plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	Cl⁻ SO4⁻
1	40 ml	glass plastic	yes (no)	(None) HCl, HNO3, NaOH, H2SO4	NO3 as N
1	40 ml	glass plastic	yes (no)	None, HCl, HNO3, NaOH, (H2SO4)	NO2

FINAL INSPECTION

Barr lock in place?	YES	NO	(NA)	Repairs needed?	YES	NO	(NA)	Tubing added?	YES NO
Well 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

WELL DEVEOPMENT LOG

Project Name: SGPP-Merrimack Date Started: 11/1/16

Project Number: 16.6126 Date Finished: _____

Field Parameters	Well Volumes and Corresponding Field Parameters Value										
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level	45.93										
pH											
Conductivity (uS)											
ORP (mV)											
DO (mg/L)											
Temperature (C)	0										
Turbidity (NTU)											

Monitoring Well: MW-45-1A Notes: Surge at ~~09:35 to~~ Blockage at 27.82 ft, cannot GT bailer any deeper
Total Depth: 47.68
Water Column: 2.2
One Well Volume: 0.352

Field Parameters	Well Volumes and Corresponding Field Parameters Value										
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level	45.93	45.93	45.95	45.96	45.93	45.93	45.95	45.97	45.93	45.93	45.93
pH	8.19	6.81	6.44	6.27	6.12	6.09	5.95	6.01	5.96	5.89	5.86
Conductivity (uS)	870	817	771	745	726	724	725	727	726	724	726
ORP (mV)	241.8	92.3	103.8	104.1	123.8	120.3	139.1	123.1	132.9	143.4	143.6
DO (mg/L)	6.46	6.37	8.36	9.09	10.44	10.35	10.18	9.70	9.43	10.04	8.26
Temperature (C)	9.8	10.1	10.1	10.0	9.8	9.8	9.8	9.9	9.9	9.9	9.9
Turbidity (NTU)	1540 AU	OR	OR	OR	OR	OR	1184 AU	647 AU	654 AU	~~-35~~	67.5

Monitoring Well: MW-45-2A Notes: Surge at 11:00 to 11:30
Total Depth: 51.78 Surge + Purge 11:30 to ~~12:45~~ 12:45 RH
Water Column: 5.85 Purge at 12:50 to 13:35
One Well Volume: 0.94

Field Parameters	Well Volumes and Corresponding Field Parameters Value										
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level	30.50	42.19									
pH	6.11	5.87									
Conductivity (uS)	358.7	530									
ORP (mV)	30.0	42.5									
DO (mg/L)	1.33	4.83									
Temperature (C)	10.5	10.1									
Turbidity (NTU)	OR	OR									

Monitoring Well: MW-45-2B Notes: Surge at 14:45 to 15:15. Water level dropped below 27' during Purge
Total Depth: 52.46 Well purged dry @51.1' at 9 gallons
Water Column: 31.96
One Well Volume: 5.1

Field Parameters	Well Volumes and Corresponding Field Parameters 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:

WELL DEVEOPMENT LOG

Project Name: SGPP - Merrimack

Date Started: 11/2/16

Project Number: 16.6126

Date Finished: _____

Field Parameters	Well Volumes and Corresponding Field Parameters Value										
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level	19.87	19.93	20.02	20.00							
pH	6.26	6.13	6.13	6.05							
Conductivity (uS)	297.9	311.1	309.1	311.8							
ORP (mV)	189.9	214.8	227.2	238.2							
DO (mg/L)	6.14	8.86	8.88	7.81							
Temperature (C)	11.5	11.1	11.1	11.2							
Turbidity (NTU)	1652 AU	1923 AU	2861 AU	1850 AU							

Monitoring Well: MW-45-7
Total Depth: 76.25'
Water Column: 56.38'
One Well Volume: 9.0 gallons

Notes: Surge at 10:20 to 10:50
Surge + Purge at 11:00 to 13:30
Stop at 42 gallons, no more buckets

Field Parameters	Well Volumes and Corresponding Field Parameters Value										
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level	25.15	25.19	25.18	25.16	25.16						
pH	6.29	6.11	6.09	6.14	6.12						
Conductivity (uS)	354.3	348.3	349.4	345.6	346.1						
ORP (mV)	247.3	251.2	257.1	260.5	261.9						
DO (mg/L)	5.64	7.01	6.93	8.04	6.58						
Temperature (C)	11.4	11.2	11.1	11.1	11.1						
Turbidity (NTU)	15.2	808 AU	30	7	16						

Monitoring Well: MW-45-6
Total Depth: 71.92
Water Column: 46.77'
One Well Volume: 7.5 gallons

Notes: Surge at ~~15:30~~ 15:30 to 16:00
Purge and surge at 16:15 to 17:35 at 4 well Volumes, to dark to continue.

Field Parameters	Well Volumes and Corresponding Field Parameters 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:
Total Depth:
Water Column:
One Well Volume:

Notes:

Field Parameters	Well Volumes and Corresponding Field Parameters 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:
Total Depth:
Water Column:
One Well Volume:

Notes:

WELL DEVEOPMENT LOG

Project Name: SGPP-Merrimack

Date Started: 11/3/16

Project Number: 16.6126

Date Finished: _____

Field Parameters	Well Volumes and Corresponding Field Parameters Value										
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level	22.92	23.15	23.20	23.19	23.19	23.18	23.22				
pH	6.47	6.16	6.03	6.00	6.07	6.13	6.04				
Conductivity (uS)	255.8	297.3	300.4	299.1	298.8	297.6	298.1				
ORP (mV)	55.6	87.0	118.6	138.5	127.0	123.8	139.8				
DO (mg/L)	0.97	5.41	7.12	8.11	8.38	8.60	8.78				
Temperature (C)	9.8	9.9	10.0	10.1	10.1	10.1	10.1				
Turbidity (NTU)	OR	OR	OR	OR	76.9	63.5	41.7				

Monitoring Well: MW-45-4A
Total Depth: 35.20'
Water Column: 12.28'
One Well Volume: 2.0 gallons

Notes: Surge at 08:45 to 09:15
Surge + Purge at 09:25 to 10:45
Purge at 10:45 to 11:00, Turbitity below 50 NTU

Field Parameters	Well Volumes and Corresponding Field Parameters Value										
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level	23.93	23.98	23.97	23.95	23.96	23.93					
pH	5.97	5.97	5.95	5.94	6.00	6.11					
Conductivity (uS)	353.2	339.6	332.9	331.4	344.5	349.8					
ORP (mV)	222.2	227.2	234.8	243.1	251.2	253.3					
DO (mg/L)	7.68	7.60	7.33	7.59	7.66	10.69					
Temperature (C)	11.2	11.0	10.9	10.9	11.2	10.7					
Turbidity (NTU)	944 AV	1635 AV	906 AV	43.4	1115 AV	1783 AV					

Monitoring Well: MW-45-8
Total Depth: 68.67'
Water Column: 44.74'
One Well Volume: 7.2 gallons

Notes: Surge at 13:20 to 13:50
Surge + Purge at 14:00 to 16:00
Purge 16:00 to 16:20

Field Parameters	Well Volumes and Corresponding Field Parameters 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:
Total Depth:
Water Column:
One Well Volume:

Notes:

Field Parameters	Well Volumes and Corresponding Field Parameters 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:
Total Depth:
Water Column:
One Well Volume:

Notes:

WELL DEVEOPMENT LOG

Project Name: SGPP-Merrimack
Date Started: 11/4/16
Project Number: 16.6126
Date Finished: 11/4/16

Field Parameters		Well Volumes and Corresponding Field Parameters Value									
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level	26.22	26.39	26.60	26.62	26.75	26.75					
pH	7.34	6.39	6.41	6.32	6.22	6.24					
Conductivity (uS)	241.6	375.9	339.1	350.1	354.3	351.3					
ORP (mV)	59.4	155.8	119.4	96.7	104.2	109.9					
DO (mg/L)	2.05	9.21	9.95	10.02	9.42	10.29					
Temperature (C)	9.2	9.9	9.6	9.3	9.3	9.3					
Turbidity (NTU)	636AU	26AU	OR	OR	OR	OR					

Monitoring Well: MW-45-5A
Notes: Surge at 08:45 to 09:15
52.98 Total Depth: 39.72
Purge + Surge at 09:20 to 11:50. Ran out of buckets to continue.
26.76 Water Column: 13.5
4.3 One Well Volume: 2.2
Blockage at 35.7', able to send water level meter past it after ~15min.

Field Parameters		Well Volumes and Corresponding Field Parameters Value									
	Initial	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:

Field Parameters		Well Volumes and Corresponding Field Parameters Value									
	Initial	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:

Field Parameters		Well Volumes and Corresponding Field Parameters Value									
	Initial	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:

WELL DEVEOPMENT LOG

Project Name: SGPP-Merrimack

Project Number: 16.6126

Date Started: 11/08/16

Date Finished: 11/08/16

Field Parameters	11:40	Well Volumes and Corresponding Field Parameters Value									
Time	Intitial	10	20	30	34	40	45	50	58	60	610
Water Level	22.91	23.06	23.07	23.06	23.06	23.05	23.04	23.03	23.01		
pH	6.54	6.40	6.27	6.10	6.08	6.09	6.13	6.09	6.09		
Conductivity (uS)	620	582	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	7.20	6.82	6.66	6.73	6.76	6.70	6.78		
Temperature (C)	10.8	10.5	10.4	10.5	10.6	10.6	10.8	10.9	10.9		
Turbidity (NTU)	58.8	42.0	23.4	15.6	13.1	14.4	8.55	8.47	8.16		

Monitoring Well: 45-44
Total Depth: 44.8
Water Column: ~~22.9~~ SC
One Well Volume: ~~21.9~~ SC

Notes: tubing @ 42.1'

Field Parameters		Well Volumes and Corresponding Field Parameters Value									
15:00	Intitial	10	20	30	35	40	45	50	55	60	6510
Water Level	27.15	27.17	27.16	27.16	27.16	27.16	27.16				
pH	5.92	5.70	5.56	5.45	5.41	5.43	5.39				
Conductivity (uS)	482.5	476.8	477.2	481.5	485.5	489.3	496.5				
ORP (mV)	152.4	178.2	198.3	210.5	218.0	220.8	223.1				
DO (mg/L)	7.87	7.70	7.61	7.41	7.24	7.30	7.36				
Temperature (C)	11.3	10.9	10.8	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: 45-9
Total Depth:
Water Column: ~~27.15~~ SC
One Well Volume:

Notes: tubing @ 56'

Field Parameters		Well Volumes and Corresponding Field Parameters 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:
Total Depth:
Water Column:
One Well Volume:

Notes:

Field Parameters		Well Volumes and Corresponding Field Parameters 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:
Total Depth:
Water Column:
One Well Volume:

Notes:

WELL DEVEOPMENT LOG

Project Name: SGPP- Merrimack

Project Number: 16.6126

Date Started: ~~11/10/16~~ 11/8/16

Date Finished: 11/10/16

11/10/16

Field Parameters		Well Volumes and Corresponding Field Parameters Value									
	Intitial	1	2	3	4	8	10	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	5.90	5.90	5.93	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	152.8	156.9				
DO (mg/L)	9.41	9.60	9.76	9.56	9.62	10.04	9.88				
Temperature (C)	14.5	12.1	11.8	12.2	12.2	12.0	11.6				
Turbidity (NTU)	OR	OR	OR	OR	OR	OR	OR				

Monitoring Well: MW-45-2A Notes: Purge at 12:20 to 13:00

Total Depth: 47.68'

Water Column: 2.43'

One Well Volume: 0.4

Field Parameters		Well Volumes and Corresponding Field Parameters 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:

11/8/16

Field Parameters		Well Volumes and Corresponding Field Parameters Value									
	Intitial	10	20	30	35	40	45	50	55	60	65
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)	157.4	161.7	165.5	169.2	170.8	172.7	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	11.3	11.3	11.2	11.2	11.2	11.2	11.3			
Turbidity (NTU)	3.51	2.20	4.02	6.84	8.78	7.15	7.52	7.73			

Monitoring Well: MW-45-7 Notes: Parastaltic Pump

Total Depth:

Water Column:

One Well Volume:

Start at 15:20 to 16:10

Tubing at 65.5'

2 gallons

Field Parameters		Well Volumes and Corresponding Field Parameters 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:

WELL DEVEOPMENT LOG

Project Name: SGPP-MER

Project Number: 160612S

Date Started: 11-09-2016

Date Finished: 11-09-2016

Field Parameters 1220	Well Volumes and Corresponding Field Parameters Value										
	Intitial	10	20	30	35.4	40.8	45.6	50.7	55.8	60.9	10
Water Level	22.96	23.62	23.48	23.29	23.32	23.39	23.49	23.50	23.50		
pH	6.81	6.85	6.87	6.92	6.92	6.80	6.72	6.68	6.67		
Conductivity (uS)	566	547	548	550	549	547	546	546	547		
ORP (mV)	-128.0	-156.3	-192.6	-185.5	-181.4	-125.8	-124.9	-125.1	-125.6		
DO (mg/L)	0.96	0.77	0.92	0.36	0.32	0.38	0.37	0.39	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	14.6	14.7	14.5	14.9	15.1	15.4		

Monitoring Well: 45-3A

Notes: Two areas in well have some degree of blockage

Total Depth: 48.48' perceived bottom Water level meter stopped at 48.48 ft.

Water Column:

One Well Volume: 12.00

Field Parameters 1445	Well Volumes and Corresponding Field Parameters Value										
	Intitial	10	20	30	35.4	40.8	45.6	50.7	55.8	60.9	10
Water Level	19.58	23.01	27.15	30.52	32.21	33.86	35.09	36.50			
pH	6.07	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	-213.2	-247.1	-261.7	-260.9	-258.1	-254.4	-251.3			
DO (mg/L)	5.38	0.23	0.21	1.02	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	10.11	11.1	10.89	11.0	10.99	11.14			

Monitoring Well: 45-28

Notes: ZC sampled here sampled @ 1550

Total Depth:

Water Column:

One Well Volume: 1505 1515 1520 1530 1540 1550

Field Parameters 1445	Well Volumes and Corresponding Field Parameters Value										
	Intitial	10	20	30	35.4	40.8	45.6	50.7	55.8	60.9	65.10
Water Level	45.35	45.35	45.35	45.35	45.36	45.35	45.35	45.35	45.35	45.35	45.35
pH	5.74	5.74	5.76	5.75	5.72	5.71	5.72	5.70	5.69	5.68	5.68
Conductivity (uS)	1131	1158	1152	1139	1144	1157	1182	1188	1201	1211	1220
ORP (mV)	20.7	12.7	7.9	10.2	14.8	18.7	23.2	28.1	30.2	32.4	34.1
DO (mg/L)	4.04	0.58	0.40	0.32	0.49	1.20	1.25	1.39	1.82	1.89	1.92
Temperature (C)	11.2	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1
Turbidity (NTU)	125	67.2	43.2	35.8	30.8	28.8	22.9	18.1	16.9	17.2	16.7

Monitoring Well: 1MW

Notes:

Total Depth:

Water Column:

One Well Volume:

Field Parameters		Well Volumes and Corresponding Field Parameters 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:

WELL DEVEOPMENT LOG

Project Name: SGPP-Merrimack

Project Number: 16.6126

Date Started: 11/9/16

Date Finished: 11/10/16

Field Parameters		Well Volumes and Corresponding Field Parameters Value									
	Intitial	10	20	30	35 4	40 5	45 6	50 7	55 8	60 9	65 10
Water Level	25.27	25.39	25.40	25.40	25.41	25.41	25.41	25.42			
pH	6.45	6.49	6.48	6.48	6.48	6.47	6.47	6.46			
Conductivity (uS)	449.5	450.8	455.7	459.2	460.3	464.1	464.8	466.7			
ORP (mV)	-19.4	-20.3	-21.8	-24.7	-26.5	-25.9	-26.7	-26.8			
DO (mg/L)	0.66	0.81	0.72	0.57	0.49	0.47	0.41	0.47			
Temperature (C)	11.4	11.3	11.4	11.3	11.3	11.3	11.3	11.3			
Turbidity (NTU)	113	21.8	17.1	11.5	12.2	10.06	10.96	9.86			

Monitoring Well: LNG-MW-4

Total Depth: 40.03

Water Column:

One Well Volume:

Notes: Start at 15:30 to 16:20 After 1.75 gallons
Parastaltic Pump
Tubing at 30'

Field Parameters		Well Volumes and Corresponding Field Parameters Value									
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level	45.40	45.40	45.40	45.40	45.40	45.40	45.40				
pH	5.91	5.75	5.68	5.63	5.61	5.59	5.61				
Conductivity (uS)	1354	1357	1354	1353	1352	1349	1345				
ORP (mV)	151.2	154.1	166.5	175.4	183.0	185.3	184.4				
DO (mg/L)	8.25	8.45	8.74	8.95	8.72	8.54	8.61				
Temperature (C)	11.8	11.4	11.2	11.2	11.2	11.2	11.1				
Turbidity (NTU)	39.3	93.6	62.7	79.5	33.3	97.5	96.4				

11/10/16

Monitoring Well: MER-MW-45-2A

Total Depth: 47.68

Water Column:

One Well Volume:

Notes: Start at 13:30 to 14:10 3.5 gallons
After Sampling Triplicates, turbidity 97 NTU.
After Sampling All Containers Turbity reading 46 NTU

Field Parameters		Well Volumes and Corresponding Field Parameters 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:

Total Depth:

Water Column:

One Well Volume:

Notes:

Field Parameters		Well Volumes and Corresponding Field Parameters Value									
	Initial	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:

Total Depth:

Water Column:

One Well Volume:

Notes:

WELL DEVEOPMENT LOG

Project Name: SGPP - Merrimack
Project Number: 16.6126

Date Started: 11/8/16
Date Finished: 11/9/16

Field Parameters		Well Volumes and Corresponding Field Parameters Value									
Mins	Intitial	10	20	30	35	40	45	50	55	60	65
Water Level	23.83	23.83	23.83	23.83	23.83	23.83	23.83				
pH	5.21	5.46	5.54	5.54	5.57	5.55	5.56				
Conductivity (uS)	898	850	855	856	853	854	852				
ORP (mV)	268.2	244.3	244.2	242.9	243.3	243.6	241.7				
DO (mg/L) 4.25	~~3.43~~	3.91	3.96	3.96	3.89	4.04	4.02				
Temperature (C)	9.6	9.7	9.9	10.1	10.1	10.2	10.3				
Turbidity (NTU)	3.46	4.39	4.76	6.88	4.64	4.41	4.65				

Monitoring Well: MER-45-8
Total Depth:
Water Column:
One Well Volume:

Notes: Parastaltic Pump
Tubing set @ Mid Screen depth is 56'
Start @ 945
Sampled @ 1030
Stop @ 1045

Field Parameters		Well Volumes and Corresponding Field Parameters Value									
Mins	Intitial	10	20	30	35	40	45	50	55	60	65
Water Level	25.03	25.08	25.03	25.04	25.05	25.04	25.05				
pH	5.71	5.60	5.61	5.64	5.63	5.65	5.65				
Conductivity (uS)	964	946	927	915	906	898	893				
ORP (mV)	231.7	235.8	234.3	233.5	232.1	231.9	231.9				
DO (mg/L)	4.25	3.89	3.71	3.62	3.50	3.56	3.60				
Temperature (C)	11.9	11.8	12.0	12.2	12.4	12.1	12.3				
Turbidity (NTU)	3.36	4.24	4.99	2.52	2.67	3.66	3.51				

Monitoring Well: MER-45-6
Total Depth:
Water Column:
One Well Volume:

Notes: Start 1330 STOP 1415
Tubing set @ 45' depth. Could not get tubing past this depth.

11/9/16

Field Parameters		Well Volumes and Corresponding Field Parameters Value									
Mins	Intitial	10	20	30	35	40	45	50	55	60	10
Water Level	26.24	26.27	26.27	26.25	26.26	26.27	26.28	26.29	26.24	26.29	
pH	6.20	6.57	6.45	6.30	6.25	6.11	6.08	6.07	6.03	6.03	
Conductivity (uS) ~~960~~	943	918	901	881	874	859	857	853	848	842	
ORP (mV)	-14.2	-80.5	-58.4	-21.4	-10.7	14.2	18.5	24.4	30.8	30.9	
DO (mg/L)	1.03	0.40	0.61	4.48	4.29	4.33	4.61	4.69	4.46	4.09	
Temperature (C)	10.1	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	
Turbidity (NTU)	35.9	34.3	33.3	27.6	26.7	23.2	18.2	~~24.4~~ 20.2	18.9	21.2	

Monitoring Well: Mer-45-5a
Total Depth:
Water Column:
One Well Volume:

Notes: Start - 1320
Stop - 1430 3.5 3-1 gallons
Tubing could only get to a depth of ~40' Biocage at 25'

Field Parameters		Well Volumes and Corresponding Field Parameters 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:
Total Depth:
Water Column:
One Well Volume:

Notes:

WELL DEVEOPMENT LOG

Project Name: SGPP-Merrimack
Project Number: 16.6126

Date Started: 11/10/16
Date Finished: 11/10/16

Field Parameters		Well Volumes and Corresponding Field Parameters Value									
Time	Intitial	10	20	30	35	40	45	50	58	69	10
Water Level	22.35	22.35	22.35	22.35	22.35	22.35					
pH	6.79	5.95	5.94	5.96	6.02	6.01					
Conductivity (uS)	261.2	337.2	364.8	373.1	375.0	377.1					
ORP (mV)	179.5	180.8	180.6	178.3	175.5	177.6					
DO (mg/L)	8.58	6.12	5.75	5.95	5.60	5.45					
Temperature (C)	11.5	12.3	12.3	12.3	12.3	12.3					
Turbidity (NTU)	3.55	2.42	1.08	2.15	0.70	1.04					

Monitoring Well: LNG-MW2
Total Depth:
Water Column:
One Well Volume:

Notes: Start - 1020
Stop - 1105
2.5 gallons purged
Tubing set @ 28.5'

Field Parameters		Well Volumes and Corresponding Field Parameters Value									
Time	Intitial	10	20	30	35	40	45	50	8	9	10
Water Level	18.71	18.69	18.69	18.69	18.69	18.69					
pH	5.68	5.65	5.68	5.69	5.70	5.70					
Conductivity (uS)	843	994	998	485	480	974					
ORP (mV)	172.3	191.6	196.5	200.3	201.8	203.1					
DO (mg/L)	5.68	4.81	4.72	5.05	5.11	5.09					
Temperature (C)	11.9	11.7	11.7	11.7	11.7	11.7					
Turbidity (NTU)	2.26	1.31	0.24	0.58	1.07	1.85					

Monitoring Well: MERLIS-10
Total Depth:
Water Column:
One Well Volume:

Notes: Start - 1230
Stop - 1310
4 gallons purged.
Tubing set @ 45'

Field Parameters		Well Volumes and Corresponding Field Parameters Value									
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level	~~32.93~~										
pH											
Conductivity (uS)											
ORP (mV)											
DO (mg/L)											
Temperature (C)											
Turbidity (NTU)											

Monitoring Well: ~~MERLIS-11~~
Total Depth:
Water Column:
One Well Volume:

Notes:

Field Parameters		Well Volumes and Corresponding Field Parameters 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:
Total Depth:
Water Column:
One Well Volume:

Notes:

WELL DEVEOPMENT LOG

Project Name: 56-Merrimack

Date Started: 11-10-16

Project Number: 16.6126

Date Finished: 11-10-16

6.11 ft

13:15

Field Parameters	12:30	Well Volumes and Corresponding Field Parameters Value									
	Intitial	10	20	30	35.4	40.5	45.6	50.7	55.8	60.9	65.10
Water Level	27.46	27.47	27.47	27.47	24.47	24.47	24.47				
pH	6.06	6.13	6.17	6.12	6.03	6.04	6.01				
Conductivity (uS)	623	608	604	610	624	627	627				
ORP (mV)	206.3	216.2	226.2	230.1	237.7	239.5	241.2				
DO (mg/L)	6.62	4.74	4.84	5.04	5.48	5.65	5.71				
Temperature (C)	10.7	10.0	9.9	16.0	9.9	9.9	9.8				
Turbidity (NTU)	29.0	13.7	11.9	6.68	3.23	4.54	2.91				

Monitoring Well: MW-3 (LNG-)

Notes: Bladder Pump at 39'

Start at 12 30

Total Depth:

Water Column:

One Well Volume:

16 00 16 10 16 20

Field Parameters	15:30	Well Volumes and Corresponding Field Parameters Value									
	Intitial	10	20	30	35.4	40.5	45.6	50.7	55.8	60.9	65.10
Water Level	45.65	45.90	45.87	45.87	45.88	45.88					
pH	6.78	7.11	5.95	5.85	5.84	5.82					
Conductivity (uS)	1406	1366	1276	1272	1271	1270					
ORP (mV)	-2.6	-84.3	103.2	116.6	118.5	120.8					
DO (mg/L)	1.58	1.14	6.65	7.07	7.13	7.12					
Temperature (C)	10.8	10.4	10.4	10.3	10.3	10.3					
Turbidity (NTU)	17.9	37.5	15.1	7.55	6.96	6.87					

Monitoring Well: 45-2A

Notes: 10.3

Total Depth:

Water Column:

One Well Volume:

Field Parameters		Well Volumes and Corresponding Field Parameters 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:

Field Parameters		Well Volumes and Corresponding Field Parameters 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:

WELL DEVEOPMENT LOG

Project Name: 35 Merrimack

Date Started: 11-11-16

Project Number: 16.6126

Date Finished: 11-11-16

Field Parameters	10:10	Well Volumes and Corresponding Field Parameters Value									
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level	28.21	28.21	28.21	28.21	28.21	28.21					
pH	6.36	5.84	5.82	5.82	5.82	5.84					
Conductivity (uS)	276.7	265.0	241.5	237.2	242.3	236.5					
ORP (mV)	191.2	197.3	186.9	197.1	200.1	202.0					
DO (mg/L)	8.65	8.50	8.78	8.87	8.72	8.78					
Temperature (C)	10.0	9.9	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-2 Notes:
Total Depth:
Water Column:
One Well Volume:

Field Parameters		Well Volumes and Corresponding Field Parameters Value									
	Intitial	1	2	3	4	5	6	7	8	9	10
Water Level	32.93	32.96	32.96	32.96	32.96	32.96					
pH	6.70	6.27	5.77	5.73	5.72	5.71					
Conductivity (uS)	353.3	590	1237	1353	1363	1367					
ORP (mV)	199.6	205.2	215.3	222.9	225.8	228.2					
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)	265	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 Volumes and Corresponding Field Parameters 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:

Field Parameters		Well Volumes and Corresponding Field Parameters 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:

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: Sample #: COC#: 15588

Client: **C.T. Male Associates**

Project Name/#: SGPP - Merrimack | Site ID:

Project Manager: Kirk Moline | P.O. #: 16616

Sampler: Jonathan Dipert / Pat McHugh

Phone #: 518-786-7400 | Quote #: 214135

State where sample(s) were collected: NH

For Lab Use Only

SF#: 285327

SCR#: 196062

Preservation Codes

H = HCl T = Thiosulfate

N = HNO_3 B = NaOH

S = H_2SO_4 P = H_3PO_4

O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Matrix: Soil	Matrix: Sediment	Matrix: Water (Potable / Ground / NPDES / Surface)	Matrix: Other: Blank Water	Total # of Containers	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	NO2 (353.2)	NO3 (353.2)	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
SG 2 -APRB01 - 161017 16	10/17/16	1150	X					X	2							X	
SG 2 -APEB01 - 161017 16	10/17/16	1215	X					X	11	X	X	X	X	X	X	X	
SG 2 -APDUP - 18 - 161017 16	10/17/16	1545	X				X		11	X	X	X	X	X	X	X	
SG 2 -APDUP - 28 - 161018 16	10/18/16	800	X				X		11	X	X	X	X	X	X	X	
SG 2 -APFTB - 161018 16	10/18/16	855	X					X	1							X	
SG 2 -APLTB - 161018 16	10/18/16	—	X					X	3	X						X	
SG 2 -APDUP - 38 - 161018 16	10/18/16	1120	X				X		11	X	X	X	X	X	X	X	
SG 2 -APDUP - 48 - 161018 16	10/18/16	1525	X				X		11	X	X	X	X	X	X	X	
SG -AP - 16																	
SG -APFD01 - 161018 16	10/18/16	—	X					X	11	X	X	X	X	X	X	X	

Turnaround Time Requested (TAT) (please check): Standard [X] RUSH [ ]

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP) [✓] MA MCP [ ] TX TRRP - 13 [ ]

Type III (Reduced non-CLP) [ ] CT RCP [ ]

Type IV (CLP SOW) [ ] ASP Type A [ ]

Type VI (Raw Data Only) [ ] ASP Type B [ ]

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
PJM	10/18/16	1723			
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time

Airbill No.:

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt _____ °C

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Environmental Services Analysis Request/Chain of Custody

(1|2)

Acct. #: 37191 Group #: Sample #: COC#: 15594

Client:	C.T. Male Associates
Project Name/#:	SGPP - Merrimack
Site ID:	
Project Manager:	Kirk Moline
P.O. #:	16.6126
Sampler:	PAT McHUGH
Phone #:	907-378-8737
Quote #:	214135
State where sample(s) were collected:	NH

Matrix: Sediment ☐ / Soil ☐; Water: Ground ☒ Surface ☐ Potable ☐ NPDES ☐; Other: BLANK WATER

Analyses Requested / Preservation Codes: TCL VOAs (8260C) – H; Ca, Mg, Na, K (6010C) – N; ~~NO2 (353.2)~~ (PJM2); NO3 (353.2) +NO2 as N – S; Cl-, SO4- (300.0); Alkalinity (SM 2320B); PFCs (EPA 537 mod.)

For Lab Use Only: SF#: 285327 SCR#: 196068

Preservation Codes: H = HCl, T = Thiosulfate, N = HNO_3, B = NaOH, S = H_2SO_4, P = H_3PO_4, O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Water	Other:	Total # of Containers	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	NO2 (353.2)	NO3 (353.2)	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
SG2-APER01-161020 16 (PJM2)	10/20/16	850	X				X	2							X	See Merrimack List
SG2-AP07-28-161020 16 (PJM2)	↓	1045	X			X		11	X	X		X	X	X	X	
SG2-AP07-38-161020 16 (PJM2)	↓	1250	X			X		11	X	X		X	X	X	X	
SG2-APFTB-161020 16 (PJM2)	↓	1345	X				X	1							X	
SG2-APLTB-161020 16 (PJM2)	↓	—					X	3	X						X	
SG2-AP07-48-161020 16 (PJM2)	↓	1430	X			X		11	X	X		X	X	X	X	
SG2-AP07-58-161020 16 (PJM2)	↓	1625	X			X		9	X	X		X	X	X		
SG2-AP07-58-161021 16 (PJM2)	10/21/16	910	X			X		2							X	
SG2-APRB01-161021 16 (PJM2)	10/21/16	1405	X				X	2							X	
SG2-APRB02-161021 16 (PJM2)	10/21/16	1422	X				X	2							X	

Turnaround Time Requested (TAT) (please check): Standard ☐ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: k.moline@ctmale.com

Relinquished by:	Date	Time	Received by:	Date	Time
PJM2 1830	10/21/16	1830			

Data Package Options (please check if required)

- Type I (Validation/non-CLP) ☑
- Type III (Reduced non-CLP) ☐
- Type IV (CLP SOW) ☐
- Type VI (Raw Data Only) ☐
- MA MCP ☐
- CT RCP ☐
- ASP Type A ☐
- ASP Type B ☐
- TX TRRP - 13 ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Airbill No.:
Relinquished by Commercial Carrier:
UPS ______ FedEx ______ Other ______

Temperature upon receipt ______ °C

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Environmental Services Analysis Request/Chain of Custody

(2/2)

Acct. #: 37191 Group #: Sample #: COC#: 15594

Client: C.T. Male Associates		
Project Name/#: SGPP - Merrimack	Site ID:	
Project Manager: Kirk Moline	P.O. #: 16.6126	
Sampler: PAT McHUGH		
Phone #: 907-378-8737	Quote #: 214135	
State where sample(s) were collected: NH		

For Lab Use Only
SF#: 285327
SCR#: 196068

Preservation Codes
H = HCl T = Thiosulfate
N = HNO_3 B = NaOH
S = H_2SO_4 P = H_3PO_4
O = Other

Matrix: Sediment ☐ Ground ☒ Surface ☐; Soil ☐ Water: Potable ☐ NPDES ☐; Other:

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil/Sediment	Water	Other	Total # of Containers	TCL VOAs (8260C) (H)	Ca, Mg, Na, K (6010C) (N)	NO2 (353.2)	NO3 (353.2)+NO2 as N (S)	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
SG 2 -AP07 -68-161021 16 (PJM2)	10/21/16	1100	X			X	(PJM2)	11	X	X		X	X	X	X	See Merrimack List
SG 2 -AP07 -78-161021 16 (PJM2)	"	1730	X			X		11	X	X		X	X	X	X	
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 check): Standard ☐ RUSH ☐
(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)
Date results are needed:
E-mail address to send RUSH results: k.moline@ctmale.com

Data Package Options (please check if required)
Type I (Validation/non-CLP) ☑ MA MCP ☐ TX TRRP - 13 ☐
Type III (Reduced non-CLP) ☐ CT RCP ☐
Type IV (CLP SOW) ☐ ASP Type A ☐
Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
[signature] (struck)	10/13/16 (struck)	16:00 (struck)	PJM2		
PJM2 [signature]	10/21/16	1830			

Airbill No.:
Relinquished by Commercial Carrier:
UPS _______ FedEx _______ Other _______

Temperature upon receipt _______ °C

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: Sample #: **COC#: 15596**

Client: C.T. Male Associates	
Project Name/#: SGPP - Merrimack	Site ID:
Project Manager: Kirk Moline	P.O. #: 16.6126
Sampler: Jonathon Carter, Pat McHugh	
Phone #: 608-354-5253	Quote #: 214135
State where sample(s) were collected: NH	

Matrix: Sediment ☐; Ground ☑; Surface ☐; Potable ☐; NPDES ☐; Soil ☐; Water; Other: BLANK WATER

Analyses Requested / Preservation Codes: TCL VOAs (8260C) – H; Ca, Mg, Na, K (6010C) – N; ~~NO2 (353.2)~~; NO3 (353.2) NO3 as N – S; Cl-, SO4- (300.0); Alkalinity (SM 2320B); PFCs (EPA 537 mod.)

For Lab Use Only
SF#: 285327
SCR#: 196070

Preservation Codes
H = HCl T = Thiosulfate
$N = HNO_3$ B = NaOH
$S = H_2SO_4$ $P = H_3PO_4$
O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Water	Other	Total # of Containers	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	NO2 (353.2)	NO3 (353.2)	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
SG2 -AP07 -85-161024 ~~16~~ (PSM2)	10/24/16	1035	X			X		11	X	X		X	X	X	X	See Merrimack
SG2 -APLTB -161024 ~~16~~ JTC	10/24/16	—	X				X	3	X						X	QAPP List
SG2 -APFTB01 -161024 ~~16~~ (JTC)	10/24/16	1520	X				X	1							X	
SG2 -APEB01 -161024 ~~16~~ (JTC)	10/24/16	1430	X				X	2							X	
SG2 -AP05 -21-161024 ~~16~~ (JTC)	10/24/16	1630	X			X		11	X	X		X	X	X	X	
SG2 -AP05 -31-161024 16 (JTC)	10/24/16	1750	X			X		11	X	X		X	X	X	X	
SG2 -AP05 -41-161025 16 (JTC)	10/25/16	0825	X			X		33	X	X		X	X	X	X	MSMSD
SG2 -AP05 -51-161025 ~~16~~ JTC	10/25/16	1100	X			X		11	X	X		X	X	X	X	
SG2 -AP05 -61-161025 ~~16~~ JTC	10/25/16	1235	X			X		11	X	X		X	X	X	X	
SG2 -AP05 -69-161025 ~~16~~ (JTC)	10/25/16	1430	X			X		11	X	X		X	X	X	X	

Turnaround Time Requested (TAT) (please check): Standard ☐ RUSH ☐
(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)
Date results are needed:
E-mail address to send RUSH results: k.moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP)	☑	MA MCP	☐	TX TRRP - 13	☐
Type III (Reduced non-CLP)	☐	CT RCP	☐		
Type IV (CLP SOW)	☐	ASP Type A	☐		
Type VI (Raw Data Only)	☐	ASP Type B	☐		

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
~~[signature]~~	~~10/12/16~~	~~15:00~~ (PSM)			
[signature]	10/25/16	1700			

Airbill No.:
Relinquished by Commercial Carrier:
UPS _____ FedEx _____ Other _____

Temperature upon receipt _____ °C

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: Sample #: COC#: 15588

Client: C.T. Male Associates			
Project Name/#: SGPP - Merrimack	Site ID:		
Project Manager: Kirk Moline	P.O. #: 16.6126		
Sampler: Jonathan Carter, Jonathan Dippert			
Phone #: 608-354-5253, 518-786-7400	Quote #: 214135		
State where sample(s) were collected: NH			

For Lab Use Only
SF#: 285327
SCR#: 196062

Preservation Codes: H = HCl; T = Thiosulfate; N = HNO_3; B = NaOH; S = H_2SO_4; P = H_3PO_4; O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Matrix: Soil	Matrix: Water (Potable, Ground, NPDES, Surface)	Matrix: Other: BLANK WATER	Total # of Containers	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	NO2 (353.2)	NO3 (353.2) + NO2 as N	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
SG2 -APEB01- 161026 16 JTC	10/26/16	0815	X				X	2							X	Merrimack
SG2 -APQ6 -19- 161026 16 JTC	10/26/16	1010 1109 JTC	X			X		11	X	X		X	X	X	X	QAPP List
SG2 -APQ6 -29- 161026 16 JTC	10/26/16	1145	X			X		11	X	X		X	X	X	X	
SG2 -APQ6 -39- 161026 16 JTC	10/26/16	1325	X			X		11	X	X		X	X	X	X	
SG2 -APQ6 -49- 161026 16 JTC	10/26/16	1505	X			X		12	X	X		X	X	X	X	Metals Batch QC
SG2 -APQ6 -59- 161027 16 JTC	10/27/16	0905	X			X		11	X	X		X	X	X	X	
SG2 -APLTBQ1- 161027 16 JTC	10/27/16	—					X	3	X						X	
SG2 -APFTBQ1- 161027 16 JTC	10/27/16	1125	X				X	1							X	
SG2 -APEB01- APQ6-68- 161027 16 JTC	10/27/16	1135	X			X		11	X	X		X	X	X	X	
SG2 -APQ6 -743- 161027 16 JTC	10/27/16	1355	X			X		11	X	X		X	X	X	X	

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐
(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: k.moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP)	☒	MA MCP	☐	TX TRRP - 13	☐
Type III (Reduced non-CLP)	☐	CT RCP	☐		
Type IV (CLP SOW)	☐	ASP Type A	☐		
Type VI (Raw Data Only)	☐	ASP Type B	☐		

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
Angela A. Montgomery	10/26/16	14:56 JTC			
	10/27/16	1800			

Airbill No.:
Relinquished by Commercial Carrier:
UPS _____ FedEx _____ Other _____

Temperature upon receipt _____ °C

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: Sample #: COC#: 15591

Client: C.T. Male Associates			
Project Name/#: SGPP - Merrimack	Site ID:		
Project Manager: Kirk Moline	P.O. #: 16.6126		
Sampler: Jonathon Carter, Jonathan Dippert			
Phone #: 608-354-5253, 518-786-7400	Quote #: 214135		
State where sample(s) were collected: NH			

Matrix: Soil ☐ Sediment ☐ | Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: Blank Water | Total # of Containers

Analyses Requested — Preservation Codes

Sample Identification	Collection Date	Collection Time	Grab	Composite	Matrix	Other	Total # of Containers	H	N		S								Remarks
								TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	NO2 (353.2)	NO3 (353.2) + NO2 as N	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)					
SG2 -APEB01 - 161027 (30) 16	10/27/16	1620	X			X	11	X	X		X	X	X	X					Merrimack QAPP 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																			
SG -AP - 16																			

For Lab Use Only
SF#: 285327
SCR#: 196065

Preservation Codes
H = HCl T = Thiosulfate
N = HNO_3 B = NaOH
S = H_2SO_4 P = H_3PO_4
O = Other

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐
(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.moline@ctmale.com

Data Package Options (please check if required)
Type I (Validation/non-CLP) ☒ MA MCP ☐ TX TRRP - 13 ☐
Type III (Reduced non-CLP) ☐ CT RCP ☐
Type IV (CLP SOW) ☐ ASP Type A ☐
Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
SDel (30)	10/27/16	15:25			
	10/27/16	1800			

Airbill No.:
Relinquished by Commercial Carrier:
UPS _____ FedEx _____ Other _____

Temperature upon receipt _____ °C

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: Sample #: COC#: 15591

Client: **C.T. Male Associates**

Project Name/#: SGPP - Merrimack Site ID:

Project Manager: Kirk Moline P.O. #: 16.6126

Sampler: Jonathan Dippert

Phone #: 518-786-7400 Quote #: 214135

State where sample(s) were collected: NH

For Lab Use Only

SF#: 285327

SCR#: 196065

Preservation Codes

H = HCl T = Thiosulfate

N = HNO_3 B = NaOH

S = H_2SO_4 P = H_3PO_4

O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Matrix: Soil	Water	Other: Blank Water	Total # of Containers	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	NO2 (353.2)	NO3 (353.2) + NO_2 as N	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
SG2 -AP03 -25-161028 16(30)	10/28/16	0950	X			X		11	X	X		X	X	X	X	
SG2 -APLTB01 -161028 16(30)	10/28/16	—					X	3	X						X	
SG2 -APFTB01 -161028 16(30)	10/28/16	0945	X				X	1							X	
SG2 -AP03 -35-161028 16(30)	10/28/16	1220	X			X		11	X	X		X	X	X	X	
SG2 -APFD01 -161028 16(30)	10/28/16	—	X			X		11	X	X		X	X	X	X	
SG -AP - 16																
SG -AP - 16																
SG -AP - 16																
SG -AP - 16																
SG -AP - 16																

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☒ MA MCP ☐ TX TRRP - 13 ☐

Type III (Reduced non-CLP) ☐ CT RCP ☐

Type IV (CLP SOW) ☐ ASP Type A ☐

Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
	10/28/16	1520			
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time

Airbill No.:

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt _____ °C

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Environmental Services Analysis Request/Chain of Custody

Page 1 of 1

Acct. #: 37191 Group #: Sample #: COC#: 15589

Client: C.T. Male Associates

Project Name/#: SGPP - Merrimack Site ID:

Project Manager: Kirk Moline P.O. #: 16.6126

Sampler: Jonathan Dippert

Phone #: 518-786-7400 Quote #: 214135

State where sample(s) were collected: NH

Matrix: Sediment ☐ Ground ☒ Surface ☐ Potable ☐ NPDES ☐ Soil ☐ Water; Other: Blank Water

Preservation Codes: H (TCL VOAs), N (Ca, Mg, Na, K), S (NO3)

Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other	Total # of Containers	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	~~NO2 (353.2)~~	NO3 (353.2) + NO2 as N	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)						Remarks
SG2 -AP03 -45-161031 16	10/31/16	1010	X			X		11	X	X		X	X	X	X						
SG2 -APLTB01-161031 16	↓						X	3	X						X						
SG2 -APFTB01 - 161031 16	↓	1025	X				X	1							X						
SG2 -AP03 -55-161031 16	↓	1255	X			X		11	X	X		X	X	X	X						
SG2 -AP03 -65-161031 16	10/31/16	1610	X			X		11	X	X		X	X	X	X						
SG2 -APRB01 - 161101 16	11/1/16	1550	X				X	2							X						
SG2 -AP10 -20-161102 16	11/2/16	0955	X			X		11	X	X		X	X	X	X						
SG2 -AP10 -30-161102 16	11/2/16	1210	X			X		11	X	X		X	X	X	X						
SG2 -AP10 -40-161102 16	11/2/16	1435	X			X		12	X	X		X	X	X	X						Metals Both QC
SG -AP - 16																					

For Lab Use Only

SF#: 285327

SCR#: 196063

Preservation Codes

H = HCl	T = Thiosulfate
N = HNO_3	B = NaOH
S = H_2SO_4	P = H_3PO_4
O = Other	

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP)	☒	MA MCP	☐	TX TRRP - 13	☐
Type III (Reduced non-CLP)	☐	CT RCP	☐		
Type IV (CLP SOW)	☐	ASP Type A	☐		
Type VI (Raw Data Only)	☐	ASP Type B	☐		

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
~~[signature]~~	~~10/12/16~~	~~1504~~			
[signature]	11/2/16	1810			

Airbill No.:
Relinquished by Commercial Carrier:
UPS ______ FedEx ______ Other ______

Temperature upon receipt ______ °C

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # _____ Group # _____ Sample # _____

COC # 512769

Client Information

Client: CT Male Associates	Acct. #:
Project Name/#: SGPP- Merrimack	PWSID #:
Project Manager: Kirk Moline	P.O. #: 16.6126
Sampler: Jonathan Dipert	Quote #:
State where samples were collected: NH	For Compliance: Yes ☐ No ☐

Matrix: Soil ☐ Sediment ☐ Tissue ☐ Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ Other: Blank Water

Analysis Requested — Preservation Codes

For Lab Use Only

FSC: _____

SCR#: _____

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

Page 1 of 1

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	PFCs (EPA 537 mod)	Remarks
SG2-RB01-161102	11/2/16	1500	X		1	X	
SG2-RB02-161102		1502	X		3	X	MS/MSD
SG2-RB03-161102		1505	X		1	X	
SG2-RB04-161102		1507	X		1	X	
SG2-RB05-161102		1510	X		1	X	
SG2-RB06-161102	↓	1512	X		1	X	
SG2-RBFD01-161102	11/2/16	—	X		1	X	

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: K.Moline@ctmale.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
	11/2/16	1810			

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt _____ °C

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: Sample #: **COC#: 15589**

Client: **C.T. Male Associates**	
Project Name/#: SGPP - Merrimack	Site ID:
Project Manager: Kirk Moline	P.O. #: 16-6126
Sampler: Jonathan Dippert	
Phone #: 518-786-7400	Quote #: 214135
State where sample(s) were collected: NH	

Matrix: Sediment ☐ Ground ☒ Surface ☐ Soil ☐ Potable ☐ NPDES ☐ Water; Other: Blank Water

For Lab Use Only
SF#: 285327
SCR#: 196063

Preservation Codes
H = HCl T = Thiosulfate
N = HNO_3 B = NaOH
S = H_2SO_4 P = H_3PO_4
O = Other

Analyses Requested / Preservation Codes: TCL VOAs (8260C) – H; Ca, Mg, Na, K (6010C) – N; ~~NO2 (353.2)~~ (SD); NO3 (353.2) + NO_2 as N – S; Cl-, SO4- (300.0); Alkalinity (SM 2320B); PFCs (EPA 537 mod.)

Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other	Total # of Containers	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	NO2 (353.2)	NO3 (353.2) + NO_2 as N	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
SG2 -AP10 -50-161103 16(SD)	11/3/16	0755	X			X		11	X	X		X	X	X	X	
SG2 -AP10 -60-161103 16(SD)	↓	0955	X			X		11	X	X		X	X	X	X	
SG2 -~~AP~~ (SD) LTB01-161103 16(SD)	↓	—	X				X	3	X						X	
SG2 -~~AP~~ (SD) FTB01-161103 16(SD)	↓	1015	X				X	1							X	
SG2 -AP10 -70-161103 16(SD)	↓	1205	X			X		11	X	X		X	X	X	X	
SG2 -AP10 -80-161103 16(SD)	↓	1420	X			X		11	X	X		X	X	X	X	
SG2 -AP10 -84.5-161103 16(SD)	11/3/16	1635	X			X		11	X	X		X	X	X	X	
SG2 -AP09 -28-161104 16(SD)	11/4/16	0950	X			X		33	X	X		X	X	X	X	MS/MSD
SG2 -APRB01-161104 16(SD)	11/4/16	0740	X				X	2							X	
SG -AP - 16																

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐
(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)
Date results are needed:
E-mail address to send RUSH results: K.Moline@ctmale.com

Relinquished by:	Date	Time	Received by:	Date	Time
[signature]	11/4/16	1400			

Data Package Options (please check if required)
Type I (Validation/non-CLP) ☒ MA MCP ☐ TX TRRP - 13 ☐
Type III (Reduced non-CLP) ☐ CT RCP ☐
Type IV (CLP SOW) ☐ ASP Type A ☐
Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Airbill No.:
Relinquished by Commercial Carrier:
UPS ____ FedEx ____ Other ____

Temperature upon receipt ____ °C

Eurofins Lancaster Laboratories

Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: Sample #: COC#: 15594

Client:	C.T. Male Associates
Project Name/#:	SGPP - Merrimack
Site ID:	
Project Manager:	Kirk Moline
P.O. #:	16.6126
Sampler:	JD, JC, LC, RH
Phone #:	518-786-7400
Quote #:	214135
State where sample(s) were collected:	NH

For Lab Use Only: SF#: 286049 SCR#: 196069

Matrix: Sediment ☐ Soil ☐; Water: Ground ☒ Surface ☒ Potable ☐ NPDES ☐; Other: Blank Water

Preservation Codes: H = HCl, T = Thiosulfate, N = HNO_3, B = NaOH, S = H_2SO_4, P = H_3PO_4, O = Other

Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other	Total # of Containers	TCL VOAs (8260C) + TICs (H)	Ca, Mg, Na, K (6010C) (N)	Total NO2 / NO3 (353.2) (S)	Cl-, SO4- (300.0)	ALK + Carb/Bicarb (SM 2320 B)	PFCs (EPA 537 mod.)	Remarks
SG2-SWDnMerr-161107	11/7/16	1535	X			SW		11	X	X	X	X	X	X	
SG2-SWDnBab-161107	↓	1540	X			SW		11	X	X	X	X	X	X	
SG2-SWMidBab-161107	↓	1630	X			SW		11	X	X	X	X	X	X	
SG2-SWFD01-161107	11/7/16	—	X			SW		11	X	X	X	X	X	X	
SG2-SWUpBab-161108	11/8/16	0910	X			SW		33	X	X	X	X	X	X	MS/MSD
SG2-SWUpMerr-161108	11/8/16	1030	X			SW		11	X	X	X	X	X	X	
SG2-FTB01-161108	↓	0823					X	1						X	
SG2-LTB01-161108	↓	—					X	3	X					X	
SG2-MER45-8-161108	↓	1030	X			GW		11	X	X	X	X	X	X	
SG2-SWEB01-161108	11/8/16	1200	X				X	11	X	X	X	X	X	X	

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.Moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☒	MA MCP ☐	TX TRRP - 13 ☐
Type III (Reduced non-CLP) ☐	CT RCP ☐	
Type IV (CLP SOW) ☐	ASP Type A ☐	
Type VI (Raw Data Only) ☐	ASP Type B ☐	

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
Lorene Carr	11/8/16	1745			

Airbill No.:
Relinquished by Commercial Carrier:
UPS ______ FedEx ______ Other ______

Temperature upon receipt ______ °C

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: Sample #: COC#: 15594

Client: C.T. Male Associates	
Project Name/#: SGPP - Merrimack	Site ID:
Project Manager: Kirk Moline	P.O. #: 16.6126
Sampler: JD, JC, LC, RH	
Phone #: 518-786-7400	Quote #: 214135
State where sample(s) were collected: NH	

Matrix: Sediment ☐ Ground ☒ Surface ☐ Potable ☐ NPDES ☐ Soil ☐ Water Other: Blank Water

For Lab Use Only: SF#: 286049 SCR#: 196069

Preservation Codes: H = HCl, T = Thiosulfate, N = HNO_3, B = NaOH, S = H_2SO_4, P = H_3PO_4, O = Other

Analyses Requested / Preservation Codes:

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Water	Other:	Total # of Containers	TCL VOAs (8260C) + TICs (H)	Ca, Mg, Na, K (6010C) (N)	Total NO2 / NO3 (353.2) (S)	Cl-, SO4- (300.0)	ALK + Carb/Bicarb (SM 2320 B)	PFCs (EPA 537 mod.)	Remarks
SG2-RB01-161108	11/8/16	0815	X				X	1						X	
SG2-RB02-161108		0830	X				X	1						X	
SG2-MER45-4A-161108		1235	X			X		11	X	X	X	X	X	X	
SG2-PolandDistilled-161108		0810	X			X		1						X	Bottled Water for Dilution
SG2-MER45-6-161108		1415	X			X		11	X	X	X	X	X	X	
SG2-MER45-9-161108		1545	X			X		11	X	X	X	X	X	X	
SG2-MER45-7-161108		1620	X			X		11	X	X	X	X	X	X	

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP)	☑	MA MCP	☐	TX TRRP - 13	☐
Type III (Reduced non-CLP)	☐	CT RCP	☐		
Type IV (CLP SOW)	☐	ASP Type A	☐		
Type VI (Raw Data Only)	☐	ASP Type B	☐		

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
Lorene Cam[?]	11/8/16	1745			

Airbill No.:
Relinquished by Commercial Carrier:
UPS ______ FedEx ______ Other ______

Temperature upon receipt ______ °C

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: Sample #: COC#: 15594

Client:	C.T. Male Associates
Project Name/#:	SGPP - Merrimack
Site ID:	
Project Manager:	Kirk Moline
P.O. #:	16-6126
Sampler:	LC, JC, RH
Phone #:	518-786-7502
Quote #:	214135
State where sample(s) were collected:	NH

Matrix: Sediment, Ground, Surface, Soil, Water (Potable, NPDES), Other: Blank Water

Preservation Codes: H (TCL VOAs), N (Ca, Mg, Na, K), S (Total NO2/NO3)

For Lab Use Only: SF#: 286049; SCR#: 196069

Preservation Codes: H = HCl, T = Thiosulfate, N = HNO_3, B = NaOH, S = H_2SO_4, P = H_3PO_4, O = Other

Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other: Blank Water	Total # of Containers	TCL VOAs (8260C) + TICs	Ca, Mg, Na, K (6010C)	Total NO2 / NO3 (353.2)	Cl-, SO4- (300.0)	ALK + Carb/Bicarb (SM 2320 B)	PFCs (EPA 537 mod.)	Remarks
SG2-GWEB01-161109	11/9/16	0815	X				X	11	X	X	X	X	X	X	
SG2-FTB01-161109		0830	X				X	1						X	
SG2-MER45-3A-161109		1015	X			X		11	X	X	X	X	X	X	
SG2-MER45-5A-161109		1430	X			X		11	X	X	X	X	X	X	
SG2-MER45-28-161109		1550	X			X		11	X	X	X	X	X	X	
SG2-MER1MW-161109		1550	X			X		10	X	X	X	X	X	X	
SG2-LNGMW-4-161109		1630	X			X		11	X	X	X	X	X	X	
SG2-GWFD01-161109		—	X			X		11	X	X	X	X	X	X	
SG2-LTB01-161109		—					X	3	X					X	

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: k.moline@ctmale.com

Relinquished by:	Date	Time	Received by:	Date	Time
Lorene James	11/9/16	1845			

Data Package Options (please check if required)

- Type I (Validation/non-CLP) ☑
- Type III (Reduced non-CLP) ☐
- Type IV (CLP SOW) ☐
- Type VI (Raw Data Only) ☐
- MA MCP ☐
- CT RCP ☐
- ASP Type A ☐
- ASP Type B ☐
- TX TRRP - 13 ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Airbill No.:
Relinquished by Commercial Carrier:
UPS _______ FedEx _______ Other _______

Temperature upon receipt _______ °C

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: Sample #:

COC#: 15594

Client: C.T. Male Associates

Project Name/#: SGPP - Merrimack Site ID:

Project Manager: Kirk Moline P.O. #: 16.6126

Sampler: LC, JC, RH

Phone #: 518-786-7500 Quote #: 214135

State where sample(s) were collected: NH

For Lab Use Only

SF#: 286049

SCR#: 196069

Matrix: Soil ☐ Sediment ☐ | Water: Potable ☐ Ground ☒ NPDES ☐ Surface ☐ | Other: Blank Water

Analyses Requested / **Preservation Codes**

Preservation Codes: H = HCl; T = Thiosulfate; N = HNO_3; B = NaOH; S = H_2SO_4; P = H_3PO_4; O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Total # of Containers	H: TCL VOAs (8260C) + TICs	N: Ca, Mg, Na, K (6010C)	S: Total NO2 / NO3 (353.2)	Cl-, SO4- (300.0)	ALK + Carb/Bicarb (SM 2320 B)	PFCs (EPA 537 mod.)	Remarks
SG2-ETB01-161110	11/10/16	—			3	X					X	
SG2-RB01-161110		0800	X		1						X	
SG2-FTB01-161110		0805	X		1						X	
SG2-LNGMW-1-161110		1105	X		11	X	X	X	X	X	X	
SG2-MER45-10-161110		1310	X		34	X	X	X	X	X	X	
SG2-LNGMW-3-161110		1315	X		11	X	X	X	X	X	X	
SG2-MER45-2A-161110		1420	X		15	X	X	X	X	X	X	
SG2-RB02-161110		1440	X		1						X	
SG2-MER45-2A-161110	↓	1615	X		11	X	X	X	X	X	X	

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.moline@cmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☑ MA MCP ☐ TX TRRP - 13 ☐

Type III (Reduced non-CLP) ☐ CT RCP ☐

Type IV (CLP SOW) ☐ ASP Type A ☐

Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
Lenene Carver	11/10/16	1730			

Airbill No.:

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt _____ °C

Lancaster Laboratories

Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: Sample #: COC#: 15594

Client: C.T. Male Associates

Project Name/#: SGPP - Merrimack | Site ID:

Project Manager: Kirk Moline | P.O. #: 16.6126

Sampler: JC

Phone #: 518-786-7502 | Quote #: 214135

State where sample(s) were collected: NH

Matrix: Sediment; Ground; Surface; Soil; Water (Potable, NPDES); Other: Blank Water

Analyses Requested / Preservation Codes

For Lab Use Only: SF#: 286049 SCR#: 196069

Preservation Codes: H = HCl, T = Thiosulfate, N = HNO_3, B = NaOH, S = H_2SO_4, P = H_3PO_4, O = Other

Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other: Blank Water	Total # of Containers	TCL VOAs (8260C) + TICs (H)	Ca, Mg, Na, K (6010C) (N)	Total NO2 / NO3 (353.2) (S)	Cl-, SO4- (300.0)	ALK + Carb/Bicarb (SM 2320 B)	PFCs (EPA 537 mod.)		Remarks
SG2-LTB01-161111	11/11/16	—					X	3	X					X	11	
SG2-FTB01-161111	11/11/16	0815	X				X	1						X		
SG2-LNGMW-2-161111	11/11/16	1050	X			X		11	X	X	X	X	X	X		
SG2-MER45-11-161111	11/11/16	1205	X			X		11	X	X	X	X	X	X		

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.moline@ctmale.com

Data Package Options (please check if required)

- Type I (Validation/non-CLP) ☑ MA MCP ☐ TX TRRP - 13 ☐
- Type III (Reduced non-CLP) ☐ CT RCP ☐
- Type IV (CLP SOW) ☐ ASP Type A ☐
- Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
Lorene Camera	11/11/16	1400			

Airbill No.:
Relinquished by Commercial Carrier:
UPS ______ FedEx ______ Other ______

Temperature upon receipt ______ °C

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Environmental Services Analysis Request/Chain of Custody

Page 1 of 2

Acct #: 37191 Group #: Sample #: COC#: 15595

Client: C.T. Male Associates			
Project Name/#: SGPP - Merrimack	Site ID:		
Project Manager: Kirk Moline	P.O. #: 16.6126		
Sampler: Jim Dippert, Ryan Hubbard			
Phone #: 518-786-7400	Quote #: 214135		
State where sample(s) were collected: NH			

Matrix: Soil ☐ Sediment ☐ Water ☒ Ground ☐ Potable ☐ Surface ☐ NPDES ☐ Other: Blank Water

Analyses Requested / Preservation Codes

Sample Identification	Collection Date	Collection Time	Grab	Composite	Total # of Containers	TCL VOAs (8260C) H	Ca, Mg, Na, K (6010C) N	NO2 (353.2)	NO3 (353.2) + NO2 as N S	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
SG 2 -AP (1) - LTB01 - 16 1114	11/4/16	—			3	X						X	
SG 2 -AP (2) - MVD4 - 00 - 16 1114	11/4/16	1335	X		11	X	X		X	X	X	X	
SG 2 -AP (3) - MVD4 - 10 - 16 1114		1345	X		11	X	X		X	X	X	X	
SG 2 -AP (4) - MVD4 - 20 - 16 1114		1355	X		11	X	X		X	X	X	X	
SG 2 -AP (5) - MVD4 - 30 - 16 1114		1405	X		11	X	X		X	X	X	X	
SG 2 -AP (6) - FTB01 - 16 1114		1445	X		1							X	
SG 2 -AP (7) - MVD5 - 00 - 16 1114		1530	X		11	X	X		X	X	X	X	
SG 2 -AP (8) - MVD5 - 10 - 16 1114		1540	X		12	X	X		X	X	X	X	Metals QAQC
SG 2 -AP (9) - MVD5 - 20 - 16 1114	↓	1550	X		11	X	X		X	X	X	X	
SG 2 -AP (10) - MVD5 - 30 - 16 1114	11/4/16	1600	X		3	X	X		X	X	X	X	MS/MSD

For Lab Use Only

SF#: 285327

SCR#: 196069

Preservation Codes

H = HCl T = Thiosulfate

N = HNO_3 B = NaOH

S = H_2SO_4 P = H_3PO_4

O = Other

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.Moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☒ MA MCP ☐ TX TRRP - 13 ☐

Type III (Reduced non-CLP) ☐ CT RCP ☐

Type IV (CLP SOW) ☐ ASP Type A ☐

Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
[signature]	10/12/16	15:15			
[signature]	11/4/16	1730			

Airbill No.:

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt _____ °C

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: Sample #: COC#: 15595

Client: C.T. Male Associates			
Project Name/#: SGPP - Merrimack	Site ID:		
Project Manager: Kirk Moline	P.O. #: 16.6126		
Sampler: Jim Dippel, Ryan Hubbard			
Phone #: 518-786-7400	Quote #: 214135		
State where sample(s) were collected: NH			

Matrix: Soil ☐ Sediment ☐ Water ☒ Ground ☐ Potable ☐ Surface ☐ NPDES ☐ Other: ☐

Analyses Requested / Preservation Codes

Sample Identification	Collection Date	Collection Time	Grab	Composite	Total # of Containers	H: TCL VOAs (8260C)	N: Ca, Mg, Na, K (6010C)	NO2 (353.2)	S: NO3 (353.2) + NO2 as N	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)
SG2 -AP (60) - MWDF001 - 16 1114	11/14/16	—	X		11	X	X		X	X	X	X
SG -AP - 16												
SG -AP - 16												
SG -AP - 16												
SG -AP - 16												
SG -AP - 16												
SG -AP - 16												
SG -AP - 16												
SG -AP - 16												
SG -AP - 16												

Preservation Codes: H = HCl; T = Thiosulfate; N = HNO_3; B = NaOH; S = H_2SO_4; P = H_3PO_4; O = Other

For Lab Use Only: SF#: 285327; SCR#: 196069

Remarks

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☒ MA MCP ☐ TX TRRP - 13 ☐

Type III (Reduced non-CLP) ☐ CT RCP ☐

Type IV (CLP SOW) ☐ ASP Type A ☐

Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
	11/14/16	1720			
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time

Airbill No.:

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt _____ °C

Environmental Analysis Request/Chain of Custody

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Acct. # 37191 Group # _____ Sample # _____

COC # 512676

Client Information

Client: CT Male Associates	Acct. #:
Project Name/#: SUPP-Merrimack	PWSID #:
Project Manager: Kirk Moline	P.O. #: 16.6126
Sampler: STS (Stephen Johnson)	Quote #: 214135
State where samples were collected: NH	For Compliance: Yes ☐ No ☐

Matrix: Soil ☐ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☒ NPDES ☐ Surface ☐ | Other: DI PFC rinse

Analysis Requested / Preservation Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	TCL VOCs (8260C)	Ca, Mg, Na, K (6010C)	Total Metals Filtered	NO2+NO3 as N	Cl, SO4 (300.0)	Alkalinity (SM2320B)	PFCs (EPA 537 mod)	Remarks
SG2-AP01-45-46-170110	1/10/17	1103	X		11	X	X	X	X	X	X	X	Filter for metals
SG2-AP01-55-56-170110	1/10/17	1421	X		11	X	X	X	X	X	X	X	Filter for metals
SG2-AP01-65-66-170111	1/11/17	0904	X		12	X	X	X	X	X	X	X	Filter metals
SG2-AP01-75-76-170111	1/11/17	1151	X		12	X	X	X	X	X	X	X	Filter metals
SG2-AP01-79-80-170111	1/11/17	1522	X		12	X	X	X	X	X	X	X	Filter metals
SG2-AP02-24-25-170112	1/12/17	1037	X		11	X	X		X	X	X	X	
SG2-AP02-34-35-170112	1/12/17	1212	X		11	X	X		X	X	X	X	
SG2-AP02-44-45-170112	1/12/17	1348	X		11	X	X		X	X	X	X	
SG2-FB02-170112	1/12/17	1548	X		2							X	
SG2-AP02-54-55-170113	1/13/17	0915	X		11	X	X		X	X	X	X	

For Lab Use Only

FSC: _____

SCR#: _____

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ASAP

E-mail address: K.moline@ctmale.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
	1/13/17	17:08			

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS _____ FedEx X Other _____

Temperature upon receipt _____ °C

Environmental Analysis Request/Chain of Custody

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Acct. # 37191 Group # _____ Sample # _____

COC # 512677

Client Information

Client: CT Male Associates	Acct. #:
Project Name/#: SHPP-Merrimack	PWSID #:
Project Manager: Kirk Moline	P.O. #: 16.6126
Sampler: STS Stephen Johnson	Quote #: 214135
State where samples were collected: NH	For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Tissue ☐ Water: Potable ☐ Ground ☒ NPDES ☐ Surface ☐ Other: DI PFC Free

Analysis Requested

Preservation Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	Nickel, Filtered	NO_3+NO_2 as N	Cl, SO_4 (300.0)	Alkalinity (SM2320B)	PFCs (EPA 537mod)	Remarks
AFSTS													
SH2-AP02-64-65-170113	1/13/17	1244	X		12	X	X	X	X	X	X	X	Filter for metals, Filter for Lab
TRIP Blank PFCs	—	—			1							X	Filter for Lab
SH2-EBWP01-170113	1/13/17	1424	X		2							X	Filter for metals
SH2-EB PP01-170113	1/13/17	1417	X		2							X	Filter for metals
Trip Blank VOCs	—	—			2	X							

For Lab Use Only

FSC: _____

SCR#: _____

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ASAP

E-mail address: Kmoline@ctmale.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	1/13/17	1708			

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS _____ FedEx X Other _____

Temperature upon receipt _____ °C

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: Sample #: **COC#: 16303**

Client: **C.T. Male Associates**			
Project Name/#: SGPP - Merrimack	Site ID:		
Project Manager: Kirk Moline	P.O. #:		
Sampler: Stephen Johnson SJ			
Phone #: 7155291670	Quote #: 214135		
State where sample(s) were collected: NH			

Matrix: Sediment ☐ / Soil ☒; Water: Ground ☒, Surface ☐, Potable ☐, NPDES ☐; Other:

For Lab Use Only
SF#: 286377
SCR#: 200280

Preservation Codes
H = HCl T = Thiosulfate
N = HNO_3 B = NaOH
S = H_2SO_4 P = H_3PO_4
O = Other

Analyses Requested / **Preservation Codes**: H (TCL VOAs), N (Ca, Mg, Na, K), S (Total NO2 / NO3)

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Water	Other:	Total # of Containers	TCL VOAs (8260C) + TICs	Ca, Mg, Na, K (6010C)	Total NO2 / NO3 (353.2)	Cl-, SO4- (300.0)	ALK + Carb/Bicarb (SM 2320 B)	16 PFCs (EPA 537 mod.)	TCL 22 VOCs	PFCs	Moisture	TOC			Remarks
Sh2-AP02-3-5-170116	1/16/17	1145	X		X			5							X	X	X	X			
Sh2-AP02-7-8-170116	1/16/17	0955	X		X			5							X	X	X	X			
Sh2-AP02-12-13-170116	1/16/17	1033	X		X			5							X	X	X	X			
Sh2-AP02-17-18-170116	1/16/17	1057	X		X			5							X	X	X	X			
Sh2-AP02-20-21.5-170116	1/16/17	1117	X		X			5							X	X	X	X			
Sh2-AP03-68-69-170116	1/16/17	1422	X			X		12	X	X	X	X	X	X							Filter metals
Sh2-AP04-27-28-170116	1/16/17	1553	X			X		11	X	X	X	X	X	X							
Sh2-AP04-34-35-170117	1/17/17	0917	X			X		12	X	X	X	X	X	X							Filter metals
Sh2-AP04-44-45-170117	1/17/17	1046	X			X	21	[illegible]	X	X	X	X	X	X							MS/MSD
Sh2-FD01-170117 AP04-34-35	1/17/17	—	X			X		12	X	X	X	X	X	X							Filter metals

Turnaround Time Requested (TAT) (please check): Standard ☐ RUSH ☒
(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)
Date results are needed:
E-mail address to send RUSH results:

Relinquished by:	Date	Time	Received by:	Date	Time
Steph Jo	1-19-17	16:42			

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☑ MA MCP ☐ TX TRRP - 13 ☐
Type III (Reduced non-CLP) ☐ CT RCP ☐
Type IV (CLP SOW) ☐ ASP Type A ☐
Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Airbill No.:
Relinquished by Commercial Carrier:
UPS ____ FedEx X Other ____

Temperature upon receipt ____ °C

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: Sample #:

COC#: 16303

Client: C.T. Male Associates	
Project Name/#: SGPP - Merrimack	Site ID:
Project Manager: Kirk Moline	P.O. #:
Sampler: Stephen Johnson STJ	
Phone #: 715 529 1670	Quote #: 214135
State where sample(s) were collected: NH	

Matrix: Sediment ☐; Water: Ground ☒, Surface ☐, Potable ☐, NPDES ☐; Soil ☐; Other: PFC Free DI water

Analyses Requested / Preservation Codes: H: TCL VOAs (8260C) + TICs; N: Ca, Mg, Na, K (6010C); S: Total NO2 / NO3 (353.2); Cl-, SO4- (300.0); ALK + Carb/Bicarb (SM 2320 B); 16 PFCs (EPA 537 mod.); TCL 2.2 VOCs; PFCs; Moisture; TOC

For Lab Use Only

SF#: 286377

SCR#: 200280

Preservation Codes: H = HCl, T = Thiosulfate, N = HNO_3, B = NaOH, S = H_2SO_4, P = H_3PO_4, O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Water	Other	Total # of Containers	TCL VOAs (8260C) + TICs (H)	Ca, Mg, Na, K (6010C) (N)	Total NO2 / NO3 (353.2) (S)	Cl-, SO4- (300.0)	ALK + Carb/Bicarb (SM 2320 B)	16 PFCs (EPA 537 mod.)	TCL 2.2 VOCs	PFCs	Moisture	TOC			Remarks
Sh2-AP04-54-55-170117	1/17/17	1206	X			X		12	X	X	X	X	X	X							Filter metals
Sh2-AP04-64-65-170117	1/17/17	1429	X			X		11	X	X	X	X	X	X							
Sh2-AP04-74-75-170118	1/18/17	0843	X			X		11	X	X	X	X	X	X							
Sh2-AP04-83.5-84.5-170118	1/18/17	1057	X			X		12	X	X	X	X	X	X							Filter Metals
Sh2-FB03-170118	1/18/17	1120	X				2							X							
Sh2-AP05-7-8-170118	1/18/17	1300	X		X			5							X	X	X	X			
Sh2-AP05-11.5-14.5-170118	1/18/17	1320	X		X			5							X	X	X	X			
Sh2-AP05-2-3-170118	1/18/17	1351	X		X			5							X	X	X	X			
Sh2-AP06-2.5-4.5-170118	1/18/17	1522	X		X			5							X	X	X	X			
Sh2-FD02-170118 AP05-11.5-14.5	1/18/17	—	X		X			5							X	X	X	X			

Turnaround Time Requested (TAT) (please check): Standard ☐ RUSH ☒

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results:

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☑ MA MCP ☐ TX TRRP - 13 ☐

Type III (Reduced non-CLP) ☐ CT RCP ☐

Type IV (CLP SOW) ☐ ASP Type A ☐

Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
[signature]	1-19-17	16:42			

Airbill No.:

Relinquished by Commercial Carrier:

UPS ______ FedEx X Other ______

Temperature upon receipt ______ °C

Environmental Analysis Request/Chain of Custody

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Acct. # 37191 Group # _____ Sample # _____

COC # 512678

Client Information

Client: CT Mak Associates	Acct. #:
Project Name/#: SWPP - Merrimack	PWSID #:
Project Manager: Kirk Moline	P.O. #:
Sampler: Stephen Johnson SJ	Quote #:
State where samples were collected: NH	For Compliance: Yes ☐ No ☐

Matrix: ☐ Tissue ☐ Ground ☐ Surface ☐ Sediment ☐ Potable ☐ NPDES ☒ Soil ☐ Water Other: PFC Free DI Water

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	TCL VOAs (8260) + TICs	Ca, Mg, Na, K (6010C)	Total NO2 NO3 as N (353.2)	Cl, SO4 (300.0)	Alkalinity (SM 2320B)	16 PFCs (EPA 537 mod)	TCL 2,2 VOCs	8 PFCs	Moisture	TOC	Remarks
SHZ-MP06-6-8-170118	1/18/17	1548	X		13							X	X	X	X	MS MSD
VOC Trip Blank	—	—	X		2	X										
PFC Trip Blank	—	—	X		1						X					

Analysis Requested

Preservation Codes

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

For Lab Use Only
FSC: _____
SCR#: _____

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
Stephen Johnson	1-19-17	16:42			
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time

EDD Required? Yes No

If yes, format: Equis

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS _____ FedEx X Other _____

Temperature upon receipt _____ °C

Environmental Services Analysis Request/Chain of Custody

eurofins | Lancaster Laboratories

Acct. #: 37191 Group #: Sample #: COC#: 16303

Client: C.T. Male Associates | Site ID:

Project Name/#: SGPP - Merrimack | P.O. #:

Project Manager: Kirk Moline

Sampler: Stephen Johnson SJJ

Phone #: 715-529-1670 | Quote #: 214135

State where sample(s) were collected: NH

For Lab Use Only
SF#: 286377
SCR#: 200280

Preservation Codes
H = HCl T = Thiosulfate
N = HNO_3 B = NaOH
S = H_2SO_4 P = H_3PO_4
O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Matrix: Soil	Matrix: Water (Sediment / Ground / Potable / Surface / NPDES)	Matrix: Other: PFC Free DI water	Total # of Containers	Analyses Requested: TCL VOAs (8260C) + TICs (H)	Ca, Mg, Na, K (6010C) (N)	Total NO2 / NO3 (353.2) (S)	Cl-, SO4- (300.0)	ALK + Carb/Bicarb (SM 2320 B)	16 PFCs (EPA 537 mod.)	TCL 2,2 VOCs	PFCs	Moisture	TOC	Remarks
SH2-AP08-57-58-170119	1/19/17	1004	X			X		21	X	X	X	X	X	X					MS/MSD
SH2-AP08-67-68-170119	1/19/17	1208	X			X		11	X	X	X	X	X	X					
SH2-AP08-77-78-170119	1/19/17	1433	X			X		11	X	X	X	X	X	X					
SH2-FB03-170119 AP08-67-68	1/19/17	—	X			X		11	X	X	X	X	X	X					
SH2-AP08-81-82-170120	1/20/17	0918	X			X		12	X	X	X	X	X	X					F: Hex Metals
SH2-AP09-25-3-170120	1/20/17	1118	X		X			5							X	X	X	X	
SH2-AP09-6-8-170120	1/20/17	1129	X		X			5							X	X	X	X	
SH2-AP09-11-12-170120	1/20/17	1224	X			X		12	X	X	X	X	X	X					F: Hex Metals
SH2-FB03-170120	1/20/17	1420	X				X							X					
PFC Trip blank	—	—	X				X							X					

Turnaround Time Requested (TAT) (please check): Standard ☐ RUSH ☒
(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results:

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☑ MA MCP ☐ TX TRRP - 13 ☐
Type III (Reduced non-CLP) ☐ CT RCP ☐
Type IV (CLP SOW) ☐ ASP Type A ☐
Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
Stephen Johnson	1/20/17	1728			
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time

Airbill No.:
Relinquished by Commercial Carrier:
UPS _____ FedEx _____ Other _____

Temperature upon receipt _____ °C

Environmental Analysis Request/Chain of Custody

eurofins

Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 37191 Group # _____ Sample # _____

COC # 518835

Client Information

Client: CT Male Associates	Acct. #:
Project Name/#: Shaff-Merrimack	PWSID #:
Project Manager: Kirk Molnar	P.O. #:
Sampler: Stephen Johnson SPS	Quote #: 2/4/35
State where samples were collected: NH	For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Tissue ☐ Water ☐ Potable ☐ Ground ☐ NPDES ☐ Surface ☐ Other: DI water

Analysis Requested

Preservation Codes

For Lab Use Only

FSC: _____

SCR#: _____

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	TCL VOAs (624)
VOC Trip Blank	—	—			2	X

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	1/24/17	1728			

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt _____ °C

Environmental Analysis Request/Chain of Custody

eurofins | Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 37191 Group # _____ Sample # _____

COC # 518836

Client Information

Client: CT Male Associates	Acct. #:
Project Name/#: SHPP - Merrimack	PWSID #:
Project Manager: Kirk Moline	P.O. #:
Sampler: Stephen Johnson SJ	Quote #: 214135
State where samples were collected: NH	For Compliance: Yes ☐ No ☐

Matrix: Soil ☐ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground X Surface ☐ NPDES ☐ | Other: PFC Free Water

For Lab Use Only
FSC: _____
SCR#: _____

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	TCL VOAs (8260C)+TICs	Ca, Mg, Na, K (6010C)	Total NO_2/NO_3 (353.2)	Cl^-, SO_4^{2-} (300.0)	Alk + Carb Bicarb (SM2320B)	16 PFAS (EPA 537 mod)
SH2-AP09-17-18-170123	1/23/17	0842	X		11	X	X	X	X	X	X
SH2-AP09-35-36-170123	1/23/17	1057	X		11	X	X	X	X	X	X
SH2-AP09-47-48-170123	1/23/17	1242	X		11	X	X	X	X	X	X
SH2-AP09-56-57-170123	1/23/17	1419	X		11	X	X	X	X	X	X
SH2-AP09-65-66-170123	1/23/17	1611	X		11	X	X	X	X	X	X
SH2-FB05-170124	1/24/17	0822	X		2						X
SH2-EBDW-170124	1/24/17	0825	X		2						X
SH2-EBSW-170124	1/24/17	0827	X		2						X
SH2-EBWP02-170124	1/24/17	0842	X		2						X
SH2-EBPP02-170124	1/24/17	0853	X		2						X

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
	1/25/17	1325			

EDD Required? Yes No
If yes, format: Equis

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS _____ FedEx X Other _____

Temperature upon receipt _____ °C

Environmental Analysis Request/Chain of Custody

eurofins | Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 37191 Group # _____ Sample # _____

COC # 518925

Client Information

Client: CT Male Associates	Acct. #:
Project Name/#: SCPA-Merrimack	PWSID #:
Project Manager: Kirk Molinaro	P.O. #:
Sampler: Stephen Johnson SJS	Quote #: 214135
State where samples were collected: NH	For Compliance: Yes ☐ No ☐

Matrix: Soil ☐ Sediment ☐ Tissue ☐ Water ☒ Potable ☐ Ground ☐ NPDES ☐ Surface ☐ Other: PFCs + VOCs only

For Lab Use Only

FSC: _____

SCR#: _____

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	TCL VOAs (8260C) + TICs	Ca, Mg, Na, K (6010C)	Total NO_2/NO_3 (353.2)	Cl^-, SO_4^{2-} (300.0)	HW + Cam/Bcam (DW 3100)	16 PFCs (EPA 537 mod)	Remarks
MW-SK2-APR09-20-71-170125	1/25/17	1038	X		12	X	X	X	X	X	X	F: Hg, Mn, Fe
Trip Blank PFCs	—	—	X		1						X	
Trip Blank VOCs	—	—	X		2	X						

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: _____

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	1/25/17	1325			

EDD Required? Yes No

If yes, format: Equis

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS _____ FedEx X Other _____

Temperature upon receipt _____ °C

eurofins | Lancaster Laboratories

Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: Sample #: **COC#: 16237**

Client: **C.T. Male Associates**	
Project Name/#: SGPP - Merrimack	Site ID:
Project Manager: Kirk Moline	P.O. #: 16.6126
Sampler: Stephen Johnson STJ	
Phone #: 715 529 1670	Quote #: 214135
State where sample(s) were collected: NH	

Matrix: ☐ Sediment ☑ Soil; Water: ☐ Ground ☐ Surface ☐ Potable ☐ NPDES; Other:

Analyses Requested / **Preservation Codes**

For Lab Use Only
SF#: 266803
SCR#: 199966

Preservation Codes
H = HCl T = Thiosulfate
N = HNO_3 B = NaOH
S = H_2SO_4 P = H_3PO_4
O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Water	Other:	Total # of Containers	TOC (5310 B)	Moisture (2540 G)	PFCs (EPA 537 mod.)	Grain Size (ASTM D422)								Remarks
SG2-AP02-25.7-26.5-170116	1/16/17	—	X		X			1				X								
SG2-AP02-27-28.4-170116	1/16/17	—	X		X			1				X								
SG2-AP05-SWS-27.6-29.8-170118	1/18/17	—	~~X~~ STJ	X	X			1				X								
SG2-AP09-FS-14.1-17-170120	1/20/17	—		X				1				X								
SG2-AP09-34-35-170123	1/23/17	—	X		X			1				X								

Turnaround Time Requested (TAT) (please check): Standard ☐ RUSH ☒
(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)
Date results are needed:
E-mail address to send RUSH results: kmoline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP)	☑	MA MCP	☐	TX TRRP - 13	☐
Type III (Reduced non-CLP)	☐	CT RCP	☐		
Type IV (CLP SOW)	☐	ASP Type A	☐		
Type VI (Raw Data Only)	☐	ASP Type B	☐		

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
S Deke [signature]	1/6/17	10:35	Stephen Johnson [signature]	1/12/17	15:05
Stephen Johnson [signature]	1/25/17	13:25			

Airbill No.:
Relinquished by Commercial Carrier:
UPS ______ FedEx X Other ______

Temperature upon receipt ______ °C

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) NH 1603534608-001 SC PPW 11/29/2016 Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: NHD982746778
2. Page 1 of: 1
3. Emergency Response Phone: (800) 483-3718
4. Manifest Tracking Number: 009903118 FLE

GENERATOR

5. Generator's Name and Mailing Address
Saint Gobain
701 Daniel Webster Highway
Merrimack, NH 03054
Generator's Phone: (603) 420-9000 ATTN: Kim Weeks

Generator's Site Address (if different than mailing address): SAME

6. Transporter 1 Company Name: Clean Harbors Environmental Service, Inc.
U.S. EPA ID Number: MAD039322250

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Clean Harbors Environmental Service, Inc.
37 Rumery Road
South Portland, ME 04106
Facility's Phone: (207) 772-2201
U.S. EPA ID Number: MED980672182

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. NON HAZARDOUS, NON D O T REGULATED LIQUID, (WATER)	01	TT	7489	G	
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1. CH1240296B

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Justin A. Masters (P. T. for) Signature: Justin A. Masters Month: 12 Day: 06 Year: 16

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Justin A. Masters Signature: Justin A. Masters Month: 12 Day: 06 Year: 16

Transporter 2 Printed/Typed Name: Signature: Month: Day: Year:

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H135			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: Signature: Month: Day: Year:

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete. **GENERATOR'S INITIAL COPY**

TR 2130

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) NH 1603534608-001 SC PPW 11/29/2016 Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	NHD982746778	1	(800) 483-3718	009903119 FLE

GENERATOR

5. Generator's Name and Mailing Address
Saint Gobain
701 Daniel Webster Highway
Merrimack, NH 03054
Generator's Phone: (603)420-9000 ATTN:Kim Weeks

Generator's Site Address (if different than mailing address)
SAME

6. Transporter 1 Company Name
Clean Harbors Environmental Service, Inc

U.S. EPA ID Number
MAD039322250

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address
Clean Harbors Environmental Service, Inc.
37 Rumery Road
South Portland, ME 04106
Facility's Phone: (207)772-2291

U.S. EPA ID Number
MED986672182

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. NON HAZARDOUS, NON D.O.T. REGULATED LIQUID, (WATER)		TT	07542 G		
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1.CH1340366

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: MIKE DEMONTMO (AS AGENT FOR) Signature: [signature] Month: 12 Day: 06 Year: 16

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: DALE R FULLER Signature: Dale R Fuller Month: 12 Day: 06 Year: 16

Transporter 2 Printed/Typed Name: Signature: Month: Day: Year:

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H135			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: Signature: Month: Day: Year:

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping

GENERATOR'S INITIAL COPY

TLL 2131

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) NH 1603534608-001 SC PPW 11/29/2016

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
NHD982746778	1	(800) 483-3718	009903121 FLE

GENERATOR

5. Generator's Name and Mailing Address
Saint Gobain
701 Daniel Webster Highway
Merrimack, NH 03054
Generator's Phone: (603)420-9000 ATTN:Kim Weeks

Generator's Site Address (if different than mailing address)
SAME

6. Transporter 1 Company Name
Clean Harbors Environmental Service, Inc.

U.S. EPA ID Number
MAD039322250

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address
Clean Harbors Environmental Service, Inc.
37 Rumery Road
South Portland, ME 04106
Facility's Phone: (207)772-2201

U.S. EPA ID Number
MED980672182

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. NON HAZARDOUS, NON D.O.T. REGULATED LIQUID, (WATER)	001	TT	B003	G	
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1. CH1340906B

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: AGENT FOR BOB WEST
Signature: AGENT FOR Bob West
Month: 12 Day: 06 Year: 16

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: BOB WEST
Signature: Bob West
Month: 12 Day: 06 Year: 16

Transporter 2 Printed/Typed Name
Signature
Month Day Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H135			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name
Signature
Month Day Year

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

GENERATOR'S INITIAL COPY

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) NH 1603534608-001 SC PPW 11/29/2016 Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
NHD982746778	1	(800) 483-3718	009903123 FLE

GENERATOR

5. Generator's Name and Mailing Address
Saint Gobain
701 Daniel Webster Highway
Merrimack, NH 03054
Generator's Phone: (603) 420-5000 ATTN: Kim Weeks

Generator's Site Address (if different than mailing address)
SAME

6. Transporter 1 Company Name: Clean Harbors Environmental Service, Inc. — U.S. EPA ID Number: MAD039322250

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address
Clean Harbors Environmental Service, Inc.
37 Rumery Road
South Portland, ME 04106
Facility's Phone: (207) 772-2204
U.S. EPA ID Number: MED980672182

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. NON HAZARDOUS, NON D.O.T. REGULATED LIQUID, (WATER)	001	TT	4450	G	
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1.CH1340206B

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Agent for Bob West — Signature: Agent for Bob Juliet — Month: 12 — Day: 07 — Year: 16

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Bob West — Signature: Bob Juliet — Month: 12 — Day: 07 — Year: 16

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month — Day — Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H135			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name — Signature — Month — Day — Year

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping

GENERATOR'S INITIAL COPY

Appendix E

Laboratory Analytical Reports

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2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

Client Sample Description	Lancaster Labs (LL) #
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

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

Sample #s: 8650982, 8650983, 8650985, 8650989, 8650990

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.

Sample #s: 8650988

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

Batch #: 163010635003 (Sample number(s): 8650983-8650985, 8650988-8650990 UNSPK: P643058 BKG: P643058)

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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

S3901 SDG#: MMK01-01RB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	3	B	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-ethyl perfluorooctanesulfonamidoacetic 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.

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	16301011	11/18/2016 16:15	Jason W Knight	1

*=This limit was used in the evaluation of the final result

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

S3901 SDG#: MMK01-01RB

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	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	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	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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	U	0.5	1	1

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 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	3	B	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 perfluorooctanesulfonamidoacetic 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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

S3902 SDG#: MMK01-02EB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Metals	**SW-846 6010C**		**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 Chemistry	**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 Time	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) - U4	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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

S3902 SDG#: MMK01-02EB

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 04:11	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16302005201A	10/28/2016 16:56	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016 16:56	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016 16:56	Brandon P Costik	1

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

S3902

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8650983
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16oct27a.b/yc27s07.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

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
4.					
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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	2	J	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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 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 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	210	B	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	B	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	14	B	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-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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 6010C**		**mg/l**	**mg/l**	**mg/l**	
01750	Calcium	7440-70-2	15.7	0.0382	0.400	1
01757	Magnesium	7439-95-4	3.03	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 Chemistry	**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 Time	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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

S3903 SDG#: MMK01-03

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 04:32	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
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: 8650984
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16oct27a.b/yc27s18.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.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
4.					
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30.					

page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 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 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	71	B	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	B	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	10	B	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-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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 6010C**		**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 Chemistry	**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 Time	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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

S3904 SDG#: MMK01-04

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 04:34	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

S3904

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/yc27s19.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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

S3905 SDG#: MMK01-05TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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-ethyl perfluorooctanesulfonamidoacetic 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.

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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

S3905 SDG#: MMK01-05TB

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	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

*=This limit was used in the evaluation of the final result

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

S3906 SDG#: MMK01-06TB

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	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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

S3906 SDG#: MMK01-06TB

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	U	0.5	1	1

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 modified**		**ng/l**		**ng/l**	**ng/l**	
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 perfluorooctanesulfonamidoacetic 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 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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

S3906 SDG#: MMK01-06TB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution 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 Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED 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/16oct27a.b/yc27s08.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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	47	B	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	B	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-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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 6010C**		**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 Chemistry	**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 Time	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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

S3907 SDG#: MMK01-07

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 04:36	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16302005201A	10/28/2016 17:29	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016 17:29	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016 17:29	Brandon P Costik	1

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

S3907

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8650988
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16oct27a.b/yc27s20.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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	U	0.5	1	1

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 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	46	B	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	B	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-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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 6010C**		**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 Chemistry	**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 Time	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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 04:38	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16302005201A	10/28/2016 18:04	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016 18:04	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016 18:04	Brandon P Costik	1

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

S3908

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8650989
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16oct27a.b/yc27s21.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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

S3909 SDG#: MMK01-09FD

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	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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

S3909 SDG#: MMK01-09FD

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 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 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	71	B	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	B	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-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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

S3909 SDG#: MMK01-09FD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
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	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 Chemistry	**EPA 300.0**		**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 353.2		**mg/l**	**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	4.4	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.	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 Time	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

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

Submitted: 10/19/2016 10:00
Reported: 12/29/2016 10:11

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

S3909 SDG#: MMK01-09FD

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 04:39	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16302005201A	10/28/2016 17:22	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016 17:22	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16302005201A	10/28/2016 17:22	Brandon P Costik	1

*=This limit was used in the evaluation of the final result

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 12/29/2016 10:11

Group Number: 1722616

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): 8650983-8650985,8650987-8650990			
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	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.
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.

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	Sample number(s): 8650982-8650990			
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	Sample number(s): 8650983-8650985,8650988-8650990			
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: 16294972171B	Sample number(s): 8650983-8650985,8650988-8650990			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
Batch number: 16301118102A	Sample number(s): 8650983-8650985,8650988-8650990			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
	mg/l as CaCO3		mg/l as CaCO3	mg/l as CaCO3
Batch number: 16302005201A	Sample number(s): 8650983-8650985,8650988-8650990			
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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 12/29/2016 10:11

Group Number: 1722616

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 number(s): 8650983-8650985,8650987-8650990								
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.
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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 12/29/2016 10:11

Group Number: 1722616

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					
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					
Batch number: 16301011	Sample number(s): 8650982-8650990								
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 number(s): 8650983-8650985,8650988-8650990								
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 number(s): 8650983-8650985,8650988-8650990								
Chloride	3.00	2.94			98		90-110		
Sulfate	7.50	7.30			97		90-110		
Batch number: 16301118102A	Sample number(s): 8650983-8650985,8650988-8650990								
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	Sample number(s): 8650983-8650985,8650988-8650990								
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.
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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 12/29/2016 10:11

Group Number: 1722616

MS/MSD

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
	ng/l		ng/l	ng/l	ng/l	ng/l					
Batch number: 16301011	Sample number(s): 8650982-8650990 UNSPK: 8650988										
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	Sample number(s): 8650983-8650985,8650988-8650990 UNSPK: P643058										
Calcium	50.25		4.00	55.34	4.00	56.07	127 (2)	145 (2)	75-125	1	20
Magnesium	10.92		2.00	12.88	2.00	13.29	98 (2)	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: 16294972171B	Sample number(s): 8650983-8650985,8650988-8650990 UNSPK: 8650984										
Chloride	84.47		80	169.53			106		90-110		
Sulfate	14.07		50	63.15			98		90-110		
Batch number: 16301118102A	Sample number(s): 8650983-8650985,8650988-8650990 UNSPK: P653675										
Total Nitrite/Nitrate Nitrogen	2.45		1.00	3.39			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: 16302005201A	Sample number(s): 8650983-8650985,8650988-8650990 UNSPK: P650711										
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.
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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 12/29/2016 10:11

Group Number: 1722616

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): 8650983-8650985,8650988-8650990 BKG: P643058			
Calcium	50.25	50.65	1	20
Magnesium	10.92	10.99	1	20
Potassium	11.53	11.67	1	20
Sodium	216.88	216.58	0	20
	mg/l	mg/l		
Batch number: 16294972171B	Sample number(s): 8650983-8650985,8650988-8650990 BKG: 8650984			
Chloride	84.47	84.96	1	15
Sulfate	14.07	14.01	0 (1)	15
Batch number: 16301118102A	Sample number(s): 8650983-8650985,8650988-8650990 BKG: P653675			
Total Nitrite/Nitrate Nitrogen	2.45	2.47	1	2
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 16302005201A	Sample number(s): 8650983-8650985,8650988-8650990 BKG: P650711			
Total Alkalinity to pH 4.5	1.7 U	1.7 U	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: 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.
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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 12/29/2016 10:11

Group Number: 1722616

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*
Limits:	70-130	70-130	70-130	70-130	70-130	70-130

	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
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(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.

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.
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.

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: 1722616 Sample #: 8650982-90 **COC#: 15588**

Client:	**C.T. Male Associates**
Project Name/#: SGPP - Merrimack	Site ID:
Project Manager: Kirk Moline	P.O. #: 16.6126
Sampler: Jonathan Dippert / Pat McHugh	
Phone #: 378-786-7400	Quote #: 214135
State where sample(s) were collected: NH	

Matrix: Sediment ☐ | Ground ☒ | Surface ☐ | Potable ☐ | NPDES ☐ | Soil ☐ | Water | Other: Blank Water

For Lab Use Only
SF#: 285327
SCR#: 196062

Preservation Codes
H = HCl T = Thiosulfate
N = HNO_3 B = NaOH
S = H_2SO_4 P = H_3PO_4
O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Water	Other: Blank Water	Total # of Containers	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	NO2 (353.2)	NO3 (353.2)	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
Preservation Codes									H	N		S				
SG 2 -AP RB01 - 161017 ~~16~~ (JD)	10/17/16	1150	X				X	2							X	
SG 2 -AP EB01 - 161017 ~~16~~ (JD)	10/17/16	1215	X				X	11	X	X	X	X	X	X	X	
SG 2 -AP 08 - 18 - 161017 ~~16~~ (JD)	10/17/16	1545	X			X		11	X	X	X	X	X	X	X	
SG 2 -AP 08 - 28 - 161018 ~~16~~ (PJM2)	10/18/16	800	X			X		11	X	X	X	X	X	X	X	
SG 2 -AP FTB - 161018 ~~16~~ (PJM2)	10/18/16	855	X				X	1							X	
SG 2 -AP LTB - 161018 ~~16~~ (PJM2)	10/18/16	—	X				X	3	X						X	
SG 2 -AP 08 - 38 - 161018 ~~16~~ (PJM2)	10/18/16	1120	X			X		11	X	X	X	X	X	X	X	
SG 2 -AP 08 - 48 - 161018 ~~16~~ (PJM)	10/18/16	1525	X			X		11	X	X	X	X	X	X	X	
~~SG -AP - 16~~ (PJM2)																
SG -AP FD01 - 161018 ~~16~~ (PJM3)	10/18/16	—	X				X	11	X	X	X	X	X	X	X	

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐
(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)
Date results are needed:
E-mail address to send RUSH results: K.moline@ctmale.com

Relinquished by:	Date	Time	Received by:	Date	Time
PJM [signature]	10/18/16	1723			
			[signature]	10/19/16	10:00

Data Package Options (please check if required)

Type I (Validation/non-CLP)	☑	MA MCP	☐	TX TRRP - 13	☐
Type III (Reduced non-CLP)	☐	CT RCP	☐		
Type IV (CLP SOW)	☐	ASP Type A	☐		
Type VI (Raw Data Only)	☐	ASP Type B	☐		

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Airbill No.:
Relinquished by Commercial Carrier:
UPS ______ FedEx ______ Other ____________

Temperature upon receipt 1.3 - 2.3 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 165705

Group Number(s): 1722616

Client: C.T. Male Associates

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:	N/A
Samples Chilled:	Yes	Total Trip Blank Qty:	3
Paperwork Enclosed:	Yes	Trip Blank Type:	HCl
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	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	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	2.3	DT	Pack/Wet	Y	Bagged	N
2	DT146	1.3	DT	Pack/Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425

T : 717-656-2300
F : 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< 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.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

Client Sample Description	Lancaster Labs (LL) #
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

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

Sample #s: 8656715, 8656720, 8656726

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.

Sample #s: 8656718

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.

Sample #s: 8656719

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.

Batch #: 16306001 (Sample number(s): 8656715-8656720, 8656722-8656726 UNSPK: 8656726)

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

SW-846 6010C, Metals

Batch #: 163010635003 (Sample number(s): 8656716-8656717, 8656720-8656721, 8656725-8656726 UNSPK: P643058 BKG: P643058)

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

Batch #: 16309972602A (Sample number(s): 8656716-8656717 UNSPK: P660373 BKG: P660373)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Sulfate

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M0201 SDG#: MMK02-01EB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	3	B	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-ethyl perfluorooctanesulfonamidoacetic 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.

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	16306001	11/18/2016 23:47	Jason W Knight	1

*=This limit was used in the evaluation of the final result

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M0201 SDG#: MMK02-01EB

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	U	0.5	1	1

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 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	7	B	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 perfluorooctanesulfonamidoacetic 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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 6010C**		**mg/l**		**mg/l**	**mg/l**	
01750	Calcium	7440-70-2	15.7		0.0382	0.400	1
01757	Magnesium	7439-95-4	3.78		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 Chemistry	**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 Time	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) - U4	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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

M0202

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8656716
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16oct30a.b/yc30s20.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 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 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	5	B	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 perfluorooctanesulfonamidoacetic 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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 6010C**		**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 Chemistry	**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 Time	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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M0203 SDG#: MMK02-03

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 07:49	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

M0203

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8656717
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16oct30a.b/yc30s21.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M0204 SDG#: MMK02-04TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	3	B	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	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-ethyl perfluorooctanesulfonamidoacetic 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.

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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M0204 SDG#: MMK02-04TB

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	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

*=This limit was used in the evaluation of the final result

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M0205 SDG#: MMK02-05TB

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	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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M0205 SDG#: MMK02-05TB

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	U	0.5	1	1

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 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	150	B	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	U	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	3		0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	6		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	25		0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	6	B	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	7		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	1	J	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	19		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	89		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	8	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 perfluorooctanesulfonamidoacetic 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 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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M0205 SDG#: MMK02-05TB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution 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 Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

M0205

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8656719
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16oct30a.b/yc30s19.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	11	B	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	B	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 perfluorooctanesulfonamidoacetic 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	**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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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.

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	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	Calcium	SW-846 6010C	1	163010635003	10/30/2016 20:00	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	163010635003	10/30/2016 20:00	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163010635003	10/30/2016 20:00	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163010635003	10/30/2016 20:00	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	11/07/2016 22:54	Clinton M Wilson	20
00228	Sulfate	EPA 300.0	1	16309972602B	11/05/2016 10:27	Alexandria M Lanager	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 4.5	SM 2320 B-1997	1	16306005103A	11/02/2016 05:12	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16306005103A	11/02/2016 05:12	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16306005103A	11/02/2016 05:12	Brandon P Costik	1

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

M0206

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8656720
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov02a.b/ln02s08.d
Level: (low/med) LOW Date Received: 10/22/16
% Moisture: not dec. Date Analyzed: 11/02/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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-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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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-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.						
Metals	**SW-846 6010C**		**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 Chemistry	**EPA 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
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate 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.	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

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163071AA	11/02/2016 13:57	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163071AA	11/02/2016 13:57	Angela D Sneeringer	1
01750	Calcium	SW-846 6010C	1	163010635003	10/30/2016 20:03	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	163010635003	10/30/2016 20:03	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163010635003	10/30/2016 20:03	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163010635003	10/30/2016 20:03	Elaine F Stoltzfus	1

*=This limit was used in the evaluation of the final result

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M0207 SDG#: MMK02-07

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED 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/16nov02a.b/ln02s09.d
Level: (low/med) LOW Date Received: 10/22/16
% Moisture: not dec. Date Analyzed: 11/02/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
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25.					
26.					
27.					
28.					
29.					
30.					

page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M0208 SDG#: MMK02-08

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 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	5	B	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 perfluorooctanesulfonamidoacetic 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.

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	16306001	11/19/2016 01:50	Jason W Knight	1

*=This limit was used in the evaluation of the final result

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M0208 SDG#: MMK02-08

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M0209 SDG#: MMK02-09RB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	12	B	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 perfluorooctanesulfonamidoacetic 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.

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	16306001	11/19/2016 02:11	Jason W Knight	1

*=This limit was used in the evaluation of the final result

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M0209 SDG#: MMK02-09RB

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M0210 SDG#: MMK02-10RB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	2	B	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-ethyl perfluorooctanesulfonamidoacetic 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.

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	16306001	11/19/2016 03:33	Jason W Knight	1

*=This limit was used in the evaluation of the final result

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M0210 SDG#: MMK02-10RB

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	3	B	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	B	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-ethyl perfluorooctanesulfonamidoacetic 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	**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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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 Time	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 4.5	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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M0211 SDG#: MMK02-10

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12148	Carbonate 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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

M0211

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8656725
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov02a.b/ln02s10.d
Level: (low/med) LOW Date Received: 10/22/16
% Moisture: not dec. Date Analyzed: 11/02/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	4	B	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	B	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 perfluorooctanesulfonamidoacetic 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	**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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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 No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163071AA	11/02/2016 14:41	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	16309972602B	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

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

Submitted: 10/22/2016 10:00
Reported: 12/21/2016 11:51

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M0212 SDG#: MMK02-11

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12148	Carbonate 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

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: 8656726
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov02a.b/ln02s11.d
Level: (low/med) LOW Date Received: 10/22/16
% Moisture: not dec. Date Analyzed: 11/02/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 12/21/2016 11:51

Group Number: 1723907

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): 8656720-8656721,8656725-8656726			
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	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	0.8	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
**-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.

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1723907
Reported: 12/21/2016 11:51

Method Blank (continued)

Analysis Name	Result ug/l		MDL** ug/l	LOQ 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
Batch number: Y163041AA	Sample number(s): 8656716-8656717,8656719			
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
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

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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	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/l		ng/l	ng/l
Batch number: 16306001	Sample number(s): 8656715-8656720,8656722-8656726			
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
	mg/l		mg/l	mg/l
Batch number: 163010635003	Sample number(s): 8656716-8656717,8656720-8656721,8656725-8656726			
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: 16304118101B	Sample number(s): 8656716-8656717,8656720-8656721,8656725-8656726			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 16309972602A	Sample number(s): 8656716-8656717			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 12/21/2016 11:51

Group Number: 1723907

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 CaCO3	mg/l as 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 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: L163071AA	Sample number(s): 8656720-8656721,8656725-8656726								
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

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 12/21/2016 11:51

Group Number: 1723907

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	16.59	83	83	63-121	0	30
m+p-Xylene	40	37.46	40	36.7	94	92	80-120	2	30
o-Xylene	20	18.69	20	18.56	93	93	80-120	1	30
Batch number: Y163041AA	Sample number(s): 8656716-8656717,8656719								
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	19.88	20	19.72	99	99	80-120	1	30
1,3-Dichlorobenzene	20	19.98	20	19.53	100	98	80-120	2	30
1,4-Dichlorobenzene	20	20.01	20	19.76	100	99	80-120	1	30
Dichlorodifluoromethane	20	17.46	20	17.29	87	86	49-134	1	30
1,1-Dichloroethane	20	21.58	20	21.66	108	108	80-120	0	30
1,2-Dichloroethane	20	23.14	20	23.04	116	115	66-128	0	30

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 12/21/2016 11:51

Group Number: 1723907

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-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 number(s): 8656715-8656720,8656722-8656726								
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

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 12/21/2016 11:51

Group Number: 1723907

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/l	mg/l	mg/l	mg/l					
Batch number: 163010635003	Sample number(s): 8656716-8656717,8656720-8656721,8656725-8656726								
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 number(s): 8656716-8656717,8656720-8656721,8656725-8656726								
Total Nitrite/Nitrate Nitrogen	2.50	2.51			100		90-110		
Batch number: 16309972602A	Sample number(s): 8656716-8656717								
Chloride	3.00	2.96			99		90-110		
Sulfate	7.50	7.44			99		90-110		
Batch number: 16309972602B	Sample number(s): 8656720-8656721,8656725-8656726								
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(s): 8656716-8656717								
Total Alkalinity to pH 4.5	188	173.59			92		84-110		
Batch number: 16306005103A	Sample number(s): 8656720-8656721,8656725-8656726								
Total Alkalinity to pH 4.5	188	173.02			92		84-110		

MS/MSD

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
	ng/l		ng/l	ng/l	ng/l	ng/l					
Batch number: 16306001	Sample number(s): 8656715-8656720,8656722-8656726 UNSPK: 8656726										
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		

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 12/21/2016 11:51

Group Number: 1723907

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
	ng/l		ng/l	ng/l	ng/l	ng/l					
Perfluorohexanesulfonate	1	U	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 number(s): 8656716-8656717,8656720-8656721,8656725-8656726 UNSPK: P643058										
Calcium	50.25		4.00	55.34	4.00	56.07	127 (2)	145 (2)	75-125	1	20
Magnesium	10.92		2.00	12.88	2.00	13.29	98 (2)	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 number(s): 8656716-8656717,8656720-8656721,8656725-8656726 UNSPK: P657025										
Total Nitrite/Nitrate Nitrogen	0.893		1.00	1.92			102		90-110		
Batch number: 16309972602A	Sample number(s): 8656716-8656717 UNSPK: P660373										
Chloride	26.35		20	45.02			93		90-110		
Sulfate	53.71		50	130.94			154*		90-110		
Batch number: 16309972602B	Sample number(s): 8656720-8656721,8656725-8656726 UNSPK: P658434										
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 number(s): 8656716-8656717 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 number(s): 8656720-8656721,8656725-8656726 UNSPK: 8656721										
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): 8656716-8656717,8656720-8656721,8656725-8656726 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.
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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 12/21/2016 11:51

Group Number: 1723907

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): 8656716-8656717,8656720-8656721,8656725-8656726 BKG: P657025			
Total Nitrite/Nitrate Nitrogen	0.893	0.896	0	2
Batch number: 16309972602A	Sample number(s): 8656716-8656717 BKG: P660373			
Chloride	26.35	26.21	1	15
Sulfate	53.71	53.39	1	15
Batch number: 16309972602B	Sample number(s): 8656720-8656721,8656725-8656726 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	Sample number(s): 8656720-8656721,8656725-8656726 BKG: 8656721			
Total Alkalinity to pH 4.5	23.75	23.77	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: 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.
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.

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.
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.

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.
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.

1723907

EQC Eurofins QC, Inc

Picksheet: P6467861
Cust: U00064
Schd: 43093

Expected: MONDAY 10/03/16 - 12/31/16
Project Name: ZYDUS PHARMACEUTICALS, INC.
Start Date: 04/24/08 Stop Date:
Comments/Schedule Details:

JOE RENNER
ZYDUS PHARMACEUTICALS, INC.
73 ROUTE 31 NORTH

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

LAB USE ONLY

		Bottle Type
#_____	Ascorbic/HCL Vials	#_6_ HCL Vials
#_____	NA2S2O3	
#_____	NaOH/Zn acetate pH	
#_____	HNO3 pH	
#_____	H2SO4 pH	
#_____	NaOH pH	
#_____	Unpreserved	
#_____	HCL	
#_____	NH4CL	
#_____	MEOH	
#_____	Na2SO3/HCL	
#_____	DI Water	

Field Tests By: /Time:

	Pseudo	HPC	eColi	Coli	Collection Date	Collection Time (Military)	# Bottles	Free Cl2 mg/L	pH/TempC	BR2 mg/L	Total CL2 mg/L
6467861-1 VOCS) TP001001 NJDEPE 60 VOC					10/20/16	1005					
POE											
6467861-2 RAW WATER NJDEPE 60 VOC					↓	1000					

Cooler ID:

Sample Collected By	Circle One		Initials
	Client	EQC	

Required TAT: Standard ___/Rush___# Days____

Relinquished By	Time	Date	Received By	Time	Date	Temp	Iced Y/N	Site	Initials
Andrea Rocco	1400	10/20/16	Andrea Rocco	1400	10/20/16	3.6°C	Y	EBC	AR
			Kevin Tse	1520	10/20/16	OS	Y	EBC	KT

Comments (reporting, methods, etc)

Hazardous Y/N

M: 07:00-17:00 T: 07:00-17:00 W: 07:00-17:00 Th: 07:00-17:00 F: 07:00-17:00 St: - Sn: - Printed: 09/14/16 GPS X: -74.78741 Y: 40.30899
M: - T: - W: - Th: - F: - St: - Sn: -
PM: MJADICO

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:	N/A
Samples Chilled:	Yes	Total Trip Blank Qty:	0
Paperwork Enclosed:	Yes	Air Quality Samples Present:	No
Samples Intact:	Yes		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	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	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	0.8	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425

T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

eurofins | 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	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< 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 (1/2)

Acct # 37191 Group # Sample #

COC#: 15594

Client: C.T. Male Associates

Project Name/#: SGPP - Merrimack | Site ID:

Project Manager: Kirk Moline | P.O.# 16.6126

Sampler: PAT McHUGH

Phone #: 927-378-8737 | Quote #: 214135

State where sample(s) were collected: NH

For Lab Use Only
SF#: 285327
SCR#: 196068

Sample Identification	Collection Date	Collection Time	Grab	Composite	Matrix: Soil	Sediment	Potable Water	Ground Water	NPDES	Surface Water	Other: BLANK WATER	Total # of Containers	Preservation Codes	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	NO2+NO3 (353.2)	NO3 (353.2)	Cl, SO4 (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
SG2-APEB02-161020	10/20/16	850	X								X	2								X	
SG2-AP07-28-161020		1045	X				X					11		X	X		X	X	X	X	See Merrimack List
SG2-AP07-38-161020		1250	X				X					11		X	X		X	X	X	X	
SG2-APFIB-161020		1345	X								X	1								X	
SG2-APLIB-161020		—									X	3		X						X	
SG2-AP07-48-161020		1430	X				X					11		X	X		X	X	X	X	
SG2-AP07-58-161020		1625	X				X					9		X	X		X	X	X		
SG2-AP07-58-161021	10/21/16	910	X				X					2								X	
SG2-APEB02-161021	10/21/16	1405	X								X	2								X	
SG2-APRB02-161021	10/21/16	1422	X								X	2								X	

Preservation Codes: H = HCl; T = Thiosulfate; N = HNO3; B = NaOH; S = H2SO4; P = H3PO4; O = Other

Turnaround Time Requested (TAT) (please check): Standard ☐ RUSH ☐
(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP)	☑	MA MCP	☐
Type III (Reduced non-CLP)	☐	CT RCP	☐
Type IV (CLP SOW)	☐	ASP Type A	☐
Type VI (Raw Data Only)	☐	ASP Type B	☐
		TX TRRP - 13	☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
PSM2 1830	10/21/16	1830			
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time

Airbill No.
Relinquished by Commercial Carrier: UPS _____ FedEx _____ Other _____

Temperature upon receipt _____ °C

Client: C.T. Male Associates
Group #:
Sample #:

COC#: 15594

For Lab Use Only
SF# 285327
SCR# 196068

Project Name/#: SGPP - Merrimack	Site ID:
Project Manager: Kirk Moline	P.O. #: 16.6126
Sampler: PAT McHUGH	
Phone #: 907-378-8737	Quote #: 214135
State where sample(s) were collected: NH	

Matrix: Sediment ☐ Soil ☐ Water: Ground ☒ Surface ☐ Potable ☐ NPDES ☐ Other:

Analyses Requested / Preservation Codes

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Water	Other:	Total # of Containers	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	NO2 (353.2)	NO3 (353.2) + NO2 as N	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
									H	N		S				
SG 2 -AP07 -68-161021 ~~16~~ PJm2	10/21/16	1100	X			X	PJm2	11	X	X		X	X	X	X	See Merrimack List
SG 2 -AP07 -78-161021 ~~16~~ [illegible]	"	1730	X			X		11	X	X		X	X	X	X	
SG -AP - 16																
SG -AP - 16																
SG -AP - 16																
SG -AP - 16																
SG -AP - 16																
SG -AP - 16																
SG -AP - 16																
SG -AP - 16																

Preservation Codes
H = HCl T = Thiosulfate
N = HNO_3 B = NaOH
S = H_2SO_4 P = H_3PO_4
O = Other

Turnaround Time Requested (TAT) (please check): Standard ☐ RUSH ☐
(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)
Date results are needed:
E-mail address to send RUSH results: R.Moline@ctmale.com

Data Package Options (please check if required)
Type I (Validation/non-CLP) ☑
Type III (Reduced non-CLP) ☐
Type IV (CLP SOW) ☐
Type VI (Raw Data Only) ☐
MA MCP ☐
CT RCP ☐
ASP Type A ☐
ASP Type B ☐
TX TRRP - 13 ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
~~[illegible]~~	~~10/12/16~~	~~16:00~~ PJm2			
PJm2	10/21/16	1830			

Airbill No.:
Relinquished by Commercial Carrier:
UPS ______ FedEx ______ Other ______

Temperature upon receipt ______ °C

Issued by Dept. 40 Management

Eurofins Lancaster Laboratories Environmental • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

Client Sample Description	Lancaster Labs (LL) #
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

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

Sample #s: 8662643, 8662646, 8662647, 8662648, 8662649, 8662650, 8662653, 8662654, 8662655

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 #s: 8662644

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.

Batch #: 16306002 (Sample number(s): 8662643-8662651, 8662653-8662655 UNSPK: 8662649)

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

Batch #: 16309004201A (Sample number(s): 8662649-8662652 UNSPK: 8662649 BKG: P8662649-P664206)

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 #: 16309004203A (Sample number(s): 8662653 UNSPK: P664194 BKG: P664194, P664204)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Alkalinity to pH 4.5

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	41	B	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	B	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	B	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-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	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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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 Time	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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

07-85

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8662643
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov01b.b/ln01s69.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

07B5T SDG#: MMK03-02TB

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	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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

07B5T SDG#: MMK03-02TB

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	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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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-ethyl perfluorooctanesulfonamidoacetic 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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163063AA	11/02/2016 00:13	Matthew S Krause	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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

07B5T

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8662644
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov01b.b/ln01s68.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
4.					
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30.					

page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

075FT SDG#: MMK03-03TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	3	B	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-ethyl perfluorooctanesulfonamidoacetic 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 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.

*=This limit was used in the evaluation of the final result

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

075FT SDG#: MMK03-03TB

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	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

*=This limit was used in the evaluation of the final result

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

07B5E SDG#: MMK03-04EB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	2	B	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 perfluorooctanesulfonamidoacetic 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.

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	16306002	11/24/2016 11:28	Jason W Knight	1

*=This limit was used in the evaluation of the final result

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

07B5E SDG#: MMK03-04EB

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16306002	11/01/2016 19:15	Devon M Whooley	1

*=This limit was used in the evaluation of the final result

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	39	B	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	B	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	B	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-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	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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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 Time	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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

05-21

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8662647
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov01b.b/ln01s70.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	100	B	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	B	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	B	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-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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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.

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 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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

05-31

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8662648
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov01b.b/ln01s71.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	140	B	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	B	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	B	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-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	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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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.

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	11/01/2016 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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

05-41

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8662649
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov01b.b/ln01s65.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	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	21	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	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	Methyl Tertiary Butyl Ether	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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	o-Xylene	95-47-6	20		0.5	1	1
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	340	B	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	200		0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	200		0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	220		1	3	1
10954	Perfluorododecanoic acid	307-55-1	220		0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	240		0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	210		0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	230	B	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	250		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	200		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	190		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	200		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	190	B	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	220	B	0.5	2	1
10954	NEtFOSAA	2991-50-6	220		1	3	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic 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	100
00228	Sulfate	14808-79-8	60.6		3.0	10.0	10

*=This limit was used in the evaluation of the final result

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**EPA 353.2**		**mg/l**	**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	10.1	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.	202	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	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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

05-41 SDG#: MMK03-07MSD

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	18	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	20	1	5	1
11997	Carbon Tetrachloride	56-23-5	21	0.5	1	1
11997	Chlorobenzene	108-90-7	19	0.5	1	1
11997	Chloroethane	75-00-3	18	0.5	1	1
11997	Chloroform	67-66-3	20	0.5	1	1
11997	Chloromethane	74-87-3	17	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	19	0.5	1	1
11997	1,1-Dichloroethane	75-34-3	20	0.5	1	1
11997	1,2-Dichloroethane	107-06-2	19	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	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	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	108-87-2	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	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	19	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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

05-41 SDG#: MMK03-07MSD

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 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	350	B	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	190		0.6	2	1
10954	Perfluorodecanoic acid	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	Perfluorotridecanoic acid	72629-94-8	230		0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	230		0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	210	B	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	250		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	200		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	190		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	250		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	180	B	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	230	B	0.5	2	1
10954	NEtFOSAA	2991-50-6	250	E	1	3	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic 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 Chemistry	**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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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.

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	11/01/2016 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 4.5	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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
Metals	**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 Chemistry	**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
	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.	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.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution 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) - 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 18:09	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16312120601A	11/07/2016 17:54	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16308118101B	11/03/2016 13:38	Joseph E McKenzie	5
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16309004201A	11/04/2016 20:59	Brandon P Costik	1

*=This limit was used in the evaluation of the final result

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	120	B	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	B	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	B	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-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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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 Nitrogen	n.a.	4.4	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.	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.

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 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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

05-51

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8662653
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov01b.b/ln01s72.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	**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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	**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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	120	B	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	B	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	B	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-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	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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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.

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 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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

05-61

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8662654
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	130	B	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	B	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	B	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-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	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

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

Submitted: 10/26/2016 09:30
Reported: 01/04/2017 12:19

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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.

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 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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

05-69

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8662655
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov01b.b/ln01s74.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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	ug/l
Batch number: L163063AA	Sample number(s): 8662643-8662644,8662647-8662651,8662653-8662655			
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	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
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(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.

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): 8662643-8662651,8662653-8662655			
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): 8662643,8662647-8662655			
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): 8662643,8662647-8662650,8662652-8662655			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 16312120601A	Sample number(s): 8662643,8662647-8662650,8662652-8662655			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
	mg/l as CaCO3		mg/l as CaCO3	mg/l as CaCO3
Batch number: 16309004201A	Sample number(s): 8662649-8662652			
Total Alkalinity to pH 4.5	1.7	U	1.7	5.0

*- Outside of specification
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(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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 12:19

Group Number: 1725147

Method Blank (continued)

Analysis Name	Result mg/l as CaCO3		MDL** mg/l as CaCO3	LOQ mg/l as CaCO3
Batch number: 16309004202A	Sample number(s): 8662643,8662647-8662648,8662654-8662655			
Total Alkalinity to pH 4.5	1.7	U	1.7	5.0
Batch number: 16309004203A	Sample number(s): 8662653			
Total Alkalinity to pH 4.5	1.7	J	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: L163063AA	Sample number(s): 8662643-8662644,8662647-8662651,8662653-8662655								
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
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(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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 12:19

Group Number: 1725147

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 number(s): 8662643-8662651,8662653-8662655								
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 number(s): 8662643,8662647-8662655								
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					
Batch number: 16308118101B	Sample number(s): 8662643,8662647-8662650,8662652-8662655								

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(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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 12:19

Group Number: 1725147

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 number(s): 8662643,8662647-8662650,8662652-8662655								
Chloride	3.00	2.79			93		90-110		
Sulfate	7.50	7.07			94		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16309004201A	Sample number(s): 8662649-8662652								
Total Alkalinity to pH 4.5	188	182.05			97		84-110		
Batch number: 16309004202A	Sample number(s): 8662643,8662647-8662648,8662654-8662655								
Total Alkalinity to pH 4.5	188	182.62			97		84-110		
Batch number: 16309004203A	Sample number(s): 8662653								
Total Alkalinity to pH 4.5	188	181.41			96		84-110		

MS/MSD

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
Batch number: L163063AA	Sample number(s): 8662643-8662644,8662647-8662651,8662653-8662655 UNSPK: 8662649										
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

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(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.

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	0	30
1,2,4-Trichlorobenzene	1	U	20	18.83	20	18.68	94	93	72-120	1	30
1,1,1-Trichloroethane	0.5	U	20	18.04	20	17.71	90	89	66-126	2	30
1,1,2-Trichloroethane	0.5	U	20	18.79	20	18.51	94	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
	ng/l		ng/l	ng/l	ng/l	ng/l					
Batch number: 16306002	Sample number(s): 8662643-8662651,8662653-8662655 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

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(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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 12:19

Group Number: 1725147

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 number(s): 8662643,8662647-8662655 UNSPK: 8662649									
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 number(s): 8662643,8662647-8662650,8662652-8662655 UNSPK: 8662649									
Total Nitrite/Nitrate Nitrogen	4.79	5.00	10.11			106		90-110		
Batch number: 16312120601A	Sample number(s): 8662643,8662647-8662650,8662652-8662655 UNSPK: 8662649									
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 number(s): 8662649-8662652 UNSPK: 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 number(s): 8662643,8662647-8662648,8662654-8662655 UNSPK: P662780									
Total Alkalinity to pH 4.5	284.58	188	445.63			86		84-110		
Batch number: 16309004203A	Sample number(s): 8662653 UNSPK: P664194									
Total Alkalinity to pH 4.5	297.08	188	416.65			64*		84-110		

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: 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.
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.

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	Sample number(s): 8662643,8662647-8662650,8662652-8662655 BKG: 8662649			
Total Nitrite/Nitrate Nitrogen	4.79	4.83	1	2
Batch number: 16312120601A	Sample number(s): 8662643,8662647-8662650,8662652-8662655 BKG: 8662649			
Chloride	96.41	102.99	7 (1)	15
Sulfate	11.46	12.57	9 (1)	15
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 16309004201A	Sample number(s): 8662649-8662652 BKG: 8662649			
Total Alkalinity to pH 4.5	21.67	20.89	4 (1)	5
Batch number: 16309004202A	Sample number(s): 8662643,8662647-8662648,8662654-8662655 BKG: P662780			
Total Alkalinity to pH 4.5	284.58	281.27	1	5
Batch number: 16309004203A	Sample number(s): 8662653 BKG: P664194			
Total Alkalinity to pH 4.5	297.08	295.8	0	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	Toluene-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.
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.

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*
8662645	10*	45*	46*	30*	18*	15*
8662646	9*	56*	80	71	80	70
8662647	8*	51*	91	68*	90	67*
8662648	8*	53*	100	57*	71	58*
8662649	51*	57*	107	69*	70	63*
8662650	8*	53*	111	63*	90	63*
8662651	6*	40*	87	51*	72	49*
8662653	7*	53*	91	61*	65*	53*
8662654	8*	55*	109	48*	66*	51*
8662655	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

	13C8-PFOA	13C8-PFOS	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA
8662643	66*	83	84	54*	71	56*
8662644	9*	13*	8*	6*	61*	4*
8662645	10*	11*	9*	6*	61*	4*
8662646	66*	57*	53*	51*	48*	22*
8662647	69*	74	55*	49*	56*	46*
8662648	56*	68*	49*	49*	52*	43*
8662649	61*	76	63*	59*	62*	50*
8662650	61*	86	63*	67*	73	62*
8662651	46*	57*	57*	49*	60*	48*
8662653	55*	59*	51*	50*	53*	52*
8662654	53*	70	55*	48*	60*	38*
8662655	54*	86	67*	57*	62*	50*
Blank	74	72	68*	72	79	73
LCS	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*
8662644	68*	3*	2*
8662645	64*	2*	1*
8662646	41*	16*	23*
8662647	66*	42*	48*

*- 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.

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

*- 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.

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: 1725147 Sample #: 866643-55 COC#: 15596

Client: C.T. Male Associates			
Project Name/#: SGPP - Merrimack	Site ID:		
Project Manager: Kirk Moline	P.O. #: 16.6176		
Sampler: Jonathon Carter, Pat McHugh			
Phone #: 608-354-5253	Quote #: 214135		
State where sample(s) were collected: NH			

Matrix: Soil ☐ Sediment ☐ Potable ☐ Ground ☐ NPDES ☐ Surface ☐ Water ☒ Other: BLANK WATER

Analyses Requested / Preservation Codes

Sample Identification	Collection Date	Collection Time	Grab	Composite	Total # of Containers	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	NO2 (353.2)	NO3 (353.2)+NO2 as N	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
SG 2 -APOF - BS - 161024 (16 JTC)	10/24/16	1035	X		11	X	X		X	X	X	X	See Merrimack QAPP List
SG 2 -APLTB - 161024 (16 JTC)	10/24/16	—	X		3	X						X	
SG 2 -AP FTB01 - 161024 (16 JTC)	10/24/16	1520	X		1							X	
SG 2 -AP EB01 - 161024 (16 JTC)	10/24/16	1430	X		2							X	
SG 2 -APOS - 21 - 161024 (16 JTC)	10/24/16	1630	X		11	X	X		X	X	X	X	
SG 2 -AP 05 - 31 - 161024 (16 JTC)	10/24/16	1750	X		11	X	X		X	X	X	X	
SG 2 -AP 05 - 41 - 161025 (16 JTC)	10/25/16	0825	X		33	X	X		X	X	X	X	MS MSD
SG 2 -AP 05 - 51 - 161025 (16 JTC)	10/25/16	1100	X		11	X	X		X	X	X	X	
SG 2 -AP 05 - 61 - 161025 (16 JTC)	10/25/16	1235	X		11	X	X		X	X	X	X	
SG 2 -AP 05 - 69 - 161025 (16 JTC)	10/25/16	1430	X		11	X	X		X	X	X	X	

Preservation Codes: H = HCl; T = Thiosulfate; N = HNO_3; B = NaOH; S = H_2SO_4; P = H_3PO_4; O = Other

For Lab Use Only: SF#: 285327 SCR#: 196070

Turnaround Time Requested (TAT) (please check): Standard ☐ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☑ MA MCP ☐ TX TRRP - 13 ☐

Type III (Reduced non-CLP) ☐ CT RCP ☐

Type IV (CLP SOW) ☐ ASP Type A ☐

Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
Angela Montgomery	10/12/16	15:50	Pony		
Pat McHugh	10/25/16	1700			
			Kristen Alger	10/26/16	0930

Airbill No.:

Relinquished by Commercial Carrier: UPS ____ FedEx X Other ____

Temperature upon receipt 0.8 / 0.2 °C

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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:	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:	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	Y	Bagged	N
2	DT146	0.7	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< 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.

REVISED

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

Client Sample Description	Lancaster Labs (LL) #
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

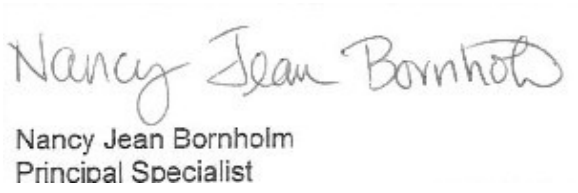
The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

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

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.

Batch #: 16315120601B (Sample number(s): 8668862-8668866, 8668869-8668871 UNSPK: 8668862 BKG: 8668862)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Chloride

SM 2320 B-1997, Wet Chemistry

Sample #s: 8668871

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.

Batch #: 16305006203A (Sample number(s): 8668862-8668866, 8668869, 8668871 UNSPK: P668954 BKG: P668870, P668954)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Alkalinity to pH 4.5

Batch #: 16305006203B (Sample number(s): 8668870 UNSPK: P668954 BKG: P8668870-P668954)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Alkalinity to pH 4.5

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M4-01 SDG#: MMK04-01EB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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 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.

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	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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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 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	7		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	4	J	3	10	1
10954	Perfluoropentanoic 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 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	**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	2.64		0.0190	0.200	1
01762	Potassium	7440-09-7	2.19		0.160	1.00	1
01767	Sodium	7440-23-5	64.3		0.173	2.00	1
Wet Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	109		4.0	8.0	20
00228	Sulfate	14808-79-8	11.3		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	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 to pH 4.5	n.a.	20.8		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	20.8		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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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.

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	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

*=This limit was used in the evaluation of the final result

REVISED

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M4-02

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8668862
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov05a.b/ln05s20.d
Level: (low/med) LOW Date Received: 10/28/16
% Moisture: not dec. Date Analyzed: 11/05/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
4.					
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29.					
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	**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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	**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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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-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	**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	2.95		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 Chemistry	**EPA 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 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate 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 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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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.

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	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

*=This limit was used in the evaluation of the final result

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M4-03

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8668863
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov05a.b/ln05s21.d
Level: (low/med) LOW Date Received: 10/28/16
% Moisture: not dec. Date Analyzed: 11/05/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M4-04 SDG#: 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 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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M4-04 SDG#: 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 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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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-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	**SW-846 6010C**		**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 Chemistry	**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 Nitrogen	n.a.	4.0		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 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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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.

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	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

REVISED

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M4-04

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8668864
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov05a.b/ln05s22.d
Level: (low/med) LOW Date Received: 10/28/16
% Moisture: not dec. Date Analyzed: 11/05/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M4-05 SDG#: MMK04-05

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 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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M4-05 SDG#: MMK04-05

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 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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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	12		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	10		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	4	J	3	10	1
10954	Perfluoropentanoic 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 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	**SW-846 6010C**		**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 Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	81.8		4.0	8.0	20
00228	Sulfate	14808-79-8	13.8		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	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 pH 4.5	n.a.	23.0		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	23.0		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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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.

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	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

*=This limit was used in the evaluation of the final result

REVISED

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M4-05

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8668865
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov05a.b/ln05s23.d
Level: (low/med) LOW Date Received: 10/28/16
% Moisture: not dec. Date Analyzed: 11/05/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M4-06 SDG#: 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	**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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M4-06 SDG#: 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	**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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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 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	12		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	6	J	5	10	1
10954	Perfluorobutanoic Acid	375-22-4	4	J	3	10	1
10954	Perfluoropentanoic 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 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	**SW-846 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 Chemistry	**EPA 300.0**		**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 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	3.5		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.	15.1		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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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.

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	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

*=This limit was used in the evaluation of the final result

REVISED

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M4-06

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8668866
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov05a.b/ln05s24.d
Level: (low/med) LOW Date Received: 10/28/16
% Moisture: not dec. Date Analyzed: 11/05/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M4-07 SDG#: MMK04-07TB

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	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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M4-07 SDG#: MMK04-07TB

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	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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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 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.

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	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

*=This limit was used in the evaluation of the final result

REVISED

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M4-07

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8668867
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov05a.b/ln05s25.d
Level: (low/med) LOW Date Received: 10/28/16
% Moisture: not dec. Date Analyzed: 11/05/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M4-08 SDG#: MMK04-08TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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 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.

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	16314003	12/02/2016 14:22	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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M4-09 SDG#: 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 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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M4-09 SDG#: 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 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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	63		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	11		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	4	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 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	**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 Chemistry	**EPA 300.0**		**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 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.	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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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.

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	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

*=This limit was used in the evaluation of the final result

REVISED

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M4-09

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8668869
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov05a.b/ln05s26.d
Level: (low/med) LOW Date Received: 10/28/16
% Moisture: not dec. Date Analyzed: 11/05/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M4-10 SDG#: 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	**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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M4-10 SDG#: 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	**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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	63		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	11		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	4	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 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	**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 Chemistry	**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/Nitrate Nitrogen	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 pH 4.5	n.a.	24.7		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	24.7		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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Time	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

REVISED

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M4-10

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8668870
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov05a.b/ln05s27.d
Level: (low/med) LOW Date Received: 10/28/16
% Moisture: not dec. Date Analyzed: 11/05/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M4-11 SDG#: MMK04-11EB

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	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

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M4-11 SDG#: MMK04-11EB

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	U	0.5	1	1
	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 modified**		**ng/l**		**ng/l**	**ng/l**	
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 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	**SW-846 6010C**		**mg/l**		**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	Potassium	7440-09-7	0.829	J	0.160	1.00	1
01767	Sodium	7440-23-5	19.3		0.173	2.00	1
Wet Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	23.2		0.20	0.40	1
	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.						
00228	Sulfate	14808-79-8	5.3		0.30	1.0	1
	Smple was analyzed in duplicate to comfirm the result.						

*=This limit was used in the evaluation of the final result

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

Submitted: 10/28/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M4-11 SDG#: MMK04-11EB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Wet Chemistry	**EPA 353.2**		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate 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
	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.						
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 Time		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

*=This limit was used in the evaluation of the final result

REVISED

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M4-11

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8668871
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov09a.b/ln09s41.d
Level: (low/med) LOW Date Received: 10/28/16
% Moisture: not dec. Date Analyzed: 11/09/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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): 8668862-8668867,8668869-8668870			
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.
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.

REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:27

Group Number: 1726627

Method Blank (continued)

Analysis Name	Result ug/l		MDL** ug/l	LOQ 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
Batch number: L163143AA	Sample number(s): 8668871			
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

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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
	ng/l		ng/l	ng/l
Batch number: 16314003	Sample number(s): 8668861-8668871			
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): 8668862-8668866,8668869-8668871			
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: 16314118101B	Sample number(s): 8668862-8668866,8668869-8668871			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 16315120601B	Sample number(s): 8668862-8668866,8668869-8668871			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0

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REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:27

Group Number: 1726627

Method Blank (continued)

Analysis Name	Result mg/l as CaCO3		MDL** mg/l as CaCO3	LOQ mg/l as CaCO3
Batch number: 16305006203A	Sample number(s): 8668862-8668866,8668869,8668871			
Total Alkalinity to pH 4.5	1.8	J	1.7	5.0
Batch number: 16305006203B	Sample number(s): 8668870			
Total Alkalinity to pH 4.5	1.8	J	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: L163101AA	Sample number(s): 8668862-8668867,8668869-8668870								
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

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REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:27

Group Number: 1726627

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 number(s): 8668871								
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

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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	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	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 number(s): 8668861-8668871								
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(s): 8668862-8668866,8668869-8668871								
Calcium	4.00	4.13			103		80-120		
Magnesium	2.00	2.08			104		80-120		

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REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:27

Group Number: 1726627

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/l	mg/l	mg/l	mg/l					
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 number(s): 8668862-8668866,8668869-8668871								
Total Nitrite/Nitrate Nitrogen	2.50	2.56			102		90-110		
Batch number: 16315120601B	Sample number(s): 8668862-8668866,8668869-8668871								
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 number(s): 8668862-8668866,8668869,8668871								
Total Alkalinity to pH 4.5	188	182.66			97		84-110		
Batch number: 16305006203B	Sample number(s): 8668870								
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	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					
Batch number: L163101AA	Sample number(s): 8668862-8668867,8668869-8668870 UNSPK: P657871										
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

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:27

Group Number: 1726627

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-Dichlorobenzene	20	U	400	378.88	400	385.39	95	96	80-120	2	30
1,3-Dichlorobenzene	20	U	400	370.38	400	382.71	93	96	80-120	3	30
1,4-Dichlorobenzene	20	U	400	374.97	400	381.87	94	95	80-120	2	30
Dichlorodifluoromethane	10	U	400	369.63	400	382.58	92	96	49-134	3	30
1,1-Dichloroethane	10	U	400	392.9	400	408.29	98	102	80-120	4	30
1,2-Dichloroethane	10	U	400	393.75	400	400.19	98	100	66-128	2	30
1,1-Dichloroethene	10	U	400	430.72	400	439.55	108	110	76-124	2	30
cis-1,2-Dichloroethene	10	U	400	403.83	400	409.48	101	102	80-120	1	30
trans-1,2-Dichloroethene	10	U	400	416.06	400	424.36	104	106	80-120	2	30
1,2-Dichloropropane	10	U	400	380.01	400	389.76	95	97	80-120	3	30
cis-1,3-Dichloropropene	10	U	400	361.31	400	367.48	90	92	80-120	2	30
trans-1,3-Dichloropropene	10	U	400	351.97	400	353.67	88	88	76-120	0	30
Ethylbenzene	10	U	400	383.32	400	386.97	96	97	78-120	1	30
Freon 113	40	U	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	U	400	396.16	400	401.39	99	100	80-120	1	30
Methyl Acetate	26.19		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	U	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	U	400	403.7	400	412.33	101	103	80-120	2	30
Styrene	20	U	400	384.41	400	388.72	96	97	80-120	1	30
1,1,2,2-Tetrachloroethane	10	U	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	U	400	349.95	400	364.67	87	91	69-120	4	30
1,2,4-Trichlorobenzene	20	U	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	U	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	U	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/l		ng/l	ng/l	ng/l	ng/l					
Batch number: 16314003	Sample number(s): 8668861-8668871 UNSPK: 8668870										
Perfluorooctanoic acid	63.4		200.7	262.13			99		70-130		
Perfluorononanoic acid	1	U	200.7	189.54			94		70-130		
Perfluorodecanoic acid	1	U	200.7	204.81			102		70-130		
Perfluoroundecanoic acid	2	U	200.7	196.14			98		70-130		
Perfluorododecanoic acid	3	U	200.7	195.99			98		70-130		
Perfluorotridecanoic acid	2	U	200.7	209.04			104		70-130		
Perfluorotetradecanoic acid	3	U	200.7	196.52			98		70-130		
Perfluorohexanoic acid	10.55		200.7	207.64			98		70-130		
Perfluoroheptanoic acid	9.05		200.7	209.12			100		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.

REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:27

Group Number: 1726627

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 number(s): 8668862-8668866,8668869-8668871 UNSPK: 8668865									
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	Sample number(s): 8668862-8668866,8668869-8668871 UNSPK: P668762									
Total Nitrite/Nitrate Nitrogen	0.040 U	1.00	1.07			107		90-110		
Batch number: 16315120601B	Sample number(s): 8668862-8668866,8668869-8668871 UNSPK: 8668862									
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: 16305006203A	Sample number(s): 8668862-8668866,8668869,8668871 UNSPK: P668954									
Total Alkalinity to pH 4.5	287.93	188	347.4			32*		84-110		
Batch number: 16305006203B	Sample number(s): 8668870 UNSPK: P668954									
Total Alkalinity to pH 4.5	287.93	188	347.4			32*		84-110		

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: 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

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REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:27

Group Number: 1726627

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): 8668862-8668866,8668869-8668871 BKG: P668762			
Total Nitrite/Nitrate Nitrogen	0.040 U	0.040 U	0 (1)	2
Batch number: 16315120601B	Sample number(s): 8668862-8668866,8668869-8668871 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): 8668862-8668866,8668869,8668871 BKG: P668954			
Total Alkalinity to pH 4.5	287.93	287.34	0	5
Batch number: 16305006203B	Sample number(s): 8668870 BKG: 8668870			
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
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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

	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*
Blank	67*	75	77	71	78	73
LCS	76	82	78	83	93	79
LCSD	71	79	73	72	91	72
MS	88	95	106	83	80	81

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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: 16 PFCs
Batch number: 16314003

Limits:	70-130	70-130	70-130	70-130	70-130	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
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Environmental Services Analysis Request/Chain of Custody

Page 1 of 2

Acct. #: 37191 Group #: 1726027 Sample #: 8668861-71 **COC#: 15588**

Client: **C.T. Male Associates**	
Project Name/#: SGPP - Merrimack	Site ID:
Project Manager: Kirk Moline	P.O. #: 16.6126
Sampler: Jonathan Carter, Jonathan Dippert	
Phone #: 608-354-5253, 578-786-7400	Quote #: 214135
State where sample(s) were collected: NH	

For Lab Use Only
SF#: 285327
SCR#: 196062

Preservation Codes
H = HCl T = Thiosulfate
N = HNO_3 B = NaOH
S = H_2SO_4 P = H_3PO_4
O = Other

Matrix: Sediment ☐ / Soil ☐; Water: Ground ☒ Surface ☐ Potable ☐ NPDES ☐; Other: BLANK WATER

Analyses Requested / Preservation Codes: TCL VOAs (8260C) – H; Ca, Mg, Na, K (6010C) – N; ~~NO2 (353.2)~~; NO3 (353.2) + NO2 as N – S; Cl-, SO4- (300.0); Alkalinity (SM 2320B); PFCs (EPA 537 mod.)

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Water	Other	Total # of Containers	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	~~NO2 (353.2)~~	NO3 (353.2) + NO2 as N	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
SG2 -APEB01-161026 ~~16~~ JTC	10/26/16	0815	X				X	2							X	Merrimack
SG2 -AP06-19-161026 ~~16~~ JTC	10/26/16	~~1100~~ 1010 JTC	X			X		11	X	X		X	X	X	X	QAPP List
SG2 -AP06-29-161026 ~~16~~ JTC	10/26/16	1145	X			X		11	X	X		X	X	X	X	
SG2 -AP06-39-161026 ~~16~~ JTC	10/26/16	1325	X			X		11	X	X		X	X	X	X	
SG2 -AP06-49-161026 ~~16~~ JD	10/26/16	1505	X			X		12	X	X		X	X	X	X	Metals Batch QC
SG2 -AP06-59-161027 ~~16~~ JD	10/27/16	0905	X			X		11	X	X		X	X	X	X	
SG2 ~~-AP~~ LTB01-161027 ~~16~~ JD	10/27/16	—					X	3	X						X	
SG2 ~~-AP~~ FTB01-161027 ~~16~~ JD	10/27/16	1125	X				X	1							X	
SG2 ~~-AP FB01~~ -AP06-68-161027 ~~16~~ JD	10/27/16	1135	X			X		11	X	X		X	X	X	X	
SG2 -AP06-~~79~~ 73-161027 ~~16~~ JD	10/27/16	1355	X			X		11	X	X		X	X	X	X	

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐
(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)
Date results are needed:
E-mail address to send RUSH results: k.moline@ctmale.com

Data Package Options (please check if required)
Type I (Validation/non-CLP) ☒ MA MCP ☐ TX TRRP - 13 ☐
Type III (Reduced non-CLP) ☐ CT RCP ☐
Type IV (CLP SOW) ☐ ASP Type A ☐
Type VI (Raw Data Only) ☐ ASP Type B ☐
EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
~~[signature]~~	~~10/12/16~~	~~14:50~~ JTC			
[signature]	10/27/16	1800			
			[signature]	10.28.16	930

Airbill No.:
Relinquished by Commercial Carrier:
UPS ______ FedEx X Other ______

Temperature upon receipt 2.2 - 2.3 °C

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: 1726627 Sample #: 8668861-71 COC#: 15591

Client: **C.T. Male Associates**

Project Name/#: SGPP - Merrimack | Site ID:

Project Manager: Kirk Moline | P.O. #: 16.6126

Sampler: Jonathan Carter, Jonathan Dippert

Phone #: 608-354-5253, 518-786-7400 | Quote #: 214135

State where sample(s) were collected: NH

Matrix: Sediment / Soil; Water: Ground, Surface, Potable, NPDES; Other: Blank Water

For Lab Use Only
SF#: 285327
SCR#: 196065

Preservation Codes
H = HCl T = Thiosulfate
N = HNO_3 B = NaOH
S = H_2SO_4 P = H_3PO_4
O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Water	Other: Blank Water	Total # of Containers	TCL VOAs (8260C) (H)	Ca, Mg, Na, K (6010C) (N)	~~NO2 (353.2)~~	NO3 (353.2) + NO2 as N (S)	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)						Remarks
SG2 -AP EBW - 161027 ~~16~~	10/27/16	1620	X				X	11	X	X		X	X	X	X						Merrimack QAPP 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																					
SG -AP - 16																					

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: Kmoline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☒ MA MCP ☐ TX TRRP - 13 ☐
Type III (Reduced non-CLP) ☐ CT RCP ☐
Type IV (CLP SOW) ☐ ASP Type A ☐
Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by	Date	Time	Received by	Date	Time
[signature]	10/12/16	1525			
[signature]	10/27/16	1800			
			[signature]	10-28-16	930

Airbill No.:
Relinquished by Commercial Carrier:
UPS ______ FedEx ✓ Other ______

Temperature upon receipt 2.2-2.3 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 166586

Group Number(s): 1726627

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:	Yes	Air Quality Samples Present:	No
Samples Intact:	Yes		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	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	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	2.2	DT	Wet	Y	Bagged	N
2	DT131	2.3	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425

T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< 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.

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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.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

Client Sample Description	Lancaster Labs (LL) #
SG-2-AP03-25-161028 Grab Groundwater	8670454
SG-2-LTB01-161028 Blank Water	8670455
SG-2-FTB01-161028 Blank Water	8670456
SG-2-AP03-35-161028 Grab Groundwater	8670457
SG-2-APFD01-161028 Grab Groundwater	8670458

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

Sample #s: 8670456

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

Sample #s: 8670457

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

SW-846 6010C, Metals

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

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

Submitted: 10/31/2016 08:20
Reported: 12/30/2016 15:16

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	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

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

Submitted: 10/31/2016 08:20
Reported: 12/30/2016 15:16

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 modified**		**ng/l**		**ng/l**	**ng/l**	
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	0.7	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	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 perfluorooctanesulfonamidoacetic Acid.						
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.						
Metals	**SW-846 6010C**		**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 Chemistry	**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		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate 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 pH 4.5	n.a.	1.7	U	1.7	5.0	1

*=This limit was used in the evaluation of the final result

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

Submitted: 10/31/2016 08:20
Reported: 12/30/2016 15:16

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
Wet Chemistry	**SM 2320 B-1997**		**mg/l as CaCO3**		**mg/l as CaCO3**	**mg/l as CaCO3**	
12149	Bicarbonate Alkalinity	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

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MMK51

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8670454
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov09a.b/ln09s43.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:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
4.					
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29.					
30.					

page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/31/2016 08:20
Reported: 12/30/2016 15:16

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MMK52 SDG#: MMK05-02TB

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	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

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

Submitted: 10/31/2016 08:20
Reported: 12/30/2016 15:16

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MMK52 SDG#: MMK05-02TB

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	U	0.5	1	1

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 modified**		**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-methyl perfluorooctanesulfonamidoacetic 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 Time	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

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

Submitted: 10/31/2016 08:20
Reported: 12/30/2016 15:16

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MMK52 SDG#: MMK05-02TB

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
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

1E

EPA SAMPLE NO.

MMK52

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8670455
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov09a.b/ln09s42.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:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 10/31/2016 08:20
Reported: 12/30/2016 15:16

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MMK53 SDG#: MMK05-03TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**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-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 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

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

Submitted: 10/31/2016 08:20
Reported: 12/30/2016 15:16

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	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

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

Submitted: 10/31/2016 08:20
Reported: 12/30/2016 15:16

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 modified**		**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	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-ethyl perfluorooctanesulfonamidoacetic 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	24.7		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

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

Submitted: 10/31/2016 08:20
Reported: 12/30/2016 15:16

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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.

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	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MMK54

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8670457
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:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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FORM I VOA-TIC

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

Submitted: 10/31/2016 08:20
Reported: 12/30/2016 15:16

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	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

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

Submitted: 10/31/2016 08:20
Reported: 12/30/2016 15:16

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	U	0.5	1	1

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 modified**		**ng/l**		**ng/l**	**ng/l**	
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 perfluorooctanesulfonamidoacetic 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

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

Submitted: 10/31/2016 08:20
Reported: 12/30/2016 15:16

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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
	EPA 353.2		**mg/l**	**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate 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 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.

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	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

1E

EPA SAMPLE NO.

MMK55

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8670458
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
% Moisture: not dec. Date Analyzed: 11/09/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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): 8670454-8670455,8670457-8670458			
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	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.
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.

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	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: 16316001	Sample number(s): 8670454-8670458			
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	4	J	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: 163090635001	Sample number(s): 8670454,8670457-8670458			
Calcium	0.0383	J	0.0382	0.400
Magnesium	0.0334	J	0.0190	0.200
Potassium	0.160	U	0.160	1.00
Sodium	0.291	J	0.173	2.00
Batch number: 16314118103B	Sample number(s): 8670454,8670457-8670458			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 16315120601A	Sample number(s): 8670458			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
Batch number: 16315120601B	Sample number(s): 8670454,8670457			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0

*- Outside of specification
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(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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 12/30/2016 15:16

Group Number: 1726931

Method Blank (continued)

Analysis Name	Result mg/l as CaCO3		MDL** mg/l as CaCO3	LOQ mg/l as CaCO3
Batch number: 16312002102B	Sample number(s): 8670458			
Total Alkalinity to pH 4.5	2.9	J	1.7	5.0
Batch number: 16312002103A	Sample number(s): 8670454,8670457			
Total Alkalinity to pH 4.5	2.8	J	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: L163143AA	Sample number(s): 8670454-8670455,8670457-8670458								
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
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(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.
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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 12/30/2016 15:16

Group Number: 1726931

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	19.04	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: 16316001	Sample number(s): 8670454-8670458								
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 number(s): 8670454,8670457-8670458								
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 number(s): 8670454,8670457-8670458								

*- 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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 12/30/2016 15:16

Group Number: 1726931

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 number(s): 8670458								
Chloride	3.00	2.94			98		90-110		
Sulfate	7.50	7.59			101		90-110		
Batch number: 16315120601B	Sample number(s): 8670454,8670457								
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 number(s): 8670458								
Total Alkalinity to pH 4.5	188	177.97			95		84-110		
Batch number: 16312002103A	Sample number(s): 8670454,8670457								
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 number(s): 8670454-8670458 UNSPK: 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.
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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 12/30/2016 15:16

Group Number: 1726931

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
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 163090635001	Sample number(s): 8670454,8670457-8670458 UNSPK: P677168									
Calcium	46.77	4.00	53.4	4.00	51.7	166 (2)	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 number(s): 8670454,8670457-8670458 UNSPK: 8670454									
Total Nitrite/Nitrate Nitrogen	0.040 U	1.00	1.10			110		90-110		
Batch number: 16315120601A	Sample number(s): 8670458 UNSPK: P671823									
Chloride	48.19	100	147.97			100		90-110		
Sulfate	24.01	25	48.14			97		90-110		
Batch number: 16315120601B	Sample number(s): 8670454,8670457 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 number(s): 8670458 UNSPK: 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 number(s): 8670454,8670457 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	DUP RPD	DUP RPD Max
	mg/l	mg/l		
Batch number: 163090635001	Sample number(s): 8670454,8670457-8670458 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): 8670454,8670457-8670458 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.
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.

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.
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.

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.
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.

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: 1726931 Sample #: 8670454-58 COC#: 15591

Client: C.T. Male Associates			
Project Name/#: SGPP - Merrimack	Site ID:		
Project Manager: Kirk Moline	P.O. #: 16 6126		
Sampler: Jonathan Dysart			
Phone #: 518-786-7400	Quote #: 214135		
State where sample(s) were collected: NH			

Matrix: Soil ☐ Sediment ☐ Potable ☐ Ground ☒ NPDES ☐ Surface ☐ Water ☒ Other: Blank Water

Analyses Requested / Preservation Codes

Sample Identification	Collection Date	Collection Time	Grab	Composite	Total # of Containers	TCL VOAs (8260C) H	Ca, Mg, Na, K (6010C) N	~~NO2 (353.2)~~	NO3 (353.2) + NO2 as N S	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
SG 2 -AP 03 -25-161028 16 (34)	10/28/16	0950	X		11	X	X		X	X	X	X	
SG 2 -AP LTB01 - 161028 16 (33)	10/28/16	—			3	X						X	
SG 2 -AP FTB01 - 161028 16 (35)	10/28/16	0945	X		1							X	
SG 2 -AP 03 -35-161028 16 (36)	10/28/16	1220	X		11	X	X		X	X	X	X	
SG 2 -AP FD01 - 161028 16 (37)	10/28/16	—	X		11	X	X		X	X	X	X	
SG -AP - 16													
SG -AP - 16													
SG -AP - 16													
SG -AP - 16													
SG -AP - 16													

Preservation Codes: H = HCl; T = Thiosulfate; N = HNO_3; B = NaOH; S = H_2SO_4; P = H_3PO_4; O = Other

For Lab Use Only: SF#: 285327; SCR#: 196065

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☒ MA MCP ☐ TX TRRP - 13 ☐

Type III (Reduced non-CLP) ☐ CT RCP ☐

Type IV (CLP SOW) ☐ ASP Type A ☐

Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

	Relinquished by:	Date	Time	Received by:	Date	Time
1		10/28/16	1520			
2						
3						
4						
5						

Airbill No.:

Relinquished by Commercial Carrier:

UPS _____ FedEx X Other _____

Temperature upon receipt 2.0-4.7 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 166759

Group Number(s): 1726931

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:	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 250mL bottle

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	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	4.7	DT	Wet	N	Bagged	N
2	DT131	2.0	DT	Wet	N	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
T : 717-656-2300
F : 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< 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.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

Client Sample Description	Lancaster Labs (LL) #
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

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.

Sample #s: 8679407, 8679409, 8679410, 8679413, 8679414

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

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

Submitted: 11/03/2016 09:30
Reported: 01/04/2017 11:25

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

2RB01 SDG#: MMK06-01

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 modified**		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-methyl perfluorooctanesulfonamidoacetic 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 Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321006	11/22/2016 19:25	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

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

Submitted: 11/03/2016 09:30
Reported: 01/04/2017 11:25

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

2RB02 SDG#: MMK06-02BKG

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 modified**		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-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 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

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

Submitted: 11/03/2016 09:30
Reported: 01/04/2017 11:25

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 modified**		ng/l	ng/l	ng/l	
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-ethyl perfluorooctanesulfonamidoacetic Acid.					
10954	NMeFOSAA	2355-31-9	150	1	3	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic 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 Time	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

*=This limit was used in the evaluation of the final result

Sample Description: SG2-RB02-161102MSD Grab Water
SGPP - Merrimack

LL Sample # GW 8679409
LL Group # 1729119
Account # 37191

Project Name: SGPP - Merrimack

Collected: 11/02/2016 15:02 by JD

Submitted: 11/03/2016 09:30
Reported: 01/04/2017 11:25

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 modified**		ng/l	ng/l	ng/l	
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 perfluorooctanesulfonamidoacetic Acid.					
10954	NMeFOSAA	2355-31-9	170	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 Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321006	11/22/2016 20:26	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

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

Submitted: 11/03/2016 09:30
Reported: 01/04/2017 11:25

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

2RB03 SDG#: MMK06-03

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 modified**		ng/l		ng/l	ng/l	
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-ethyl perfluorooctanesulfonamidoacetic 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 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

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

Submitted: 11/03/2016 09:30
Reported: 01/04/2017 11:25

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

2RB04 SDG#: MMK06-04

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 modified**		**ng/l**		**ng/l**	**ng/l**	
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-ethyl perfluorooctanesulfonamidoacetic Acid.						
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic 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.

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	16321006	11/22/2016 22:09	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

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

Submitted: 11/03/2016 09:30
Reported: 01/04/2017 11:25

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

2RB05 SDG#: MMK06-05

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 modified**		ng/l		ng/l	ng/l	
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	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	375-73-5	1	J	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	9		1	3	1
10954	Perfluoro-octanesulfonate	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 perfluorooctanesulfonamidoacetic Acid.						
10954	NMeFOSAA	2355-31-9	1	U	1	3	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic 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 Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321006	11/22/2016 22:30	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

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

Submitted: 11/03/2016 09:30
Reported: 01/04/2017 11:25

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

2RB06 SDG#: MMK06-06

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 modified**		ng/l		ng/l	ng/l	
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-ethyl perfluorooctanesulfonamidoacetic 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 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

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

Submitted: 11/03/2016 09:30
Reported: 01/04/2017 11:25

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

2RB-D SDG#: MMK06-07FD

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 modified**		ng/l		ng/l	ng/l	
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-ethyl perfluorooctanesulfonamidoacetic 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 Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321006	12/02/2016 23:16	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

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 11:25

Group Number: 1729119

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 ng/l		MDL** ng/l	LOQ ng/l
Batch number: 16321006	Sample number(s): 8679406-8679414			
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(s): 8679406-8679414								
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.
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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 11:25

Group Number: 1729119

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	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: 16321006	Sample number(s): 8679406-8679414 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.
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.

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.
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 Analysis Request/Chain of Custody

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Acct. # 37191 Group # 1729119 Sample # 8679406 -14

COC # 512769

Client Information

Client: CT Male Associates	Acct. #:
Project Name/#: SGPP- Merrimack	PWSID #:
Project Manager: Kirk Moline	P.O. #: 16.6126
Sampler: Jonathon Dipaet	Quote #:
State where samples were collected: NH	For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Tissue ☐ Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ Other: Blank Water

Analysis Requested

Preservation Codes

PFCs (EPA 537 mod)

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers
SG2-RB01-161102	11/2/16	1500	X		1
SG2-RB02-161102		1502	X		3
SG2-RB03-161102		1505	X		1
SG2-RB04-161102		1507	X		1
SG2-RB05-161102		1510	X		1
SG2-RB06-161102	↓	1512	X		1
SG2-RBFD01-161102	11/2/16	—	X		1

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

Page 1 of 1

MS/MSD

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: K.moline@ctmale.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
	11/2/16	1810			
			Cathy Murphy	11/3/16	9:30

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt 1.2-1.5°C

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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:	11/03/2016 9:30
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:	N/A
Samples Chilled:	Yes	Total Trip Blank Qty:	3
Paperwork Enclosed:	Yes	Trip Blank Type:	HCl
Samples Intact:	Yes	Air Quality Samples Present:	No
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	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	1.2	DT	Wet	Y	Bagged	N
2	DT146	1.5	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

<	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.

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Analysis Report

REVISED

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

Client Sample Description	Lancaster Labs (LL) #
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

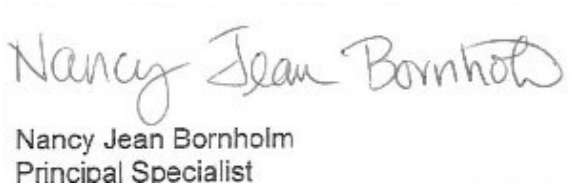
The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

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

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.

Sample #s: 8679492

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

Batch #: 16314118104B (Sample number(s): 8679492-8679493, 8679495-8679497 UNSPK: 8679492 BKG: 8679492)

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

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

03-45 SDG#: MMK07-01

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	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

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

03-45 SDG#: MMK07-01

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
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 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	44		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	8		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	7		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	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-ethyl perfluorooctanesulfonamidoacetic Acid.						
10954	NMeFOSAA	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.						
Metals	**SW-846 6010C**		**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 Chemistry	**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/Nitrate 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 pH 4.5	n.a.	20.4		1.7	5.0	1
12149	Bicarbonate Alkalinity	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

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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.

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	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

*=This limit was used in the evaluation of the final result

REVISED

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
03-45

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8679489
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov11a.b/ln11s08.d
Level: (low/med) LOW Date Received: 11/03/16
% Moisture: not dec. Date Analyzed: 11/11/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

2-TB1 SDG#: MMK07-02TB

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	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

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

2-TB1 SDG#: MMK07-02TB

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	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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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 perfluorooctanesulfonamidoacetic Acid.						
10954	NMeFOSAA	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic 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 Time	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

*=This limit was used in the evaluation of the final result

REVISED

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
2-TB1

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8679490
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov11a.b/ln11s04.d
Level: (low/med) LOW Date Received: 11/03/16
% Moisture: not dec. Date Analyzed: 11/11/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

2FTB1 SDG#: MMK07-03TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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 perfluorooctanesulfonamidoacetic Acid.						
10954	NMeFOSAA	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic 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 Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16318002	11/22/2016 15:59	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

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	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

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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-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.						
	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**	
00224	Chloride	16887-00-6	109		4.0	8.0	20
00228	Sulfate	14808-79-8	11.4		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	

*=This limit was used in the evaluation of the final result

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**EPA 353.2**		**mg/l**	**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	3.6	0.040	0.10	1
Wet Chemistry	**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 Alkalinity	n.a.	24.1	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 Time	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

*=This limit was used in the evaluation of the final result

REVISED

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

03-55

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8679492
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov11a.b/ln11s09.d
Level: (low/med) LOW Date Received: 11/03/16
% Moisture: not dec. Date Analyzed: 11/11/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

0365- SDG#: MMK07-05

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 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

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

0365- SDG#: MMK07-05

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 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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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	Perfluorohexanoic acid	307-24-4	9		1	2	1
10954	Perfluoroheptanoic acid	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	Perfluorobutanoic Acid	375-22-4	3	J	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-ethyl perfluorooctanesulfonamidoacetic Acid.						
10954	NMeFOSAA	2355-31-9	4	U	4	8	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.						
Metals	**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
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 Chemistry	**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

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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.

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	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

*=This limit was used in the evaluation of the final result

REVISED

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

0365-

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8679493
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov11a.b/ln11s10.d
Level: (low/med) LOW Date Received: 11/03/16
% Moisture: not dec. Date Analyzed: 11/11/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

2-RB1 SDG#: MMK07-06RB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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-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.

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	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

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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-ethyl perfluorooctanesulfonamidoacetic 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.						
Metals	**SW-846 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 Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	17.9		1.0	2.0	5
00228	Sulfate	14808-79-8	4.3	J	1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate 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 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

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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.

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	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

*=This limit was used in the evaluation of the final result

REVISED

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
21020

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8679495
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov11a.b/ln11s11.d
Level: (low/med) LOW Date Received: 11/03/16
% Moisture: not dec. Date Analyzed: 11/11/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

21030 SDG#: MMK07-08

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	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

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

21030 SDG#: MMK07-08

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	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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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	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	48		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	23		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	10		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	9		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	37		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	7	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	17		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-methyl perfluorooctanesulfonamidoacetic 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	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 Chemistry	**EPA 300.0**		**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		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	1.6		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.	1.7	U	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	1.7	U	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

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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.

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	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

*=This limit was used in the evaluation of the final result

REVISED

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
21030

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8679496
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov11a.b/ln11s12.d
Level: (low/med) LOW Date Received: 11/03/16
% Moisture: not dec. Date Analyzed: 11/11/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	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

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 on the back of this form.						
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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 perfluorooctanesulfonamidoacetic 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.						
Metals	**SW-846 6010C**		**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 Chemistry	**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/Nitrate 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 Alkalinity	n.a.	20.9		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

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

Submitted: 11/03/2016 09:30
Reported: 01/30/2017 13:27

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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.

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	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) - 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 20:25	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

*=This limit was used in the evaluation of the final result

REVISED

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
21040

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8679497
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov11a.b/ln11s13.d
Level: (low/med) LOW Date Received: 11/03/16
% Moisture: not dec. Date Analyzed: 11/11/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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 ug/l		MDL** ug/l	LOQ ug/l
Batch number: L163161AA	Sample number(s): 8679489-8679490,8679492-8679493,8679495-8679497			
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	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.
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.

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		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: 16318002	Sample number(s): 8679489-8679494			
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
Batch number: 16321006	Sample number(s): 8679495-8679497			
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

*- 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.

REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:27

Group Number: 1729126

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ
	mg/l		mg/l	mg/l
Batch number: 163120635002	Sample number(s): 8679489,8679492-8679493,8679495-8679497			
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: 16314118104A	Sample number(s): 8679489			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 16314118104B	Sample number(s): 8679492-8679493,8679495-8679497			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 16316972601A	Sample number(s): 8679489,8679492-8679493,8679495-8679497			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
	mg/l as CaCO3		mg/l as CaCO3	mg/l as CaCO3
Batch number: 16316002105A	Sample number(s): 8679489,8679492-8679493			
Total Alkalinity to pH 4.5	3.1	J	1.7	5.0
Batch number: 16316002106A	Sample number(s): 8679495-8679496			
Total Alkalinity to pH 4.5	3.2	J	1.7	5.0
Batch number: 16316002106B	Sample number(s): 8679497			
Total Alkalinity to pH 4.5	3.2	J	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: L163161AA	Sample number(s): 8679489-8679490,8679492-8679493,8679495-8679497								
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
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(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.

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	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: 16318002	Sample number(s): 8679489-8679494								
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

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REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:27

Group Number: 1729126

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
	ng/l	ng/l	ng/l	ng/l					
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 number(s): 8679495-8679497								
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 number(s): 8679489,8679492-8679493,8679495-8679497								
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 number(s): 8679489								
Total Nitrite/Nitrate Nitrogen	2.50	2.51			100		90-110		
Batch number: 16314118104B	Sample number(s): 8679492-8679493,8679495-8679497								
Total Nitrite/Nitrate Nitrogen	2.50	2.51			100		90-110		
Batch number: 16316972601A	Sample number(s): 8679489,8679492-8679493,8679495-8679497								
Chloride	3.00	3.01			100		90-110		
Sulfate	7.50	7.59			101		90-110		

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REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:27

Group Number: 1729126

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	Sample number(s): 8679489,8679492-8679493								
Total Alkalinity to pH 4.5	188	177.21			94		84-110		
Batch number: 16316002106A	Sample number(s): 8679495-8679496								
Total Alkalinity to pH 4.5	188	179.23			95		84-110		
Batch number: 16316002106B	Sample number(s): 8679497								
Total Alkalinity to pH 4.5	188	179.23			95		84-110		

MS/MSD

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
Batch number: L163161AA	Sample number(s): 8679489-8679490,8679492-8679493,8679495-8679497 UNSPK: P682722										
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

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REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:27

Group Number: 1729126

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
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	Sample number(s): 8679489-8679494 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		
Batch number: 16321006	Sample number(s): 8679495-8679497 UNSPK: P679407										
Perfluorooctanoic acid	0.5	U	200.38	171.26	199.5	185.2	85	93	70-130	8	30

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REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:27

Group Number: 1729126

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
	ng/l		ng/l	ng/l	ng/l	ng/l					
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 number(s): 8679489,8679492-8679493,8679495-8679497 UNSPK: P682722										
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 number(s): 8679489 UNSPK: P672528										
Total Nitrite/Nitrate Nitrogen	0.993		1.00	1.99			100		90-110		
Batch number: 16314118104B	Sample number(s): 8679492-8679493,8679495-8679497 UNSPK: 8679492										
Total Nitrite/Nitrate Nitrogen	3.55		5.00	8.79			105		90-110		
Batch number: 16316972601A	Sample number(s): 8679489,8679492-8679493,8679495-8679497 UNSPK: 8679495										
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	Sample number(s): 8679489,8679492-8679493 UNSPK: P688452										
Total Alkalinity to pH 4.5	204.66		188	357			81*		84-110		
Batch number: 16316002106A	Sample number(s): 8679495-8679496 UNSPK: 8679496										
Total Alkalinity to pH 4.5	1.7	U	188	150.83			80*		84-110		
Batch number: 16316002106B	Sample number(s): 8679497 UNSPK: 8679496										
Total Alkalinity to pH 4.5	1.7	U	188	150.83			80*		84-110		

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REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:27

Group Number: 1729126

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): 8679489,8679492-8679493,8679495-8679497 BKG: P682722			
Calcium	15.81	15.84	0	20
Magnesium	2.77	2.78	0	20
Potassium	2.74	2.78	1 (1)	20
Sodium	62.63	62.75	0	20
	mg/l	mg/l		
Batch number: 16314118104A	Sample number(s): 8679489 BKG: P672528			
Total Nitrite/Nitrate Nitrogen	0.993	0.982	1	2
Batch number: 16314118104B	Sample number(s): 8679492-8679493,8679495-8679497 BKG: 8679492			
Total Nitrite/Nitrate Nitrogen	3.55	3.38	5*	2
Batch number: 16316972601A	Sample number(s): 8679489,8679492-8679493,8679495-8679497 BKG: 8679495			
Chloride	17.87	17.35	3	15
Sulfate	4.29	4.14	3 (1)	15
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 16316002105A	Sample number(s): 8679489,8679492-8679493 BKG: P688452			
Total Alkalinity to pH 4.5	204.66	203.32	1	5
Batch number: 16316002106A	Sample number(s): 8679495-8679496 BKG: 8679496			
Total Alkalinity to pH 4.5	1.7 U	1.89	200* (1)	5
Batch number: 16316002106B	Sample number(s): 8679497 BKG: 8679497			
Total Alkalinity to pH 4.5	20.92	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.
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.

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.
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.

REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:27

Group Number: 1729126

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

	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.
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.

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Environmental Services Analysis Request/Chain of Custody

Page 1 of 1

Acct. #: 37191 Group #: 172912 Sample #: 8679489-97

COC#: 15589

Client: C.T. Male Associates			
Project Name/#: SGPP - Merrimack	Site ID:		
Project Manager: Kirk Moline	P.O. #: 16.6126		
Sampler: Jonathan Dippert			
Phone #: 518-786-7400	Quote #: 214135		
State where sample(s) were collected: NH			

Matrix: Soil ☐ Sediment ☐ | Water: Potable ☐ Ground ☒ NPDES ☐ Surface ☐ | Other: Blank Water

Analyses Requested / Preservation Codes

Sample Identification	Collection Date	Collection Time	Grab	Composite	Total # of Containers	TCL VOAs (8260C) [H]	Ca, Mg, Na, K (6010C) [N]	NO2 (353.2)	NO3 (353.2)+NO2 as N [S]	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
SG2 -AP03 - 45 - 161031	10/31/16	1010	X		11	X	X		X	X	X	X	
SG2 -AP LTB01 - 161031					3	X						X	
SG2 -AP FTB1 - 161031		1025	X		1							X	
SG2 -AP03 - 55 - 161031		1255	X		11	X	X		X	X	X	X	
SG2 -AP03 - 65 - 161031	10/31/16	1610	X		11	X	X		X	X	X	X	
SG2 -AP RB01 - 161101	11/1/16	1530	X		2							X	
SG2 -AP10 - 20 - 161102	11/2/16	0955	X		11	X	X		X	X	X	X	
SG2 -AP10 - 30 - 161102	11/2/16	1210	X		11	X	X		X	X	X	X	
SG2 -AP10 - 40 - 161102	11/2/16	1435	X		12	X	X		X	X	X	X	Matrix Spike QC
SG -AP - 16													

For Lab Use Only

SF#: 285327

SCR#: 196063

Preservation Codes

H = HCl T = Thiosulfate

N = HNO_3 B = NaOH

S = H_2SO_4 P = H_3PO_4

O = Other

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☒ MA MCP ☐ TX TRRP - 13 ☐

Type III (Reduced non-CLP) ☐ CT RCP ☐

Type IV (CLP SOW) ☐ ASP Type A ☐

Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
[signature]	10/12/16	1504			
[signature]	11/2/16	1810			
			Cathy Rich	11/3/16	9:30

Airbill No.:

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt 1.2 - 1.5 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 167155

Group Number(s): 172926

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:	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:	N/A
Samples Chilled:	Yes	Total Trip Blank Qty:	3
Paperwork Enclosed:	Yes	Trip Blank Type:	HCl
Samples Intact:	Yes	Air Quality Samples Present:	No
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	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	1.2	DT	Wet	Y	Bagged	N
2	DT146	1.5	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
T : 717-656-2300
F : 717-656-2681
www.LancasterLabs.com

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< 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.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

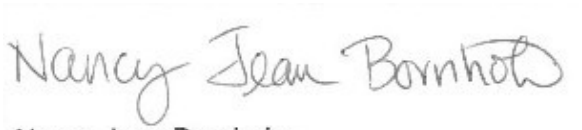
Client Sample Description	Lancaster Labs (LL) #
SG2-AP10-50-161103 Grab Groundwater	8682715
SG2-AP10-60-161103 Grab Groundwater	8682716
SG2-LTB01-161103 Blank Water	8682717
SG2-FTB01-161103 Blank Water	8682718
SG2-AP10-70-161103 Grab Groundwater	8682719
SG2-AP10-80-161103 Grab Groundwater	8682720
SG2-AP10-84.5-161103 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

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

Sample #s: 8682717, 8682722

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

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/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 perfluorooctanesulfonamidoacetic 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
Wet Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	89.0		20.0	40.0	100
00228	Sulfate	14808-79-8	12.8		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	

*=This limit was used in the evaluation of the final result

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**EPA 353.2**		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	4.3		0.20	0.50	5
Wet Chemistry	**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 Alkalinity	n.a.	16.6		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 No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

08MM1

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8682715
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov11a.b/ln11s14.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	**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

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	**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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/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 perfluorooctanesulfonamidoacetic 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
00228	Sulfate	14808-79-8	13.1		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	

*=This limit was used in the evaluation of the final result

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**EPA 353.2**		**mg/l**	**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	4.3	0.20	0.50	5
Wet Chemistry	**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 Alkalinity	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

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

08MM2

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8682716
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov11a.b/ln11s15.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

08MM3 SDG#: MMK08-03TB

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	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

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

08MM3 SDG#: MMK08-03TB

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	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 Rev. 1.1 modified**		**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-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 Time	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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

08MM3

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8682717
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov11a.b/ln11s03.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

08MM4 SDG#: MMK08-04TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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 perfluorooctanesulfonamidoacetic 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 Time	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 modified	1	16321007	11/16/2016 14:30	Devon M Whooley	1

*=This limit was used in the evaluation of the final result

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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-ethyl perfluorooctanesulfonamidoacetic 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
Wet Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	116		20.0	40.0	100
00228	Sulfate	14808-79-8	13.1		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	

*=This limit was used in the evaluation of the final result

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**EPA 353.2**		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	4.9		0.20	0.50	5
Wet Chemistry	**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 Alkalinity	n.a.	23.1		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 Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED 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: 11/05/16
% Moisture: not dec. Date Analyzed: 11/11/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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-ethyl perfluorooctanesulfonamidoacetic 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**	
00224	Chloride	16887-00-6	125		20.0	40.0	100
00228	Sulfate	14808-79-8	14.0		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	

*=This limit was used in the evaluation of the final result

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**EPA 353.2**		**mg/l**	**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	4.8	0.20	0.50	5
Wet Chemistry	**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 Alkalinity	n.a.	23.1	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 Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

08MM6

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8682720
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	**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

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	**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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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 perfluorooctanesulfonamidoacetic 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**	
00224	Chloride	16887-00-6	128		20.0	40.0	100
00228	Sulfate	14808-79-8	13.2		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	

*=This limit was used in the evaluation of the final result

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**EPA 353.2**		**mg/l**	**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	4.4	0.20	0.50	5
Wet Chemistry	**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 Alkalinity	n.a.	21.8	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 Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED 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/16nov11a.b/ln11s18.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

08MM8 SDG#: MMK08-08BKG

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	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

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

08MM8 SDG#: MMK08-08BKG

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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	150		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	20		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	17		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	13		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-methyl perfluorooctanesulfonamidoacetic 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	15.8		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 Chemistry	**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/Nitrate Nitrogen	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 to pH 4.5	n.a.	27.5		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	27.5		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

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Time	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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

08MM8

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8682722
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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	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

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 8260C**		**ug/l**	**ug/l**	**ug/l**	
11997	o-Xylene	95-47-6	19	0.5	1	1
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**	**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	330	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	220	0.6	2	1
10954	Perfluorodecanoic acid	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	Perfluorotridecanoic acid	72629-94-8	190	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	190	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	210	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	230	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	180	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	180	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	170	2	6	1
10954	Perfluorobutanoic Acid	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
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic 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	**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	4.74	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 Chemistry	**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/Nitrate 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

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Time	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

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	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	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	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	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	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	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

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	o-Xylene	95-47-6	19	0.5	1	1
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**	**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	310	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	190	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	170	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	190	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	180	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	190	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	210	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	170	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	190	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	180	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	190	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-ethyl perfluorooctanesulfonamidoacetic 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	**SW-846 6010C**		**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 Chemistry	**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.	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.

*=This limit was used in the evaluation of the final result

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

08MM8 SDG#: MMK08-08MSD

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	L163161AA	11/11/2016 11:21	Linda C Pape	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163161AA	11/11/2016 11:21	Linda C Pape	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16321007	11/23/2016 03:38	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 15:37	Suzanne M Will	1
01757	Magnesium	SW-846 6010C	1	163120635002	11/10/2016 15:37	Suzanne M Will	1
01762	Potassium	SW-846 6010C	1	163120635002	11/10/2016 15:37	Suzanne M Will	1
01767	Sodium	SW-846 6010C	1	163120635002	11/10/2016 15:37	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
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16319006204A	11/14/2016 22:02	Brandon P Costik	1

*=This limit was used in the evaluation of the final result

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
Metals	**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 Chemistry	**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/Nitrate Nitrogen	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 pH 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 Time	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) - 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 17:16	Hallie Burnett	20
00228	Sulfate	EPA 300.0	1	16321120131A	11/16/2016 17:03	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16319118101B	11/14/2016 15:19	Joseph E McKenzie	5
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

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

Submitted: 11/05/2016 09:50
Reported: 01/04/2017 14:13

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

08MM9 SDG#: MMK08-09RB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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-ethyl perfluorooctanesulfonamidoacetic 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 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

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): 8682715-8682717,8682719-8682724			
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.
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.

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
	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: 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
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: 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
Sulfate	0.30	U	0.30	1.0

*- Outside of specification
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(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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 14:13

Group Number: 1729841

Method Blank (continued)

Analysis Name	Result mg/l as CaCO3		MDL** mg/l as CaCO3	LOQ mg/l as CaCO3
Batch number: 16319006204A	Sample number(s): 8682715-8682716,8682719,8682721-8682725			
Total Alkalinity to pH 4.5	1.7	U	1.7	5.0
Batch number: 16319006204B	Sample number(s): 8682720			
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: L163161AA	Sample number(s): 8682715-8682717,8682719-8682724								
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		

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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 number(s): 8682715-8682724,8682726								
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 number(s): 8682715-8682716,8682719-8682725								
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: 16319118101B	Sample number(s): 8682715-8682716,8682720-8682723,8682725								

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(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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 14:13

Group Number: 1729841

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	Sample number(s): 8682719								
Total Nitrite/Nitrate Nitrogen	2.50	2.26			90		90-110		
Batch number: 16321120131A	Sample number(s): 8682715-8682716,8682719-8682723,8682725								
Chloride	3.00	2.93			98		90-110		
Sulfate	7.50	7.30			97		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16319006204A	Sample number(s): 8682715-8682716,8682719,8682721-8682725								
Total Alkalinity to pH 4.5	188	188.07			100		84-110		
Batch number: 16319006204B	Sample number(s): 8682720								
Total Alkalinity to pH 4.5	188	188.07			100		84-110		

MS/MSD

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
Batch number: L163161AA	Sample number(s): 8682715-8682717,8682719-8682724 UNSPK: 8682722										
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

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(1) The result for one or both determinations was less than five times the LOQ.
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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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 14:13

Group Number: 1729841

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	Sample number(s): 8682715-8682724,8682726 UNSPK: 8682722										
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

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(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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 14:13

Group Number: 1729841

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 number(s): 8682715-8682716,8682719-8682725 UNSPK: 8682722									
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 number(s): 8682715-8682716,8682720-8682723,8682725 UNSPK: 8682722									
Total Nitrite/Nitrate Nitrogen	5.07	5.00	10.36			106		90-110		
Batch number: 16321118102A	Sample number(s): 8682719 UNSPK: P687845									
Total Nitrite/Nitrate Nitrogen	3.59	5.00	6.43			57*		90-110		
Batch number: 16321120131A	Sample number(s): 8682715-8682716,8682719-8682723,8682725 UNSPK: 8682722									
Chloride	103.54	80	180.83			97		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 number(s): 8682715-8682716,8682719,8682721-8682725 UNSPK: 8682722									
Total Alkalinity to pH 4.5	27.53	188	198.17	188	200.17	91	92	84-110	1	5
Batch number: 16319006204B	Sample number(s): 8682720 UNSPK: 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 mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Batch number: 163120635002	Sample number(s): 8682715-8682716,8682719-8682725 BKG: 8682722			
Calcium	15.81	15.84	0	20
Magnesium	2.77	2.78	0	20

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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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 14:13

Group Number: 1729841

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	2.74	2.78	1 (1)	20
Sodium	62.63	62.75	0	20
	mg/l	mg/l		
Batch number: 16319118101B	Sample number(s): 8682715-8682716,8682720-8682723,8682725 BKG: 8682722			
Total Nitrite/Nitrate Nitrogen	5.07	5.03	1	2
Batch number: 16321118102A	Sample number(s): 8682719 BKG: P687845			
Total Nitrite/Nitrate Nitrogen	3.59	3.56	1	2
Batch number: 16321120131A	Sample number(s): 8682715-8682716,8682719-8682723,8682725 BKG: 8682722			
Chloride	103.54	102.52	1	15
Sulfate	14.23	14.04	1 (1)	15
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 16319006204A	Sample number(s): 8682715-8682716,8682719,8682721-8682725 BKG: 8682722			
Total Alkalinity to pH 4.5	27.53	27.49	0	5
Batch number: 16319006204B	Sample number(s): 8682720 BKG: 8682720			
Total Alkalinity to pH 4.5	23.11	21.6	7* (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
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

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(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.

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
8682715	71	65*	61*
8682716	71	73	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.
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.

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.

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: 1729841 Sample #: 8682715-26 COC#: 15589

Client: C.T. Male Associates			
Project Name/#: SGPP - Merrimack	Site ID:		
Project Manager: Kirk Moline	P.O. #: 16.6126		
Sampler: Jonathan Dippert			
Phone #: 978-786-7400	Quote #: 214135		
State where sample(s) were collected: NH			

Matrix: Soil ☐ Sediment ☐ Water ☒ (Potable ☐ Ground ☐ NPDES ☐ Surface ☐) Other: Blank Water ☐

Analyses Requested / Preservation Codes

Sample Identification	Collection Date	Collection Time	Grab	Composite	Total # of Containers	TCL VOAs (8260C) H	Ca, Mg, Na, K (6010C) N	NO2 (353.2) S	NO3 (353.2) + NO2 as N S	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
SG2-AP10-50-161103 16(50)	11/3/16	0755	X		11	X	X		X	X	X	X	
SG2-AP10-60-161103 16(50)		0955	X		11	X	X		X	X	X	X	
SG2-AP(GW)LTB01-161103 16(50)		—	X		3	X						X	
SG2-AP(GW)FTB01-161103 16(50)		1015	X		1							X	
SG2-AP10-70-161103 16(50)		1205	X		11	X	X		X	X	X	X	
SG2-AP10-80-161103 16(50)		1420	X		11	X	X		X	X	X	X	
SG2-AP10-84.5-161103 16(50)	11/3/16	1635	X		11	X	X		X	X	X	X	
SG2-AP09-28-161104 16(50)	11/4/16	0950	X		33	X	X		X	X	X	X	MS/MSD
SG2-APRB01-161104 16(50)	11/4/16	0740	X		2							X	
SG-AP- 16													

Preservation Codes: H = HCl; T = Thiosulfate; N = HNO_3; B = NaOH; S = H_2SO_4; P = H_3PO_4; O = Other

For Lab Use Only: SF#: 285327 SCR#: 196063

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.Moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☒ MA MCP ☐ TX TRRP - 13 ☐

Type III (Reduced non-CLP) ☐ CT RCP ☐

Type IV (CLP SOW) ☐ ASP Type A ☐

Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
	11/4/16	1400			
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	11/5/16	0950

Airbill No.:

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt 19-24 °C

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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:	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:	N/A
Samples Chilled:	Yes	Total Trip Blank Qty:	3
Paperwork Enclosed:	Yes	Trip Blank Type:	HCl
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Karen Diem (3060) at 12:42 on 11/05/2016

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	DT121	1.9	DT	Wet	Y	Bagged	N
2	DT121	2.4	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

<	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.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

Client Sample Description	Lancaster Labs (LL) #
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

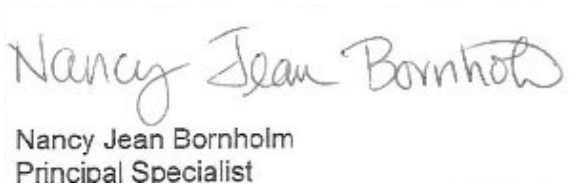
The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

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

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.

Sample #s: 8687837, 8687842

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 accpetance 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

Batch #: 16323120121B (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

Batch #: 16321118101B (Sample number(s): 8687827-8687832, 8687834-8687835, 8687838-8687839, 8687842, 8687844 UNSPK: 8687831 BKG: 8687831)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Total Nitrite/Nitrate Nitrogen

Batch #: 16321118102A (Sample number(s): 8687845-8687846 UNSPK: 8687845 BKG: 8687845)

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 #: 16321002202A (Sample number(s): 8687830, 8687839 UNSPK: P688635 BKG: P688635, P688637)

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, 8687838, 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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM901 SDG#: MMK09-01

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	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM901 SDG#: MMK09-01

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
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 modified**		**ng/l**		**ng/l**	**ng/l**	
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	J	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	2	J	0.5	2	1
	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	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 Chemistry	**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/Nitrate 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.	8.7		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	8.7		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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM901 SDG#: MMK09-01

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 No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
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	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016 12:11	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 03:10	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016 03:10	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016 03:10	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016 03:10	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	16323120121B	11/18/2016 18:14	Hallie Burnett	5
00228	Sulfate	EPA 300.0	1	16323120121B	11/18/2016 18:14	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16321118101B	11/16/2016 03:17	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321005106A	11/17/2016 16:54	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321005106A	11/17/2016 16:54	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16321005106A	11/17/2016 16:54	Brandon P Costik	1

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MM901

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8687827
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov18b.b/yn18s78.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM902 SDG#: MMK09-02

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	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM902 SDG#: MMK09-02

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	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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	13		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	4		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	4	J	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	7	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	3		0.5	2	1
	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	15.3		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 Chemistry	**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/Nitrate Nitrogen	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 to pH 4.5	n.a.	12.7		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	12.7		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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM902 SDG#: MMK09-02

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 Time	Analyst	Dilution Factor
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	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016 12:32	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 03:13	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016 03:13	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016 03:13	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016 03:13	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	16323120121B	11/18/2016 21:44	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16323120121B	11/18/2016 21:27	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16321118101B	11/16/2016 03:19	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321002201A	11/16/2016 21:00	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321002201A	11/16/2016 21:00	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16321002201A	11/16/2016 21:00	Brandon P Costik	1

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

MM902

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8687828
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov18b.b/yn18s79.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM903 SDG#: MMK09-03

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM903 SDG#: MMK09-03

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	12		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	5		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	3		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	4	J	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	7	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	4		0.5	2	1
	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	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 Chemistry	**EPA 300.0**		**mg/l**		**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/Nitrate 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 to pH 4.5	n.a.	12.7		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	12.7		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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
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	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016 12:52	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 03:22	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016 03:22	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016 03:22	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016 03:22	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 14:44	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16326120151A	11/21/2016 14:29	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16321118101B	11/16/2016 03:20	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321005106A	11/17/2016 16:37	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321005106A	11/17/2016 16:37	Brandon P Costik	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MM903

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8687829
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov18b.b/yn18s80.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

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM904 SDG#: MMK09-04FD

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	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM904 SDG#: MMK09-04FD

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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	11		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	4		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	2		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	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	5		0.5	2	1
	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	15.0		0.0382	0.400	1
01757	Magnesium	7439-95-4	3.45		0.0190	0.200	1
01762	Potassium	7440-09-7	2.96		0.160	1.00	1
01767	Sodium	7440-23-5	45.3		0.173	2.00	1
Wet Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	83.8		10.0	20.0	50
00228	Sulfate	14808-79-8	29.8		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate 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 to pH 4.5	n.a.	11.6		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	11.6		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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution 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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MM904

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8687830
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov18b.b/yn18s81.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

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM905 SDG#: MMK09-05BKG

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	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM905 SDG#: MMK09-05BKG

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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	11		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	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	4		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	3		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	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
	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	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 Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	84.2		10.0	20.0	50
00228	Sulfate	14808-79-8	30.7		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	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 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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MM905

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8687831
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov18b.b/yn18s75.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
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29.					
30.					

page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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	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	22	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	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	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 8260C**		**ug/l**	**ug/l**	**ug/l**	
11997	o-Xylene	95-47-6	21	0.5	1	1
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**	**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	230	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	210	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	230	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	250	1	3	1
10954	Perfluorododecanoic acid	307-55-1	230	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	230	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	240	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	220	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	250	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	210	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	220	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	240	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	240	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	230	0.5	2	1
	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	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
Wet Chemistry	**EPA 300.0**		**mg/l**	**mg/l**	**mg/l**	
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/Nitrate 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.	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 No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor

*=This limit was used in the evaluation of the final result

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM905 SDG#: MMK09-05MS

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	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Rev. 1.1 modified**		**ng/l**	**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	270	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	250	0.6	2	1
10954	Perfluorodecanoic acid	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	Perfluorotridecanoic acid	72629-94-8	260	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	260	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	270	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	250	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	220	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	220	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	240	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	250	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	250	0.5	2	1
	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	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 Chemistry	**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.	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 Time	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM905 SDG#: MMK09-05MSD

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	**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 Chemistry	**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/Nitrate Nitrogen	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 Time	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

*=This limit was used in the evaluation of the final result

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM906 SDG#: MMK09-06

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM906 SDG#: MMK09-06

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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	J	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	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	2	J	0.5	2	1
	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	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 Chemistry	**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/Nitrate 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.	5.4		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	5.4		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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM906 SDG#: MMK09-06

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

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
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	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016 13:33	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 03:28	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016 03:28	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016 03:28	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016 03:28	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 13:45	Hallie Burnett	5
00228	Sulfate	EPA 300.0	1	16326120151A	11/21/2016 13:45	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16321118101B	11/16/2016 03:27	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321005106A	11/17/2016 17:02	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321005106A	11/17/2016 17:02	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16321005106A	11/17/2016 17:02	Brandon P Costik	1

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MM906

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8687835
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov18b.b/yn18s82.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

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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3.					
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM907 SDG#: MMK09-07TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**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

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
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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM908 SDG#: MMK09-08TB

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	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM908 SDG#: MMK09-08TB

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	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 Rev. 1.1 modified**		**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

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 accpetance 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	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163234AA	11/19/2016 00:14	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163234AA	11/19/2016 00:14	Kevin D Kelly	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016 14:14	Jason W Knight	1

*=This limit was used in the evaluation of the final result

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM908 SDG#: MMK09-08TB

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
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

1E

EPA SAMPLE NO.

MM908

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8687837
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov18b.b/yn18s73.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM909 SDG#: MMK09-09

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	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM909 SDG#: MMK09-09

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 on the back of this form.						
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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	11		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	11		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	8		0.5	2	1
	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	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 Chemistry	**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/Nitrate Nitrogen	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 to pH 4.5	n.a.	21.8		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	21.8		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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
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	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016 14:35	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 03:31	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016 03:31	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016 03:31	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016 03:31	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 17:42	Hallie Burnett	100
00228	Sulfate	EPA 300.0	1	16326120151A	11/21/2016 17:27	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16321118101B	11/16/2016 03:29	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321005106A	11/17/2016 16:21	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321005106A	11/17/2016 16:21	Brandon P Costik	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MM909

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8687838
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov18b.b/yn18s83.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM910 SDG#: MMK09-10EB

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	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM910 SDG#: MMK09-10EB

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	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 Rev. 1.1 modified**		**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
	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	0.0896	J	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	0.229	J	0.173	2.00	1
Wet Chemistry	**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/Nitrate 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 pH 4.5	n.a.	1.7	U	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	1.7	U	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution 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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MM910

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8687839
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov18b.b/yn18s74.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM911 SDG#: MMK09-11RB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**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	0.7	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.

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 Time	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

*=This limit was used in the evaluation of the final result

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM912 SDG#: MMK09-12RB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**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

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
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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM913 SDG#: MMK09-13

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	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM913 SDG#: MMK09-13

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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	82		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	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	14		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	4	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

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 accpetance limits. The data is reported from the initial injection of the sample. Both sets of data are available in the data package.

Metals	**SW-846 6010C**		**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 Chemistry	**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		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	3.5		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.	24.6		1.7	5.0	1

*=This limit was used in the evaluation of the final result

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM913 SDG#: MMK09-13

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**SM 2320 B-1997**		**mg/l as CaCO3**	**mg/l as CaCO3**	**mg/l as CaCO3**	
12149	Bicarbonate Alkalinity	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 No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution 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 modified	1	16322013	11/23/2016 16:59	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 03:37	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016 03:37	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016 03:37	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016 03:37	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 18:26	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16326120151A	11/21/2016 18:11	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16321118101B	11/16/2016 03:33	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321002201A	11/16/2016 20:06	Brandon P Costik	1
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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MM913

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8687842
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov18b.b/yn18s84.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM914 SDG#: MMK09-14

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 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	2		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		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	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	1	J	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 Time	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM915 SDG#: MMK09-15

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	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM915 SDG#: MMK09-15

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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	49		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	9		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	4	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	7		0.5	2	1
	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	15.9		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 Chemistry	**EPA 300.0**		**mg/l**		**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/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.	21.0		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	21.0		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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
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	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016 17:40	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 03:40	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016 03:40	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016 03:40	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016 03:40	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 18:56	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16326120151A	11/21/2016 18:41	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16321118101B	11/16/2016 03:34	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321005106A	11/17/2016 16:29	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321005106A	11/17/2016 16:29	Brandon P Costik	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MM915

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8687844
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov18b.b/yn18s85.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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FORM I VOA-TIC

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM916 SDG#: MMK09-16

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	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM916 SDG#: MMK09-16

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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	93		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	19		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	6		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	8		2	6	1
10954	Perfluorobutanoic Acid	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 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	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 Chemistry	**EPA 300.0**		**mg/l**		**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/Nitrate Nitrogen	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 pH 4.5	n.a.	17.1		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	17.1		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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
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	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016 18:00	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 03:43	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016 03:43	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016 03:43	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016 03:43	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	16323120121B	11/18/2016 21:11	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16323120121B	11/18/2016 20:55	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16321118102A	11/16/2016 03:40	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321005106A	11/17/2016 16:45	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321005106A	11/17/2016 16:45	Brandon P Costik	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MM916

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8687845
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov18b.b/yn18s86.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

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM917 SDG#: MMK09-17

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	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM917 SDG#: MMK09-17

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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	58		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	0.5	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	11		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	4	J	2	6	1
10954	Perfluorobutanoic Acid	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 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	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 Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	96.0		10.0	20.0	50
00228	Sulfate	14808-79-8	11.4		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate 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 pH 4.5	n.a.	20.4		1.7	5.0	1
12149	Bicarbonate Alkalinity	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

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

Submitted: 11/09/2016 09:30
Reported: 01/25/2017 13:54

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
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	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16322013	11/23/2016 18:21	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 03:46	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016 03:46	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016 03:46	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016 03:46	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	16323120121B	11/18/2016 22:16	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16323120121B	11/18/2016 22:00	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16321118102A	11/16/2016 04:11	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321002201A	11/16/2016 19:42	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321002201A	11/16/2016 19:42	Brandon P Costik	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MM917

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8687846
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov18b.b/yn18s87.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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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 number(s): 8687827-8687833,8687835,8687837-8687839,8687842,8687844-8687846			
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	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.
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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/25/2017 13:54

Group Number: 1731052

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	Sample number(s): 8687827-8687833,8687835-8687846			
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	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
	mg/l		mg/l	mg/l
Batch number: 163160635005	Sample number(s): 8687827-8687835,8687838-8687839,8687842,8687844-8687846			
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: 16321118101B	Sample number(s): 8687827-8687832,8687834-8687835,8687838-8687839,8687842,8687844			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 16321118102A	Sample number(s): 8687845-8687846			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 16323120121B	Sample number(s): 8687827-8687828,8687845-8687846			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
Batch number: 16326120151A	Sample number(s): 8687829-8687832,8687834-8687835,8687838-8687839,8687842,8687844			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0

*- Outside of specification
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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/25/2017 13:54

Group Number: 1731052

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ
	mg/l		mg/l	mg/l
	mg/l as CaCO3		mg/l as CaCO3	mg/l as CaCO3
Batch number: 16321002201A	Sample number(s): 8687828,8687842,8687846			
Total Alkalinity to pH 4.5	1.7	U	1.7	5.0
Batch number: 16321002202A	Sample number(s): 8687830,8687839			
Total Alkalinity to pH 4.5	1.7	U	1.7	5.0
Batch number: 16321005106A	Sample number(s): 8687827,8687829,8687831-8687835,8687838,8687844-8687845			
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: Y163234AA	Sample number(s): 8687827-8687833,8687835,8687837-8687839,8687842,8687844-8687846								
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

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/25/2017 13:54

Group Number: 1731052

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	20.49	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 number(s): 8687827-8687833,8687835-8687846								
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 number(s): 8687827-8687835,8687838-8687839,8687842,8687844-8687846								
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		

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/25/2017 13:54

Group Number: 1731052

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	Sample number(s): 8687827-8687832,8687834-8687835,8687838-8687839,8687842,8687844								
Total Nitrite/Nitrate Nitrogen	2.50	2.51			101		90-110		
Batch number: 16321118102A	Sample number(s): 8687845-8687846								
Total Nitrite/Nitrate Nitrogen	2.50	2.26			90		90-110		
Batch number: 16323120121B	Sample number(s): 8687827-8687828,8687845-8687846								
Chloride	3.00	2.91			97		90-110		
Sulfate	7.50	7.41			99		90-110		
Batch number: 16326120151A	Sample number(s): 8687829-8687832,8687834-8687835,8687838-8687839,8687842,8687844								
Chloride	3.00	2.96			99		90-110		
Sulfate	7.50	7.47			100		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 16321002201A	Sample number(s): 8687828,8687842,8687846								
Total Alkalinity to pH 4.5	188	188.05			100		84-110		
Batch number: 16321002202A	Sample number(s): 8687830,8687839								
Total Alkalinity to pH 4.5	188	188.96			101		84-110		
Batch number: 16321005106A	Sample number(s): 8687827,8687829,8687831-8687835,8687838,8687844-8687845								
Total Alkalinity to pH 4.5	188	179.47			95		84-110		

MS/MSD

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
Batch number: Y163234AA	Sample number(s): 8687827-8687833,8687835,8687837-8687839,8687842,8687844-8687846 UNSPK: 8687831										
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

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/25/2017 13:54

Group Number: 1731052

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
Chloroethane	0.5	U	20	20.96	20	21.04	105	105	56-120	0	30
Chloroform	0.5	U	20	22.94	20	23.04	115	115	80-120	0	30
Chloromethane	0.5	U	20	19.77	20	20.37	99	102	59-127	3	30
Cyclohexane	2	U	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	U	20	20.94	20	20.92	105	105	80-120	0	30
1,2-Dichlorobenzene	1	U	20	20.69	20	20.96	103	105	80-120	1	30
1,3-Dichlorobenzene	1	U	20	20.57	20	20.79	103	104	80-120	1	30
1,4-Dichlorobenzene	1	U	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	U	20	23.53	20	23.53	118	118	80-120	0	30
1,2-Dichloroethane	0.5	U	20	24.52	20	24.01	123	120	66-128	2	30
1,1-Dichloroethene	0.5	U	20	22.44	20	22.77	112	114	76-124	1	30
cis-1,2-Dichloroethene	0.5	U	20	21.57	20	21.4	108	107	80-120	1	30
trans-1,2-Dichloroethene	0.5	U	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	U	20	19.61	20	20.06	98	100	80-120	2	30
trans-1,3-Dichloropropene	0.5	U	20	20.74	20	21.03	104	105	76-120	1	30
Ethylbenzene	0.5	U	20	22.1	20	22.25	111	111	78-120	1	30
Freon 113	2	U	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	U	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/l		ng/l	ng/l	ng/l	ng/l					
Batch number: 16322013	Sample number(s): 8687827-8687833,8687835-8687846 UNSPK: 8687831										
Perfluorooctanoic acid	11.48		199.42	232.26	200.52	265.58	111	127	70-130	13	30
Perfluorononanoic acid	0.616		199.42	212.98	200.52	254.84	106	127	70-130	18	30

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/25/2017 13:54

Group Number: 1731052

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 number(s): 8687827-8687835,8687838-8687839,8687842,8687844-8687846 UNSPK: 8687831									
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 number(s): 8687827-8687832,8687834-8687835,8687838-8687839,8687842,8687844 UNSPK: 8687831									
Total Nitrite/Nitrate Nitrogen	0.175	1.00	1.24			106		90-110		
Batch number: 16321118102A	Sample number(s): 8687845-8687846 UNSPK: 8687845									
Total Nitrite/Nitrate Nitrogen	3.59	5.00	6.43			57*		90-110		
Batch number: 16323120121B	Sample number(s): 8687827-8687828,8687845-8687846 UNSPK: 8687827									
Chloride	14.29	20	41.29			135*		90-110		
Sulfate	5.20	50	61.51			113*		90-110		
Batch number: 16326120151A	Sample number(s): 8687829-8687832,8687834-8687835,8687838-8687839,8687842,8687844 UNSPK: 8687831									
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 number(s): 8687828,8687842,8687846 UNSPK: P688768									
Total Alkalinity to pH 4.5	32.42	188	215.84			98		84-110		
Batch number: 16321002202A	Sample number(s): 8687830,8687839 UNSPK: 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.
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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/25/2017 13:54

Group Number: 1731052

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 number(s): 8687827,8687829,8687831-8687835,8687838,8687844-8687845 UNSPK: 8687831									
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): 8687827-8687835,8687838-8687839,8687842,8687844-8687846 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): 8687827-8687832,8687834-8687835,8687838-8687839,8687842,8687844 BKG: 8687831			
Total Nitrite/Nitrate Nitrogen	0.175	0.165	6* (1)	2
Batch number: 16321118102A	Sample number(s): 8687845-8687846 BKG: 8687845			
Total Nitrite/Nitrate Nitrogen	3.59	3.56	1	2
Batch number: 16323120121B	Sample number(s): 8687827-8687828,8687845-8687846 BKG: 8687827			
Chloride	14.29	17.18	18*	15
Sulfate	5.20	6.41	21* (1)	15
Batch number: 16326120151A	Sample number(s): 8687829-8687832,8687834-8687835,8687838-8687839,8687842,8687844 BKG: 8687831			
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	Sample number(s): 8687828,8687842,8687846 BKG: P688768			
Total Alkalinity to pH 4.5	32.42	32.47	0	5
Batch number: 16321002202A	Sample number(s): 8687830,8687839 BKG: P688635			
Total Alkalinity to pH 4.5	150.64	146.27	3	5

*- Outside of specification
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(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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/25/2017 13:54

Group Number: 1731052

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
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)	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: Y163234AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-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
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(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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/25/2017 13:54

Group Number: 1731052

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.
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.

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

Limits:	70-130	70-130	70-130	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.
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.

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: 1731052 Sample #: 8687827-46 COC#: 15594

Client: C.T. Male Associates	
Project Name/#: SGPP - Merrimack	Site ID:
Project Manager: Kirk Moline	P.O. #: 16.6126
Sampler: JD, JC, LC, RH	
Phone #: 518-786-7400	Quote #: 214135
State where sample(s) were collected: NH	

Matrix: Sediment ☐; Ground ☒; Surface ☒; Soil ☐; Water: Potable ☐, NPDES ☐; Other: Blank Water

Analyses Requested / Preservation Codes: H – TCL VOAs (8260C) + TICs; N – Ca, Mg, Na, K (6010C); S – Total NO2 / NO3 (353.2); Cl-, SO4- (300.0); ALK + Carb/Bicarb (SM 2320 B); PFCs (EPA 537 mod.)

For Lab Use Only: SF#: 286049 SCR#: 196069

Preservation Codes: H = HCl, T = Thiosulfate, N = HNO_3, B = NaOH, S = H_2SO_4, P = H_3PO_4, O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Water	Other	Total # of Containers	TCL VOAs (8260C) + TICs	Ca, Mg, Na, K (6010C)	Total NO2 / NO3 (353.2)	Cl-, SO4- (300.0)	ALK + Carb/Bicarb (SM 2320 B)	PFCs (EPA 537 mod.)	Remarks
SG2-SWDnMerr-161107	11/7/16	1515	X			SW		11	X	X	X	X	X	X	
SG2-SWDnBab-161107	↓	1540	X			SW		11	X	X	X	X	X	X	
SG2-SWMidBab-161107	↓	1630	X			SW		11	X	X	X	X	X	X	
SG2-SWFD01-161107	11/7/16	—	X			SW		11	X	X	X	X	X	X	
SG2-SWUpBab-161108	11/8/16	0910	X			SW		33	X	X	X	X	X	X	MS/MSD
SG2-SWUpMerr-161108	11/8/16	1030	X			SW		11	X	X	X	X	X	X	
SG2-FTB01-161108	↓	0823					X	1						X	
SG2-LTB01-161108	↓	—					X	3	X					X	
SG2-MER45-8-161108	↓	1030	X			GW		11	X	X	X	X	X	X	
SG2-SWEB01-161108	11/8/16	1200	X				X	11	X	X	X	X	X	X	

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.Moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP)	☒	MA MCP	☐	TX TRRP - 13	☐
Type III (Reduced non-CLP)	☐	CT RCP	☐		
Type IV (CLP SOW)	☐	ASP Type A	☐		
Type VI (Raw Data Only)	☐	ASP Type B	☐		

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
Lorraine Carr	11/8/16	1745			
			Kristin [illegible]	11/9/16	0930

Airbill No.:
Relinquished by Commercial Carrier:
UPS ____ FedEx X Other ____

Temperature upon receipt 8.2 / 4.2 °C

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: 1731052 Sample #: 8687827-46 COC#: 15594

Client: C.T. Male Associates

Project Name/#: SGPP - Merrimack Site ID:

Project Manager: Kirk Moline P.O. #: 16.6126

Sampler: JD, JC, LC, RH

Phone #: 518-786-7400 Quote #: 214135

State where sample(s) were collected: NH

For Lab Use Only: SF#: 286049 SCR#: 196069

Preservation Codes: H = HCl, T = Thiosulfate, N = HNO_3, B = NaOH, S = H_2SO_4, P = H_3PO_4, O = Other

Matrix: Sediment / Soil; Water (Ground ☒, Surface, Potable, NPDES); Other: Blank Water

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Water	Other	Total # of Containers	TCL VOAs (8260C) + TICs (H)	Ca, Mg, Na, K (6010C) (N)	Total NO2 / NO3 (353.2) (S)	Cl-, SO4- (300.0)	ALK + Carb/Bicarb (SM 2320 B)	PFCs (EPA 537 mod.)	Remarks
SG2-RB01-161108	11/8/16	0815	X				X	1						X	
SG2-RB02-161108		0830	X				X	1						X	
SG2-MER45-4A-161108		1235	X			X		11	X	X	X	X	X	X	
SG2-Poland Distilled-161108		0810	X			X		1						X	Bottled Water for Decon
SG2-MER45-6-161108		1415	X			X		11	X	X	X	X	X	X	
SG2-MER45-9-161108		1545	X			X		11	X	X	X	X	X	X	
SG2-MER45-7-161108		1620	X			X		11	X	X	X	X	X	X	

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.moline@ctmale.com

Data Package Options (please check if required)

- Type I (Validation/non-CLP) ☑ MA MCP ☐ TX TRRP - 13 ☐
- Type III (Reduced non-CLP) ☐ CT RCP ☐
- Type IV (CLP SOW) ☐ ASP Type A ☐
- Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by	Date	Time	Received by	Date	Time
Lorene Cann	11/8/16	1745			
			[signature]	11/9/16	0930

Airbill No.:

Relinquished by Commercial Carrier: UPS ____ FedEx X ____ Other ____

Temperature upon receipt 6.7 / 4.7 °C

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Issued by Dept. 40 Management

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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:	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:	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): 1 Unpres, 2 Hcl

Unpacked by Krista Abel (3058) at 14:00 on 11/09/2016

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	0.7	DT	Wet	Y	Bagged	N
2	DT146	1.6	DT	Wet	Y	Bagged	N
3	DT146	4.7	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
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www.LancasterLabs.com

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< 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.

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Analysis Report

REVISED

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

Client Sample Description	Lancaster Labs (LL) #
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

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, 8695117, 8695118, 8695119, Blank, LCS, MS, MSD

EPA 300.0, Wet Chemistry

Batch #: 16330987171B (Sample number(s): 8695118-8695119 UNSPK: P693356 BKG: P693356)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Chloride, Sulfate

EPA 353.2, Wet Chemistry

Batch #: 16323118103A (Sample number(s): 8695118-8695119 UNSPK: P693363 BKG: P693363)

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 #: 16326010102A (Sample number(s): 8695119 UNSPK: P697075 BKG: P697075, P697666)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Total Alkalinity to pH 4.5

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

Submitted: 11/12/2016 11:00
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM101 SDG#: MMK10-01TB

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	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

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Analysis Report

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

Submitted: 11/12/2016 11:00
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM101 SDG#: MMK10-01TB

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	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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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

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
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 modified	1	16327003	11/25/2016 08:45	Robert Brown	1

*=This limit was used in the evaluation of the final result

REVISED

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
MM101

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8695116
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov22a.b/yn22s02.d
Level: (low/med) LOW Date Received: 11/12/16
% 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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
4.					
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29.					
30.					

page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/12/2016 11:00
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM102 SDG#: MMK10-02TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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

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
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

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

Submitted: 11/12/2016 11:00
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM103 SDG#: MMK10-03

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**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

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

Submitted: 11/12/2016 11:00
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM103 SDG#: MMK10-03

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	75		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	15		1	2	1
10954	Perfluoroheptanoic acid	375-85-9	10		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	8	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	9		1	3	1
	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	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 Chemistry	**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/Nitrate 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 pH 4.5	n.a.	41.3		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	41.3		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

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

Submitted: 11/12/2016 11:00
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 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

REVISED

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
MM103

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8695118
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov22a.b/yn22s07.d
Level: (low/med) LOW Date Received: 11/12/16
% 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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/12/2016 11:00
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM104 SDG#: MMK10-04

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	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

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

Submitted: 11/12/2016 11:00
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

MM104 SDG#: MMK10-04

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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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	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	11		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	5	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	10		1	3	1
	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	40.9		0.0382	0.400	1
01757	Magnesium	7439-95-4	9.79		0.0190	0.200	1
01762	Potassium	7440-09-7	3.63		0.160	1.00	1
01767	Sodium	7440-23-5	134		0.173	2.00	1
Wet Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	303		20.0	40.0	100
00228	Sulfate	14808-79-8	9.9		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate 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.	20.4		1.7	5.0	1
12149	Bicarbonate Alkalinity	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

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

Submitted: 11/12/2016 11:00
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

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 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 modified	1	16327003	11/30/2016 05:23	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 03:58	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163260635001	11/22/2016 03:58	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163260635001	11/22/2016 03:58	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163260635001	11/22/2016 03:58	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	11/27/2016 18:25	Clinton M Wilson	100
00228	Sulfate	EPA 300.0	1	16330987171B	11/25/2016 23:00	Clinton M Wilson	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16323118103A	11/18/2016 09:03	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16326010102A	11/21/2016 19:10	Kenneth A Bell	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16326010102A	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

REVISED

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
MM104

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8695119
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov22a.b/yn22s08.d
Level: (low/med) LOW Date Received: 11/12/16
% 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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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 ug/l		MDL** ug/l	LOQ ug/l
Batch number: Y163271AA	Sample number(s): 8695116,8695118-8695119			
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.
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.

REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:32

Group Number: 1732744

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: 16327003	Sample number(s): 8695116-8695119			
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
	mg/l		mg/l	mg/l
Batch number: 163260635001	Sample number(s): 8695118-8695119			
Calcium	0.0508	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: 16323118103A	Sample number(s): 8695118-8695119			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 16330987171B	Sample number(s): 8695118-8695119			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
	mg/l as CaCO3		mg/l as CaCO3	mg/l as CaCO3
Batch number: 16324004201A	Sample number(s): 8695118			
Total Alkalinity to pH 4.5	1.7	U	1.7	5.0
Batch number: 16326010102A	Sample number(s): 8695119			
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.

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 mg/l as CaCO3	MDL** mg/l as CaCO3	LOQ mg/l as CaCO3

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: Y163271AA	Sample number(s): 8695116,8695118-8695119								
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		

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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	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					
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 number(s): 8695116-8695119								
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 number(s): 8695118-8695119								
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 number(s): 8695118-8695119								
Total Nitrite/Nitrate Nitrogen	2.50	2.63			105		90-110		
Batch number: 16330987171B	Sample number(s): 8695118-8695119								
Chloride	3.00	2.95			98		90-110		
Sulfate	7.50	7.33			98		90-110		

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REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:32

Group Number: 1732744

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 number(s): 8695118								
Total Alkalinity to pH 4.5	188	185.14			98		84-110		
Batch number: 16326010102A	Sample number(s): 8695119								
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	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
Batch number: Y163271AA	Sample number(s): 8695116,8695118-8695119 UNSPK: P695182										
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

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REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:32

Group Number: 1732744

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: 16327003	Sample number(s): 8695116-8695119 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	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	10.19		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	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
	mg/l		**mg/l**	**mg/l**	**mg/l**	**mg/l**					
Batch number: 163260635001	Sample number(s): 8695118-8695119 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

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REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:32

Group Number: 1732744

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 number(s): 8695118-8695119 UNSPK: P693363									
Total Nitrite/Nitrate Nitrogen	0.040 U	1.00	1.19			119*		90-110		
Batch number: 16330987171B	Sample number(s): 8695118-8695119 UNSPK: P693356									
Chloride	14.5	40	59.38			112*		90-110		
Sulfate	45.85	100	159.95			114*		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 number(s): 8695118 UNSPK: 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 number(s): 8695119 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	Sample number(s): 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: P693356			
Chloride	14.5	14.37	1 (1)	15
Sulfate	45.85	45.72	0 (1)	15
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 16324004201A	Sample number(s): 8695118 BKG: P695182			
Total Alkalinity to pH 4.5	16.67	16.81	1 (1)	5
Batch number: 16326010102A	Sample number(s): 8695119 BKG: P697075			
Total Alkalinity to pH 4.5	17.59	20.4	15* (1)	5

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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-Dichloroethane-d4	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*
Limits:	70-130	70-130	70-130	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*

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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

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: 1732744 Sample #: 8695116-19 COC#: 15594

Client:	C.T. Male Associates
Project Name/#:	SGPP - Merrimack
Site ID:	
Project Manager:	Kirk Moline
P.O. #:	16.6126
Sampler:	JC
Phone #:	518-786-7502
Quote #:	214135
State where sample(s) were collected:	NH

Matrix: Sediment ☐; Ground ☒; Surface ☐; Soil ☐; Water: Potable ☐, NPDES ☐; Other: Blank Water

For Lab Use Only
SF#: 286049
SCR#: 196069

Preservation Codes
H = HCl T = Thiosulfate
N = HNO_3 B = NaOH
S = H_2SO_4 P = H_3PO_4
O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Water	Other	Total # of Containers	TCL VOAs (8260C) + TICs (H)	Ca, Mg, Na, K (6010C) (N)	Total NO2 / NO3 (353.2) (S)	Cl-, SO4- (300.0)	ALK + Carb/Bicarb (SM 2320 B)	PFCs (EPA 537 mod.)	Remarks
SG2-LTB01-161111	11/11/16	—					X	3	X					X	
SG2-FTB01-161111	11/11/16	0815	X				X	1						X	
SG2-LNGMW-2-161111	11/11/16	1050	X			X		11	X	X	X	X	X	X	
SG2-MER45-11-161111	11/11/16	1205	X			X		11	X	X	X	X	X	X	

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐
(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)
Date results are needed:
E-mail address to send RUSH results: K.moline@ctmale.com

Data Package Options (please check if required)
Type I (Validation/non-CLP) ☑ MA MCP ☐ TX TRRP - 13 ☐
Type III (Reduced non-CLP) ☐ CT RCP ☐
Type IV (CLP SOW) ☐ ASP Type A ☐
Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
Lorene Camera	11/11/16	1400			
			Kristen Nelly	11/12/16	1100

Airbill No.:
Relinquished by Commercial Carrier:
UPS ____ FedEx X Other ____

Temperature upon receipt 0.9 0.5 °C

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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:	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:	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): 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	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	0.9	DT	Wet	Y	Bagged	N
2	DT146	0.5	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425

T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< 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.

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2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

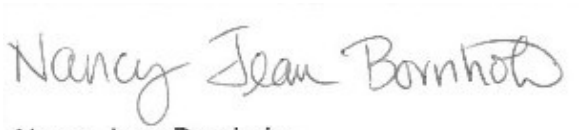
Client Sample Description	Lancaster Labs (LL) #
SG2-GWEB01-161109 Blank Water	8695120
SG2-FTB01-161109 Blank Water	8695121
SG2-MER45-3A-161109 Grab Groundwater	8695122
SG2-MER45-5A-161109 Grab Groundwater	8695123
SG2-MER45-28-161109 Grab Groundwater	8695124
SG2-MER1MW-161109 Grab Groundwater	8695125
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

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

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

11MM1 SDG#: MMK11-01EB

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	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

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

11MM1 SDG#: MMK11-01EB

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	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 Rev. 1.1 modified**		**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
	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	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	U	0.173	2.00	1
Wet Chemistry	**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/Nitrate Nitrogen	n.a.	0.056	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.	1.7	U	1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	1.7	U	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

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
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

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 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	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/23/2016 23:09	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 03:49	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016 03:49	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016 03:49	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016 03:49	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	16326120171B	11/23/2016 06:23	Clinton M Wilson	1
00228	Sulfate	EPA 300.0	2	16326120171B	11/23/2016 06:23	Clinton M Wilson	1
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16323118103A	11/18/2016 09:05	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321005103A	11/17/2016 03:15	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321005103A	11/17/2016 03:15	Brandon P Costik	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

11MM1

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8695120
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov23a.b/ln23s02.d
Level: (low/med) LOW Date Received: 11/10/16
% Moisture: not dec. Date Analyzed: 11/23/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

11MM2 SDG#: MMK11-02TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**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

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
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

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

11MM3 SDG#: MMK11-03

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**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

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

11MM3 SDG#: MMK11-03

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**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 Rev. 1.1 modified**		**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	0.5	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		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	22		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	9		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	7	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	12		0.5	2	1
	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	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 Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	99.4		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/Nitrate 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 pH 4.5	n.a.	34.4		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	34.4		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

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

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 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	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/23/2016 23:50	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 03:58	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016 03:58	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016 03:58	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016 03:58	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	1	16326120171B	11/21/2016 19:35	Clinton M Wilson	50
00228	Sulfate	EPA 300.0	1	16326120171B	11/21/2016 19:20	Clinton M Wilson	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101A	11/20/2016 19:08	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321005103A	11/17/2016 03:22	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321005103A	11/17/2016 03:22	Brandon P Costik	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

11MM3

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8695122
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov21b.b/yn21s71.d
Level: (low/med) LOW Date Received: 11/10/16
% Moisture: not dec. Date Analyzed: 11/21/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
4.					
5.					
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29.					
30.					

page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	**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

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	**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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	62		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		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	4		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
	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	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 Chemistry	**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/Nitrate 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 Alkalinity	n.a.	28.8		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

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

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 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	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/24/2016 00:10	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 04:01	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016 04:01	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016 04:01	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016 04:01	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	1	16326120171B	11/21/2016 20:04	Clinton M Wilson	50
00228	Sulfate	EPA 300.0	1	16326120171B	11/21/2016 19:50	Clinton M Wilson	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101A	11/20/2016 19:13	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321005103A	11/17/2016 03:29	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321005103A	11/17/2016 03:29	Brandon P Costik	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED 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
% Moisture: not dec. Date Analyzed: 11/21/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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

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 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	2.23		0.160	1.00	1
01767	Sodium	7440-23-5	50.3		0.173	2.00	1
Wet Chemistry	**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		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	0.53		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.	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

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

11MM5

Lab Name: Lancaster Laboratories Contract:_____
Lab 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/16nov21b.b/yn21s73.d
Level: (low/med) LOW Date Received: 11/10/16
% 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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

11MM6 SDG#: MMK11-06

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260C**		ug/l		ug/l	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	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

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

11MM6 SDG#: MMK11-06

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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	8		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	7		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	5		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	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	8		0.5	2	1
	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	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 Chemistry	**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/Nitrate Nitrogen	n.a.	0.33		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.	13.6		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	13.6		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

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
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	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/24/2016 00:51	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 04:07	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016 04:07	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016 04:07	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016 04:07	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 21:32	Clinton M Wilson	50
00228	Sulfate	EPA 300.0	1	16326120171B	11/21/2016 20:48	Clinton M Wilson	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101A	11/20/2016 19:16	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321005104A	11/17/2016 07:44	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321005104A	11/17/2016 07:44	Brandon P Costik	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

11MM6

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8695125
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov21b.b/yn21s74.d
Level: (low/med) LOW Date Received: 11/10/16
% 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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

11MM7 SDG#: MMK11-07

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	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	0.7	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	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

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

11MM7 SDG#: MMK11-07

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
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 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	12		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.7	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	0.6	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	4		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	7		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	3	J	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	11		3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	24		0.5	2	1
	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	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 Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	42.2		10.0	20.0	50
00228	Sulfate	14808-79-8	48.2		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate 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 pH 4.5	n.a.	55.7		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	55.7		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

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

11MM7 SDG#: MMK11-07

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

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
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	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/24/2016 01:12	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 04:10	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016 04:10	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016 04:10	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016 04:10	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 22:01	Clinton M Wilson	50
00228	Sulfate	EPA 300.0	1	16326120171B	11/21/2016 21:46	Clinton M Wilson	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101A	11/20/2016 19:18	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321005103A	11/17/2016 02:57	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321005103A	11/17/2016 02:57	Brandon P Costik	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16321005103A	11/17/2016 02:57	Brandon P Costik	1

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

11MM7

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8695126
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov21b.b/yn21s75.d
Level: (low/med) LOW Date Received: 11/10/16
% 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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

11MM8 SDG#: MMK11-08FD

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	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

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

11MM8 SDG#: MMK11-08FD

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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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	0.5	U	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	11		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	9		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	J	2	6	1
10954	Perfluorobutanoic Acid	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 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	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 Chemistry	**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/Nitrate 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 Alkalinity	n.a.	26.9		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

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
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	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/24/2016 01:32	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 04:13	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163160635005	11/19/2016 04:13	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163160635005	11/19/2016 04:13	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163160635005	11/19/2016 04:13	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 22:30	Clinton M Wilson	50
00228	Sulfate	EPA 300.0	1	16326120171B	11/21/2016 22:15	Clinton M Wilson	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101B	11/20/2016 19:43	Joseph E McKenzie	2
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16321005104A	11/17/2016 07:36	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16321005104A	11/17/2016 07:36	Brandon P Costik	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

11MM8

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8695127
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov21b.b/yn21s76.d
Level: (low/med) LOW Date Received: 11/10/16
% 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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

11MM9 SDG#: MMK11-09TB

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	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

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

Submitted: 11/10/2016 09:30
Reported: 01/04/2017 16:35

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

11MM9 SDG#: MMK11-09TB

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	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 Rev. 1.1 modified**		**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

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
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163263AA	11/21/2016 21:02	Kevin D Kelly	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163263AA	11/21/2016 21:02	Kevin D Kelly	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/24/2016 02:34	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

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
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
% Moisture: not dec. Date Analyzed: 11/21/16
Column: (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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FORM I VOA-TIC

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 ug/l		MDL** ug/l	LOQ 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.
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.

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732745
Reported: 01/04/2017 16:35

Method Blank (continued)

Analysis Name	Result ug/l		MDL** ug/l	LOQ 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
Batch number: Y163263AA	Sample number(s): 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	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.
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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 16:35

Group Number: 1732745

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
	ng/l		ng/l	ng/l
Batch number: 16323001	Sample number(s): 8695120-8695128			
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
	mg/l		mg/l	mg/l
Batch number: 163160635005	Sample number(s): 8695120,8695122-8695127			
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: 16323118103A	Sample number(s): 8695120			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 16325118101A	Sample number(s): 8695122-8695126			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 16325118101B	Sample number(s): 8695127			

*- 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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 16:35

Group Number: 1732745

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ
	mg/l		mg/l	mg/l
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 16326120171B	Sample number(s): 8695120,8695122-8695127			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
	mg/l as CaCO3		mg/l as CaCO3	mg/l as CaCO3
Batch number: 16321005103A	Sample number(s): 8695120,8695122-8695124,8695126			
Total Alkalinity to pH 4.5	1.7	U	1.7	5.0
Batch number: 16321005104A	Sample number(s): 8695125,8695127			
Total Alkalinity to pH 4.5	2.8	J	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(s): 8695120								
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		

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 16:35

Group Number: 1732745

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-1,2-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			90		80-120		
Batch number: Y163263AA	Sample number(s): 8695122-8695128								
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		

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 16:35

Group Number: 1732745

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
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		
	ng/l	**ng/l**	**ng/l**	**ng/l**					
Batch number: 16323001	Sample number(s): 8695120-8695128								
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		

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 16:35

Group Number: 1732745

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
	ng/l	ng/l	ng/l	ng/l					
	mg/l	mg/l	mg/l	mg/l					
Batch number: 163160635005	Sample number(s): 8695120,8695122-8695127								
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 number(s): 8695120								
Total Nitrite/Nitrate Nitrogen	2.50	2.63			105		90-110		
Batch number: 16325118101A	Sample number(s): 8695122-8695126								
Total Nitrite/Nitrate Nitrogen	2.50	2.43			97		90-110		
Batch number: 16325118101B	Sample number(s): 8695127								
Total Nitrite/Nitrate Nitrogen	2.50	2.43			97		90-110		
Batch number: 16326120171B	Sample number(s): 8695120,8695122-8695127								
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	Sample number(s): 8695120,8695122-8695124,8695126								
Total Alkalinity to pH 4.5	188	174.26			93		84-110		
Batch number: 16321005104A	Sample number(s): 8695125,8695127								
Total Alkalinity to pH 4.5	188	177.97			95		84-110		

MS/MSD

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					
Batch number: L163281AA	Sample number(s): 8695120 UNSPK: 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

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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
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

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 16:35

Group Number: 1732745

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	18.94	20	18.67	95	93	80-120	1	30
Batch number: Y163263AA	Sample number(s): 8695122-8695128 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

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 16:35

Group Number: 1732745

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					
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 number(s): 8695120-8695128 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 number(s): 8695120,8695122-8695127 UNSPK: P687831										
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 number(s): 8695120 UNSPK: P693363										
Total Nitrite/Nitrate Nitrogen	0.040	U	1.00	1.19			119*		90-110		
Batch number: 16325118101A	Sample number(s): 8695122-8695126 UNSPK: P695182										
Total Nitrite/Nitrate Nitrogen	1.02		2.00	3.07			102		90-110		
Batch number: 16325118101B	Sample number(s): 8695127 UNSPK: P697075										
Total Nitrite/Nitrate Nitrogen	2.23		2.00	4.78			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.
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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 16:35

Group Number: 1732745

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 number(s): 8695120,8695122-8695127 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 CaCO3					
Batch number: 16321005103A	Sample number(s): 8695120,8695122-8695124,8695126 UNSPK: P690739									
Total Alkalinity to pH 4.5	465.09	188	615.97	188	615.73	80*	80*	84-110	0	5
Batch number: 16321005104A	Sample number(s): 8695125,8695127 UNSPK: 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 mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Batch number: 163160635005	Sample number(s): 8695120,8695122-8695127 BKG: P687831			
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: P693363			
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	Sample number(s): 8695127 BKG: P697075			
Total Nitrite/Nitrate Nitrogen	2.23	2.25	1	2
Batch number: 16326120171B	Sample number(s): 8695120,8695122-8695127 BKG: 8695122			
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): 8695120,8695122-8695124,8695126 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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/04/2017 16:35

Group Number: 1732745

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			
Total Alkalinity to pH 4.5	96.37	98.97	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: 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
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
8695120	62*	63*	57*	72	69*	65*
8695121	56*	55*	51*	57*	51*	53*
8695122	60*	63*	58*	60*	65*	61*

*- Outside of specification
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(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.

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

	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
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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.

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.
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Environmental Services Analysis Request/Chain of Custody

Page 1 of 1

Acct. #: 37191 Group #: 1732745 Sample #: 8695120-28 COC#: 15594

Client: C.T. Male Associates			
Project Name/#: SGPP - Merrimack	Site ID:		
Project Manager: Kirk Moline	P.O. #: 16.6126		
Sampler: LC, JG, RH			
Phone #: 518-786-7502	Quote #: 214135		
State where sample(s) were collected: NH			

Matrix: Sediment ☐; Ground ☒; Surface ☐; Soil ☐; Water: Potable ☐, NPDES ☐; Other: Blank Water

Analyses Requested / Preservation Codes: H, N, S

For Lab Use Only: SF#: 286049; SCR#: 196069

Preservation Codes: H = HCl; T = Thiosulfate; N = HNO_3; B = NaOH; S = H_2SO_4; P = H_3PO_4; O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Water	Other	Total # of Containers	TCL VOAs (8260C) + TICs (H)	Ca, Mg, Na, K (6010C) (N)	Total NO2 / NO3 (353.2) (S)	Cl-, SO4- (300.0)	ALK + Carb/Bicarb (SM 2320 B)	PFCs (EPA 537 mod.)						Remarks
SG2-GWEB01-161109	11/9/16	0815	X				X	11	X	X	X	X	X	X						
SG2-FTB01-161109		0830	X				X	1						X						
SG2-MER45-3A-161109		1015	X			X		11	X	X	X	X	X	X						
SG2-MER45-5A-161109		1430	X			X		11	X	X	X	X	X	X						
SG2-MER45-28-161109		1550	X			X		11	X	X	X	X	X	X						
SG2-MER1MW-161109		1550	X			X		10	X	X	X	X	X	X						
SG2-LNGMW-4-161109		1630	X			X		11	X	X	X	X	X	X						
SG2-GWFD01-161109		—	X			X		11	X	X	X	X	X	X						
SG2-LTB01-161109		—					X	3	X					X						

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: k.moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP)	☑	MA MCP	☐	TX TRRP - 13	☐
Type III (Reduced non-CLP)	☐	CT RCP	☐		
Type IV (CLP SOW)	☐	ASP Type A	☐		
Type VI (Raw Data Only)	☐	ASP Type B	☐		

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
Lorene Cammer	11/9/16	1845			
Relinquished by:			Received by:		
Relinquished by:			Received by:		
Relinquished by:			Received by:		
Relinquished by:			Received by: [signature]	11-10-16	930

Airbill No.:

Relinquished by Commercial Carrier:

UPS ____ FedEx X Other ____

Temperature upon receipt 0.4 - 2.6 °C

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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:	3	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:	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 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	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	2.6	DT	Wet	Y	Bagged	N
2	DT131	0.9	DT	Wet	Y	Bagged	N
3	DT131	1.7	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
T : 717-656-2300
F : 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

<	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.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

Client Sample Description	Lancaster Labs (LL) #
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

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

Sample #s: 8695178, 8695179, 8695180, 8695181, 8695182, 8695183, 8695184, 8695186, 8695187, 8695188, 8695189

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

Batch #: 16323001 (Sample number(s): 8695178-8695184, 8695186-8695189 UNSPK: 8695182)

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

Batch #: 16326010102A (Sample number(s): 8695181, 8695189 UNSPK: P697075 BKG: P697075, P697666)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Total Alkalinity to pH 4.5

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM1 SDG#: MMK12-01TB

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	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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM1 SDG#: MMK12-01TB

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	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 Rev. 1.1 modified**		**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

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
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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED 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/16nov22a.b/yn22s03.d
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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM2 SDG#: MMK12-02RB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**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

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
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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM3 SDG#: MMK12-03TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**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

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
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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM4 SDG#: MMK12-04

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	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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM4 SDG#: MMK12-04

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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	110		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	0.5	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	23		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	16		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	4	J	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	11		3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	14		0.5	2	1
	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	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 Chemistry	**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/Nitrate Nitrogen	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 to pH 4.5	n.a.	96.0		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	96.0		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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

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 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	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/24/2016 03:56	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 03:18	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163260635001	11/22/2016 03:18	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163260635001	11/22/2016 03:18	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163260635001	11/22/2016 03:18	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 02:16	Hallie Burnett	5
00228	Sulfate	EPA 300.0	1	16328120602A	11/24/2016 02:16	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101A	11/20/2016 19:01	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16326010102A	11/21/2016 18:35	Kenneth A Bell	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16326010102A	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

12MM4

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8695181
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov22a.b/yn22s09.d
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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM5 SDG#: MMK12-05BKG

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	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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM5 SDG#: MMK12-05BKG

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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	17		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		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	3		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	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	4		0.5	2	1
	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	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 Chemistry	**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/Nitrate Nitrogen	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 to pH 4.5	n.a.	16.7		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	16.7		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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM5 SDG#: MMK12-05BKG

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 Time	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163271AA	11/22/2016 10:59	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y163271AA	11/22/2016 10:59	Kevin A Sposito	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/23/2016 21:05	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 02:59	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163260635001	11/22/2016 02:59	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163260635001	11/22/2016 02:59	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163260635001	11/22/2016 02:59	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 22:51	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	16328120602A	11/23/2016 22:35	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101A	11/20/2016 18:55	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16324004201A	11/19/2016 16:58	Kenneth A Bell	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16324004201A	11/19/2016 16:58	Kenneth A Bell	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16324004201A	11/19/2016 16:58	Kenneth A Bell	1

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

12MM5

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8695182
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov22a.b/yn22s04.d
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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	10061-02-6	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	91	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	21	0.5	1	1
11997	4-Methyl-2-pentanone	108-10-1	93	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	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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	o-Xylene	95-47-6	20	0.5	1	1
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**	**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	270	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	240	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	220	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	240	1	3	1
10954	Perfluorododecanoic acid	307-55-1	240	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	250	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	240	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	240	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	250	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	220	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	220	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	270	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	230	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	250	0.5	2	1
	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	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
Wet Chemistry	**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		**mg/l**	**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	3.1	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.	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 No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor

*=This limit was used in the evaluation of the final result

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM5 SDG#: MMK12-05MS

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 11:21	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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	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	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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 modified**		**ng/l**	**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	250	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	250	0.6	2	1
10954	Perfluorodecanoic acid	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	Perfluorotridecanoic acid	72629-94-8	250	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	250	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	250	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	270	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	210	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	220	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	230	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	240	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	250	0.5	2	1
	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	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 Chemistry	**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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM5 SDG#: MMK12-05MSD

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	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

*=This limit was used in the evaluation of the final result

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	**SW-846 6010C**		**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 Chemistry	**EPA 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
	EPA 353.2		**mg/l**	**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	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 to pH 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 Time	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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM6 SDG#: MMK12-06

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**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	0.6	J	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	0.6	J	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	J	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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM6 SDG#: MMK12-06

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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	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	1	J	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	10		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	10		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	2	J	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	6	J	3	10	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.						
Metals	**SW-846 6010C**		**mg/l**		**mg/l**	**mg/l**	
01750	Calcium	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
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/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate 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.	22.6		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	22.6		1.7	5.0	1

*=This limit was used in the evaluation of the final result

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM6 SDG#: MMK12-06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**SM 2320 B-1997**		**mg/l as CaCO3**	**mg/l as CaCO3**	**mg/l as CaCO3**	
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 Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

12MM6

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8695186
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov22a.b/yn22s10.d
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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM7 SDG#: MMK12-07

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	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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM7 SDG#: MMK12-07

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
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 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	26		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	10		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	7		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	6		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	5	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	8		0.5	2	1
	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	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
Wet Chemistry	**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/Nitrate Nitrogen	n.a.	0.91		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.	10.3		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	10.3		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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM7 SDG#: MMK12-07

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

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 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	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/24/2016 04:37	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 03:30	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163260635001	11/22/2016 03:30	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163260635001	11/22/2016 03:30	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163260635001	11/22/2016 03:30	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	11/28/2016 01:28	Clinton M Wilson	100
00228	Sulfate	EPA 300.0	1	16328120602A	11/24/2016 01:13	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101A	11/20/2016 19:04	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16324004201A	11/19/2016 18:05	Kenneth A Bell	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16324004201A	11/19/2016 18:05	Kenneth A Bell	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16324004201A	11/19/2016 18:05	Kenneth A Bell	1

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

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: 8695187
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov22a.b/yn22s11.d
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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM8 SDG#: MMK12-08RB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**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

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
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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM9 SDG#: MMK12-09

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	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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM9 SDG#: MMK12-09

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 on the back of this form.						
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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	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		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	1	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	16		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	6	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	13		0.5	2	1
	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	15.0		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
01767	Sodium	7440-23-5	158		0.173	2.00	1
Wet Chemistry	**EPA 300.0**		**mg/l**		**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/Nitrate Nitrogen	n.a.	0.98		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.	21.9		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	21.9		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

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

Submitted: 11/11/2016 09:25
Reported: 01/05/2017 10:50

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12MM9 SDG#: MMK12-09

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 Time	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y163271AA	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	1
10954	14 PFCs	EPA 537 Rev. 1.1 modified	1	16323001	11/24/2016 05:18	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 03:33	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	163260635001	11/22/2016 03:33	Matthew R Machtinger	1
01762	Potassium	SW-846 6010C	1	163260635001	11/22/2016 03:33	Matthew R Machtinger	1
01767	Sodium	SW-846 6010C	1	163260635001	11/22/2016 03:33	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	11/28/2016 01:43	Clinton M Wilson	100
00228	Sulfate	EPA 300.0	1	16328120602A	11/24/2016 01:44	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101A	11/20/2016 19:06	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16326010102A	11/21/2016 19:42	Kenneth A Bell	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16326010102A	11/21/2016 19:42	Kenneth A Bell	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16326010102A	11/21/2016 19:42	Kenneth A Bell	1

*=This limit was used in the evaluation of the final result

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
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/16nov22a.b/yn22s12.d
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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
4.					
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page 1 of 1

FORM I VOA-TIC

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 ug/l		MDL** ug/l	LOQ ug/l
Batch number: Y163271AA	Sample number(s): 8695178,8695181-8695184,8695186-8695187,8695189			
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.
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.

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	Sample number(s): 8695178-8695184,8695186-8695189			
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	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
	mg/l		mg/l	mg/l
Batch number: 163260635001	Sample number(s): 8695181-8695187,8695189			
Calcium	0.0508	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: 16325118101A	Sample number(s): 8695181-8695183,8695185-8695187,8695189			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 16328120602A	Sample number(s): 8695181-8695183,8695185-8695187,8695189			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
	mg/l as CaCO3		mg/l as CaCO3	mg/l as CaCO3
Batch number: 16324004201A	Sample number(s): 8695182-8695187			
Total Alkalinity to pH 4.5	1.7	U	1.7	5.0
Batch number: 16326010102A	Sample number(s): 8695181,8695189			
Total Alkalinity to pH 4.5	1.7	U	1.7	5.0

*- Outside of specification
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(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.

Quality Control Summary

Client Name: C. T. Male Associates Group Number: 1732751
Reported: 01/05/2017 10:50

Method Blank (continued)

Analysis Name	Result mg/l as CaCO3	MDL** mg/l as CaCO3	LOQ mg/l as CaCO3

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: Y163271AA	Sample number(s): 8695178,8695181-8695184,8695186-8695187,8695189								
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
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(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.

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	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					
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 number(s): 8695178-8695184,8695186-8695189								
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	Sample number(s): 8695181-8695187,8695189								
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(s): 8695181-8695183,8695185-8695187,8695189								
Total Nitrite/Nitrate Nitrogen	2.50	2.43			97		90-110		
Batch number: 16328120602A	Sample number(s): 8695181-8695183,8695185-8695187,8695189								
Chloride	3.00	3.05			102		90-110		
Sulfate	7.50	7.69			102		90-110		

*- Outside of specification
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(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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/05/2017 10:50

Group Number: 1732751

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 number(s): 8695182-8695187								
Total Alkalinity to pH 4.5	188	185.14			98		84-110		
Batch number: 16326010102A	Sample number(s): 8695181,8695189								
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	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
Batch number: Y163271AA	Sample number(s): 8695178,8695181-8695184,8695186-8695187,8695189 UNSPK: 8695182										
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.
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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/05/2017 10:50

Group Number: 1732751

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 number(s): 8695178-8695184,8695186-8695189 UNSPK: 8695182										
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: 163260635001	Sample number(s): 8695181-8695187,8695189 UNSPK: 8695182										
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
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(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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/05/2017 10:50

Group Number: 1732751

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 number(s): 8695181-8695183,8695185-8695187,8695189 UNSPK: 8695182									
Total Nitrite/Nitrate Nitrogen	1.02	2.00	3.07			102		90-110		
Batch number: 16328120602A	Sample number(s): 8695181-8695183,8695185-8695187,8695189 UNSPK: 8695182									
Chloride	154.88	200	350.26			98		90-110		
Sulfate	10.32	50	59.91			99		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 number(s): 8695182-8695187 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 number(s): 8695181,8695189 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	Sample number(s): 8695181-8695187,8695189 BKG: 8695182			
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: 16325118101A	Sample number(s): 8695181-8695183,8695185-8695187,8695189 BKG: 8695182			
Total Nitrite/Nitrate Nitrogen	1.02	1.04	2	2
Batch number: 16328120602A	Sample number(s): 8695181-8695183,8695185-8695187,8695189 BKG: 8695182			
Chloride	154.88	160.41	4	15
Sulfate	10.32	10.34	0 (1)	15
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 16324004201A	Sample number(s): 8695182-8695187 BKG: 8695182			
Total Alkalinity to pH 4.5	16.67	16.81	1 (1)	5
Batch number: 16326010102A	Sample number(s): 8695181,8695189 BKG: P697075			
Total Alkalinity to pH 4.5	17.59	20.4	15* (1)	5

*- Outside of specification
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(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.

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*
8695183	58*	55*	58*	69*	82	70

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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
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Environmental Services Analysis Request/Chain of Custody

Page 1 of 1

Acct. #: 37191 Group #: 1732751 Sample #: 8695178-89 COC#: 15594

Client: C.T. Male Associates

Project Name/#: SGPP - Merrimack Site ID:

Project Manager: Kirk Moline P.O. #: 16.6126

Sampler: LC, JC, RH

Phone #: 518-786-7502 Quote #: 214135

State where sample(s) were collected: NH

Matrix: Sediment, Ground, Surface, Soil, Potable, NPDES, Water, Other: Blank Water

Analyses Requested / Preservation Codes: H – TCL VOAs (8260C) + TICs; N – Ca, Mg, Na, K (6010C); S – Total NO2 / NO3 (353.2); Cl-, SO4- (300.0); ALK + Carb/Bicarb (SM 2320 B); PFCs (EPA 537 mod.)

Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other	Total # of Containers	TCL VOAs (8260C) + TICs	Ca, Mg, Na, K (6010C)	Total NO2 / NO3 (353.2)	Cl-, SO4- (300.0)	ALK + Carb/Bicarb (SM 2320 B)	PFCs (EPA 537 mod.)	Remarks
SG2-LTB01-161110	11/10/16	—					X	3	X					X	
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	X	
SG2-MER45-10-161110		1310	X			X		39	X	X	X	X	X	X	
SG2-LNGMW-3-161110		1315	X			X		11	X	X	X	X	X	X	
SG2-MER45-2A-161110		1420	X			X		15	X	X	X	X	X	X	
SG2-RB02-161110		1440	X				X	1						X	
SG2-MER45-2A-161110	↓	1615	X			X		11	X	X	X	X	X	X	

For Lab Use Only
SF#: 286049
SCR#: 196069

Preservation Codes
H = HCl T = Thiosulfate
N = HNO_3 B = NaOH
S = H_2SO_4 P = H_3PO_4
O = Other

Turnaround Time Requested (TAT) (please check): Standard ☒ RUSH ☐
(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)
Date results are needed:
E-mail address to send RUSH results: K.moline@ctmale.com

Data Package Options (please check if required)
Type I (Validation/non-CLP) ☑ MA MCP ☐ TX TRRP - 13 ☐
Type III (Reduced non-CLP) ☐ CT RCP ☐
Type IV (CLP SOW) ☐ ASP Type A ☐
Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format. EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
Lenene Carner	11/10/16	1730			
			[signature]	11-11-16	925

Airbill No.:
Relinquished by Commercial Carrier:
UPS ______ FedEx X Other ______

Temperature upon receipt 0.6-3.1 °C

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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:	11/11/2016 9:25
Number of Packages:	3	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:	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 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	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	1.2	DT	Wet	Y	Bagged	N
2	DT131	0.6	DT	Wet	Y	Bagged	N
3	DT131	3.1	DT	Wet	Y	Bagged	N

General Comments: SG2-MER45-10-161110 rec'd a Metals Batch QC

2425 New Holland Pike
Lancaster, PA 17605-2425
T 717-656-2300
F 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< 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.

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Analysis Report

REVISED

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

Client Sample Description	Lancaster Labs (LL) #
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

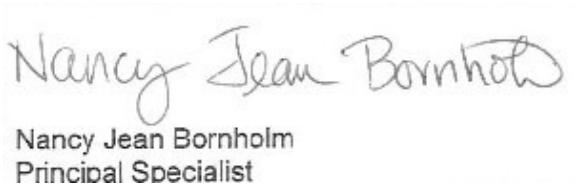
The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

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

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

Sample #s: 8697066, 8697067, 8697068, 8697069, 8697070, 8697071, 8697072, 8697073, 8697074, 8697075, 8697076, 8697077, 8697079

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

Batch #: 16331972171A (Sample number(s): 8697067-8697070, 8697072-8697076, 8697078-8697079 UNSPK: 8697075 BKG: 8697075)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Chloride

EPA 353.2, Wet Chemistry

Batch #: 16325118101B (Sample number(s): 8697067-8697070, 8697072-8697076, 8697078-8697079 UNSPK: 8697075 BKG: 8697075)

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 #: 16326010102A (Sample number(s): 8697075-8697078 UNSPK: 8697075 BKG: P8697075-P697666)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Total Alkalinity to pH 4.5

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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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1301 SDG#: MMK13-01TB

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	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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1301 SDG#: MMK13-01TB

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	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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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 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.						

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 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

REVISED

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M1301

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8697066
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov23a.b/ln23s03.d
Level: (low/med) LOW Date Received: 11/15/16
% Moisture: not dec. Date Analyzed: 11/23/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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3.					
4.					
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1302 SDG#: MMK13-02

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	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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1302 SDG#: MMK13-02

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	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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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 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	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 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	**SW-846 6010C**		**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 Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	90.5		10.0	20.0	50
00228	Sulfate	14808-79-8	14.7		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	2.8		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 pH 4.5	n.a.	21.6		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	21.6		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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

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 12:33	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163281AA	11/23/2016 12:33	Kevin A Sposito	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16327003	11/30/2016 06:04	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 23:52	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	163280635001	11/25/2016 23:52	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163280635001	11/25/2016 23:52	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163280635001	11/25/2016 23:52	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 16:30	Alexandria M Lanager	50
00228	Sulfate	EPA 300.0	1	16331972171A	11/26/2016 16:16	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101B	11/20/2016 19:25	Joseph E McKenzie	2
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16324004203A	11/20/2016 04:01	Kenneth A Bell	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16324004203A	11/20/2016 04:01	Kenneth A Bell	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16324004203A	11/20/2016 04:01	Kenneth A Bell	1

*=This limit was used in the evaluation of the final result

REVISED

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M1302

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8697067
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov23a.b/ln23s08.d
Level: (low/med) LOW Date Received: 11/15/16
% Moisture: not dec. Date Analyzed: 11/23/16
Column: (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1303 SDG#: MMK13-03

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1303 SDG#: MMK13-03

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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 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	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	7		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	**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	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 Chemistry	**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/Nitrate Nitrogen	n.a.	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 to pH 4.5	n.a.	20.1		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	20.1		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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1303 SDG#: MMK13-03

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 Time	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	L163281AA	11/23/2016 12:55	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163281AA	11/23/2016 12:55	Kevin A Sposito	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16327003	11/30/2016 06:24	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 23:55	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	163280635001	11/25/2016 23:55	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163280635001	11/25/2016 23:55	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163280635001	11/25/2016 23:55	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 17:29	Alexandria M Lanager	20
00228	Sulfate	EPA 300.0	1	16331972171A	11/26/2016 17:14	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101B	11/20/2016 19:27	Joseph E McKenzie	2
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16326010103A	11/22/2016 00:42	Kenneth A Bell	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16326010103A	11/22/2016 00:42	Kenneth A Bell	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16326010103A	11/22/2016 00:42	Kenneth A Bell	1

*=This limit was used in the evaluation of the final result

REVISED

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M1303

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8697068
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov23a.b/ln23s09.d
Level: (low/med) LOW Date Received: 11/15/16
% Moisture: not dec. Date Analyzed: 11/23/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1304 SDG#: MMK13-04

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	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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1304 SDG#: MMK13-04

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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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 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	**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 Chemistry	**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/Nitrate Nitrogen	n.a.	2.7		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 pH 4.5	n.a.	20.4		1.7	5.0	1
12149	Bicarbonate Alkalinity	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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

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 13:17	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163281AA	11/23/2016 13:17	Kevin A Sposito	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16327003	11/30/2016 06:45	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 00:04	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	163280635001	11/26/2016 00:04	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163280635001	11/26/2016 00:04	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163280635001	11/26/2016 00:04	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 18:56	Alexandria M Lanager	20
00228	Sulfate	EPA 300.0	1	16331972171A	11/26/2016 18:42	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101B	11/20/2016 19:29	Joseph E McKenzie	2
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16324004203A	11/20/2016 04:18	Kenneth A Bell	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16324004203A	11/20/2016 04:18	Kenneth A Bell	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16324004203A	11/20/2016 04:18	Kenneth A Bell	1

*=This limit was used in the evaluation of the final result

REVISED

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M1304

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8697069
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov23a.b/ln23s10.d
Level: (low/med) LOW Date Received: 11/15/16
% Moisture: not dec. Date Analyzed: 11/23/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1305 SDG#: MMK13-05

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 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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1305 SDG#: MMK13-05

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 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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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	12		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	5	J	3	10	1
10954	Perfluoropentanoic 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 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	**SW-846 6010C**		**mg/l**		**mg/l**	**mg/l**	
01750	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 Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	87.6		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.	2.8		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 pH 4.5	n.a.	20.3		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	20.3		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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

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 13:39	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163281AA	11/23/2016 13:39	Kevin A Sposito	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16327003	11/30/2016 01:57	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 00:07	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	163280635001	11/26/2016 00:07	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163280635001	11/26/2016 00:07	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163280635001	11/26/2016 00:07	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 19:25	Alexandria M Lanager	20
00228	Sulfate	EPA 300.0	1	16331972171A	11/26/2016 19:11	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101B	11/20/2016 19:34	Joseph E McKenzie	2
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16326010103A	11/22/2016 00:50	Kenneth A Bell	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16326010103A	11/22/2016 00:50	Kenneth A Bell	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16326010103A	11/22/2016 00:50	Kenneth A Bell	1

*=This limit was used in the evaluation of the final result

REVISED

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M1305

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8697070
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov23a.b/ln23s11.d
Level: (low/med) LOW Date Received: 11/15/16
% Moisture: not dec. Date Analyzed: 11/23/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1306 SDG#: MMK13-06TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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 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.

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	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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1307 SDG#: MMK13-07

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	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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1307 SDG#: MMK13-07

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
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 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	45		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	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	4	J	3	10	1
10954	Perfluoropentanoic 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 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	**SW-846 6010C**		**mg/l**		**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 Chemistry	**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/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.	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

*=This limit was used in the evaluation of the final result

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

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 14:01	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163281AA	11/23/2016 14:01	Kevin A Sposito	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16327003	11/30/2016 08:28	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 00:11	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	163280635001	11/26/2016 00:11	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163280635001	11/26/2016 00:11	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163280635001	11/26/2016 00:11	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 19:55	Alexandria M Lanager	100
00228	Sulfate	EPA 300.0	1	16331972171A	11/26/2016 19:40	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101B	11/20/2016 19:36	Joseph E McKenzie	2
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16324004201A	11/19/2016 18:56	Kenneth A Bell	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16324004201A	11/19/2016 18:56	Kenneth A Bell	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16324004201A	11/19/2016 18:56	Kenneth A Bell	1

*=This limit was used in the evaluation of the final result

REVISED

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M1307

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8697072
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov23a.b/ln23s12.d
Level: (low/med) LOW Date Received: 11/15/16
% Moisture: not dec. Date Analyzed: 11/23/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1308 SDG#: MMK13-08

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	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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1308 SDG#: MMK13-08

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	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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	48		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	7		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 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	**SW-846 6010C**		**mg/l**		**mg/l**	**mg/l**	
01750	Calcium	7440-70-2	18.0		0.0382	0.400	1
01757	Magnesium	7439-95-4	3.21		0.0190	0.200	1
01762	Potassium	7440-09-7	2.39		0.160	1.00	1
01767	Sodium	7440-23-5	58.9		0.173	2.00	1
Wet Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	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		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate 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 pH 4.5	n.a.	18.1		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	18.1		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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

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 14:24	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163281AA	11/23/2016 14:24	Kevin A Sposito	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16327003	11/30/2016 08:48	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 00:14	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	163280635001	11/26/2016 00:14	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163280635001	11/26/2016 00:14	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163280635001	11/26/2016 00:14	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 20:24	Alexandria M Lanager	50
00228	Sulfate	EPA 300.0	1	16331972171A	11/26/2016 20:09	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101B	11/20/2016 19:37	Joseph E McKenzie	2
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16326010103A	11/22/2016 00:57	Kenneth A Bell	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16326010103A	11/22/2016 00:57	Kenneth A Bell	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16326010103A	11/22/2016 00:57	Kenneth A Bell	1

*=This limit was used in the evaluation of the final result

REVISED

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M1308

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8697073
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov23a.b/ln23s13.d
Level: (low/med) LOW Date Received: 11/15/16
% Moisture: not dec. Date Analyzed: 11/23/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1309 SDG#: MMK13-09

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	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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1309 SDG#: MMK13-09

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 on the back of this form.						
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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	10		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	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 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	**SW-846 6010C**		**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 Chemistry	**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	14.2		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate 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 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

*=This limit was used in the evaluation of the final result

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Time	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

REVISED

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M1309

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8697074
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov23a.b/ln23s14.d
Level: (low/med) LOW Date Received: 11/15/16
% Moisture: not dec. Date Analyzed: 11/23/16
Column: (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1310 SDG#: MMK13-10BKG

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	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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1310 SDG#: MMK13-10BKG

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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	45		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	7		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 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	**SW-846 6010C**		**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 Chemistry	**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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

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 11:26	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163281AA	11/23/2016 11:26	Kevin A Sposito	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16327003	11/30/2016 02:18	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 23:34	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	163280635001	11/25/2016 23:34	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163280635001	11/25/2016 23:34	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163280635001	11/25/2016 23:34	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 15:03	Alexandria M Lanager	20
00228	Sulfate	EPA 300.0	1	16331972171A	11/26/2016 14:48	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101B	11/20/2016 19:20	Joseph E McKenzie	2
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16326010102A	11/21/2016 17:46	Kenneth A Bell	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16326010102A	11/21/2016 17:46	Kenneth A Bell	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16326010102A	11/21/2016 17:46	Kenneth A Bell	1

*=This limit was used in the evaluation of the final result

REVISED

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M1310

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8697075
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov23a.b/ln23s05.d
Level: (low/med) LOW Date Received: 11/15/16
% Moisture: not dec. Date Analyzed: 11/23/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

*=This limit was used in the evaluation of the final result

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	o-Xylene	95-47-6	19	0.5	1	1
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**	**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	260	1	2	1
10954	Perfluorononanoic acid	375-95-1	230	1	2	1
10954	Perfluorodecanoic acid	335-76-2	200	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	240	2	4	1
10954	Perfluorododecanoic acid	307-55-1	240	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	240	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	220	3	5	1
10954	Perfluorohexanoic acid	307-24-4	250	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	240	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	220	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	220	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	200	5	10	1
10954	Perfluorobutanoic Acid	375-22-4	240	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	240	1	3	1
10954	NEtFOSAA	2991-50-6	140	5	8	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
10954	NMeFOSAA	2355-31-9	140	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	**SW-846 6010C**		**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 Chemistry	**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/Nitrate 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 pH 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.

*=This limit was used in the evaluation of the final result

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1310 SDG#: MMK13-10MS

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 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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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	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	100-41-4	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	79-01-6	21	0.5	1	1
11997	Trichlorofluoromethane	75-69-4	25	0.5	1	1
11997	Vinyl Chloride	75-01-4	21	0.5	1	1
11997	m+p-Xylene	179601-23-1	38	0.5	1	1

*=This limit was used in the evaluation of the final result

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 8260C**		**ug/l**	**ug/l**	**ug/l**	
11997	o-Xylene	95-47-6	19	0.5	1	1
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**	**ng/l**	**ng/l**	
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 acid	2058-94-8	260	2	4	1
10954	Perfluorododecanoic acid	307-55-1	230	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	230	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	220	3	5	1
10954	Perfluorohexanoic acid	307-24-4	240	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	230	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	210	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	200	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	220	5	10	1
10954	Perfluorobutanoic Acid	375-22-4	230	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	230	1	3	1
10954	NEtFOSAA	2991-50-6	130	5	8	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
10954	NMeFOSAA	2355-31-9	150	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	**SW-846 6010C**		**mg/l**	**mg/l**	**mg/l**	
01750	Calcium	7440-70-2	23.0	0.0382	0.400	1
01757	Magnesium	7439-95-4	5.42	0.0190	0.200	1
01762	Potassium	7440-09-7	13.3	0.160	1.00	1
01767	Sodium	7440-23-5	74.3	0.173	2.00	1
Wet Chemistry	**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

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 12:11	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163281AA	11/23/2016 12:11	Kevin A Sposito	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16327003	11/30/2016 02:59	Marissa C Drexinger	1

*=This limit was used in the evaluation of the final result

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1310 SDG#: MMK13-10MSD

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	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 4.5	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

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Analysis Report

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	**SW-846 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 Chemistry	**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/Nitrate 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 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 No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01750	Calcium	SW-846 6010C	1	163280635001	11/25/2016 23:40	Elaine F Stoltzfus	1
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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
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 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	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	**SW-846 6010C**		**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
	EPA 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		**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

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

Submitted: 11/15/2016 09:40
Reported: 01/30/2017 13:32

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1311 SDG#: MMK13-11FD

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 15:08	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	L163281AA	11/23/2016 15:08	Kevin A Sposito	1
10954	16 PFCs	EPA 537 Rev. 1.1 modified	1	16327003	11/30/2016 09:29	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 00:20	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	163280635001	11/26/2016 00:20	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	163280635001	11/26/2016 00:20	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	163280635001	11/26/2016 00:20	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 21:51	Alexandria M Lanager	20
00228	Sulfate	EPA 300.0	1	16331972171A	11/26/2016 21:37	Alexandria M Lanager	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	16325118101B	11/20/2016 19:41	Joseph E McKenzie	2
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	16326010103A	11/22/2016 00:35	Kenneth A Bell	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	16326010103A	11/22/2016 00:35	Kenneth A Bell	1
12148	Carbonate Alkalinity	SM 2320 B-1997	1	16326010103A	11/22/2016 00:35	Kenneth A Bell	1

*=This limit was used in the evaluation of the final result

REVISED

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
M1311

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8697079
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09915.i/16nov23a.b/ln23s15.d
Level: (low/med) LOW Date Received: 11/15/16
% Moisture: not dec. Date Analyzed: 11/23/16
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
4.					
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page 1 of 1

FORM I VOA-TIC

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): 8697066-8697070,8697072-8697077,8697079			
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.
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.

REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:32

Group Number: 1733211

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: 16327003	Sample number(s): 8697066-8697077,8697079			
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: 163280635001	Sample number(s): 8697067-8697070,8697072-8697079			
Calcium	0.0472	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: 16325118101B	Sample number(s): 8697067-8697070,8697072-8697076,8697078-8697079			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 16331972171A	Sample number(s): 8697067-8697070,8697072-8697076,8697078-8697079			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
	mg/l as CaCO3		mg/l as CaCO3	mg/l as CaCO3
Batch number: 16324004201A	Sample number(s): 8697072			
Total Alkalinity to pH 4.5	1.7	U	1.7	5.0

*- Outside of specification
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(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.

REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:32

Group Number: 1733211

Method Blank (continued)

Analysis Name	Result mg/l as CaCO3		MDL** mg/l as CaCO3	LOQ mg/l as CaCO3
Batch number: 16324004203A	Sample number(s): 8697067,8697069,8697074			
Total Alkalinity to pH 4.5	2.4	J	1.7	5.0
Batch number: 16326010102A	Sample number(s): 8697075-8697078			
Total Alkalinity to pH 4.5	1.7	U	1.7	5.0
Batch number: 16326010103A	Sample number(s): 8697068,8697070,8697073,8697079			
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(s): 8697066-8697070,8697072-8697077,8697079								
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.
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.

REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:32

Group Number: 1733211

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 number(s): 8697066-8697077,8697079								
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 number(s): 8697067-8697070,8697072-8697079								
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		

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REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:32

Group Number: 1733211

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 number(s): 8697067-8697070,8697072-8697076,8697078-8697079								
Total Nitrite/Nitrate Nitrogen	2.50	2.43			97		90-110		
Batch number: 16331972171A	Sample number(s): 8697067-8697070,8697072-8697076,8697078-8697079								
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(s): 8697072								
Total Alkalinity to pH 4.5	188	185.14			98		84-110		
Batch number: 16324004203A	Sample number(s): 8697067,8697069,8697074								
Total Alkalinity to pH 4.5	188	185.39			99		84-110		
Batch number: 16326010102A	Sample number(s): 8697075-8697078								
Total Alkalinity to pH 4.5	188	181.54			97		84-110		
Batch number: 16326010103A	Sample number(s): 8697068,8697070,8697073,8697079								
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	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
Batch number: L163281AA	Sample number(s): 8697066-8697070,8697072-8697077,8697079 UNSPK: 8697075										
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

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REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:32

Group Number: 1733211

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-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
o-Xylene	0.5	U	20	18.94	20	18.67	95	93	80-120	1	30
	ng/l		**ng/l**	**ng/l**	**ng/l**	**ng/l**					
Batch number: 16327003	Sample number(s): 8697066-8697077,8697079 UNSPK: 8697075										
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	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	10.19		200.54	249.55	200.7	236.09	119	113	70-130	6	30

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REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:32

Group Number: 1733211

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 number(s): 8697067-8697070,8697072-8697079 UNSPK: 8697075										
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 number(s): 8697067-8697070,8697072-8697076,8697078-8697079 UNSPK: 8697075										
Total Nitrite/Nitrate Nitrogen	2.23		2.00	4.78			128*		90-110		
Batch number: 16331972171A	Sample number(s): 8697067-8697070,8697072-8697076,8697078-8697079 UNSPK: 8697075										
Chloride	112.32		80	181.49			86*		90-110		
Sulfate	13.97		50	63.18			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: 16324004201A	Sample number(s): 8697072 UNSPK: P695182										
Total Alkalinity to pH 4.5	16.67		188	185.69	188	195.59	90	95	84-110	5	5
Batch number: 16324004203A	Sample number(s): 8697067,8697069,8697074 UNSPK: P697170										
Total Alkalinity to pH 4.5	34.14		188	194.55			85		84-110		
Batch number: 16326010102A	Sample number(s): 8697075-8697078 UNSPK: 8697075										
Total Alkalinity to pH 4.5	17.59		188	183.25	188	191.31	88	92	84-110	4	5
Batch number: 16326010103A	Sample number(s): 8697068,8697070,8697073,8697079 UNSPK: P697734										
Total Alkalinity to pH 4.5	84		188	253.74			90		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

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REVISED

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 01/30/2017 13:32

Group Number: 1733211

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: 163280635001	Sample number(s): 8697067-8697070,8697072-8697079 BKG: 8697075			
Calcium	18.99	17.97	6	20
Magnesium	3.37	3.17	6	20
Potassium	2.57	2.41	6 (1)	20
Sodium	64.4	61.07	5	20
	mg/l	mg/l		
Batch number: 16325118101B	Sample number(s): 8697067-8697070,8697072-8697076,8697078-8697079 BKG: 8697075			
Total Nitrite/Nitrate Nitrogen	2.23	2.25	1	2
Batch number: 16331972171A	Sample number(s): 8697067-8697070,8697072-8697076,8697078-8697079 BKG: 8697075			
Chloride	112.32	112.51	0	15
Sulfate	13.97	13.96	0 (1)	15
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 16324004201A	Sample number(s): 8697072 BKG: P695182			
Total Alkalinity to pH 4.5	16.67	16.81	1 (1)	5
Batch number: 16324004203A	Sample number(s): 8697067,8697069,8697074 BKG: P697170			
Total Alkalinity to pH 4.5	34.14	34.47	1	5
Batch number: 16326010102A	Sample number(s): 8697075-8697078 BKG: 8697075			
Total Alkalinity to pH 4.5	17.59	20.4	15* (1)	5
Batch number: 16326010103A	Sample number(s): 8697068,8697070,8697073,8697079 BKG: P697734			
Total Alkalinity to pH 4.5	84	85.11	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: 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

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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

	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*
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*

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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

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Environmental Services Analysis Request/Chain of Custody

Page 1 of 2

Acct. #: 37191 Group #: 173321 Sample #: 8697066-79

COC#: 15595

Client: **C.T. Male Associates**

Project Name/#: SGPP - Merrimack | Site ID:

Project Manager: Kirk Moline | P.O. #: 16.6126

Sampler: Jon Dipert, Ryan Hubbard

Phone #: 978-786-7460 | Quote #: 214135

State where sample(s) were collected: NH

For Lab Use Only

SF#: 285327

SCR#: 196069

Preservation Codes: H = HCl; T = Thiosulfate; N = HNO_3; B = NaOH; S = H_2SO_4; P = H_3PO_4; O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Matrix: Soil	Sediment	Water: Ground	Water: Potable	Water: Surface	Water: NPDES	Other: Blank Water	Total # of Containers	Preservation: H	Preservation: N	Preservation: S	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	NO2 (353.2)	NO3 (353.2) + NH2 as N	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
SG2 -AP(50) - LTB01 - 16/1114	11/14/16	-									X	3				X						X	
SG2 -AP(50) - MVD4 - 00 - 16/1114	11/14/16	1335	X				X					11				X	X		X	X	X	X	
SG2 -AP(50) - MVD4 - 10 - 16/1114		1345	X				X					11				X	X		X	X	X	X	
SG2 -AP(50) - MVD4 - 20 - 16/1114		1355	X				X					11				X	X		X	X	X	X	
SG2 -AP(50) - MVD4 - 30 - 16/1114		1405	X				X					11				X	X		X	X	X	X	
SG2 -AP(50) - FTB01 - 16/1114		1445	X								X											X	
SG2 -AP(50) - MVD5 - 00 - 16/1114		1530	X				X					11				X	X		X	X	X	X	
SG2 -AP(50) - MVD5 - 10 - 16/1114		1540	X				X					12				X	X		X	X	X	X	Metals QAQC
SG2 -AP(50) - MVD5 - 20 - 16/1114		1550	X				X					11				X	X		X	X	X	X	
SG2 -AP(50) - MVD5 - 30 - 16/1114	11/14/16	1600	X				X					33				X	X		X	X	X	X	MS/MSD

Turnaround Time Requested (TAT) (please check): Standard [X] RUSH [ ]

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.Moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP) [X] | MA MCP [ ] | TX TRRP - 13 [ ]

Type III (Reduced non-CLP) [ ] | CT RCP [ ]

Type IV (CLP SOW) [ ] | ASP Type A [ ]

Type VI (Raw Data Only) [ ] | ASP Type B [ ]

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
Charles S. Montgomery (50)	10/12/16	15:25			
	11/14/16	1730			
			Kristen Abel	11/15/16	0940

Airbill No.:

Relinquished by Commercial Carrier:

UPS _____ FedEx X Other _____

Temperature upon receipt 2.5 4.5 °C

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: 1733211 Sample #: 8697066-79 COC#: 15595

Client: **C.T. Male Associates**

Project Name/#: SGPP - Merrimack | Site ID:

Project Manager: Kirk Moline | P.O. #: 4.6126

Sampler: Jon Dippel, Ryan Hubbard

Phone #: 518-786-7400 | Quote #: 214135

State where sample(s) were collected: NH

For Lab Use Only

SF#: 285327

SCR#: 196069

Preservation Codes

H = HCl T = Thiosulfate

N = HNO_3 B = NaOH

S = H_2SO_4 P = H_3PO_4

O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Matrix: Soil	Matrix: Sediment	Matrix: Water (Potable, Ground, NPDES)	Matrix: Surface	Matrix: Other:	Total # of Containers	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	NO2 (353.2)	NO3 (353.2) + N_2 as N	Cl-, SO4- (300.0)	Alkalinity (SM 2320B)	PFCs (EPA 537 mod.)	Remarks
SG2 ~~-AP10~~ - MWD001 - 16 1114	11/04/16	—	X				X			11	X	X		X	X	X	X	
SG -AP - 16																		
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 check): Standard ☒ RUSH ☐

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results: K.moline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☒ MA MCP ☐ TX TRRP - 13 ☐

Type III (Reduced non-CLP) ☐ CT RCP ☐

Type IV (CLP SOW) ☐ ASP Type A ☐

Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
	11/14/16	1730			
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by: Kristin Abbott	11/15/16	0940

Airbill No.:

Relinquished by Commercial Carrier:

UPS _____ FedEx X Other _____

Temperature upon receipt 2.8 4.5 °C

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Sample Administration Receipt Documentation Log

Doc Log ID: 168176

Group Number(s): 1733911

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:	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:	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 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	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	2.8	DT	Wet	Y	Bagged	N
2	DT146	3.6	DT	Wet	Y	Bagged	N
3	DT146	4.5	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425

T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< 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.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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	Lancaster Labs (LL) #
SG2-RB-ROPE-170113 Grab Blank Water	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

Sample #s: 8787450

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: NMeFOSAA

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8787450, Blank, LCS, LCSD, MS

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

Submitted: 01/14/2017 10:10
Reported: 02/15/2017 17:05

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

RROPE SDG#: MMK14-01RB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
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 acronym for N-ethyl perfluorooctanesulfonamidoacetic 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	**5**		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.

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.

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	1	17018004	01/29/2017 17:39	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17018004	01/18/2017 19:50	Devon M Whooley	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/15/2017 17:05

Group Number: 1754371

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 ng/l		MDL** ng/l	LOQ ng/l
Batch number: 17018004	Sample number(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 number(s): 8787450								
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.
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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/15/2017 17:05

Group Number: 1754371

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	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: 17018004	Sample number(s): 8787450 UNSPK: P787485										
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		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.
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.

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.
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 Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 37191 Group # 1754371 Sample # 8787450

COC # 517820

Client Information

Client: CT Male Associates	Acct. #:
Project Name/#: SGPP-Merrimack	PWSID #:
Project Manager: Kirk Moline	P.O. #: 16.6126
Sampler: Jonathan Dippert	Quote #:
State where samples were collected: NY	For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Tissue ☐ Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ Other: Blank

Analysis Requested

Preservation Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	PFCs
SG2-RB-ROPE-170113	1/3/17	1600	X		1	X

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed:

E-mail address: K.moline@ctmale.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
	1/3/17	1605			
				1/4/17	1010

EDD Required? Yes No

If yes, format:

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS FedEx Other

Temperature upon receipt 0.3-1.6 °C

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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:	5	Number of Projects:	2
State/Province of Origin:	NY		

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:	Yes	Total Trip Blank Qty:	2
Samples Intact:	Yes	Trip Blank Type:	HCl
Missing Samples:	No	Air Quality Samples Present:	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	Y	Bagged	N
2	DT121	0.6	DT	Wet	Y	Bagged	N
3	DT121	1.2	DT	Wet	Y	Bagged	N
4	DT121	1.6	DT	Wet	Y	Bagged	N
5	DT121	0.3	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< 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.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

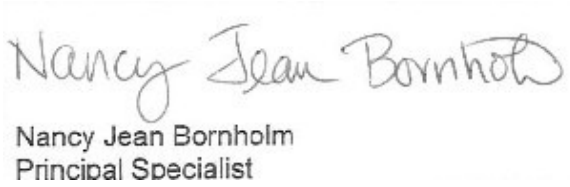
Client Sample Description	Lancaster Labs (LL) #
SG2-AP01-45-46-170110 Grab Groundwater	8787481
SG2-AP01-45-46-170110 Filtered Grab Groundwater	8787482
SG2-AP01-55-56-170110 Grab Groundwater	8787483
SG2-AP01-55-56-170110 Filtered Grab Groundwater	8787484
SG2-AP01-65-66-170111 Grab Groundwater	8787485
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.

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

Sample #s: 8787481, 8787485, 8787487, 8787489, 8787491, 8787492, 8787493, 8787494, 8787495, 8787498, 8787499, 8787500
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample #s: 8787483
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.

Batch #: 17018004 (Sample number(s): 8787481, 8787483, 8787485, 8787487, 8787489, 8787491-8787496, 8787498-8787500 UNSPK: 8787485)

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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
GC/MS Volatiles	**SW-846 8260C**		**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
	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.						
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 acronym for N-ethyl perfluorooctanesulfonamidoacetic 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	**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	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.						
Metals	**SW-846 6010C**		**mg/l**		**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
Wet Chemistry	**EPA 300.0**		**mg/l**		**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
	EPA 353.2		**mg/l**		**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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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 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	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 Nitrogen	EPA 353.2	1	17019118101B	01/19/2017 03:54	Joseph E McKenzie	1
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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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
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 acronym for N-ethyl perfluorooctanesulfonamidoacetic 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	**2**		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	**1**	**J**	1	3	1
10954	**Perfluorohexanoic acid**	307-24-4	**8**		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	**30**		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	U	1	3	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 and internal standard recoveries were again outside of the QC acceptance limits.

Metals	**SW-846 6010C**		**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
01767	**Sodium**	7440-23-5	**87.6**		0.173	2.00	1
Wet Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
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/Nitrate 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 pH 4.5**	n.a.	**25.1**		1.7	5.0	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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 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	Y170231AA	01/23/2017 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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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.

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	170180635002	01/22/2017 15:44	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	170180635002	01/22/2017 15:44	Elaine F Stoltzfus	1
01762	Potassium	SW-846 6010C	1	170180635002	01/22/2017 15:44	Elaine F Stoltzfus	1
01767	Sodium	SW-846 6010C	1	170180635002	01/22/2017 15:44	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1505 SDG#: MMK15-05

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 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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1505 SDG#: MMK15-05

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 8260C**		**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 acronym for N-ethyl perfluorooctanesulfonamidoacetic 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	**3**		0.7	2	1
10954	**Perfluorobutanoic Acid**	375-22-4	**3**	**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	**4**		0.5	2	1
10954	**Perfluorohexanesulfonate**	355-46-4	**1**	**J**	1	3	1
10954	**Perfluorohexanoic acid**	307-24-4	**5**		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	**25**		0.5	2	1
10954	**Perfluoropentanoic Acid**	2706-90-3	**5**		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.						
Metals	**SW-846 6010C**		**mg/l**		**mg/l**	**mg/l**	
01750	**Calcium**	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
Wet Chemistry	**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/l**		**mg/l**	**mg/l**	
07882	**Total Nitrite/Nitrate 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 pH 4.5**	n.a.	**21.2**		1.7	5.0	1
12149	**Bicarbonate Alkalinity**	n.a.	**21.2**		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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1505 SDG#: MMK15-05

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 Time	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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.

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	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1507 SDG#: MMK15-07

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	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1507 SDG#: MMK15-07

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
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 acronym for N-ethyl perfluorooctanesulfonamidoacetic 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	**4**		0.7	2	1
10954	**Perfluorobutanoic Acid**	375-22-4	**4**	**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	**5**		0.5	2	1
10954	**Perfluorohexanesulfonate**	355-46-4	**2**	**J**	1	3	1
10954	**Perfluorohexanoic acid**	307-24-4	**7**		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	**30**		0.5	2	1
10954	**Perfluoropentanoic Acid**	2706-90-3	**6**		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.						
Metals	**SW-846 6010C**		**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
01767	**Sodium**	7440-23-5	**131**		0.173	2.00	1
Wet Chemistry	**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/Nitrate 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.	**26.3**		1.7	5.0	1
12149	**Bicarbonate Alkalinity**	n.a.	**26.3**		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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1507 SDG#: MMK15-07

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

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 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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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.

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	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1509 SDG#: MMK15-09

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	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1509 SDG#: MMK15-09

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
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 acronym for N-ethyl perfluorooctanesulfonamidoacetic 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	**2**		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	**1**	**J**	0.5	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	**Perfluorohexanoic acid**	307-24-4	**3**		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	**6**		0.5	2	1
10954	**Perfluoropentanoic Acid**	2706-90-3	**8**		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.						
Metals	**SW-846 6010C**		**mg/l**		**mg/l**	**mg/l**	
01750	**Calcium**	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
Wet Chemistry	**EPA 300.0**		**mg/l**		**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	**Total Nitrite/Nitrate Nitrogen**	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 Alkalinity**	n.a.	**34.8**		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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1509 SDG#: MMK15-09

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 Time	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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.

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	170180635002	01/22/2017 16:02	Elaine F Stoltzfus	1
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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1511 SDG#: MMK15-11

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	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1511 SDG#: MMK15-11

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
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 acronym for N-ethyl perfluorooctanesulfonamidoacetic 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	**2**	**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	**1**	**J**	0.5	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	U	1	3	1
10954	**Perfluorohexanoic acid**	307-24-4	**3**		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	**6**		0.5	2	1
10954	**Perfluoropentanoic Acid**	2706-90-3	**9**		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.						
Metals	**SW-846 6010C**		**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
Wet Chemistry	**EPA 300.0**		**mg/l**		**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/Nitrate Nitrogen**	n.a.	**0.38**		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.	**17.9**		1.7	5.0	1
12149	**Bicarbonate Alkalinity**	n.a.	**17.9**		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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

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 13:43	Angela D Sneeringer	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170231AA	01/23/2017 13:43	Angela D Sneeringer	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17018004	02/02/2017 06:41	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 16:05	Elaine F Stoltzfus	1
01757	Magnesium	SW-846 6010C	1	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	1	170180635002	01/22/2017 16:05	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 03:49	Hallie A Burnett	50
00228	Sulfate	EPA 300.0	1	17018987131A	01/19/2017 03:34	Hallie A Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17019118102A	01/19/2017 04:18	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17017012202A	01/18/2017 00:07	Brandon P Costik	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	1	17017012202A	01/18/2017 00:07	Brandon P Costik	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1512 SDG#: MMK15-12

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	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	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1512 SDG#: MMK15-12

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	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 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-ethyl perfluorooctanesulfonamidoacetic 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	**6**		0.7	2	1
10954	**Perfluorobutanoic Acid**	375-22-4	**10**		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	**7**		0.5	2	1
10954	**Perfluorohexanesulfonate**	355-46-4	**3**	**J**	1	3	1
10954	**Perfluorohexanoic acid**	307-24-4	**12**		0.5	2	1
10954	**Perfluorononanoic acid**	375-95-1	**1**	**J**	0.6	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	**Perfluorooctanoic acid**	335-67-1	**45**		0.5	2	1
10954	**Perfluoropentanoic Acid**	2706-90-3	**9**		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.						
Metals	**SW-846 6010C**		**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 Chemistry	**EPA 300.0**		**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
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	**Total Nitrite/Nitrate Nitrogen**	n.a.	**7.6**		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.	**22.5**		1.7	5.0	1
12149	**Bicarbonate Alkalinity**	n.a.	**22.5**		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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1512 SDG#: MMK15-12

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	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1513 SDG#: MMK15-13

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	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	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1513 SDG#: MMK15-13

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	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 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-ethyl perfluorooctanesulfonamidoacetic 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	**5**		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	**9**		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	**32**		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	U	1	3	1
	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	**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
Wet Chemistry	**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
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	**Total Nitrite/Nitrate Nitrogen**	n.a.	**1.6**		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.	**23.4**		1.7	5.0	1
12149	**Bicarbonate Alkalinity**	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1513 SDG#: MMK15-13

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	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1514 SDG#: MMK15-14FB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev 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-ethyl perfluorooctanesulfonamidoacetic 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 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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1515 SDG#: MMK15-15

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	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	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1515 SDG#: MMK15-15

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	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 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-ethyl perfluorooctanesulfonamidoacetic 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	**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	**7**		0.5	2	1
10954	**Perfluorohexanesulfonate**	355-46-4	**2**	**J**	1	3	1
10954	**Perfluorohexanoic acid**	307-24-4	**9**		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	**35**		0.5	2	1
10954	**Perfluoropentanoic Acid**	2706-90-3	**8**		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.						
Metals	**SW-846 6010C**		**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
Wet Chemistry	**EPA 300.0**		**mg/l**		**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/Nitrate Nitrogen**	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.	**25.1**		1.7	5.0	1
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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1515 SDG#: MMK15-15

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

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 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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1516 SDG#: MMK15-16

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	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	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	**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	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1516 SDG#: MMK15-16

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	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 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-ethyl perfluorooctanesulfonamidoacetic 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	**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	U	0.6	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	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	U	1	3	1
Metals	**SW-846 6010C**		**mg/l**		**mg/l**	**mg/l**	
01750	**Calcium**	7440-70-2	**55.8**		0.0382	0.400	1
01757	**Magnesium**	7439-95-4	**22.1**		0.0190	0.200	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 Chemistry	**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/l**		**mg/l**	**mg/l**	
07882	**Total Nitrite/Nitrate Nitrogen**	n.a.	**1.5**		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.	**26.8**		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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1516 SDG#: MMK15-16

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

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 15:12	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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.

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	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1518 SDG#: MMK15-18TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 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-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 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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1519 SDG#: MMK15-19EB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 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-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 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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1520 SDG#: MMK15-20EB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 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	**0.6**	**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-ethyl perfluorooctanesulfonamidoacetic 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 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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1521 SDG#: MMK15-21TB

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	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

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

Submitted: 01/14/2017 10:10
Reported: 02/17/2017 14:33

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1521 SDG#: MMK15-21TB

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	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.

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	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

*=This limit was used in the evaluation of the final result

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	Sample number(s): 8787481,8787483,8787485,8787487,8787489,8787491-8787493,8787495-8787496,8787501			
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	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

*- 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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/17/2017 14:33

Group Number: 1754381

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
	ng/l		ng/l	ng/l
Batch number: 17018004	Sample number(s): 8787481,8787483,8787485,8787487,8787489,8787491-8787496,8787498-8787500			
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 number(s): 8787481-8787493,8787495-8787497			
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 number(s): 8787481,8787483,8787485,8787487,8787489,8787491-8787493			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
Batch number: 17018987131B	Sample number(s): 8787495-8787496			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
Batch number: 17019118101B	Sample number(s): 8787481,8787483			

*- 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.
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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/17/2017 14:33

Group Number: 1754381

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ
	mg/l		mg/l	mg/l
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 17019118102A	Sample number(s): 8787485,8787487,8787489,8787491-8787493,8787495			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 17019118102B	Sample number(s): 8787496			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
	mg/l as CaCO3		mg/l as CaCO3	mg/l as CaCO3
Batch number: 17017012201A	Sample number(s): 8787481,8787489,8787493,8787496			
Total Alkalinity to pH 4.5	1.7	U	1.7	5.0
Batch number: 17017012202A	Sample number(s): 8787483,8787485,8787487,8787491-8787492,8787495			
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: Y170231AA	Sample number(s): 8787481,8787483,8787485,8787487,8787489,8787491-8787493,8787495-8787496,8787501								
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.
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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/17/2017 14:33

Group Number: 1754381

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	30
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	30
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	20.3	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	17.83	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 number(s): 8787481,8787483,8787485,8787487,8787489,8787491-8787496,8787498-8787500								
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

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/17/2017 14:33

Group Number: 1754381

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
	mg/l	mg/l	mg/l	mg/l					
Batch number: 170180635002	Sample number(s): 8787481-8787493,8787495-8787497								
Calcium	4.00	4.09			102		80-120		
Magnesium	2.00	2.08			104		80-120		
Potassium	10	10.23			102		80-120		
Sodium	10	10.08			101		80-120		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17018987131A	Sample number(s): 8787481,8787483,8787485,8787487,8787489,8787491-8787493								
Chloride	3.00	2.86	3.00	2.85	95	95	90-110	0	20
Sulfate	7.50	7.34	7.50	7.28	98	97	90-110	1	20
Batch number: 17018987131B	Sample number(s): 8787495-8787496								
Chloride	3.00	2.86	3.00	2.85	95	95	90-110	0	20
Sulfate	7.50	7.34	7.50	7.28	98	97	90-110	1	20
Batch number: 17019118101B	Sample number(s): 8787481,8787483								
Total Nitrite/Nitrate Nitrogen	2.50	2.65			106		90-110		
Batch number: 17019118102A	Sample number(s): 8787485,8787487,8787489,8787491-8787493,8787495								
Total Nitrite/Nitrate Nitrogen	2.50	2.66			107		90-110		
Batch number: 17019118102B	Sample number(s): 8787496								
Total Nitrite/Nitrate Nitrogen	2.50	2.66			107		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 17017012201A	Sample number(s): 8787481,8787489,8787493,8787496								
Total Alkalinity to pH 4.5	188	185.69			99		84-110		
Batch number: 17017012202A	Sample number(s): 8787483,8787485,8787487,8787491-8787492,8787495								
Total Alkalinity to pH 4.5	188	189.22			101		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

*- Outside of specification
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(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.

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 %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 17018004	Sample number(s): 8787481,8787483,8787485,8787487,8787489,8787491-8787496,8787498-8787500 UNSPK: 8787485										
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		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		
	mg/l		**mg/l**	**mg/l**	**mg/l**	**mg/l**					
Batch number: 170180635002	Sample number(s): 8787481-8787493,8787495-8787497 UNSPK: 8787493										
Calcium	24.38		4.00	28.48	4.00	28.51	103 (2)	103 (2)	75-125	0	20
Magnesium	5.54		2.00	7.57	2.00	7.61	102	103	75-125	0	20
Potassium	3.33		10	13.81	10	13.81	105	105	75-125	0	20
Sodium	109.89		10	120.21	10	120.11	103 (2)	102 (2)	75-125	0	20
	mg/l		**mg/l**	**mg/l**	**mg/l**	**mg/l**					
Batch number: 17018987131A	Sample number(s): 8787481,8787483,8787485,8787487,8787489,8787491-8787493 UNSPK: P787996										
Chloride	9.83		20	28.9			95		90-110		
Sulfate	34.43		50	86.24			104		90-110		
Batch number: 17018987131B	Sample number(s): 8787495-8787496 UNSPK: P787998										
Chloride	6.24		20	25.29			95		90-110		
Sulfate	35.74		50	85.7			100		90-110		
Batch number: 17019118101B	Sample number(s): 8787481,8787483 UNSPK: P765484										
Total Nitrite/Nitrate Nitrogen	6.45		5.00	11.89			109		90-110		
Batch number: 17019118102A	Sample number(s): 8787485,8787487,8787489,8787491-8787493,8787495 UNSPK: P790664										
Total Nitrite/Nitrate Nitrogen	0.966		1.00	2.04			107		90-110		
Batch number: 17019118102B	Sample number(s): 8787496 UNSPK: P787996										

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/17/2017 14:33

Group Number: 1754381

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	Sample number(s): 8787481,8787489,8787493,8787496 UNSPK: P787311									
Total Alkalinity to pH 4.5	418.92	188	516.55			52*		84-110		
Batch number: 17017012202A	Sample number(s): 8787483,8787485,8787487,8787491-8787492,8787495 UNSPK: 8787491									
Total Alkalinity to pH 4.5	17.85	188	199.15			96		84-110		

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: 170180635002	Sample number(s): 8787481-8787493,8787495-8787497 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): 8787481,8787483,8787485,8787487,8787489,8787491-8787493 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): 8787485,8787487,8787489,8787491-8787493,8787495 BKG: P790664			
Total Nitrite/Nitrate Nitrogen	0.966	0.948	2	2
Batch number: 17019118102B	Sample number(s): 8787496 BKG: P787996			
Total Nitrite/Nitrate Nitrogen	0.040 U	0.040 U	0 (1)	2

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/17/2017 14:33

Group Number: 1754381

Laboratory Duplicate (continued)

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
	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

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/17/2017 14:33

Group Number: 1754381

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
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*

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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

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Environmental Analysis Request/Chain of Custody

eurofins | Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 37191 Group # 1754381 Sample # 8787481-501

COC # 512676

Client Information

Client: CT Male Associates

Acct. #:

Project Name/#: SWPP- Monmouth

PWSID #:

Project Manager: Kirk Moline

P.O. #: 16.6126

Sampler: STS (Stephen Johnson)

Quote #: 214135

State where samples were collected: NH

For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Tissue ☐ Water ☐ Potable ☐ Ground ☒ NPDES ☐ Surface ☐ Other: DI PFC Free

Analysis Requested

Preservation Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	Diss. Metals Filtered	NO_3+NO_2 as N	Cl^-, Sol. (300.0)	Alkalinity (SM2320B)	PFCs (EPA 537mod)	Remarks
SW2-AP01-45-46-170110	1/10/17	1103	X		11	X	X	X	X	X	X	X	Filter for metals
SW2-AP01-55-56-170110	1/10/17	1421	X		11	X	X	X	X	X	X	X	Filter for metals
SW2-AP01-65-66-170111	1/11/17	0904	X		12	X	X	X	X	X	X	X	Filter metals
SW2-AP01-75-76-170111	1/11/17	1151	X		12	X	X	X	X	X	X	X	Filter metals
SW2-AP01-79-80-170111	1/11/17	1522	X		12	X	X	X	X	X	X	X	Filter metals
SW2-AP02-24-25-170112	1/12/17	1037	X		11	X	X		X	X	X	X	
SW2-AP02-34-35-170112	1/12/17	1212	X		11	X	X		X	X	X	X	
SW2-AP02-44-45-170112	1/12/17	1348	X		11	X	X		X	X	X	X	
SW2-FB02-170112	1/12/17	1548	X		2							X	
SW2-AP02-54-55-170113	1/13/17	0915	X		11	X	X		X	X	X	X	

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ASAP

E-mail address: k.moline@ctmale.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
	1/13/17	17:08			
				1/14/17	1040

EDD Required? Yes No

If yes, format:

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS ____ FedEx X Other ____

Temperature upon receipt 0.3-1.6 °C

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 37191 Group # 1754381 Sample # 8787481-501

COC # 512677

Client Information

Client: CT Male Associates	Acct. #:
Project Name/#: SLPP-Merrimack	PWSID #:
Project Manager: Kirk Moline	P.O. #: 16.6126
Sampler: STS Stephen Johnson	Quote #: 214135
State where samples were collected: NH	For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Tissue ☐ | Water ☒ Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: DI PFC Free

Analysis Requested

Preservation Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	TCL VOAs (8260C)	Ca, Mg, Na, K (6010C)	Metals Filtered	NO_3+NO_2 as N	Cl^-, SO_4 (300.0)	Alkalinity by (SM2320B)	PFCs (EPA 537mod)	Remarks
APSTS													
SL2-AP02-64-65-170113	1/13/17	1244	X		12	X	X	X	X	X	X	X	Filter metals
TRIP Blank PFCs	—	—			1							X	
SL2-EBWP01-170113	1/13/17	1424	X		2							X	
SL2-EB PP01-170113	1/13/17	1417	X		2							X	
Trip Blank VOCs	—	—			2	X							
					STS								

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ASAP

E-mail address: Kmoline@ctmale.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
	1/13/17	1708			
				1/14/17	10:10

EDD Required? Yes No

If yes, format:

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS ____ FedEx X Other ____

Temperature upon receipt 0.3/1.6°C

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Sample Administration Receipt Documentation Log

Doc Log ID: 173092

Group Number(s): 1754381

Client: C.T Male

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	01/14/2017 10:10
Number of Packages:	5	Number of Projects:	2
State/Province of Origin:	NY		

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:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCl
Samples Intact:	Yes	Air Quality Samples Present:	No
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	Y	Bagged	N
2	DT121	0.6	DT	Wet	Y	Bagged	N
3	DT121	1.2	DT	Wet	Y	Bagged	N
4	DT121	1.6	DT	Wet	Y	Bagged	N
5	DT121	0.3	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425

T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< 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.

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.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

Client Sample Description	Lancaster Labs (LL) #
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

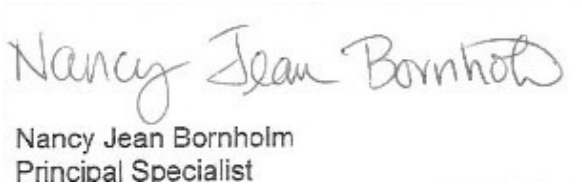
The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

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

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, 8799398, 8799403

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

Batch #: 17031006 (Sample number(s): 8799385-8799391, 8799395, 8799397-8799398, 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, 8799390, 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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1601 SDG#: MMK16-01BKG

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	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1601 SDG#: MMK16-01BKG

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 Rev 1.1**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	92		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	14		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	11		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	7		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	3		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	6	J	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	6	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-ethyl perfluorooctanesulfonamidoacetic 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.						
Metals	**SW-846 6010C**		**mg/l**		**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 Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	94.6		20.0	40.0	100
00228	Sulfate	14808-79-8	12.7		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate 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 pH 4.5	n.a.	16.8		1.7	5.0	1
12149	Bicarbonate Alkalinity	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Time	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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

K1601

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8799385
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17jan27a.b/yj27s02.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
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17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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	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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	o-Xylene	95-47-6	21	0.5	1	1
Misc. Organics	**EPA 537 Rev 1.1**		**ng/l**	**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	250	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	170	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	170	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	200	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	170	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	150	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	190	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	190	0.5	2	1
10954	NEtFOSAA	2991-50-6	200	1	3	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
10954	NMeFOSAA	2355-31-9	190	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 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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	o-Xylene	95-47-6	21	0.5	1	1
Misc. Organics	**EPA 537 Rev 1.1**		**ng/l**	**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	280	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	160	0.6	2	1
10954	Perfluorodecanoic acid	335-76-2	170	0.5	2	1
10954	Perfluoroundecanoic acid	2058-94-8	190	1	3	1
10954	Perfluorododecanoic acid	307-55-1	180	0.5	2	1
10954	Perfluorotridecanoic acid	72629-94-8	190	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	170	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	180	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	160	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	160	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	180	1	3	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
10954	NMeFOSAA	2355-31-9	200	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 Time	Analyst	Dilution Factor
11997	SOM02.2 Volatiles	SW-846 8260C	1	Y170271AA	01/27/2017 08:43	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030C	1	Y170271AA	01/27/2017 08:43	Anita M Dale	1
10954	16 PFCs	EPA 537 Rev 1.1	1	17031006	02/02/2017 15:55	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17031006	01/31/2017 14:30	Devon M Whooley	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1602 SDG#: MMK16-02

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	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1602 SDG#: MMK16-02

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	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 Rev 1.1**		**ng/l**		**ng/l**	**ng/l**	
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	19		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	16		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	9		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	3		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	9		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	8	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	15		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-methyl perfluorooctanesulfonamidoacetic 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	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 Chemistry	**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/Nitrate 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 pH 4.5	n.a.	27.6		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	27.6		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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Time	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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED 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/17jan27a.b/yj27s05.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1603 SDG#: MMK16-03

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1603 SDG#: MMK16-03

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**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 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	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	16		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	10		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	8	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	14		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-methyl perfluorooctanesulfonamidoacetic 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	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 Chemistry	**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**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	5.4		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.	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Time	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

*=This limit was used in the evaluation of the final result

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
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17jan27a.b/yj27s06.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1604 SDG#: MMK16-04FD

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	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1604 SDG#: MMK16-04FD

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 Rev 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	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		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	16		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	8		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	3		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	11		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	7	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	14		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-methyl perfluorooctanesulfonamidoacetic 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	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
Wet Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	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/Nitrate 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 pH 4.5	n.a.	30.0		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	30.0		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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 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) - U4	SW-846 3005A	1	170260635001	01/26/2017 22:00	Annamaria Kuhns	1
00224	Chloride	EPA 300.0	1	17024120601B	01/24/2017 20:23	Hallie Burnett	50
00228	Sulfate	EPA 300.0	1	17024120601B	01/24/2017 19:40	Hallie Burnett	5
07882	Total Nitrite/Nitrate Nitrogen	EPA 353.2	1	17029118102A	01/29/2017 17:43	Joseph E McKenzie	2
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17025008104B	01/26/2017 04:43	Brandon P Costik	1
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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

K1604

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8799390
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17jan27a.b/yj27s07.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1605 SDG#: MMK16-05

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 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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1605 SDG#: MMK16-05

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 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 Rev 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	0.8	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	25		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	17		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	9		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	3		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	12		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	10		3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	17		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-methyl perfluorooctanesulfonamidoacetic Acid.						
Metals	**SW-846 6010C**		**mg/l**		**mg/l**	**mg/l**	
01750	Calcium	7440-70-2	14.7		0.0382	0.400	1
01757	Magnesium	7439-95-4	2.72		0.0190	0.200	1
01762	Potassium	7440-09-7	3.76		0.160	1.00	1
01767	Sodium	7440-23-5	85.9		0.173	2.00	1
Wet Chemistry	**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**	
07882	Total Nitrite/Nitrate 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 pH 4.5	n.a.	37.1		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	37.1		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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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.

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 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) - U4	SW-846 3005A	1	170260635001	01/26/2017 22:00	Annamaria Kuhns	1
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 Nitrogen	EPA 353.2	1	17029118102A	01/29/2017 17:45	Joseph E McKenzie	2
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17025008103A	01/26/2017 03:02	Brandon P Costik	1
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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

K1605

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8799391
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17jan27a.b/yj27s08.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017 14:55	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) - U4	SW-846 3005A	1	170260635001	01/26/2017 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 8260C**		mg/kg	mg/kg	mg/kg	
11995	Acetone	67-64-1	0.012 J	0.006	0.018	0.82
11995	Benzene	71-43-2	0.0004 U	0.0004	0.004	0.82
11995	Bromochloromethane	74-97-5	0.0009 U	0.0009	0.004	0.82
11995	Bromodichloromethane	75-27-4	0.0009 U	0.0009	0.004	0.82
11995	Bromoform	75-25-2	0.0009 U	0.0009	0.004	0.82
11995	Bromomethane	74-83-9	0.002 U	0.002	0.004	0.82
11995	2-Butanone	78-93-3	0.004 U	0.004	0.009	0.82
11995	Carbon Disulfide	75-15-0	0.0009 U	0.0009	0.004	0.82
11995	Carbon Tetrachloride	56-23-5	0.0009 U	0.0009	0.004	0.82
11995	Chlorobenzene	108-90-7	0.0009 U	0.0009	0.004	0.82
11995	Chloroethane	75-00-3	0.002 U	0.002	0.004	0.82
11995	Chloroform	67-66-3	0.0009 U	0.0009	0.004	0.82
11995	Chloromethane	74-87-3	0.002 U	0.002	0.004	0.82
11995	Cyclohexane	110-82-7	0.0009 U	0.0009	0.004	0.82
11995	1,2-Dibromo-3-chloropropane	96-12-8	0.002 U	0.002	0.004	0.82
11995	Dibromochloromethane	124-48-1	0.0009 U	0.0009	0.004	0.82
11995	1,2-Dibromoethane	106-93-4	0.0009 U	0.0009	0.004	0.82
11995	1,2-Dichlorobenzene	95-50-1	0.0009 U	0.0009	0.004	0.82
11995	1,3-Dichlorobenzene	541-73-1	0.0009 U	0.0009	0.004	0.82
11995	1,4-Dichlorobenzene	106-46-7	0.0009 U	0.0009	0.004	0.82
11995	Dichlorodifluoromethane	75-71-8	0.002 U	0.002	0.004	0.82
11995	1,1-Dichloroethane	75-34-3	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	75-35-4	0.0009 U	0.0009	0.004	0.82
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	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	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	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	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	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 8260C**		**mg/kg**		**mg/kg**	**mg/kg**	
11995	o-Xylene	95-47-6	0.0009	U	0.0009	0.004	0.82
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 modified**		**ng/g**		**ng/g**	**ng/g**	
14027	NEtFOSAA	2991-50-6	0.30	U	0.30	0.90	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.						
14027	NMeFOSAA	2355-31-9	0.30	U	0.30	0.90	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.						
14027	Perfluorobutanesulfonate	375-73-5	0.20	U	0.20	0.60	1
14027	Perfluorodecanoic acid	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	Perfluorohexanesulfonate	355-46-4	0.20	U	0.20	0.60	1
14027	Perfluorohexanoic acid	307-24-4	0.10	U	0.10	0.40	1
14027	Perfluorononanoic acid	375-95-1	0.10	U	0.10	0.40	1
14027	Perfluoro-octanesulfonate	1763-23-1	0.30	U	0.30	0.90	1
14027	Perfluorooctanoic acid	335-67-1	0.20	U	0.20	0.60	1
14027	Perfluorotetradecanoic acid	376-06-7	0.20	U	0.20	0.60	1
14027	Perfluorotridecanoic acid	72629-94-8	0.20	U	0.20	0.60	1
14027	Perfluoroundecanoic acid	2058-94-8	0.20	U	0.20	0.60	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Wet Chemistry	**SW-846 9060 modified**		**mg/kg**		**mg/kg**	**mg/kg**	
02079	TOC	n.a.	213	J	122	367	1
	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.						
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	6.9		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an 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.

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1607 SDG#: MMK16-07

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	01/27/2017 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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

K1607

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/17jan27b.b/aj27s25.d
Level: (low/med) LOW Date Received: 01/21/17
% Moisture: not dec. 6.9 Date Analyzed: 01/27/17
Column: (pack/cap) CAP Dilution Factor: 1.0
CONCENTRATION UNITS:
Number TICs found: 1 (mg/L or mg/Kg) mg/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	556-67-2	Cyclotetrasiloxane, octameth	12.00	0.006	J
2.					
3.	VOCTIC	Total VOC TICs		0.006	J
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1608 SDG#: MMK16-08

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	0.024	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	0.0009 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	79-01-6	0.0009 U	0.0009	0.004	0.85
11995	Trichlorofluoromethane	75-69-4	0.002 U	0.002	0.004	0.85
11995	Vinyl Chloride	75-01-4	0.0009 U	0.0009	0.004	0.85
11995	m+p-Xylene	179601-23-1	0.001 J	0.0009	0.004	0.85

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1608 SDG#: MMK16-08

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	0.0009	U	0.0009	0.004	0.85
	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 modified**		**ng/g**		**ng/g**	**ng/g**	
14027	NEtFOSAA	2991-50-6	0.30	U	0.30	0.91	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.						
14027	NMeFOSAA	2355-31-9	0.30	U	0.30	0.91	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.						
14027	Perfluorobutanesulfonate	375-73-5	0.20	U	0.20	0.61	1
14027	Perfluorodecanoic acid	335-76-2	0.20	U	0.20	0.61	1
14027	Perfluorododecanoic acid	307-55-1	0.20	U	0.20	0.61	1
14027	Perfluoroheptanoic acid	375-85-9	0.20	U	0.20	0.61	1
14027	Perfluorohexanesulfonate	355-46-4	0.20	U	0.20	0.61	1
14027	Perfluorohexanoic acid	307-24-4	0.10	U	0.10	0.41	1
14027	Perfluorononanoic acid	375-95-1	0.10	U	0.10	0.41	1
14027	Perfluoro-octanesulfonate	1763-23-1	0.30	U	0.30	0.91	1
14027	Perfluorooctanoic acid	335-67-1	0.20	U	0.20	0.61	1
14027	Perfluorotetradecanoic acid	376-06-7	0.20	U	0.20	0.61	1
14027	Perfluorotridecanoic acid	72629-94-8	0.20	U	0.20	0.61	1
14027	Perfluoroundecanoic acid	2058-94-8	0.20	U	0.20	0.61	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Wet Chemistry	**SW-846 9060 modified**		**mg/kg**		**mg/kg**	**mg/kg**	
02079	TOC	n.a.	162	U	162	486	1
	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.						
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	2.5		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.						

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1608 SDG#: MMK16-08

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

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

K1608

Lab Name: Lancaster Laboratories Contract:_____
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/17jan30a.b/aj30s03.d
Level: (low/med) LOW Date Received: 01/21/17
% Moisture: not dec. 2.5 Date Analyzed: 01/30/17
Column: (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 1

CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	556-67-2	Cyclotetrasiloxane, octameth	12.00	0.006	J
2.					
3.	VOCTIC	Total VOC TICs		0.006	J
4.					
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1609 SDG#: MMK16-09

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	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1609 SDG#: MMK16-09

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 on the back of this form.						
Misc. Organics	**EPA 537 Rev 1.1**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	25		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	2	J	0.6	2	1
10954	Perfluorodecanoic acid	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	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	7		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	5		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	6		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	1	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	6		2	6	1
10954	Perfluorobutanoic Acid	375-22-4	5	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	5		0.5	2	1
10954	NEtFOSAA	2991-50-6	3		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-methyl perfluorooctanesulfonamidoacetic 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	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 Chemistry	**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/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.	20.9		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	20.9		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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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.

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 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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

K1609

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8799395
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
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.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
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29.					
30.					

page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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.

Laboratory Sample Analysis Record

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) - U4	SW-846 3005A	1	170260635001	01/26/2017 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1611 SDG#: MMK16-11FB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 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-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 Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev 1.1	1	17031006	02/02/2017 19:21	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17031006	01/31/2017 14:30	Devon M Whooley	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1612 SDG#: MMK16-12TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 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-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 Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev 1.1	1	17031006	02/02/2017 19:41	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17031006	01/31/2017 14:30	Devon M Whooley	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 8260C**		**mg/kg**		**mg/kg**	**mg/kg**	
11995	o-Xylene	95-47-6	0.001	U	0.001	0.005	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 modified**		**ng/g**		**ng/g**	**ng/g**	
14027	NEtFOSAA	2991-50-6	0.31	U	0.31	0.92	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.						
14027	NMeFOSAA	2355-31-9	0.31	U	0.31	0.92	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.						
14027	Perfluorobutanesulfonate	375-73-5	0.20	U	0.20	0.61	1
14027	Perfluorodecanoic acid	335-76-2	0.20	U	0.20	0.61	1
14027	Perfluorododecanoic acid	307-55-1	0.20	U	0.20	0.61	1
14027	Perfluoroheptanoic acid	375-85-9	0.20	U	0.20	0.61	1
14027	Perfluorohexanesulfonate	355-46-4	0.20	U	0.20	0.61	1
14027	Perfluorohexanoic acid	307-24-4	0.10	U	0.10	0.41	1
14027	Perfluorononanoic acid	375-95-1	0.10	U	0.10	0.41	1
14027	Perfluoro-octanesulfonate	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	Perfluorotetradecanoic acid	376-06-7	0.20	U	0.20	0.61	1
14027	Perfluorotridecanoic acid	72629-94-8	0.20	U	0.20	0.61	1
14027	Perfluoroundecanoic acid	2058-94-8	0.20	U	0.20	0.61	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Wet Chemistry	**SW-846 9060 modified**		**mg/kg**		**mg/kg**	**mg/kg**	
02079	TOC	n.a.	242	U	242	727	1
	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.						
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	8.0		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an 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.

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1613 SDG#: MMK16-13BKG

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	01/27/2017 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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

K1613

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) SOIL Lab Sample ID: 8799399
Sample wt/vol: 4.99 (g/mL) g Lab File ID: HP09685.i/17jan27b.b/aj27s27.d
Level: (low/med) LOW Date Received: 01/21/17
% Moisture: not dec. 8 Date Analyzed: 01/27/17
Column: (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 1

CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	12.00	0.008	J
2.					
3.	VOCTIC	Total VOC TICs		0.008	J
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
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29.					
30.					

page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 8260C**		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	0.022	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	0.022	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	10061-02-6	0.023	0.001	0.005	1
11995	Ethylbenzene	100-41-4	0.022	0.001	0.005	1
11995	Freon 113	76-13-1	0.024	0.002	0.011	1
11995	2-Hexanone	591-78-6	0.14	0.003	0.011	1
11995	Isopropylbenzene	98-82-8	0.024	0.001	0.005	1
11995	Methyl Acetate	79-20-9	0.024	0.002	0.005	1
11995	Methyl Tertiary Butyl Ether	1634-04-4	0.023	0.0005	0.005	1
11995	4-Methyl-2-pentanone	108-10-1	0.14	0.003	0.011	1
11995	Methylcyclohexane	108-87-2	0.025	0.001	0.005	1
11995	Methylene Chloride	75-09-2	0.022	0.002	0.005	1
11995	Styrene	100-42-5	0.022	0.001	0.005	1
11995	1,1,2,2-Tetrachloroethane	79-34-5	0.026	0.001	0.005	1
11995	Tetrachloroethene	127-18-4	0.022	0.001	0.005	1
11995	Toluene	108-88-3	0.022	0.001	0.005	1
11995	1,2,3-Trichlorobenzene	87-61-6	0.019	0.001	0.005	1
11995	1,2,4-Trichlorobenzene	120-82-1	0.019	0.001	0.005	1
11995	1,1,1-Trichloroethane	71-55-6	0.021	0.001	0.005	1
11995	1,1,2-Trichloroethane	79-00-5	0.023	0.001	0.005	1
11995	Trichloroethene	79-01-6	0.023	0.001	0.005	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	1
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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 8260C**		**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 modified**		**ng/g**	**ng/g**	**ng/g**	
14027	NEtFOSAA	2991-50-6	29	0.32	0.95	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14027	NMeFOSAA	2355-31-9	29	0.32	0.95	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14027	Perfluorobutanesulfonate	375-73-5	18	0.21	0.64	1
14027	Perfluorodecanoic acid	335-76-2	21	0.21	0.64	1
14027	Perfluorododecanoic acid	307-55-1	23	0.21	0.64	1
14027	Perfluoroheptanoic acid	375-85-9	25	0.21	0.64	1
14027	Perfluorohexanesulfonate	355-46-4	23	0.21	0.64	1
14027	Perfluorohexanoic acid	307-24-4	22	0.11	0.42	1
14027	Perfluorononanoic acid	375-95-1	22	0.11	0.42	1
14027	Perfluoro-octanesulfonate	1763-23-1	20	0.32	0.95	1
14027	Perfluorooctanoic acid	335-67-1	21	0.21	0.64	1
14027	Perfluorotetradecanoic acid	376-06-7	23	0.21	0.64	1
14027	Perfluorotridecanoic acid	72629-94-8	22	0.21	0.64	1
14027	Perfluoroundecanoic acid	2058-94-8	22	0.21	0.64	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.					
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	**%**	
00118	Moisture	n.a.	8.0	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

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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	Styrene	100-42-5	0.021	0.001	0.005	0.98
11995	1,1,2,2-Tetrachloroethane	79-34-5	0.025	0.001	0.005	0.98
11995	Tetrachloroethene	127-18-4	0.021	0.001	0.005	0.98
11995	Toluene	108-88-3	0.022	0.001	0.005	0.98
11995	1,2,3-Trichlorobenzene	87-61-6	0.018	0.001	0.005	0.98
11995	1,2,4-Trichlorobenzene	120-82-1	0.017	0.001	0.005	0.98
11995	1,1,1-Trichloroethane	71-55-6	0.020	0.001	0.005	0.98
11995	1,1,2-Trichloroethane	79-00-5	0.023	0.001	0.005	0.98
11995	Trichloroethene	79-01-6	0.022	0.001	0.005	0.98
11995	Trichlorofluoromethane	75-69-4	0.023	0.002	0.005	0.98
11995	Vinyl Chloride	75-01-4	0.021	0.001	0.005	0.98
11995	m+p-Xylene	179601-23-1	0.042	0.001	0.005	0.98

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 modified**		**ng/g**	**ng/g**	**ng/g**	
14027	NEtFOSAA	2991-50-6	24	0.30	0.91	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
14027	NMeFOSAA	2355-31-9	25	0.30	0.91	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.					
14027	Perfluorobutanesulfonate	375-73-5	19	0.20	0.61	1
14027	Perfluorodecanoic acid	335-76-2	23	0.20	0.61	1
14027	Perfluorododecanoic acid	307-55-1	24	0.20	0.61	1
14027	Perfluoroheptanoic acid	375-85-9	22	0.20	0.61	1
14027	Perfluorohexanesulfonate	355-46-4	22	0.20	0.61	1
14027	Perfluorohexanoic acid	307-24-4	23	0.10	0.41	1
14027	Perfluorononanoic acid	375-95-1	18	0.10	0.41	1
14027	Perfluoro-octanesulfonate	1763-23-1	21	0.30	0.91	1
14027	Perfluorooctanoic acid	335-67-1	20	0.20	0.61	1
14027	Perfluorotetradecanoic acid	376-06-7	22	0.20	0.61	1
14027	Perfluorotridecanoic acid	72629-94-8	20	0.20	0.61	1
14027	Perfluoroundecanoic acid	2058-94-8	22	0.20	0.61	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.					
Wet Chemistry	**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 moisture value is provided to assess the precision of the moisture test. For comparability purposes, the initial moisture determination is the value used to perform dry weight calculations.					

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	01/27/2017 23:56	Stephen C Nolte	0.98
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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1613 SDG#: MMK16-13MSD

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1614 SDG#: MMK16-14TB

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	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1614 SDG#: MMK16-14TB

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	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.

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 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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

K1614

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8799402
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17jan27a.b/yj27s01.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 10:47

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

K1615 SDG#: MMK16-15TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 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-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 Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev 1.1	1	17031006	02/02/2017 20:02	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	2	17031006	01/31/2017 14:30	Devon M Whooley	1

*=This limit was used in the evaluation of the final result

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 mg/kg		MDL** mg/kg	LOQ mg/kg
Batch number: A170272AA	Sample number(s): 8799393,8799399-8799401			
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	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
**-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.

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
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	0.001	U	0.001	0.005
m+p-Xylene	0.001	U	0.001	0.005
o-Xylene	0.001	U	0.001	0.005
Batch number: A170301AA	Sample number(s): 8799394			
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

*- 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.

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	0.001	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	Sample number(s): 8799385-8799391,8799395,8799402			
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	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

*- 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.

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	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
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(s): 8799393-8799394,8799399-8799401			
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(s): 8799385-8799391,8799395,8799397-8799398,8799403			
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

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 10:47

Group Number: 1757183

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ
	ng/l		ng/l	ng/l
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: 170260635001	Sample number(s): 8799385,8799388-8799392,8799395-8799396			
Calcium	0.0495	J	0.0382	0.400
Magnesium	0.0460	J	0.0190	0.200
Potassium	0.160	U	0.160	1.00
Sodium	0.173	U	0.173	2.00
	mg/kg		mg/kg	mg/kg
Batch number: 17024667631A	Sample number(s): 8799393-8799394,8799399			
TOC	100	U	100	300
	mg/l		mg/l	mg/l
Batch number: 17024120601A	Sample number(s): 8799385			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
Batch number: 17024120601B	Sample number(s): 8799388-8799391,8799395			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
Batch number: 17029118102A	Sample number(s): 8799385,8799388-8799391,8799395			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
	mg/l as CaCO3		mg/l as CaCO3	mg/l as CaCO3
Batch number: 17025008103A	Sample number(s): 8799388,8799391			
Total Alkalinity to pH 4.5	3.5	J	1.7	5.0
Batch number: 17025008104A	Sample number(s): 8799385,8799389,8799395			
Total Alkalinity to pH 4.5	3.3	J	1.7	5.0
Batch number: 17025008104B	Sample number(s): 8799390			
Total Alkalinity to pH 4.5	3.3	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

*- Outside of specification
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(1) The result for one or both determinations was less than five times the LOQ.
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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 10:47

Group Number: 1757183

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 number(s): 8799393,8799399-8799401								
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

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 10:47

Group Number: 1757183

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 number(s): 8799394								
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

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 10:47

Group Number: 1757183

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	Sample number(s): 8799385-8799391,8799395,8799402								
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	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		

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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	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					
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 number(s): 8799393-8799394,8799399-8799401								
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 number(s): 8799385-8799391,8799395,8799397-8799398,8799403								
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
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(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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 10:47

Group Number: 1757183

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
	ng/l	ng/l	ng/l	ng/l					
Perfluorobutanoic Acid	200	173.56			87		70-130		
Perfluoropentanoic Acid	200	164.1			82		70-130		
NEtFOSAA	200	191.24			96		70-130		
NMeFOSAA	200	194.59			97		70-130		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 170260635001	Sample number(s): 8799385,8799388-8799392,8799395-8799396								
Calcium	4.00	4.32			108		80-120		
Magnesium	2.00	2.19			110		80-120		
Potassium	10	10.79			108		80-120		
Sodium	10	10.68			107		80-120		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 17024667631A	Sample number(s): 8799393-8799394,8799399								
TOC	6030	5441.01			90		47-143		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17024120601A	Sample number(s): 8799385								
Chloride	3.00	2.97			99		90-110		
Sulfate	7.50	7.56			101		90-110		
Batch number: 17024120601B	Sample number(s): 8799388-8799391,8799395								
Chloride	3.00	2.97			99		90-110		
Sulfate	7.50	7.56			101		90-110		
Batch number: 17029118102A	Sample number(s): 8799385,8799388-8799391,8799395								
Total Nitrite/Nitrate Nitrogen	2.50	2.70			108		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 17025008103A	Sample number(s): 8799388,8799391								
Total Alkalinity to pH 4.5	188	182.44			97		84-110		
Batch number: 17025008104A	Sample number(s): 8799385,8799389,8799395								
Total Alkalinity to pH 4.5	188	182.26			97		84-110		
Batch number: 17025008104B	Sample number(s): 8799390								
Total Alkalinity to pH 4.5	188	182.26			97		84-110		
	%	%	%	%					
Batch number: 17026820004B	Sample number(s): 8799393-8799394,8799399-8799401								
Moisture	89.5	89.36			100		99-101		
Moisture	89.5	89.36			100		99-101		
Moisture Duplicate	89.5	89.36			100		99-101		

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(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.

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 number(s): 8799393,8799399-8799401 UNSPK: 8799399										
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

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(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.

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 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
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: Y170271AA	Sample number(s): 8799385-8799391,8799395,8799402 UNSPK: 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	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
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
Chloromethane	0.5	U	20	19.61	20	19.54	98	98	59-127	0	30
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	101	105	61-137	4	30
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

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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 number(s): 8799393-8799394,8799399-8799401 UNSPK: 8799399										
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 number(s): 8799385-8799391,8799395,8799397-8799398,8799403 UNSPK: 8799385										
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

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 10:47

Group Number: 1757183

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
	ng/l		ng/l	ng/l	ng/l	ng/l					
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	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 number(s): 8799393-8799394,8799399 UNSPK: 8799399										
TOC	223	U	20220	16365.48			81		47-143		
	mg/l		mg/l	mg/l	mg/l	mg/l					
Batch number: 17024120601A	Sample number(s): 8799385 UNSPK: 8799385										
Chloride	94.61		400	482.85			97		90-110		
Sulfate	12.72		50	59.83			94		90-110		
Batch number: 17024120601B	Sample number(s): 8799388-8799391,8799395 UNSPK: P799414										
Chloride	149.4		200	358.21			104		90-110		
Sulfate	19.77		50	67.98			96		90-110		
Batch number: 17029118102A	Sample number(s): 8799385,8799388-8799391,8799395 UNSPK: 8799385										
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	Sample number(s): 8799388,8799391 UNSPK: P798607										
Total Alkalinity to pH 4.5	132.51		188	221.3	188	258.71	47*	67*	84-110	16*	5
Batch number: 17025008104A	Sample number(s): 8799385,8799389,8799395 UNSPK: P798933										
Total Alkalinity to pH 4.5	98.28		188	230.89			71*		84-110		
Batch number: 17025008104B	Sample number(s): 8799390 UNSPK: P798933										
Total Alkalinity to pH 4.5	98.28		188	230.89			71*		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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 10:47

Group Number: 1757183

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	Sample number(s): 8799385,8799388-8799392,8799395-8799396 BKG: P799414			
Calcium	30.51	30.66	0	20
Magnesium	7.06	7.05	0	20
Potassium	4.94	4.94	0 (1)	20
Sodium	70.16	70.42	0	20
	mg/kg	mg/kg		
Batch number: 17024667631A	Sample number(s): 8799393-8799394,8799399 BKG: 8799399			
TOC	223 U	223 U	0 (1)	7
	mg/l	mg/l		
Batch number: 17024120601A	Sample number(s): 8799385 BKG: 8799385			
Chloride	94.61	96.85	2 (1)	15
Sulfate	12.72	12.69	0 (1)	15
Batch number: 17024120601B	Sample number(s): 8799388-8799391,8799395 BKG: P799414			
Chloride	149.4	149.87	0	15
Sulfate	19.77	19.91	1 (1)	15
Batch number: 17029118102A	Sample number(s): 8799385,8799388-8799391,8799395 BKG: 8799385			
Total Nitrite/Nitrate Nitrogen	4.75	4.73	0	2
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 17025008103A	Sample number(s): 8799388,8799391 BKG: P798607			
Total Alkalinity to pH 4.5	132.51	133.62	1	5
Batch number: 17025008104A	Sample number(s): 8799385,8799389,8799395 BKG: P798933			
Total Alkalinity to pH 4.5	98.28	96.1	2	5
Batch number: 17025008104B	Sample number(s): 8799390 BKG: 8799390			
Total Alkalinity to pH 4.5	29.95	25.3	17*	5
	%	%		
Batch number: 17026820004B	Sample number(s): 8799393-8799394,8799399-8799401 BKG: 8799399, P799399			
Moisture	8.05	8.43	5	5
Moisture	8.05	8.43	5	5
Moisture Duplicate	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

*- 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.

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.
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.

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	71	77	62*	74	60*	75
8799400	81	71	57*	69*	65*	65*
8799401	71	60*	52*	62*	47*	59*
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

	13C2-PFTeDA
8799393	67*
8799394	60*
8799399	66*
8799400	64*
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
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(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.

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
8799395	84	108	120	86	72	83
8799397	74	74	72	83	73	82
8799398	78	81	78	69*	81	81
8799403	78	76	70	81	75	84
Blank	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
8799385	75	79	83	79	67*	73
8799386	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
8799390	83	79	94	73	72	68*
8799391	90	94	100	86	89	80
8799395	82	96	99	87	86	73
8799397	80	79	74	72	75	67*
8799398	74	83	94	82	82	71
8799403	76	79	78	67*	66*	60*
Blank	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

	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
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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.

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.
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.

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: 1757183 Sample #: 8799385-403 COC#: 16303

Client: C.T. Male Associates

Project Name/#: SGPP - Merrimack Site ID:

Project Manager: Kirk Moline P.O. #:

Sampler: Stephen Johnson SPJ

Phone #: 715-529-1670 Quote #: 214135

State where sample(s) were collected: NH

For Lab Use Only
SF#: 286377
SCR#: 200280

Matrix: Sediment ☐ Ground ☒ Surface ☐ Potable ☐ NPDES ☐ Soil ☒ Water; Other: PFC Free DI Water

Preservation Codes: H = HCl, T = Thiosulfate, N = HNO_3, B = NaOH, S = H_2SO_4, P = H_3PO_4, O = Other

Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other	Total # of Containers	TCL VOAs (8260C) + TICs (H)	Ca, Mg, Na, K (6010C) (N)	Total NO2 / NO3 (353.2) (S)	Cl-, SO4- (300.0)	ALK + Carb/Bicarb (SM 2320 B)	16 PFCs (EPA 537 mod.)	TCL 22 VOCs	PFCs	Moisture	TOC		Remarks
SHZ-AP08-57-58-170119	1/19/17	1004	X			X		21	X	X	X	X	X	X						MS MSD
SHZ-AP08-67-68-170119	1/19/17	1208	X			X		11	X	X	X	X	X	X						
SHZ-AP08-77-78-170119	1/19/17	1433	X			X		11	X	X	X	X	X	X						
SHZ-FD03-170119	1/19/17	—	X			X		11	X	X	X	X	X	X						
SHZ-AP08-81-82-170120	1/20/17	0918	X			X		12	X	X	X	X	X	X						Filter Metals
SHZ-AP09-2.5-3-170120	1/20/17	1118	X		X			5							X	X	X	X		
SHZ-AP09-6-8-170120	1/20/17	1129	X		X			5							X	X	X	X		
SHZ-AP09-11-12-170120	1/20/17	1224	X			X		12	X	X	X	X	X	X						Filter Metals
SHZ-FB03-170120	1/20/17	1420	X				X							X						
PFC Tripblank	—	—	X				X							X						

Turnaround Time Requested (TAT) (please check): Standard ☐ RUSH ☒

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results:

Data Package Options (please check if required)

Type I (Validation/non-CLP)	☑	MA MCP	☐	TX TRRP - 13	☐
Type III (Reduced non-CLP)	☐	CT RCP	☐		
Type IV (CLP SOW)	☐	ASP Type A	☐		
Type VI (Raw Data Only)	☐	ASP Type B	☐		

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
Stephen Johnson	1/20/17	1728			
			P. Hill	1/21/17	9:20

Airbill No.:
Relinquished by Commercial Carrier:
UPS ______ FedEx ______ Other ______

Temperature upon receipt 0.0 - 0.5 °C

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 37191 Group # 1757183 Sample # 8799385-403

COC # 512678

Client Information

Client: CT Male Associates

Acct. #:

Project Name/#: SWPP - Merrimack

PWSID #:

Project Manager: Kirk Moline

P.O. #:

Sampler: Stephen Johnson SJS

Quote #:

State where samples were collected: NA

For Compliance: Yes ☐ No ☐

Matrix

Soil ☒ Sediment ☐ Tissue ☐ Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ Other: PFC Free DI water

Analysis Requested

Preservation Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	TCL VOAs (8260C) + TICs	Ca, Mg, Na, K (6010C)	Total NO_2 NO_3 as N (353.2)	Cl, SO_4 (300.0)	Alkalinity (SM 2320B)	16 PFCs (EPA 537 mod)	TCL 22 VOCs	PFCs	Methane	TOC	Remarks
SGZ-MP06-G-8-170118	1/18/17	1548	X		13							X	X	X	X	MS/MSD
VOC Trip Blank	—	—	X		2	X										
PFC Trip Blank	—	—	X		1						X					

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed:

E-mail address:

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
Stephen Johnson	1/19/17	16:42			
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by	Date	Time	Received by PHIL	1/21/17	9:20

EDD Required? (Yes) No

If yes, format: Equis

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS FedEx X Other

Temperature upon receipt 00-05 °C

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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:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	N/A		

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

2425 New Holland Pike
Lancaster, PA 17605-2425
T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

1757183

APO4-27-28-170116	1-16-17	1553 - 4 Bottles 7 vials
FA01- 170117	1-17-17	——— 5 Bottles - 7 vials
APO4-44-45 - 170117	1-17-17	1046 8 Bottles - 13 vials - 1 soil MS/MSD
APO3-68-69-170116	1-16-17	1422 - 7 Bottles - 7 vials
APO4 - 34-36 - 170117	1-17-17	0915 - 5 Bottles - 7 vials
APO4 - 64-65 - 170117	1-17-17	1429 - 4 Bottles - 7 vials
APO4 - 54-55 - 170117	1-17-17	1206 - 5 Bottles - 7 vials
APO4 - 83.5-84.5 170118	1-18-17	1057 - 5 Bottles - 7 vials
APO4 - 74-75 - 170118	1-18-17	0843 - 2 Bottles - 7 vials
APO4 - 20-21.5 - 170116	1-16-17	1117 - 1 Bottle - 1 soil Jar
FB03 - 170118	1-18-17	1120 - 2 Bottles
APO2 - 7-8 - 170116	1-16-17	955 - 1 Bottle - 1 soil Jar
APO2 - 12-13 - 170116	1-16-17	1033 - 1 Bottle - 1 soil Jar
APO6 - 6-8 170118	1-18-17	1546 - 1 Bottle
APO6 - 2.5-4.5 170118	1-18-17	1522 - 1 Bottle - 1 soil Jar
APO5 - 11.5-14.5 170118	1-18-17	1320 - 1 Bottle - 1 soil Jar
APO5 - 7-8 - 170118	1-18-17	1300 - 1 - Bottle - 1 soil Jar
APO6 - 6-8 170118	1-18-17	1548 - 2 Bottles - 1 soil Jar
APO2 - 3-5 170116	1-16-17	1145 - 1 Bottle - 1 soil Jar
APO2 - 2-3 - 170118	1-18-17	1351 - 1 Bottle 1 soil Jar
APO4 - 83.5-84.5 170118	1-18-17	1057 - 1 Bottle
APO2 - 17-18 - 170116	1-16-17	1057 - 1 soil Jar
FD02 - 170118	1-18-17	∅ 1 Bottle - 1 soil Jar

2 TB HCl
1 TB - Bottle

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Sample Administration Receipt Documentation Log

Doc Log ID: 173687

Group Number(s): 1757183

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:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	6
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:	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	Y	Bagged	N
2	DT121	0.5	DT	Wet	Y	Bagged	N
3	DT121	0.3	DT	Wet	Y	Bagged	N
4	DT121	0.5	DT	Wet	Y	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 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	

2425 New Holland Pike
Lancaster, PA 17605-2425

T : 717-656-2300
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eurofins | 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	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< 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.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

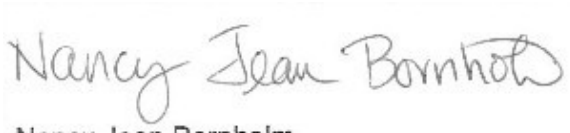
Client Sample Description	Lancaster Labs (LL) #
SG2-AP02-3-5-170116 Grab Soil	8799404
SG2-AP02-7-8-170116 Grab Soil	8799405
SG2-AP02-12-13-170116 Grab Soil	8799406
SG2-AP02-17-18-170116 Grab Soil	8799407
SG2-AP02-20-21.5-170116 Grab Soil	8799408
SG2-AP03-68-69-170116 Grab Groundwater	8799409
SG2-AP03-68-69-170116 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

Respectfully Submitted,



Nancy Jean Bornholm
Principal Specialist

(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.

Batch #: 17030004 (Sample number(s): 8799409, 8799411-8799412, 8799414-8799417 UNSPK: 8799414)

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

Batch #: 17029118102A (Sample number(s): 8799409, 8799411-8799412, 8799417 UNSPK: P799385 BKG: P799385)

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: 8799405, 8799406, 8799407, 8799408

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

Batch #: 17025008103A (Sample number(s): 8799411 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): 8799412, 8799414, 8799417 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 #: 17026002103A (Sample number(s): 8799409 UNSPK: P804238 BKG: P804217, P804238)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Total Alkalinity to pH 4.5

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

01K17 SDG#: MMK17-01

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	0.021	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

01K17 SDG#: MMK17-01

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	0.001	U	0.001	0.006	1.01
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 modified**		**ng/g**		**ng/g**	**ng/g**	
14027	NEtFOSAA	2991-50-6	0.32	U	0.32	0.96	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.						
14027	NMeFOSAA	2355-31-9	0.32	U	0.32	0.96	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.						
14027	Perfluorobutanesulfonate	375-73-5	0.21	U	0.21	0.64	1
14027	Perfluorodecanoic acid	335-76-2	0.21	U	0.21	0.64	1
14027	Perfluorododecanoic acid	307-55-1	0.21	U	0.21	0.64	1
14027	Perfluoroheptanoic acid	375-85-9	0.21	U	0.21	0.64	1
14027	Perfluorohexanesulfonate	355-46-4	0.21	U	0.21	0.64	1
14027	Perfluorohexanoic acid	307-24-4	0.11	J	0.11	0.43	1
14027	Perfluorononanoic acid	375-95-1	0.11	U	0.11	0.43	1
14027	Perfluoro-octanesulfonate	1763-23-1	0.32	U	0.32	0.96	1
14027	Perfluorooctanoic acid	335-67-1	0.35	J	0.21	0.64	1
14027	Perfluorotetradecanoic acid	376-06-7	0.21	U	0.21	0.64	1
14027	Perfluorotridecanoic acid	72629-94-8	0.21	U	0.21	0.64	1
14027	Perfluoroundecanoic acid	2058-94-8	0.21	U	0.21	0.64	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Wet Chemistry	**SW-846 9060 modified**		**mg/kg**		**mg/kg**	**mg/kg**	
02079	TOC	n.a.	1,350		184	551	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	8.5		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an 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.

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 00:40	Stephen C Nolte	1.01

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

01K17 SDG#: MMK17-01

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	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

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
Sample wt/vol: 4.96 (g/mL) g Lab File ID: HP09685.i/17jan27b.b/aj27s30.d
Level: (low/med) LOW Date Received: 01/21/17
% Moisture: not dec. 8.5 Date Analyzed: 01/28/17
Column: (pack/cap) CAP Dilution Factor: 1.0
CONCENTRATION UNITS:
Number TICs found: 2 (mg/L or mg/Kg) mg/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	10.34	0.008	J
2.	556-67-2	Cyclotetrasiloxane, octameth	12.00	0.012	J
3.					
4.	VOCTIC	Total VOC TICs		0.02	J
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 8260C**		**mg/kg**		**mg/kg**	**mg/kg**	
11995	o-Xylene	95-47-6	0.001	U	0.001	0.006	1.03
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 modified**		**ng/g**		**ng/g**	**ng/g**	
14027	NEtFOSAA	2991-50-6	0.33	U	0.33	0.98	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.						
14027	NMeFOSAA	2355-31-9	0.33	U	0.33	0.98	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.						
14027	Perfluorobutanesulfonate	375-73-5	0.22	U	0.22	0.66	1
14027	Perfluorodecanoic acid	335-76-2	0.22	U	0.22	0.66	1
14027	Perfluorododecanoic acid	307-55-1	0.22	U	0.22	0.66	1
14027	Perfluoroheptanoic acid	375-85-9	0.22	U	0.22	0.66	1
14027	Perfluorohexanesulfonate	355-46-4	0.22	U	0.22	0.66	1
14027	Perfluorohexanoic acid	307-24-4	0.11	U	0.11	0.44	1
14027	Perfluorononanoic acid	375-95-1	0.11	U	0.11	0.44	1
14027	Perfluoro-octanesulfonate	1763-23-1	0.33	U	0.33	0.98	1
14027	Perfluorooctanoic acid	335-67-1	0.27	J	0.22	0.66	1
14027	Perfluorotetradecanoic acid	376-06-7	0.22	U	0.22	0.66	1
14027	Perfluorotridecanoic acid	72629-94-8	0.22	U	0.22	0.66	1
14027	Perfluoroundecanoic acid	2058-94-8	0.22	U	0.22	0.66	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Wet Chemistry	**SW-846 9060 modified**		**mg/kg**		**mg/kg**	**mg/kg**	
02079	TOC	n.a.	195	U	195	584	1
	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.						
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	11.1		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an 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.

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

02K17 SDG#: MMK17-02

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 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

1E

EPA SAMPLE NO.

02K17

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) SOIL Lab Sample ID: 8799405
Sample wt/vol: 4.84 (g/mL) g Lab File ID: HP09685.i/17jan27b.b/aj27s31.d
Level: (low/med) LOW Date Received: 01/21/17
% Moisture: not dec. 11.1 Date Analyzed: 01/28/17
Column: (pack/cap) CAP Dilution Factor: 1.0
CONCENTRATION UNITS:
Number TICs found: 1 (mg/L or mg/Kg) mg/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	556-67-2	Cyclotetrasiloxane, octameth	12.00	0.007	J
2.					
3.	VOCTIC	Total VOC TICs		0.007	J
4.					
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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	100-41-4	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	0.003	0.010	0.99
11995	Isopropylbenzene	98-82-8	0.001	U	0.001	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	79-01-6	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 8260C**		**mg/kg**		**mg/kg**	**mg/kg**	
11995	o-Xylene	95-47-6	0.001	U	0.001	0.005	0.99
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 modified**		**ng/g**		**ng/g**	**ng/g**	
14027	NEtFOSAA	2991-50-6	0.29	U	0.29	0.88	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.						
14027	NMeFOSAA	2355-31-9	0.29	U	0.29	0.88	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.						
14027	Perfluorobutanesulfonate	375-73-5	0.19	U	0.19	0.58	1
14027	Perfluorodecanoic acid	335-76-2	0.19	U	0.19	0.58	1
14027	Perfluorododecanoic acid	307-55-1	0.19	U	0.19	0.58	1
14027	Perfluoroheptanoic acid	375-85-9	0.19	U	0.19	0.58	1
14027	Perfluorohexanesulfonate	355-46-4	0.19	U	0.19	0.58	1
14027	Perfluorohexanoic acid	307-24-4	0.097	U	0.097	0.39	1
14027	Perfluorononanoic acid	375-95-1	0.097	U	0.097	0.39	1
14027	Perfluoro-octanesulfonate	1763-23-1	0.29	U	0.29	0.88	1
14027	Perfluorooctanoic acid	335-67-1	0.29	J	0.19	0.58	1
14027	Perfluorotetradecanoic acid	376-06-7	0.19	U	0.19	0.58	1
14027	Perfluorotridecanoic acid	72629-94-8	0.19	U	0.19	0.58	1
14027	Perfluoroundecanoic acid	2058-94-8	0.19	U	0.19	0.58	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Wet Chemistry	**SW-846 9060 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 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.						
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	4.6		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an 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.

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

03K17 SDG#: MMK17-03

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 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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

03K17

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) SOIL Lab Sample ID: 8799406
Sample wt/vol: 5.05 (g/mL) g Lab File ID: HP09685.i/17jan27b.b/aj27s32.d
Level: (low/med) LOW Date Received: 01/21/17
% Moisture: not dec. 4.6 Date Analyzed: 01/28/17
Column: (pack/cap) CAP Dilution Factor: 1.0
CONCENTRATION UNITS:
Number TICs found: 1 (mg/L or mg/Kg) mg/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	556-67-2	Cyclotetrasiloxane, octameth	12.00	0.007	J
2.					
3.	VOCTIC	Total VOC TICs		0.007	J
4.					
5.					
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FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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	0.011	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	10061-02-6	0.001	U	0.001	0.005	0.99
11995	Ethylbenzene	100-41-4	0.001	U	0.001	0.005	0.99
11995	Freon 113	76-13-1	0.002	U	0.002	0.011	0.99
11995	2-Hexanone	591-78-6	0.003	U	0.003	0.011	0.99
11995	Isopropylbenzene	98-82-8	0.001	U	0.001	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	0.011	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	79-01-6	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 8260C**		**mg/kg**		**mg/kg**	**mg/kg**	
11995	o-Xylene	95-47-6	0.001	U	0.001	0.005	0.99
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 modified**		**ng/g**		**ng/g**	**ng/g**	
14027	NEtFOSAA	2991-50-6	0.30	U	0.30	0.90	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.						
14027	NMeFOSAA	2355-31-9	0.30	U	0.30	0.90	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.						
14027	Perfluorobutanesulfonate	375-73-5	0.20	U	0.20	0.60	1
14027	Perfluorodecanoic acid	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	Perfluorohexanesulfonate	355-46-4	0.20	U	0.20	0.60	1
14027	Perfluorohexanoic acid	307-24-4	0.10	U	0.10	0.40	1
14027	Perfluorononanoic acid	375-95-1	0.10	U	0.10	0.40	1
14027	Perfluoro-octanesulfonate	1763-23-1	0.30	U	0.30	0.90	1
14027	Perfluorooctanoic acid	335-67-1	0.20	U	0.20	0.60	1
14027	Perfluorotetradecanoic acid	376-06-7	0.20	U	0.20	0.60	1
14027	Perfluorotridecanoic acid	72629-94-8	0.20	U	0.20	0.60	1
14027	Perfluoroundecanoic acid	2058-94-8	0.20	U	0.20	0.60	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Wet Chemistry	**SW-846 9060 modified**		**mg/kg**		**mg/kg**	**mg/kg**	
02079	TOC	n.a.	197	U	197	592	1
	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.						
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	7.3		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an 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.

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

04K17 SDG#: MMK17-04

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 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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

04K17

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) SOIL Lab Sample ID: 8799407
Sample wt/vol: 5.05 (g/mL) g Lab File ID: HP09685.i/17jan27b.b/aj27s33.d
Level: (low/med) LOW Date Received: 01/21/17
% Moisture: not dec. 7.3 Date Analyzed: 01/28/17
Column: (pack/cap) CAP Dilution Factor: 1.0
CONCENTRATION UNITS:
Number TICs found: 1 (mg/L or mg/Kg) mg/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	556-67-2	Cyclotetrasiloxane, octameth	12.00	0.008	J
2.					
3.	VOCTIC	Total VOC TICs		0.008	J
4.					
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 8260C**		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	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	0.012	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 8260C**		**mg/kg**		**mg/kg**	**mg/kg**	
11995	o-Xylene	95-47-6	0.001	U	0.001	0.006	1.01
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 modified**		**ng/g**		**ng/g**	**ng/g**	
14027	NEtFOSAA	2991-50-6	0.33	U	0.33	1.0	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.						
14027	NMeFOSAA	2355-31-9	0.33	U	0.33	1.0	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.						
14027	Perfluorobutanesulfonate	375-73-5	0.22	U	0.22	0.67	1
14027	Perfluorodecanoic acid	335-76-2	0.22	U	0.22	0.67	1
14027	Perfluorododecanoic acid	307-55-1	0.22	U	0.22	0.67	1
14027	Perfluoroheptanoic acid	375-85-9	0.22	U	0.22	0.67	1
14027	Perfluorohexanesulfonate	355-46-4	0.22	U	0.22	0.67	1
14027	Perfluorohexanoic acid	307-24-4	0.11	U	0.11	0.45	1
14027	Perfluorononanoic acid	375-95-1	0.11	U	0.11	0.45	1
14027	Perfluoro-octanesulfonate	1763-23-1	0.33	U	0.33	1.0	1
14027	Perfluorooctanoic acid	335-67-1	0.22	U	0.22	0.67	1
14027	Perfluorotetradecanoic acid	376-06-7	0.22	U	0.22	0.67	1
14027	Perfluorotridecanoic acid	72629-94-8	0.22	U	0.22	0.67	1
14027	Perfluoroundecanoic acid	2058-94-8	0.22	U	0.22	0.67	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Wet Chemistry	**SW-846 9060 modified**		**mg/kg**		**mg/kg**	**mg/kg**	
02079	TOC	n.a.	220	U	220	659	1
	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.						
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	13.1		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an 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.

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

05K17 SDG#: MMK17-05

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 02:11	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

05K17

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) SOIL Lab Sample ID: 8799408
Sample wt/vol: 4.94 (g/mL) g Lab File ID: HP09685.i/17jan27b.b/aj27s34.d
Level: (low/med) LOW Date Received: 01/21/17
% Moisture: not dec. 13.1 Date Analyzed: 01/28/17
Column: (pack/cap) CAP Dilution Factor: 1.0
CONCENTRATION UNITS:
Number TICs found: 1 (mg/L or mg/Kg) mg/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	556-67-2	Cyclotetrasiloxane, octameth	12.00	0.008	J
2.					
3.	VOCTIC	Total VOC TICs		0.008	J
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 Rev 1.1**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	95		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	11		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	10		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	3		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	5		1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	2	U	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	4	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 perfluorooctanesulfonamidoacetic 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 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.						
Metals	**SW-846 6010C**		**mg/l**		**mg/l**	**mg/l**	
01750	Calcium	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 Chemistry	**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/Nitrate Nitrogen	n.a.	4.4		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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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.

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 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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

06K17

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8799409
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17jan27a.b/yj27s21.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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.

Laboratory Sample Analysis Record

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) - U4	SW-846 3005A	1	170260635001	01/26/2017 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 Rev 1.1**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	0.5	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	0.7	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-methyl perfluorooctanesulfonamidoacetic Acid.						
	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.						
Metals	**SW-846 6010C**		**mg/l**		**mg/l**	**mg/l**	
01750	Calcium	7440-70-2	5.95		0.0382	0.400	1
01757	Magnesium	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 Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	3.3		1.0	2.0	5
00228	Sulfate	14808-79-8	9.9		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	0.38		0.040	0.10	1
	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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.

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 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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

08K17

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8799411
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17jan27a.b/yj27s22.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 Rev 1.1**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	29		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		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	5		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	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 perfluorooctanesulfonamidoacetic 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 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.						
Metals	**SW-846 6010C**		**mg/l**		**mg/l**	**mg/l**	
01750	Calcium	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 Chemistry	**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**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	0.99		0.040	0.10	1
	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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.

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 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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

09K17

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8799412
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17jan27a.b/yj27s23.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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.

Laboratory Sample Analysis Record

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) - U4	SW-846 3005A	1	170260635001	01/26/2017 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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	0.7	J	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 Rev 1.1**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	44		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	7		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	4		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	5	J	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-ethyl perfluorooctanesulfonamidoacetic 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 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.						
Metals	**SW-846 6010C**		**mg/l**		**mg/l**	**mg/l**	
01750	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
01767	Sodium	7440-23-5	70.2		0.173	2.00	1
Wet Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	149		10.0	20.0	50
00228	Sulfate	14808-79-8	19.8		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	1.5		0.040	0.10	1
	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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.

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 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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

11K17

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8799414
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17jan27a.b/yj27s24.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
4.					
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28.					
29.					
30.					

page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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	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	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	21	0.5	1	1
11997	Freon 113	76-13-1	22	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	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 8260C**		**ug/l**	**ug/l**	**ug/l**	
11997	o-Xylene	95-47-6	21	0.5	1	1
Misc. Organics	**EPA 537 Rev 1.1**		**ng/l**	**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	240	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	160	0.6	2	1
10954	Perfluorodecanoic acid	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	Perfluorotridecanoic acid	72629-94-8	210	0.5	2	1
10954	Perfluorotetradecanoic acid	376-06-7	170	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	180	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	180	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	180	0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	180	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	140	2	6	1
10954	Perfluorobutanoic Acid	375-22-4	190	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	190	0.5	2	1
10954	NEtFOSAA	2991-50-6	180	1	3	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
10954	NMeFOSAA	2355-31-9	220	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 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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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-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	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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	o-Xylene	95-47-6	21	0.5	1	1
Misc. Organics	**EPA 537 Rev 1.1**		**ng/l**	**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	220	0.5	2	1
10954	Perfluorononanoic acid	375-95-1	160	0.6	2	1
10954	Perfluorodecanoic acid	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	Perfluorotetradecanoic acid	376-06-7	180	0.5	2	1
10954	Perfluorohexanoic acid	307-24-4	170	0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	170	0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	180	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	190	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	180	0.5	2	1
10954	NEtFOSAA	2991-50-6	200	1	3	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.					
10954	NMeFOSAA	2355-31-9	200	1	3	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic 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 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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 Rev 1.1**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	28		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		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	5		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	3	U	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	4		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-methyl perfluorooctanesulfonamidoacetic 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	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 Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	62.4		10.0	20.0	50
00228	Sulfate	14808-79-8	23.8		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	0.99		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.	47.5		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	47.5		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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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.

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 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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

12K17

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8799417
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17jan27a.b/yj27s27.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
4.					
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 12:57

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01750	Calcium	SW-846 6010C	1	170260635001	01/27/2017 14:41	Katlin N Cataldi	1
01757	Magnesium	SW-846 6010C	1	170260635001	01/27/2017 14:41	Katlin N Cataldi	1
01762	Potassium	SW-846 6010C	1	170260635001	01/27/2017 14:41	Katlin N Cataldi	1
01767	Sodium	SW-846 6010C	1	170260635001	01/27/2017 14:41	Katlin N Cataldi	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170260635001	01/26/2017 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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): 8799404-8799408			
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	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
**-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.

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	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	0.001	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: Y170272AA	Sample number(s): 8799409,8799411-8799412,8799414-8799417			
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	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
**-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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 12:57

Group Number: 1757184

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 number(s): 8799404-8799408			
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	Sample number(s): 8799409,8799411-8799412,8799414-8799417			
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
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(2) The unspiked result was more than four times the spike added.
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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
	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: 170260635001	Sample number(s): 8799409-8799414,8799417-8799418			
Calcium	0.0495	J	0.0382	0.400
Magnesium	0.0460	J	0.0190	0.200
Potassium	0.160	U	0.160	1.00
Sodium	0.173	U	0.173	2.00
	mg/kg		mg/kg	mg/kg
Batch number: 17024667631A	Sample number(s): 8799404-8799407			
TOC	100	U	100	300
Batch number: 17024667631B	Sample number(s): 8799408			
TOC	100	U	100	300
	mg/l		mg/l	mg/l
Batch number: 17024120601A	Sample number(s): 8799409,8799411			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
Batch number: 17024120601B	Sample number(s): 8799412,8799414,8799417			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
Batch number: 17029118102A	Sample number(s): 8799409,8799411-8799412,8799417			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
Batch number: 17029118102B	Sample number(s): 8799414			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
	mg/l as CaCO3		mg/l as CaCO3	mg/l as CaCO3
Batch number: 17025008103A	Sample number(s): 8799411			
Total Alkalinity to pH 4.5	3.5	J	1.7	5.0
Batch number: 17025008104A	Sample number(s): 8799412,8799414,8799417			
Total Alkalinity to pH 4.5	3.3	J	1.7	5.0
Batch number: 17026002103A	Sample number(s): 8799409			
Total Alkalinity to pH 4.5	2.6	J	1.7	5.0

LCS/LCSD

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 12:57

Group Number: 1757184

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 number(s): 8799404-8799408								
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

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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/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
	ug/l	ug/l	ug/l	ug/l					
Batch number: Y170272AA	Sample number(s): 8799409,8799411-8799412,8799414-8799417								
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	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		

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 12:57

Group Number: 1757184

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					
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 number(s): 8799404-8799408								
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	Sample number(s): 8799409,8799411-8799412,8799414-8799417								
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		

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 12:57

Group Number: 1757184

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/l	mg/l	mg/l	mg/l					
Batch number: 170260635001	Sample number(s): 8799409-8799414,8799417-8799418								
Calcium	4.00	4.32			108		80-120		
Magnesium	2.00	2.19			110		80-120		
Potassium	10	10.79			108		80-120		
Sodium	10	10.68			107		80-120		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 17024667631A	Sample number(s): 8799404-8799407								
TOC	6030	5441.01			90		47-143		
Batch number: 17024667631B	Sample number(s): 8799408								
TOC	6030	5441.01			90		47-143		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17024120601A	Sample number(s): 8799409,8799411								
Chloride	3.00	2.97			99		90-110		
Sulfate	7.50	7.56			101		90-110		
Batch number: 17024120601B	Sample number(s): 8799412,8799414,8799417								
Chloride	3.00	2.97			99		90-110		
Sulfate	7.50	7.56			101		90-110		
Batch number: 17029118102A	Sample number(s): 8799409,8799411-8799412,8799417								
Total Nitrite/Nitrate Nitrogen	2.50	2.70			108		90-110		
Batch number: 17029118102B	Sample number(s): 8799414								
Total Nitrite/Nitrate Nitrogen	2.50	2.70			108		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 17025008103A	Sample number(s): 8799411								
Total Alkalinity to pH 4.5	188	182.44			97		84-110		
Batch number: 17025008104A	Sample number(s): 8799412,8799414,8799417								
Total Alkalinity to pH 4.5	188	182.26			97		84-110		
Batch number: 17026002103A	Sample number(s): 8799409								
Total Alkalinity to pH 4.5	188	181.19			96		84-110		
	%	%	%	%					
Batch number: 17026820004B	Sample number(s): 8799404-8799408								
Moisture	89.5	89.36			100		99-101		

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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 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 number(s): 8799404-8799408 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
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

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(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.

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 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
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 number(s): 8799409,8799411-8799412,8799414-8799417 UNSPK: 8799414										
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
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	U	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

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(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.

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 number(s): 8799404-8799408 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 number(s): 8799409,8799411-8799412,8799414-8799417 UNSPK: 8799414										
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

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(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.

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		MS Spike Added	MS Conc	MSD Spike Added	MSD Conc	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
	ng/l		ng/l	ng/l	ng/l	ng/l					
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 number(s): 8799409-8799414,8799417-8799418 UNSPK: 8799414										
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 number(s): 8799404-8799407 UNSPK: P799399										
TOC	223	U	20220	16365.48			81		47-143		
Batch number: 17024667631B	Sample number(s): 8799408 UNSPK: P799432										
TOC	975.02		26610	18475.18			66		47-143		
	mg/l		mg/l	mg/l	mg/l	mg/l					
Batch number: 17024120601A	Sample number(s): 8799409,8799411 UNSPK: P799385										
Chloride	94.61		400	482.85			97		90-110		
Sulfate	12.72		50	59.83			94		90-110		
Batch number: 17024120601B	Sample number(s): 8799412,8799414,8799417 UNSPK: 8799414										
Chloride	149.4		200	358.21			104		90-110		
Sulfate	19.77		50	67.98			96		90-110		
Batch number: 17029118102A	Sample number(s): 8799409,8799411-8799412,8799417 UNSPK: P799385										
Total Nitrite/Nitrate Nitrogen	4.75		2.00	7.00			113*		90-110		
Batch number: 17029118102B	Sample number(s): 8799414 UNSPK: 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 number(s): 8799411 UNSPK: P798607										
Total Alkalinity to pH 4.5	132.51		188	221.3	188	258.71	47*	67*	84-110	16*	5
Batch number: 17025008104A	Sample number(s): 8799412,8799414,8799417 UNSPK: P798933										
Total Alkalinity to pH 4.5	98.28		188	230.89			71*		84-110		
Batch number: 17026002103A	Sample number(s): 8799409 UNSPK: P804238										
Total Alkalinity to pH 4.5	109.15		188	196.55			46*		84-110		

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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	DUP RPD Max
	mg/l	mg/l		
Batch number: 170260635001	Sample number(s): 8799409-8799414,8799417-8799418 BKG: 8799414			
Calcium	30.51	30.66	0	20
Magnesium	7.06	7.05	0	20
Potassium	4.94	4.94	0 (1)	20
Sodium	70.16	70.42	0	20
	mg/kg	mg/kg		
Batch number: 17024667631A	Sample number(s): 8799404-8799407 BKG: P799399			
TOC	223 U	223 U	0 (1)	7
Batch number: 17024667631B	Sample number(s): 8799408 BKG: P799432			
TOC	975.02	1126.01	14* (1)	7
	mg/l	mg/l		
Batch number: 17024120601A	Sample number(s): 8799409,8799411 BKG: P799385			
Chloride	94.61	96.85	2 (1)	15
Sulfate	12.72	12.69	0 (1)	15
Batch number: 17024120601B	Sample number(s): 8799412,8799414,8799417 BKG: 8799414			
Chloride	149.4	149.87	0	15
Sulfate	19.77	19.91	1 (1)	15
Batch number: 17029118102A	Sample number(s): 8799409,8799411-8799412,8799417 BKG: P799385			
Total Nitrite/Nitrate Nitrogen	4.75	4.73	0	2
Batch number: 17029118102B	Sample number(s): 8799414 BKG: 8799414			
Total Nitrite/Nitrate Nitrogen	1.53	1.53	0	2
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 17025008103A	Sample number(s): 8799411 BKG: P798607			
Total Alkalinity to pH 4.5	132.51	133.62	1	5
Batch number: 17025008104A	Sample number(s): 8799412,8799414,8799417 BKG: P798933			
Total Alkalinity to pH 4.5	98.28	96.1	2	5
Batch number: 17026002103A	Sample number(s): 8799409 BKG: P804238			
Total Alkalinity to pH 4.5	109.15	110.5	1	5
	%	%		
Batch number: 17026820004B	Sample number(s): 8799404-8799408 BKG: P799399			
Moisture	8.05	8.43	5	5

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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.

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.
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.

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

	13C9-PFNA	13C6-PFDA	d3-NMeFOSAA	13C7-PFUnDA	d5-NEtFOSAA	13C2-PFDoDA
Limits:	70-130	70-130	70-130	70-130	70-130	70-130
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*
Limits:	70-130	70-130	70-130	70-130	70-130	70-130

	13C2-PFTeDA
Limits:	70-130
8799404	60*
8799405	55*
8799406	68*
8799407	56*
8799408	62*
Blank	75
LCS	75
MS	64*
MSD	56*

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.
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.

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.
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.

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: 1757184 Sample #: 879404-18 COC#: 16303

Client: **C.T. Male Associates**

Project Name/#: SGPP - Merrimack | Site ID:

Project Manager: Kirk Moline | P.O. #:

Sampler: Stephen Johnson SJS

Phone #: 7155291670 | Quote #: 214135

State where sample(s) were collected: NH

For Lab Use Only

SF#: 286377

SCR#: 200280

Preservation Codes

H = HCl T = Thiosulfate

N = HNO_3 B = NaOH

S = H_2SO_4 P = H_3PO_4

O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Matrix: Soil	Matrix: Sediment	Matrix: Water (Potable / Ground / NPDES / Surface)	Matrix: Other:	Total # of Containers	Preservation: H	Preservation: N	Preservation: S	TCL VOAs (8260C) + TICs	Ca, Mg, Na, K (6010C)	Total NO2 / NO3 (353.2)	Cl-, SO4- (300.0)	ALK + Carb/Bicarb (SM 2320 B)	16 PFCs (EPA 537 mod.)	TCL 22 VOCs	PFCs	Moisture	TOC	Remarks
SH2-AP02-3-5-170116	1/16/17	1145	X		X				5										X	X	X	X	
SH2-AP02-7-8-170116	1/16/17	0955	X		X				5										X	X	X	X	
SH2-AP02-12-13-170116	1/16/17	1033	X		X				5										X	X	X	X	
SH2-AP02-17-18-170116	1/16/17	1057	X		X				5										X	X	X	X	
SH2-AP02-20-21.5-170116	1/16/17	1117	X		X				5										X	X	X	X	
SH2-AP03-68-69-170116	1/16/17	1422	X			X			12	X	X	X	X	X	X	X	X	X					Filter metals
SH2-AP04-27-28-170116	1/16/17	1553	X			X			11	X	X	X	X	X	X	X	X	X					
SH2-AP04-34-35-170117	1/17/17	0917	X			X			12	X	X	X	X	X	X	X	X	X					Filter metals
SH2-AP04-44-45-170117	1/17/17	1046	X			X		2	14	X	X	X	X	X	X	X	X	X					MS/MSD
SH2-FB01-170117	1/17/17	—	X			X			12	X	X	X	X	X	X	X	X	X					Filter metals

Turnaround Time Requested (TAT) (please check): Standard ☐ RUSH ☒

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results:

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☑ MA MCP ☐ TX TRRP - 13 ☐

Type III (Reduced non-CLP) ☐ CT RCP ☐

Type IV (CLP SOW) ☐ ASP Type A ☐

Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
Stephen Johnson	1-19-17	16:42			
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by: P. Hill	1/21/17	9:20

Airbill No.:

Relinquished by Commercial Carrier:

UPS _____ FedEx X Other _____

Temperature upon receipt 0.0 - 0.5 °C

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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:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	3
Paperwork Enclosed:	No	Trip Blank Type:	N/A
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	N/A		

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

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Lancaster, PA 17605-2425
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F | 717-656-2681
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1757184

APOU-27-28-170116	1-16-17	1553	4 Bottles 7 vials
FA01-170117	1-17-17	——	5 Bottles - 7 vials
APOU-44-45-170117	1-17-17	1046	8 Bottles - 13 vials - 1 QBI ms/ms2
APO3-68-69-170116	1-16-17	1422	7 Bottles - 7 vials
APOU-34-36-170117	1-17-17	0915	5 Bottles - 7 vials
APOU-64-65-170117	1-17-17	1429	4 Bottles - 7 vials
APOU-54-55-170117	1-17-17	1206	5 Bottles - 7 vials
APOU-83.5-84.5 170118	1-18-17	1057	5 Bottles - 7 vials
APOU-74-75-170118	1-18-17	0843	2 Bottles - 7 vials
APOU-20-21.5-170116	1-16-17	1117	1 Bottle - 1 soil Jar
FB03-170118	1-18-17	1120	2 Bottles
APO2-7-8-170116	1-16-17	955	1 Bottle - 1 soil Jar
APO2-12-13-170116	1-16-17	1033	1 Bottle - 1 soil Jar
APOU-6-8 170118	1-18-17	1546	1 Bottle
APOU-2.5-4.5 170118	1-18-17	1522	1 Bottle - 1 soil Jar
APO3-11.5-14.5 170118	1-18-17	1320	1 Bottle - 1 soil Jar
APO3-7-8-170118	1-18-17	1300	1 - Bottle - 1 soil Jar
APOU-6-8 170118	1-18-17	1548	2 Bottles - 1 soil Jar
APO2-3-5 170116	1-16-17	1145	1 Bottle - 1 soil Jar
APO2-2-3-170118	1-18-17	1351	1 Bottle 1 soil Jar
APOU-83.5-84.5 170118	1-18-17	1057	1 Bottle
APO2-17-18-170116	1-16-17	1057	1 soil Jar
FD02-170118	1-18-17	ϕ	1 Bottle - 1 soil Jar

2TB HCl
1TB- Bottle

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Sample Administration Receipt Documentation Log

Doc Log ID: 173687

Group Number(s): ~~1759~~ 1757184 ⑤ Kmz 1/23/16

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:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	6
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:	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	Y	Bagged	N
2	DT121	0.5	DT	Wet	Y	Bagged	N
3	DT121	0.3	DT	Wet	Y	Bagged	N
4	DT121	0.5	DT	Wet	Y	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 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	

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

<	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.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

Client Sample Description	Lancaster Labs (LL) #
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

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.

Batch #: 17030004 (Sample number(s): 8799425, 8799427-8799429, 8799431 UNSPK: 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

Sample #s: 8799432, 8799433, 8799434, 8799435, 8799436

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

SW-846 6010C, Metals

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

Batch #: 17024667631B (Sample number(s): 8799432-8799436 UNSPK: 8799432 BKG: 8799432)

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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

01K18 SDG#: MMK18-01

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	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

01K18 SDG#: MMK18-01

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
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**	
10954	Perfluorooctanoic acid	335-67-1	42		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	10		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	7		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	5		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	2	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	4	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-ethyl perfluorooctanesulfonamidoacetic 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.						
Metals	**SW-846 6010C**		**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 Chemistry	**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/Nitrate Nitrogen	n.a.	1.6		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.	20.1		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	20.1		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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 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) - U4	SW-846 3005A	1	170260635002	01/26/2017 22:00	Annamaria Kuhns	1
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 Nitrogen	EPA 353.2	1	17029118102B	01/29/2017 18:04	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17025008104A	01/26/2017 06:54	Brandon P Costik	1
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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

01K18

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

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/17jan27a.b/yj27s28.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
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29.					
30.					

page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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) - U4	SW-846 3005A	1	170260635002	01/26/2017 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

03K18 SDG#: MMK18-03

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**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	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	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	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

03K18 SDG#: MMK18-03

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**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 Rev 1.1**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	44		0.5	2	1
10954	Perfluorononanoic acid	375-95-1	0.6	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	9		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	8		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	6		0.7	2	1
10954	Perfluorohexanesulfonate	355-46-4	2	J	1	3	1
10954	Perfluoro-octanesulfonate	1763-23-1	4	J	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 perfluorooctanesulfonamidoacetic 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.						
Metals	**SW-846 6010C**		**mg/l**		**mg/l**	**mg/l**	
01750	Calcium	7440-70-2	86.6		0.0382	0.400	1
01757	Magnesium	7439-95-4	21.6		0.0190	0.200	1
01762	Potassium	7440-09-7	5.87		0.160	1.00	1
01767	Sodium	7440-23-5	54.6		0.173	2.00	1
Wet Chemistry	**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/Nitrate Nitrogen	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.	23.6		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	23.6		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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 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) - U4	SW-846 3005A	1	170260635002	01/26/2017 22:00	Annamaria Kuhns	1
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 Nitrogen	EPA 353.2	1	17029118102B	01/29/2017 18:06	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17025008104A	01/26/2017 07:22	Brandon P Costik	1
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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

03K18

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8799427
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17jan27a.b/yj27s29.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

04K18 SDG#: MMK18-04

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	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	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	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

04K18 SDG#: MMK18-04

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 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-ethyl perfluorooctanesulfonamidoacetic 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.						
Metals	**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	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
Wet Chemistry	**EPA 300.0**		**mg/l**		**mg/l**	**mg/l**	
00224	Chloride	16887-00-6	316		100	200	500
00228	Sulfate	14808-79-8	22.6		1.5	5.0	5
	EPA 353.2		**mg/l**		**mg/l**	**mg/l**	
07882	Total Nitrite/Nitrate Nitrogen	n.a.	1.5		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.	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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Time	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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

04K18

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8799428
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17jan27a.b/yj27s30.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

05K18 SDG#: MMK18-05

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 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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

05K18 SDG#: MMK18-05

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 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 Rev 1.1**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	27		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		0.5	2	1
10954	Perfluoroheptanoic acid	375-85-9	6		0.5	2	1
10954	Perfluorobutanesulfonate	375-73-5	2	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	3	J	3	10	1
10954	Perfluoropentanoic Acid	2706-90-3	5		0.5	2	1
10954	NEtFOSAA	2991-50-6	2	J	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-methyl perfluorooctanesulfonamidoacetic 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	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 Chemistry	**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/Nitrate 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.	42.3		1.7	5.0	1
12149	Bicarbonate Alkalinity	n.a.	42.3		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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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 14:36	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) - U4	SW-846 3005A	1	170260635002	01/26/2017 22:00	Annamaria Kuhns	1
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 Nitrogen	EPA 353.2	1	17029118102B	01/29/2017 18:09	Joseph E McKenzie	1
12150	Total Alkalinity to pH 4.5	SM 2320 B-1997	1	17025008104A	01/26/2017 07:01	Brandon P Costik	1
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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

05K18

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8799429
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17jan27a.b/yj27s31.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

Sample Description: SG2-AP04-83.5-84.5-170118 Filtered Grab Groundwater
SGPP - Merrimack

LL Sample # GW 8799430
LL Group # 1757186
Account # 37191

Project Name: SGPP - Merrimack

Collected: 01/18/2017 10:57 by SJ

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Time	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) - U4	SW-846 3005A	1	170260635002	01/26/2017 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

07K18 SDG#: MMK18-07FB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 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-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 Time	Analyst	Dilution Factor
10954	16 PFCs	EPA 537 Rev 1.1	1	17030004	02/02/2017 13:11	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

08K18 SDG#: MMK18-08

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	0.037		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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

08K18 SDG#: MMK18-08

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	0.001	U	0.001	0.006	0.98
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 modified**		**ng/g**		**ng/g**	**ng/g**	
14027	NEtFOSAA	2991-50-6	0.34	U	0.34	1.0	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.						
14027	NMeFOSAA	2355-31-9	0.34	U	0.34	1.0	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.						
14027	Perfluorobutanesulfonate	375-73-5	0.23	U	0.23	0.68	1
14027	Perfluorodecanoic acid	335-76-2	0.23	U	0.23	0.68	1
14027	Perfluorododecanoic acid	307-55-1	0.23	U	0.23	0.68	1
14027	Perfluoroheptanoic acid	375-85-9	0.23	U	0.23	0.68	1
14027	Perfluorohexanesulfonate	355-46-4	0.23	U	0.23	0.68	1
14027	Perfluorohexanoic acid	307-24-4	0.11	U	0.11	0.45	1
14027	Perfluorononanoic acid	375-95-1	0.11	U	0.11	0.45	1
14027	Perfluoro-octanesulfonate	1763-23-1	0.34	U	0.34	1.0	1
14027	Perfluorooctanoic acid	335-67-1	0.23	U	0.23	0.68	1
14027	Perfluorotetradecanoic acid	376-06-7	0.23	U	0.23	0.68	1
14027	Perfluorotridecanoic acid	72629-94-8	0.23	U	0.23	0.68	1
14027	Perfluoroundecanoic acid	2058-94-8	0.23	U	0.23	0.68	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Wet Chemistry	**SW-846 9060 modified**		**mg/kg**		**mg/kg**	**mg/kg**	
02079	TOC	n.a.	1,160		180	539	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	16.0		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an 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.

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 02:33	Stephen C Nolte	0.98

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

08K18 SDG#: MMK18-08

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

08K18

Lab Name: Lancaster Laboratories Contract:_____
Lab 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/17jan27b.b/aj27s35.d
Level: (low/med) LOW Date Received: 01/21/17
% Moisture: not dec. 16 Date Analyzed: 01/28/17
Column: (pack/cap) CAP Dilution Factor: 1.0
CONCENTRATION UNITS:
Number TICs found: 1 (mg/L or mg/Kg) mg/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	556-67-2	Cyclotetrasiloxane, octameth	12.00	0.015	J
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3.	VOCTIC	Total VOC TICs		0.015	J
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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	Styrene	100-42-5	0.001	U	0.001	0.007	0.99
11995	1,1,2,2-Tetrachloroethane	79-34-5	0.001	U	0.001	0.007	0.99
11995	Tetrachloroethene	127-18-4	0.001	U	0.001	0.007	0.99
11995	Toluene	108-88-3	0.001	U	0.001	0.007	0.99
11995	1,2,3-Trichlorobenzene	87-61-6	0.001	U	0.001	0.007	0.99
11995	1,2,4-Trichlorobenzene	120-82-1	0.001	U	0.001	0.007	0.99
11995	1,1,1-Trichloroethane	71-55-6	0.001	U	0.001	0.007	0.99
11995	1,1,2-Trichloroethane	79-00-5	0.001	U	0.001	0.007	0.99
11995	Trichloroethene	79-01-6	0.001	U	0.001	0.007	0.99
11995	Trichlorofluoromethane	75-69-4	0.003	U	0.003	0.007	0.99
11995	Vinyl Chloride	75-01-4	0.001	U	0.001	0.007	0.99
11995	m+p-Xylene	179601-23-1	0.001	U	0.001	0.007	0.99

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 8260C**		**mg/kg**		**mg/kg**	**mg/kg**	
11995	o-Xylene	95-47-6	0.001	U	0.001	0.007	0.99
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 modified**		**ng/g**		**ng/g**	**ng/g**	
14027	NEtFOSAA	2991-50-6	0.37	U	0.37	1.1	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.						
14027	NMeFOSAA	2355-31-9	0.37	U	0.37	1.1	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.						
14027	Perfluorobutanesulfonate	375-73-5	0.24	U	0.24	0.73	1
14027	Perfluorodecanoic acid	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 acid	375-85-9	0.24	U	0.24	0.73	1
14027	Perfluorohexanesulfonate	355-46-4	0.24	U	0.24	0.73	1
14027	Perfluorohexanoic acid	307-24-4	0.12	U	0.12	0.49	1
14027	Perfluorononanoic acid	375-95-1	0.12	U	0.12	0.49	1
14027	Perfluoro-octanesulfonate	1763-23-1	0.37	U	0.37	1.1	1
14027	Perfluorooctanoic acid	335-67-1	0.24	U	0.24	0.73	1
14027	Perfluorotetradecanoic acid	376-06-7	0.24	U	0.24	0.73	1
14027	Perfluorotridecanoic 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
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Wet Chemistry	**SW-846 9060 modified**		**mg/kg**		**mg/kg**	**mg/kg**	
02079	TOC	n.a.	755		206	619	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	24.4		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an 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.

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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

09K18 SDG#: MMK18-09

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED 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/17jan27b.b/aj27s36.d
Level: (low/med) LOW Date Received: 01/21/17
% Moisture: not dec. 24.4 Date Analyzed: 01/28/17
Column: (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 1

CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	12.00	0.009	J
2.					
3.	VOCTIC	Total VOC TICs		0.009	J
4.					
5.					
6.					
7.					
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9.					
10.					
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

10K18 SDG#: MMK18-10

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	0.13		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	0.001	0.006	0.96
11995	Methyl Acetate	79-20-9	0.002	U	0.002	0.006	0.96
11995	Methyl Tertiary Butyl Ether	1634-04-4	0.0006	U	0.0006	0.006	0.96
11995	4-Methyl-2-pentanone	108-10-1	0.004	U	0.004	0.012	0.96
11995	Methylcyclohexane	108-87-2	0.001	U	0.001	0.006	0.96
11995	Methylene Chloride	75-09-2	0.002	U	0.002	0.006	0.96
11995	Styrene	100-42-5	0.001	U	0.001	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	1,2,3-Trichlorobenzene	87-61-6	0.001	U	0.001	0.006	0.96
11995	1,2,4-Trichlorobenzene	120-82-1	0.001	U	0.001	0.006	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	79-01-6	0.001	U	0.001	0.006	0.96
11995	Trichlorofluoromethane	75-69-4	0.002	U	0.002	0.006	0.96
11995	Vinyl Chloride	75-01-4	0.001	U	0.001	0.006	0.96
11995	m+p-Xylene	179601-23-1	0.001	U	0.001	0.006	0.96

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

10K18 SDG#: MMK18-10

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	0.001	U	0.001	0.006	0.96
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 modified**		**ng/g**		**ng/g**	**ng/g**	
14027	NEtFOSAA	2991-50-6	0.36	U	0.36	1.1	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.						
14027	NMeFOSAA	2355-31-9	0.36	U	0.36	1.1	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.						
14027	Perfluorobutanesulfonate	375-73-5	0.24	U	0.24	0.71	1
14027	Perfluorodecanoic acid	335-76-2	0.30	J	0.24	0.71	1
14027	Perfluorododecanoic acid	307-55-1	0.24	U	0.24	0.71	1
14027	Perfluoroheptanoic acid	375-85-9	0.73		0.24	0.71	1
14027	Perfluorohexanesulfonate	355-46-4	0.24	U	0.24	0.71	1
14027	Perfluorohexanoic acid	307-24-4	1.4		0.12	0.48	1
14027	Perfluorononanoic acid	375-95-1	0.62		0.12	0.48	1
14027	Perfluoro-octanesulfonate	1763-23-1	1.4		0.36	1.1	1
14027	Perfluorooctanoic acid	335-67-1	5.2		0.24	0.71	1
14027	Perfluorotetradecanoic acid	376-06-7	0.24	U	0.24	0.71	1
14027	Perfluorotridecanoic acid	72629-94-8	0.24	U	0.24	0.71	1
14027	Perfluoroundecanoic acid	2058-94-8	0.24	U	0.24	0.71	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Wet Chemistry	**SW-846 9060 modified**		**mg/kg**		**mg/kg**	**mg/kg**	
02079	TOC	n.a.	11,800		994	2,980	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	22.9		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an 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.

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 03:18	Stephen C Nolte	0.96

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

10K18 SDG#: MMK18-10

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

10K18

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
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	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	8.23	0.006	J
2.		Unknown	10.34	0.026	J
3.	556-67-2	Cyclotetrasiloxane, octameth	12.00	0.013	J
4.					
5.	VOCTIC	Total VOC TICs		0.046	J
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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	0.004	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	0.003	U	0.003	0.007	1.04
11995	Methyl Tertiary Butyl Ether	1634-04-4	0.0007	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	0.003	U	0.003	0.007	1.04
11995	Styrene	100-42-5	0.001	U	0.001	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	1,1,2-Trichloroethane	79-00-5	0.001	U	0.001	0.007	1.04
11995	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 8260C**		**mg/kg**		**mg/kg**	**mg/kg**	
11995	o-Xylene	95-47-6	0.001	U	0.001	0.007	1.04
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 modified**		**ng/g**		**ng/g**	**ng/g**	
14027	NEtFOSAA	2991-50-6	0.36	U	0.36	1.1	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.						
14027	NMeFOSAA	2355-31-9	0.36	U	0.36	1.1	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.						
14027	Perfluorobutanesulfonate	375-73-5	0.24	U	0.24	0.72	1
14027	Perfluorodecanoic acid	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	Perfluorohexanesulfonate	355-46-4	0.24	U	0.24	0.72	1
14027	Perfluorohexanoic acid	307-24-4	0.12	U	0.12	0.48	1
14027	Perfluorononanoic acid	375-95-1	0.12	U	0.12	0.48	1
14027	Perfluoro-octanesulfonate	1763-23-1	0.36	U	0.36	1.1	1
14027	Perfluorooctanoic acid	335-67-1	0.24	U	0.24	0.72	1
14027	Perfluorotetradecanoic acid	376-06-7	0.24	U	0.24	0.72	1
14027	Perfluorotridecanoic 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
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Wet Chemistry	**SW-846 9060 modified**		**mg/kg**		**mg/kg**	**mg/kg**	
02079	TOC	n.a.	8,230		854	2,560	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	24.2		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an 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.

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 03:41	Stephen C Nolte	1.04

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

11K18 SDG#: MMK18-11

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

11K18

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) SOIL Lab Sample ID: 8799435
Sample wt/vol: 4.83 (g/mL) g Lab File ID: HP09685.i/17jan27b.b/aj27s38.d
Level: (low/med) LOW Date Received: 01/21/17
% Moisture: not dec. 24.2 Date Analyzed: 01/28/17
Column: (pack/cap) CAP Dilution Factor: 1.0
CONCENTRATION UNITS:
Number TICs found: 1 (mg/L or mg/Kg) mg/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	10.34	0.037	J
2.					
3.	VOCTIC	Total VOC TICs		0.037	J
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	o-Xylene	95-47-6	0.001	U	0.001	0.007	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 modified**		**ng/g**		**ng/g**	**ng/g**	
14027	NEtFOSAA	2991-50-6	0.38	U	0.38	1.1	1
	NEtFOSAA is the acronym for N-ethyl perfluorooctanesulfonamidoacetic Acid.						
14027	NMeFOSAA	2355-31-9	0.38	U	0.38	1.1	1
	NMeFOSAA is the acronym for N-methyl perfluorooctanesulfonamidoacetic Acid.						
14027	Perfluorobutanesulfonate	375-73-5	0.25	U	0.25	0.75	1
14027	Perfluorodecanoic acid	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	Perfluorohexanesulfonate	355-46-4	0.25	U	0.25	0.75	1
14027	Perfluorohexanoic acid	307-24-4	0.13	U	0.13	0.50	1
14027	Perfluorononanoic acid	375-95-1	0.13	U	0.13	0.50	1
14027	Perfluoro-octanesulfonate	1763-23-1	0.38	U	0.38	1.1	1
14027	Perfluorooctanoic acid	335-67-1	0.25	U	0.25	0.75	1
14027	Perfluorotetradecanoic acid	376-06-7	0.25	U	0.25	0.75	1
14027	Perfluorotridecanoic 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
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.						
Wet Chemistry	**SW-846 9060 modified**		**mg/kg**		**mg/kg**	**mg/kg**	
02079	TOC	n.a.	860		207	621	1
Wet Chemistry	**SM 2540 G-1997**		**%**		**%**	**%**	
00111	Moisture	n.a.	24.2		0.50	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an 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.

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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

12K18 SDG#: MMK18-12FD

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

12K18

Lab Name: Lancaster Laboratories Contract:_____
Lab 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/17jan27b.b/aj27s39.d
Level: (low/med) LOW Date Received: 01/21/17
% Moisture: not dec. 24.2 Date Analyzed: 01/28/17
Column: (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

13K18 SDG#: MMK18-13TB

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	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

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

Submitted: 01/21/2017 09:20
Reported: 02/07/2017 11:24

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

13K18 SDG#: MMK18-13TB

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	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.

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

*=This limit was used in the evaluation of the final result

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

13K18

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8799437
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17jan27a.b/yj27s32.d
Level: (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 UNITS:
Number TICs found: 0 (ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
4.					
5.					
6.					
7.					
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30.					

page 1 of 1

FORM I VOA-TIC

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 11:24

Group Number: 1757186

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): 8799432-8799436			
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
**-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.

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	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	0.001	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: Y170272AA	Sample number(s): 8799425,8799427-8799429,8799437			
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	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

*- 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.

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	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(s): 8799432-8799436			
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	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	Sample number(s): 8799425,8799427-8799429,8799431			
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
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(1) The result for one or both determinations was less than five times the LOQ.
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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 11:24

Group Number: 1757186

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 number(s): 8799425-8799430			
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
	mg/kg		mg/kg	mg/kg
Batch number: 17024667631B	Sample number(s): 8799432-8799436			
TOC	100	U	100	300
	mg/l		mg/l	mg/l
Batch number: 17024120601A	Sample number(s): 8799427-8799428			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
Batch number: 17024120601B	Sample number(s): 8799425,8799429			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
Batch number: 17029118102B	Sample number(s): 8799425,8799427-8799429			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
	mg/l as CaCO3		mg/l as CaCO3	mg/l as CaCO3
Batch number: 17025008104A	Sample number(s): 8799425,8799427-8799429			
Total Alkalinity to pH 4.5	3.3	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
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: A170272AA	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

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(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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 11:24

Group Number: 1757186

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
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
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 number(s): 8799425,8799427-8799429,8799437								
Acetone	150	174.51			116		50-168		

*- Outside of specification
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(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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 11:24

Group Number: 1757186

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
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		

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 11:24

Group Number: 1757186

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					
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 number(s): 8799432-8799436								
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 number(s): 8799425,8799427-8799429,8799431								
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		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 170260635002	Sample number(s): 8799425-8799430								
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					

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 11:24

Group Number: 1757186

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(s): 8799432-8799436								
TOC	6030	5441.01			90		47-143		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17024120601A	Sample number(s): 8799427-8799428								
Chloride	3.00	2.97			99		90-110		
Sulfate	7.50	7.56			101		90-110		
Batch number: 17024120601B	Sample number(s): 8799425,8799429								
Chloride	3.00	2.97			99		90-110		
Sulfate	7.50	7.56			101		90-110		
Batch number: 17029118102B	Sample number(s): 8799425,8799427-8799429								
Total Nitrite/Nitrate Nitrogen	2.50	2.70			108		90-110		
	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3	mg/l as CaCO3					
Batch number: 17025008104A	Sample number(s): 8799425,8799427-8799429								
Total Alkalinity to pH 4.5	188	182.26			97		84-110		
	%	%	%	%					
Batch number: 17026820004B	Sample number(s): 8799432-8799436								
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 number(s): 8799432-8799436 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

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 11:24

Group Number: 1757186

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	0.001	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
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 number(s): 8799425,8799427-8799429,8799437 UNSPK: P799414										
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

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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
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	U	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	0.671		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

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 11:24

Group Number: 1757186

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					
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 number(s): 8799432-8799436 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 number(s): 8799425,8799427-8799429,8799431 UNSPK: P799414										
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 number(s): 8799425-8799430 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

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(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.

Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 11:24

Group Number: 1757186

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
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 17024667631B	Sample number(s): 8799432-8799436 UNSPK: 8799432									
TOC	975.02	26610	18475.18			66		47-143		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17024120601A	Sample number(s): 8799427-8799428 UNSPK: P799385									
Chloride	94.61	400	482.85			97		90-110		
Sulfate	12.72	50	59.83			94		90-110		
Batch number: 17024120601B	Sample number(s): 8799425,8799429 UNSPK: P799414									
Chloride	149.4	200	358.21			104		90-110		
Sulfate	19.77	50	67.98			96		90-110		
Batch number: 17029118102B	Sample number(s): 8799425,8799427-8799429 UNSPK: P799414									
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: 17025008104A	Sample number(s): 8799425,8799427-8799429 UNSPK: P798933									
Total Alkalinity to pH 4.5	98.28	188	230.89			71*		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: 170260635002	Sample number(s): 8799425-8799430 BKG: 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 BKG: 8799432			
TOC	975.02	1126.01	14* (1)	7
	mg/l	mg/l		
Batch number: 17024120601A	Sample number(s): 8799427-8799428 BKG: 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 BKG: P799414			

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 11:24

Group Number: 1757186

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		
Chloride	149.4	149.87	0	15
Sulfate	19.77	19.91	1 (1)	15
Batch number: 17029118102B	Sample number(s): 8799425,8799427-8799429 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): 8799425,8799427-8799429 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

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/07/2017 11:24

Group Number: 1757186

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: 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

	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*
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
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

	13C2-PFTeDA
8799432	52*
8799433	61*
8799434	43*
8799435	53*
8799436	49*
Blank	75
LCS	75
MS	64*
MSD	56*

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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.

Analysis Name: 14 PFCs
Batch number: 17024006

Limits: 70-130

Analysis Name: 16 PFCs
Batch number: 17030004

	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*
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
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

*- Outside of specification
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(1) The result for one or both determinations was less than five times the LOQ.
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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.

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: 175186 Sample #: 879942-5-37 COC#: 16303

Client: **C.T. Male Associates**

Project Name/#: SGPP - Merrimack | Site ID:

Project Manager: Kirk Moline | P.O. #:

Sampler: Stephen Johnson STJ

Phone #: 715 529 1670 | Quote #: 214135

State where sample(s) were collected: NH

For Lab Use Only

SF#: 286377

SCR#: 200280

Preservation Codes: H = HCl; T = Thiosulfate; N = HNO_3; B = NaOH; S = H_2SO_4; P = H_3PO_4; O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Matrix: Soil	Matrix: Sediment	Matrix: Potable Water	Matrix: Ground Water	Matrix: NPDES Surface Water	Matrix: Other: PFAS free DI water	Total # of Containers	Preservation: H	Preservation: N	Preservation: S	TCL VOAs (8260C) + TICs	Ca, Mg, Na, K (6010C)	Total NO2 / NO3 (353.2)	Cl-, SO4- (300.0)	ALK + Carb/Bicarb (SM 2320 B)	16 PFCs (EPA 537 mod.)	TCL 22 VOCs	PFCs	Moisture	TOC	Remarks
SL2-AP04-54-55-170117	1/17/17	1206	X					X			12	X	X	X	X	X	X	X	X	X					Filter metals
SL2-AP04-64-65-170117	1/17/17	1429	X					X			11	X	X	X	X	X	X	X	X	X					
SL2-AP04-74-75-170118	1/18/17	0843	X					X			11	X	X	X	X	X	X	X	X	X					
SL2-AP04-83.5-84.5-170118	1/18/17	1057	X					X			12	X	X	X	X	X	X	X	X	X					Filter Metals
SL2-FB03-170118	1/18/17	1120	X							2										X					
SL2-AP05-7-8-170118	1/18/17	1300	X		X						5										X	X	X	X	
SL2-AP05-11.5-14.5-170118	1/18/17	1320	X		X						5										X	X	X	X	
SL2-AP05-2-3-170118	1/18/17	1351	X		X						5										X	X	X	X	
SL2-AP06-2.5-4.5-170118	1/18/17	1522	X		X						5										X	X	X	X	
SL2-FD02-170118	1/18/17	—	X		X						5										X	X	X	X	

Turnaround Time Requested (TAT) (please check): Standard ☐ RUSH ☒

(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)

Date results are needed:

E-mail address to send RUSH results:

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☑ MA MCP ☐ TX TRRP - 13 ☐

Type III (Reduced non-CLP) ☐ CT RCP ☐

Type IV (CLP SOW) ☐ ASP Type A ☐

Type VI (Raw Data Only) ☐ ASP Type B ☐

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
[signature]	1-19-17	16:42			
			P. Hill	1/24/17	9:20

Airbill No.:

Relinquished by Commercial Carrier:

UPS _____ FedEx X Other _____

Temperature upon receipt 00-0.5 °C

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 37191 Group # 757186 Sample # 879925-37

COC #518835

Client Information

Client: CT Male Associates	Acct. #:
Project Name/#: SHPP-Merrimack	PWSID #:
Project Manager: Kirk Moline	P.O. #:
Sampler: Stephen Johnson SPS	Quote #: 21435
State where samples were collected: NA	For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: DI water

Analysis Requested

Preservation Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	TCL VOAs (624 list)
VOC Trip Blank	—	—			2	X

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed:

E-mail address:

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
	1/20/17	1728			
				1/21/17	9:20

EDD Required? Yes No

If yes, format:

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS FedEx Other

Temperature upon receipt 0.0-0.5 °C

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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:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	3
Paperwork Enclosed:	No	Trip Blank Type:	N/A
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	N/A		

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

2425 New Holland Pike
Lancaster, PA 17601-5925
T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

1757186

APO4-27-28-170116	1-16-17	1553	4 Bottles 7 vials
FA01-170117	1-17-17	———	5 Bottles - 7 vials
APO4-44-45-170117	1-17-17	1046	8 Bottles - 13 vials - 1 QBI MS/MSD
APO3-68-69-170116	1-16-17	1422	7 Bottles - 7 vials
APO4-34-36-170117	1-17-17	0915	5 Bottles - 7 vials
APO4-64-65-170117	1-17-17	1429	4 Bottles - 7 vials
APO4-54-55-170117	1-17-17	1206	5 Bottles - 7 vials
APO4-83.5-845 170118	1-18-17	1057	5 Bottles - 7 vials
APO4-74-75-170118	1-18-17	0843	2 Bottles - 7 vials
APO4-20-21.5-170116	1-16-17	1117	1 Bottle - 1 soil Jar
FB03-170118	1-18-17	1120	2 Bottles
APO2-7-8-170116	1-16-17	955	1 Bottle - 1 soil Jar
APO2-12-13-170116	1-16-17	1033	1 Bottle - 1 soil Jar
APO6-6-8 170118	1-18-17	1546	1 Bottle
APO6-2.5-4.5 170118	1-18-17	1522	1 Bottle - 1 soil Jar
APO3-11.5-14.5 170118	1-18-17	1320	1 Bottle - 1 soil Jar
APO3-7-8-170118	1-18-17	1300	1 - Bottle - 1 soil Jar
APO6-6-8 170118	1-18-17	1548	2 Bottles - 1 soil Jar
APO2-3-5 170116	1-16-17	1145	1 Bottle - 1 soil Jar
APO2-2-3-170118	1-18-17	1351	1 Bottle 1 soil Jar
APO4-83.5-84.5 170118	1-18-17	1057	1 Bottle
APO2-17-18-170116	1-16-17	1057	1 soil Jar
FD02-170118	1-18-17	ϕ	1 Bottle - 1 soil Jar

2 TB HCl
1 TB - Bottle

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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:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	6
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:	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	Y	Bagged	N
2	DT121	0.5	DT	Wet	Y	Bagged	N
3	DT121	0.3	DT	Wet	Y	Bagged	N
4	DT121	0.5	DT	Wet	Y	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 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	

2425 New Holland Pike
Lancaster, PA 17605-2425
T 717-656-2300
F 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< 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.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

Client Sample Description	Lancaster Labs (LL) #
SG2-AP09-17-18-170123 Grab Groundwater	8805593
SG2-AP09-35-36-170123 Grab Groundwater	8805594
SG2-AP09-47-48-170123 Grab Groundwater	8805595
SG2-AP09-56-57-170123 Grab Groundwater	8805596
SG2-AP09-65-66-170123 Grab Groundwater	8805597
SG2-FB05-170124 Grab Blank Water	8805598
SG2-EBDW-170124 Grab Blank Water	8805599
SG2-EBSW-170124 Grab Blank Water	8805600
SG2-EBWP02-170124 Grab Blank Water	8805601
SG2-EBPP02-170124 Grab Blank Water	8805602
SG2-AP09-70-71-170125 Grab Groundwater	8805603
SG2-AP09-70-71-170125 Filtered Grab Groundwater	8805604
Trip Blank PFCs Water	8805605
Trip Blank VOCs Water	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

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

Sample #s: 8805593, 8805594, 8805595, 8805596, 8805597, 8805598, 8805599, 8805601, 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

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 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-ethyl perfluorooctanesulfonamidoacetic 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	**5**		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	**15**		0.5	2	1
10954	**Perfluorohexanesulfonate**	355-46-4	**4**		1	3	1
10954	**Perfluorohexanoic acid**	307-24-4	**15**		0.5	2	1
10954	**Perfluorononanoic acid**	375-95-1	**1**	**J**	0.6	2	1
10954	**Perfluoro-octanesulfonate**	1763-23-1	**5**	**J**	2	6	1
10954	**Perfluorooctanoic acid**	335-67-1	**140**		0.5	2	1
10954	**Perfluoropentanoic Acid**	2706-90-3	**8**		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.						
Metals	**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 Chemistry	**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/Nitrate Nitrogen**	n.a.	**4.4**		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

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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 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 18:27	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

1E

EPA SAMPLE NO.

M1901

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8805593
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17feb01a.b/yf01s41.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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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30.					

page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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**	**J**	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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
GC/MS Volatiles	**SW-846 8260C**		**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 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**	
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-methyl perfluorooctanesulfonamidoacetic Acid.						
10954	**Perfluorobutanesulfonate**	375-73-5	**10**		0.7	2	1
10954	**Perfluorobutanoic Acid**	375-22-4	**7**	**J**	3	10	1
10954	**Perfluorodecanoic 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	**Perfluoroheptanoic acid**	375-85-9	**14**		0.5	2	1
10954	**Perfluorohexanesulfonate**	355-46-4	**3**		1	3	1
10954	**Perfluorohexanoic acid**	307-24-4	**17**		0.5	2	1
10954	**Perfluorononanoic acid**	375-95-1	**1**	**J**	0.6	2	1
10954	**Perfluoro-octanesulfonate**	1763-23-1	**11**		2	6	1
10954	**Perfluorooctanoic acid**	335-67-1	**120**		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	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.						
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	**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
Wet Chemistry	**EPA 300.0**		**mg/l**		**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/Nitrate Nitrogen**	n.a.	**5.1**		0.20	0.50	5

*=This limit was used in the evaluation of the final result

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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 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 18:49	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

M1902

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8805594
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17feb01a.b/yf01s42.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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
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30.					

page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 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-ethyl perfluorooctanesulfonamidoacetic 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	**10**		0.7	2	1
10954	**Perfluorobutanoic Acid**	375-22-4	**6**	**J**	3	10	1
10954	**Perfluorodecanoic acid**	335-76-2	**0.5**	**J**	0.5	2	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	**Perfluoroheptanoic acid**	375-85-9	**16**		0.5	2	1
10954	**Perfluorohexanesulfonate**	355-46-4	**2**	**J**	1	3	1
10954	**Perfluorohexanoic acid**	307-24-4	**18**		0.5	2	1
10954	**Perfluorononanoic acid**	375-95-1	**0.7**	**J**	0.6	2	1
10954	**Perfluoro-octanesulfonate**	1763-23-1	**6**	**J**	2	6	1
10954	**Perfluorooctanoic acid**	335-67-1	**100**		0.5	2	1
10954	**Perfluoropentanoic Acid**	2706-90-3	**10**		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.						
Metals	**SW-846 6010C**		**mg/l**		**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 Chemistry	**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/Nitrate Nitrogen**	n.a.	**4.9**		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

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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 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 19:11	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

1E

EPA SAMPLE NO.

M1903

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

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/17feb01a.b/yf01s43.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

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 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-ethyl perfluorooctanesulfonamidoacetic 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	**9**		0.7	2	1
10954	**Perfluorobutanoic Acid**	375-22-4	**6**	**J**	3	10	1
10954	**Perfluorodecanoic 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	**Perfluoroheptanoic acid**	375-85-9	**16**		0.5	2	1
10954	**Perfluorohexanesulfonate**	355-46-4	**3**	**J**	1	3	1
10954	**Perfluorohexanoic acid**	307-24-4	**17**		0.5	2	1
10954	**Perfluorononanoic acid**	375-95-1	**1**	**J**	0.6	2	1
10954	**Perfluoro-octanesulfonate**	1763-23-1	**6**		2	6	1
10954	**Perfluorooctanoic acid**	335-67-1	**110**		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	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.						
Metals	**SW-846 6010C**		**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 Chemistry	**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/Nitrate Nitrogen**	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**	

*=This limit was used in the evaluation of the final result

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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 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 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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

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/17feb01a.b/yf01s44.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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 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-ethyl perfluorooctanesulfonamidoacetic 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	**8**		0.7	2	1
10954	**Perfluorobutanoic Acid**	375-22-4	**8**	**J**	3	10	1
10954	**Perfluorodecanoic acid**	335-76-2	**0.8**	**J**	0.5	2	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	**Perfluoroheptanoic acid**	375-85-9	**20**		0.5	2	1
10954	**Perfluorohexanesulfonate**	355-46-4	**4**		1	3	1
10954	**Perfluorohexanoic acid**	307-24-4	**23**		0.5	2	1
10954	**Perfluorononanoic acid**	375-95-1	**1**	**J**	0.6	2	1
10954	**Perfluoro-octanesulfonate**	1763-23-1	**13**		2	6	1
10954	**Perfluorooctanoic acid**	335-67-1	**140**		0.5	2	1
10954	**Perfluoropentanoic Acid**	2706-90-3	**18**		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.						
Metals	**SW-846 6010C**		**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 Chemistry	**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		**mg/l**		**mg/l**	**mg/l**	
07882	**Total Nitrite/Nitrate Nitrogen**	n.a.	**5.7**		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

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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 Time	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

1E

EPA SAMPLE NO.

M1905

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

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/17feb01a.b/yf01s45.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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
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28.					
29.					
30.					

page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1906 SDG#: MMK19-06FB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
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 acronym for N-ethyl perfluorooctanesulfonamidoacetic 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 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
10954	16 PFCs	EPA 537 Rev 1.1	1	17027007	02/03/2017 11:06	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17027007	01/30/2017 16:00	Devon M Whooley	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1907 SDG#: MMK19-07EB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
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 acronym for N-ethyl perfluorooctanesulfonamidoacetic 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 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
10954	16 PFCs	EPA 537 Rev 1.1	1	17027007	02/03/2017 11:26	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17027007	01/30/2017 16:00	Devon M Whooley	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1908 SDG#: MMK19-08EB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
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 acronym for N-ethyl perfluorooctanesulfonamidoacetic 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	**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.

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	1	17027007	02/03/2017 11:47	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17027007	01/30/2017 16:00	Devon M Whooley	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1909 SDG#: MMK19-09EB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
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 acronym for N-ethyl perfluorooctanesulfonamidoacetic 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 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
10954	16 PFCs	EPA 537 Rev 1.1	1	17027007	02/03/2017 12:07	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17027007	01/30/2017 16:00	Devon M Whooley	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1910 SDG#: MMK19-10EB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev 1.1**		**ng/l**		**ng/l**	**ng/l**	
10954	**NEtFOSAA**	2991-50-6	**1**	**J**	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-methyl perfluorooctanesulfonamidoacetic 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.

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	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

*=This limit was used in the evaluation of the final result

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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
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 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-ethyl perfluorooctanesulfonamidoacetic 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	**8**		0.7	2	1
10954	**Perfluorobutanoic Acid**	375-22-4	**8**	**J**	3	10	1
10954	**Perfluorodecanoic acid**	335-76-2	**1**	**J**	0.5	2	1
10954	Perfluorododecanoic acid	307-55-1	0.5	U	0.5	2	1
10954	**Perfluoroheptanoic acid**	375-85-9	**20**		0.5	2	1
10954	**Perfluorohexanesulfonate**	355-46-4	**3**		1	3	1
10954	**Perfluorohexanoic acid**	307-24-4	**22**		0.5	2	1
10954	**Perfluorononanoic acid**	375-95-1	**1**	**J**	0.6	2	1
10954	**Perfluoro-octanesulfonate**	1763-23-1	**15**		2	6	1
10954	**Perfluorooctanoic acid**	335-67-1	**150**		0.5	2	1
10954	**Perfluoropentanoic Acid**	2706-90-3	**16**		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.						
Metals	**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	**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 Chemistry	**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/Nitrate Nitrogen**	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

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**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.

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	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

M1911

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8805603
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17feb01a.b/yf01s46.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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 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.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01750	Calcium	SW-846 6010C	1	170300635002	01/31/2017 23:57	Matthew R Machtinger	1
01757	Magnesium	SW-846 6010C	1	170330635001	02/03/2017 08:37	Eric L Eby	1
01762	Potassium	SW-846 6010C	2	170330635001	02/03/2017 08:37	Eric L Eby	1
01767	Sodium	SW-846 6010C	1	170330635001	02/03/2017 08:37	Eric L Eby	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	170300635002	01/31/2017 06:35	Lisa J Cooke	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	2	170330635001	02/02/2017 22:00	Annamaria Kuhns	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M1913 SDG#: MMK19-13TB

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
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 acronym for N-ethyl perfluorooctanesulfonamidoacetic 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 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
10954	16 PFCs	EPA 537 Rev 1.1	1	17027007	02/03/2017 12:48	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev 1.1	1	17027007	01/30/2017 16:00	Devon M Whooley	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	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

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

Submitted: 01/26/2017 09:50
Reported: 02/17/2017 10:10

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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	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.

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	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

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

M1914

Lab Name: Lancaster Laboratories Contract:_____
Lab Code: LANCAS Case No.:_____ SAS No.:_____ SDG No.:_____
Matrix: (soil/water) WATER Lab Sample ID: 8805606
Sample wt/vol: 5.0 (g/mL)mL Lab File ID:HP09355.i/17feb01a.b/yf01s40.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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	VOCTIC	Total VOC TICs		0	U
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page 1 of 1

FORM I VOA-TIC

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): 8805593-8805597,8805603,8805606			
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.
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.

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	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: 17027007	Sample number(s): 8805593-8805603,8805605			
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: 170270635002	Sample number(s): 8805593-8805597,8805603			
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: 170300635002	Sample number(s): 8805604			
Calcium	0.0388	J	0.0382	0.400
Batch number: 170330635001	Sample number(s): 8805604			
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: 17026987151A	Sample number(s): 8805593-8805596			
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
Batch number: 17027987601A	Sample number(s): 8805597,8805603			

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/17/2017 10:10

Group Number: 1758641

Method Blank (continued)

Analysis Name	Result		MDL**	LOQ
	mg/l		mg/l	mg/l
Chloride	0.20	U	0.20	0.40
Sulfate	0.30	U	0.30	1.0
Batch number: 17034118101A	Sample number(s): 8805593-8805597,8805603			
Total Nitrite/Nitrate Nitrogen	0.040	U	0.040	0.10
	mg/l as CaCO3		mg/l as CaCO3	mg/l as CaCO3
Batch number: 17030003103A	Sample number(s): 8805593-8805597,8805603			
Total Alkalinity to pH 4.5	2.1	J	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: Y170322AA	Sample number(s): 8805593-8805597,8805603,8805606								
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	19.22	20	19.24	96	96	80-120	0	30
Bromoform	20	17.19	20	17.25	86	86	59-120	0	30
Bromomethane	20	18.34	20	17.76	92	89	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

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/17/2017 10:10

Group Number: 1758641

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	20	20.72	20	20.32	104	102	80-120	2	30
Trichlorofluoromethane	20	17.62	20	17.38	88	87	67-129	1	30
Vinyl Chloride	20	18.29	20	17.9	91	90	63-121	2	30
m+p-Xylene	40	41.42	40	40.81	104	102	80-120	1	30
o-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 number(s): 8805593-8805603,8805605								
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 number(s): 8805593-8805597,8805603								
Calcium	4.00	4.20			105		80-120		
Magnesium	2.00	2.18			109		80-120		

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/17/2017 10:10

Group Number: 1758641

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/l	mg/l	mg/l	mg/l					
Potassium	10	10.52			105		80-120		
Sodium	10	10.19			102		80-120		
Batch number: 170300635002	Sample number(s): 8805604								
Calcium	4.00	4.16			104		80-120		
Batch number: 170330635001	Sample number(s): 8805604								
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 number(s): 8805593-8805596								
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 number(s): 8805597,8805603								
Chloride	3.00	3.09			103		90-110		
Sulfate	7.50	7.85			105		90-110		
Batch number: 17034118101A	Sample number(s): 8805593-8805597,8805603								
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	Sample number(s): 8805593-8805597,8805603								
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		MS Spike Added	MS Conc	MSD Spike Added	MSD Conc	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
	ng/l		ng/l	ng/l	ng/l	ng/l					
Batch number: 17027007	Sample number(s): 8805593-8805603,8805605 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		

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/17/2017 10:10

Group Number: 1758641

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
	ng/l	ng/l	ng/l	ng/l	ng/l					
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 number(s): 8805593-8805597,8805603 UNSPK: 8805596									
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	Sample number(s): 8805604 UNSPK: P809203									
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 number(s): 8805593-8805596 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 number(s): 8805597,8805603 UNSPK: P806927									
Chloride	29.92	40	68.43			96		90-110		
Sulfate	38.66	50	134.89			192*		90-110		
Batch number: 17034118101A	Sample number(s): 8805593-8805597,8805603 UNSPK: 8805593									
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 number(s): 8805593-8805597,8805603 UNSPK: P806471									
Total Alkalinity to pH 4.5	155.2	188	323.21			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: 170270635002	Sample number(s): 8805593-8805597,8805603 BKG: 8805596			

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Quality Control Summary

Client Name: C. T. Male Associates
Reported: 02/17/2017 10:10

Group Number: 1758641

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		
Calcium	16.88	16.8	0	20
Magnesium	2.85	2.85	0	20
Potassium	3.25	3.27	1 (1)	20
Sodium	51.89	51.96	0	20
Batch number: 170300635002	Sample number(s): 8805604 BKG: P809203			
Calcium	2.27	2.17	5	20
	mg/l	mg/l		
Batch number: 17026987151A	Sample number(s): 8805593-8805596 BKG: P805184			
Chloride	258.02	254.51	1 (1)	15
Sulfate	1815.28	1819.57	0	15
Batch number: 17027987601A	Sample number(s): 8805597,8805603 BKG: P806927			
Chloride	29.92	28.62	4	15
Sulfate	38.66	38.67	0	15
Batch number: 17034118101A	Sample number(s): 8805593-8805597,8805603 BKG: 8805593			
Total Nitrite/Nitrate Nitrogen	4.37	4.62	5*	2
	mg/l as CaCO3	mg/l as CaCO3		
Batch number: 17030003103A	Sample number(s): 8805593-8805597,8805603 BKG: P806471			
Total Alkalinity to pH 4.5	155.2	153.39	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: 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

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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.

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
Limits:	70-130	70-130	70-130	70-130	70-130	70-130

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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

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Environmental Analysis Request/Chain of Custody

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Acct. # 37191 Group # 1758641 Sample # 8805593-6606

COC # 518836

Client Information

Client: CT Male Associates	Acct. #:
Project Name/#: SHPP - Merrimack	PWSID #:
Project Manager: Kirk Moline	P.O. #:
Sampler: Stephen Johnson SJ	Quote #: 214135
State where samples were collected: NH	For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☒ NPDES ☐ Surface ☐ | Other: PFC Free water

Analysis Requested

Preservation Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	TCL VOCs (8260C) + TICs	Ca, Mg, Na, K (6010C)	Total NO2/NO3 (353.2)	Cl-, SO4 (300.0)	Alk + Carb/Bicarb (SM2320B)	16 PFCs (EPA 537 mod)
SHZ-APO9-17-18-170123	1/23/17	0842	X		11	X	X	X	X	X	X
SHZ-APO9-35-36-170123	1/23/17	1057	X		11	X	X	X	X	X	X
SHZ-APO9-47-48-170123	1/23/17	1242	X		11	X	X	X	X	X	X
SHZ-APO9-56-57-170123	1/23/17	1419	X		11	X	X	X	X	X	X
SHZ-APO9-65-66-170123	1/23/17	1611	X		11	X	X	X	X	X	X
SHZ-FB05-170124	1/24/17	0822	X		2			X			X
SHZ-EBDW-170124	1/24/17	0825	X		2						X
SHZ-EBSW-170124	1/24/17	0827	X		2						X
SHZ-EBWP02-170124	1/24/17	0842	X		2						X
SHZ-EBPP02-170124	1/24/17	0853	X		2						X

For Lab Use Only

FSC:

SCR#:

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed:

E-mail address:

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)

Type III (Reduced non-CLP) NJ DKQP TX TRRP-13

NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
[signature]	1/25/17	1325			
			[signature]	1.26.17	950

EDD Required? Yes No

If yes, format: Equis

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS FedEx X Other

Temperature upon receipt 2.0-2.4 °C

Environmental Analysis Request/Chain of Custody

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Acct. # 37191 Group # 1758641 Sample # 8805593-606

COC # 518925

Client Information

Client: CT Male Associates	Acct. #:
Project Name/#: SCPP-Merrimack	PWSID #:
Project Manager: Rick Molina	P.O. #:
Sampler: Stephen Johnson SJJ	Quote #: 214135
State where samples were collected: NH	For Compliance: Yes ☐ No ☐

Matrix

Soil ☐ Sediment ☐ Tissue ☐ | Water ☒ Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: PFC Free Blanks

Analysis Requested

Preservation Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	TCL VOCs (8260C) + TICs	Ca, Mg, Na, K (6010C)	Total NO2/NO3 (353.2)	Cl-, SO4 (300.0)	Alk + Cond/Bicarb (SM 2320B)	16 PFCs (EPA 537 mod)	Remarks
SL2-MP09-20-21-170125	1/25/17	1038	X		12	X	X	X	X	X	X	Filtered Metals
Trip Blank PFCs	—	—	X		1						X	
Trip Blank VOCs	—	—	X		2	X						

For Lab Use Only
FSC:
SCR#:

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)
Standard Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed:

E-mail address:

Data Package Options (circle if required)
Type I (EPA Level 3 Equivalent/non-CLP) Type VI (Raw Data Only)
Type III (Reduced non-CLP) NJ DKQP TX TRRP-13
NYSDEC Category A or B MA MCP CT RCP

Relinquished by	Date	Time	Received by	Date	Time
Stephen Johnson	1/25/17	1325			
			3	1/26/17	950

EDD Required? Yes No
If yes, format: Equis

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS FedEx X Other

Temperature upon receipt 1.0 °C

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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:	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:	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 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 #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	2.0	DT	Wet	Y	Bagged	N
2	DT131	2.4	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425

T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< 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.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

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

Client Sample Description	Lancaster Labs (LL) #
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.

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

Submitted: 01/26/2017 09:50
Reported: 02/06/2017 10:03

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**ASTM D422-63 (reapproved 2007)**		% Passing		% Passing	% Passing	
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.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07103	Grain Size to 1 um	ASTM D422-63 (reapproved 2007)	1	17027710301A	01/27/2017 10:00	Joshua Trost	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/26/2017 09:50
Reported: 02/06/2017 10:03

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**ASTM D422-63 (reapproved 2007)**		% Passing		% Passing	% Passing	
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.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07103	Grain Size to 1 um	ASTM D422-63 (reapproved 2007)	1	17027710301A	01/27/2017 10:00	Joshua Trost	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/26/2017 09:50
Reported: 02/06/2017 10:03

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

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 Chemistry	**ASTM D422-63 (reapproved 2007)**		% Passing		% Passing	% Passing	
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 Time	Analyst	Dilution Factor
07103	Grain Size to 1 um	ASTM D422-63 (reapproved 2007)	1	17027710301A	01/27/2017 10:00	Joshua Trost	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/26/2017 09:50
Reported: 02/06/2017 10:03

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M2004 SDG#: MMK20-04

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**ASTM D422-63 (reapproved 2007)**		% Passing		% Passing	% Passing	
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 Time	Analyst	Dilution Factor
07103	Grain Size to 1 um	ASTM D422-63 (reapproved 2007)	1	17027710301A	01/27/2017 10:00	Joshua Trost	1

*=This limit was used in the evaluation of the final result

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

Submitted: 01/26/2017 09:50
Reported: 02/06/2017 10:03

C. T. Male Associates
50 Century Hill Drive
Latham NY 12110

M2005 SDG#: MMK20-05

CAT No.	Analysis Name	CAS Number	As Received Result		As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Wet Chemistry	**ASTM D422-63 (reapproved 2007)**		% Passing		% Passing	% Passing	
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 Time	Analyst	Dilution Factor
07103	Grain Size to 1 um	ASTM D422-63 (reapproved 2007)	1	17027710301A	01/27/2017 10:00	Joshua Trost	1

*=This limit was used in the evaluation of the final result

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.

*- 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.

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Environmental Services Analysis Request/Chain of Custody

Acct. #: 37191 Group #: 1758664 Sample #: 8805648-52 COC#: 16237

Client: **C.T. Male Associates**			
Project Name/#: SGPP - Merrimack	Site ID:		
Project Manager: Kirk Moline	P.O. #: 16.6126		
Sampler: Stephen Johnson STJ			
Phone #: 715 529 1670	Quote #: 214135		
State where sample(s) were collected: NH			

For Lab Use Only
SF#: 266803
SCR#: 199966

Preservation Codes
H = HCl T = Thiosulfate
N = HNO_3 B = NaOH
S = H_2SO_4 P = H_3PO_4
O = Other

Matrix: Sediment / Soil ☑; Water: Ground, Surface, Potable, NPDES; Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Water	Other:	Total # of Containers	TOC (5310 B)	Moisture (2540 G)	PFCs (EPA 537 mod.)	Grain Size (ASTM D422)	Remarks
SG2-AP02-25.7-26.5-170116	1/16/17	—	X		X			1				X	
SG2-AP02-27-28.4-170116	1/16/17	—	X		X			1				X	
~~SG2-AP05-SWS~~-27.6-29.8-170118	1/18/17	—	~~X~~ STJ	X	X			1				X	
SG2-AP09-FS-14.1-17-170120	1/20/17	—		X				1				X	
SG2-AP09-34-35-170123	1/23/17	—	X		X			1				X	

Turnaround Time Requested (TAT) (please check): Standard ☐ RUSH ☒
(RUSH TAT is subject to Eurofins Lancaster Laboratories approval and surcharges.)
Date results are needed:
E-mail address to send RUSH results: Kmoline@ctmale.com

Data Package Options (please check if required)

Type I (Validation/non-CLP)	☑	MA MCP	☐	TX TRRP - 13	☐
Type III (Reduced non-CLP)	☐	CT RCP	☐		
Type IV (CLP SOW)	☐	ASP Type A	☐		
Type VI (Raw Data Only)	☐	ASP Type B	☐		

EDD Format: EQuIS

If site-specific QC (MS/MSD/Dup) required, indicate QC samples and submit triplicate volume.

Relinquished by:	Date	Time	Received by:	Date	Time
SDeRe [signature]	1/6/17	10:35	[signature]	1/12/17	15:05
[signature]	1/25/17	13:25			
			CEshl [signature]	1/26/17	0950

Airbill No.:
Relinquished by Commercial Carrier:
UPS ______ FedEx X Other ______

Temperature upon receipt NA °C

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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:	NH		

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	Total Trip Blank Qty:	0
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Corey Eshleman (3647) at 10:54 on 01/26/2017

2425 New Holland Pike
Lancaster, PA 17605-2425

T | 717-656-2300
F | 717-656-2681
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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	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)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< 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

Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING AP02

Project:SGPP - Merrimack MVD 4/5
Project No.:32421001.01 NH2 002
Location:Merrimack, NH
Coordinates:UTM 19N N:297047.6m, E:4749425.9m
Datum:H:NAD83, V:NAVD88

Surface Elevation:119.1 ft
Drilling Method:Hand Auger/Geoprobe
Sampling Method:Hand Auger/Direct Push
Completion Depth:30.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0.0					Dark brown TOPSOIL; trace fine to coarse Gravel; with roots and leaves.	
			G/S/F:0%/ 98%/ 2%		Pale yellow fine SAND; trace Silt; moist.	
2.5		SG2-AP02-3-5-170116	**D/O/S:**None/ None/ None			117.5
5.0			**PID:**0.0 **D/O/S:**None/ None/ None			115.0
7.5		SG2-AP02-7-8-170116	**PID:**0.0 **D/O/S:**None/ None/ None			112.5
10.0			**PID:**0.0 **D/O/S:**None/ None/ None			110.0
12.5		SG2-AP02-12-13-170116	**PID:**0.0 **D/O/S:**None/ None/ None			107.5
15.0			**G/S/F:**0%/ 95%/ 5%		Light gray fine SAND; trace Silt; orange brown mottling throughout; moist.	105.0
17.5		SG2-AP02-17-18-170116	**PID:**0.0 **D/O/S:**None/ None/ None			102.5
20.0			**PID:**0.0 **D/O/S:**None/ None/ None			100.0

Date Boring Started: 1/16/17
Date Boring Completed: 1/16/17
Logged By: Stephen Johnson
Drilling Contractor: Cascade
Drill Rig: 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.

O:\GINT\PROJECTS\32421001 PFOA FATE AND TRANSPORT\SGPP_MERRIMACK_LONGA_20170206.GPJ BARRLIBRARY - SGPP.GLB ENVIRO LOG BARR TEMPLATE.GDT

Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING AP02

Project:SGPP - Merrimack MVD 4/5
Project No.:32421001.01 NH2 002
Location:Merrimack, NH
Coordinates:UTM 19N N:297047.6m, E:4749425.9m
Datum:H:NAD83, V:NAVD88

Surface Elevation:119.1 ft
Drilling Method:Hand Auger/Geoprobe
Sampling Method:Hand Auger/Direct Push
Completion Depth:30.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
20.0		SG2-AP02-20-21.5-170116	**G/S/F:**0%/ 95%/ 5% **PID:**0.0 **D/O/S:**None/ None/ None		Light gray fine SAND; trace Silt; orange brown mottling throughout; moist. *(continued)*	
					At 21.5 feet, saturated.	97.5
22.5			**PID:**0.0 **D/O/S:**None/ None/ None			95.0
25.0		SG2-AP02-25.7-26.5-170116	**G/S/F:**100%/ 0%/ 0%		Light gray fine GRAVEL; saturated.	
			G/S/F:0%/ 75%/ 25% **PID:**0.2 **D/O/S:**None/ None/ None		Reddish yellow fine SAND; trace to some (25%) Silt; occasional lens of increased (little) Silt; saturated.	
		SG2-AP02-27-28.4-170116	**G/S/F:**5%/ 90%/ 5%		Reddish yellow coarse SAND; trace fine Gravel and Silt; saturated.	92.5
27.5						
			PID:0.5 **D/O/S:**None/ None/ None			90.0
30.0					End of boring 30.0 feet	
32.5						
35.0						
37.5						
40.0						

Date Boring Started: 1/16/17
Date Boring Completed: 1/16/17
Logged By: Stephen Johnson
Drilling Contractor: Cascade
Drill Rig: 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.

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Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING AP05

Project:SGPP - Merrimack MVD 4/5
Project No.:32421001.01 NH2 002
Location:Merrimack, NH
Coordinates:UTM 19N N:297163.9m, E:4749628.6m
Datum:H:NAD83, V:NAVD88

Surface Elevation:116.0 ft
Drilling Method:Hand Auger/Geoprobe
Sampling Method:Hand Auger/Direct Push
Completion Depth:30.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0.0					Dark brown TOPSOIL; with roots and leaves; moist.	115.0
2.5		SG2-AP05-2-3-170118	**G/S/F:**0%/ 85%/ 15%		Very pale brown fine SAND; little Silt; trace Clay; with small roots and organic silt; dry.	112.5
5.0		SG2-AP05-7-8-170118	**PID:**0.0 **D/O/S:**None/ None/ None			110.0
7.5			**D/O/S:**None/ None/ None			107.5
10.0			**G/S/F:**0%/ 98%/ 2%		Pale yellow fine SAND; trace Silt and Clay; dry.	
		SG2-AP05-11.5-14.5-170118	**G/S/F:**0%/ 85%/ 15% **PID:**0.0 **D/O/S:**None/ None/ None		Pale yellow fine SAND; little Silt; trace Clay; orange brown mottling throughout; moist.	105.0
12.5						102.5
			PID:0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 98%/ 2%		Pale yellow fine SAND; trace Silt and Clay; moist.	
15.0			**G/S/F:**0%/ 85%/ 15%		Very pale brown fine SAND; little Silt; trace Clay; with small roots; moist.	
			PID:0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 98%/ 2%		Light gray fine SAND; trace Clay; moist. At 16 feet, saturated.	100.0
17.5			**G/S/F:**85%/ 15%/ 0%		Light gray fine GRAVEL; little fine to medium Sand; red discoloration due to iron oxidation; saturated.	
			G/S/F:0%/ 98%/ 2% **PID:**0.0 **D/O/S:**None/ None/ None		Light gray fine SAND; trace Clay; laminated; saturated.	97.5
20.0			**G/S/F:**85%/ 15%/ 0%		Light gray fine GRAVEL; little fine to medium Sand; saturated.	

Date Boring Started: 1/18/17
Date Boring Completed: 1/18/17
Logged By: Stephen Johnson
Drilling Contractor: Cascade
Drill Rig: 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.

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Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING AP05

Project:SGPP - Merrimack MVD 4/5
Project No.:32421001.01 NH2 002
Location:Merrimack, NH
Coordinates:UTM 19N N:297163.9m, E:4749628.6m
Datum:H:NAD83, V:NAVD88

Surface Elevation:116.0 ft
Drilling Method:Hand Auger/Geoprobe
Sampling Method:Hand Auger/Direct Push
Completion Depth:30.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
20.0			**G/S/F:**85%/ 15%/ 0%		Light brownish gray fine GRAVEL; little fine to medium Sand; saturated.	95.0
22.5			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**70%/ 30%/ 0%		Light brownish gray fine GRAVEL; some fine to medium Sand; saturated.	
			G/S/F:85%/ 15%/ 0%		Light brownish gray fine GRAVEL; little fine to medium Sand; saturated.	92.5
25.0			**PID:**0.0 **D/O/S:**None/ None/ None		At 25.5 feet, 2-inch thick lens of medium Gravel.	90.0
27.5		SG2-AP05-SWS-27.6-29.8-170118	**G/S/F:**0%/ 75%/ 25%		Light brownish gray fine SAND; some Silt, trace Clay; saturated.	
			PID:0.0 **D/O/S:**None/ None/ None		At 28.5 and 28.9 feet, 1 to 3-mm thick lenses of gray CLAY.	87.5
30.0					End of boring 30.0 feet	
32.5						
35.0						
37.5						
40.0						

Date Boring Started: 1/18/17
Date Boring Completed: 1/18/17
Logged By: Stephen Johnson
Drilling Contractor: Cascade
Drill Rig: 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 AP06

Project:SGPP - Merrimack MVD 4/5
Project No.:32421001.01 NH2 002
Location:Merrimack, NH
Coordinates:UTM 19N N:297140.6m, E:4749674.6m
Datum:H:NAD83, V:NAVD88

Surface Elevation:116.2 ft
Drilling Method:Geoprobe
Sampling Method:Direct Push
Completion Depth:15.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0.0					Dark brown TOPSOIL; with roots, leaves and wood; moist.	115.0
2.5		SG2-AP06-2.5-4.5-170118	**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 95%/ 5%		Pale yellow fine SAND; trace Silt and Clay; brown and black mottling throughout; dry.	112.5
5.0		SG2-AP06-6-8-170118	**PID:**0.0 **D/O/S:**None/ None/ None			110.0
7.5			**PID:**0.0 **D/O/S:**None/ None/ None			107.5
10.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 98%/ 2%		Gray fine SAND; trace Silt and Clay; moist. At 10.8 feet, saturated.	105.0
12.5			**PID:**0.0 **D/O/S:**None/ None/ None		At 12.6 feet, lens of increased (15%) coarse Sand.	102.5
			G/S/F:83%/ 15%/ 2%		Light brown fine GRAVEL; little medium to coarse Sand; trace fine Sand and Silt; saturated. At 13.6 feet, 1-inch thick lens of fine Sand.	
15.0			**PID:**0.0 **D/O/S:**None/ None/ None **G/S/F:**0%/ 98%/ 2% **G/S/F:**83%/ 15%/ 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. End of boring 15.0 feet	
17.5						
20.0						

Date Boring Started: 1/18/17
Date Boring Completed: 1/18/17
Logged By: Stephen Johnson
Drilling Contractor: Cascade
Drill Rig: 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.

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Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING AP09

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

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0.0					Dark brown TOPSOIL.	137.5
					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.	
2.5		SG2-AP09-2.5-3-170120	**PID:**1.9 **D/O/S:**None/ None/ None			135.0
5.0		SG2-AP09-6-8-170120	**PID:**2.0 **D/O/S:**None/ None/ None		At 5.6 feet, 0.5-inch diameter pieces of clay.	132.5
7.5					At 7.9 feet, wood pieces.	130.0
			G/S/F:0%/ 2%/ 98% **PID:**1.5 **D/O/S:**None/ None/ None		Pinkish gray SILT; trace fine Sand and Clay; laminated in 1 to 3-mm layers; moist. At 9 feet, saturated. At 9.5 feet, 1-inch thick lens of fine SAND; trace Silt.	
10.0					BLIND DRILLED.	127.5
12.5			**G/S/F:**0%/ 2%/ 98%		Light gray SILT; trace fine Sand and Clay; laminated in 1 to 3-mm layers; saturated.	125.0
			G/S/F:0%/ 90%/ 10% **PID:**2.1 **D/O/S:**None/ None/ None **G/S/F:**0%/ 2%/ 98%		Light gray fine SAND; little clay; orange mottling present at 1-mm thick seams of coarse Sand; saturated. Light gray SILT; trace fine Sand and Clay; laminated in 1 to 3-mm layers; saturated.	
		SG2-AP09-FS-14.1-17-170120	**G/S/F:**0%/ 98%/ 2%		Light gray fine SAND; trace Silt and Clay; loose; saturated. At 14.5 feet, 2-inch thick lens of SILT.	
15.0			**PID:**1.4 **D/O/S:**None/ None/ None **G/S/F:**0%/ 2%/ 98%		Light gray SILT; trace fine Sand and Clay; saturated. From 16 to 16.3 feet, occasional 3-mm thick lenses of fine SAND.	122.5
			G/S/F:0%/ 98%/ 2%		Light gray fine SAND; trace Silt and Clay; saturated.	
17.5					BLIND DRILLED.	120.0
20.0						

Date Boring Started: 1/20/17
Date Boring Completed: 1/23/17
Logged By: Stephen Johnson
Drilling Contractor: Cascade
Drill Rig: 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.

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Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING AP09

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

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
20.0			**G/S/F:**0%/ 98%/ 2%		Light gray fine SAND; trace Silt and Clay; saturated.	117.5
					At 20.4 feet, 2-inch thick lens of light brownish gray CLAY.	
					From 20.7 to 21.0 feet, red discoloration due to iron oxidation.	
			PID:0.5			
			D/O/S: None/ None/ None			
22.5					From 22.1 to 23.1 feet, red discoloration due to iron oxidation.	115.0
			G/S/F:0%/ 80%/ 20%		Light gray fine SAND; little Silt; trace Clay; saturated.	
					At 23.6 feet, 0.25-inch thick lens of light brownish gray CLAY.	
			PID:0.5		At 24.1 feet, 1-inch thick lens of light brownish gray CLAY.	
			D/O/S: None/ None/ None			
25.0						112.5
					At 25.2 feet, 2-inch thick lens of light brownish gray CLAY.	
			G/S/F:0%/ 98%/ 2%		Light gray fine SAND; trace Silt; saturated.	
			G/S/F:0%/ 80%/ 20%		Light gray fine SAND; little Silt; trace Clay; loose; saturated.	
			PID:0.9		At 26.4 feet, 4-inch thick lens of SILT; little fine Sand.	
			D/O/S: None/ None/ None			
27.5					At 27.1 feet, 2-inch thick lens of light brownish gray CLAY; firm.	110.0
					At 27.6 and 27.8 feet, 0.25-inch thick lenses of fine SAND.	
			G/S/F:0%/ 98%/ 2%		Light gray fine SAND; trace Silt; 0.25-inch thick lens of CLAY at bottom of unit; saturated.	
			G/S/F:0%/ 80%/ 20%		Light gray fine SAND; little Silt; trace Clay; saturated.	
			PID:0.7			
			D/O/S: None/ None/ None		Light gray fine SAND; trace Silt; firm; orange mottling occuring throughout as lenses; saturated.	
			G/S/F:0%/ 95%/ 5%			
30.0					BLIND DRILLED.	107.5
32.5						105.0
		SG2-AP09-34-35-170123	**G/S/F:**0%/ 95%/ 5%		Pale yellow fine SAND; little medium Sand; trace Silt; loose; saturated.	
35.0					End of boring 35.0 feet	
37.5						
40.0						

Date Boring Started: 1/20/17
Date Boring Completed: 1/23/17
Logged By: Stephen Johnson
Drilling Contractor: Cascade
Drill Rig: 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.

O:\GINT\PROJECTS\32421001 PFOA FATE AND TRANSPORT\SGPP_MERRIMACK_LONGA_20170206.GPJ BARRLIBRARY - SGPP.GLB ENVIRO LOG BARR TEMPLATE.GDT

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

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: Jessica Bulova

Jessica Bulova, Data Manager, Cascade Technical Services

1. PLOTS OF PHYSIOCHEMICAL AND (I_K) DATA

BORING NAME: AP01

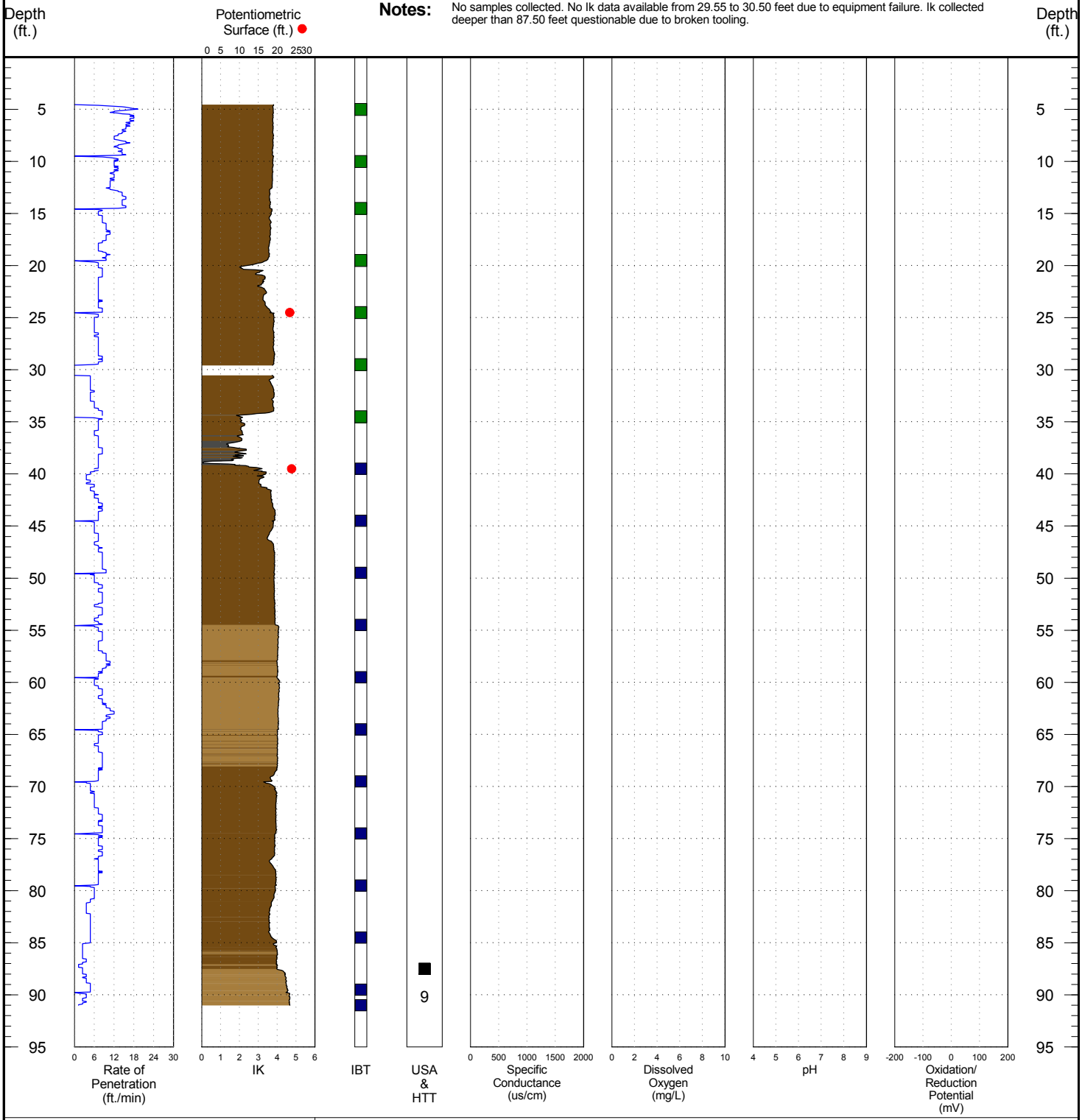
Total Depth 91.00 ft.

Waterloo APS-D™ 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
Gas Drive or Peri Pump Peri Pump

Notes: No samples collected. No Ik data available from 29.55 to 30.50 feet due to equipment failure. Ik collected deeper than 87.50 feet questionable due to broken tooling.



IK Scale

0 to 0.1
0.1 to 2
2 to 4
4 to 6
>6

Legend

IBT = IK Behavior Type
- = IK increase when hammer stops
- = IK decrease when hammer stops
- = No change when hammer stops

USA = Unsuccessful Sample Attempt
- ✳ = Could not produce water
- ▲ = Yield deemed too slow
- ■ = Equipment issue

HTT = Hole Termination Type
- 7 = Broken downhole equipment
- 8 = Reached Target Depth
- 9 = ROP dropped below threshold
- 10 = Sudden Hard Refusal

WATERLOO APS - WATERLOO AND MIP 10.13.2015.GDT - 11/10/16 10:38 - C:\USERS\JBULOVA\DESKTOP\205169222 CT MALE MERRIMACK, NH.GPJ

BORING NAME: AP02

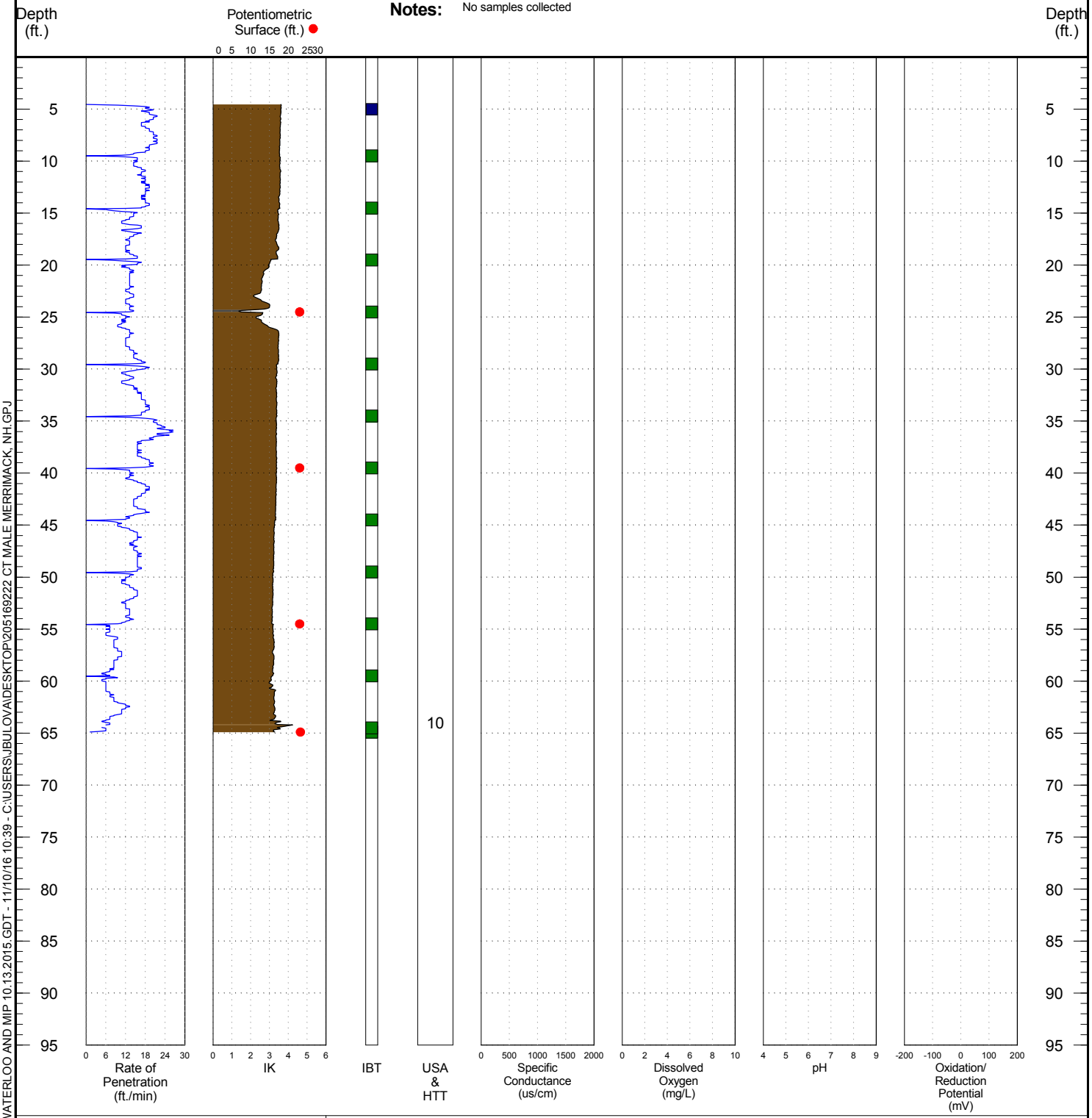
Total Depth 64.90 ft.

Waterloo APS-D™ 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
Gas Drive or Peri Pump Peri Pump

Notes: No samples collected



IK Scale

0 to 0.1
0.1 to 2
2 to 4
4 to 6
>6

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- 10 = Sudden Hard Refusal

WATERLOO APS - WATERLOO AND MIP 10.13.2015.GDT - 11/10/16 10:39 - C:\USERS\JBULOVA\DESKTOP\205169222 CT MALE MERRIMACK, NH.GPJ

BORING NAME: AP03

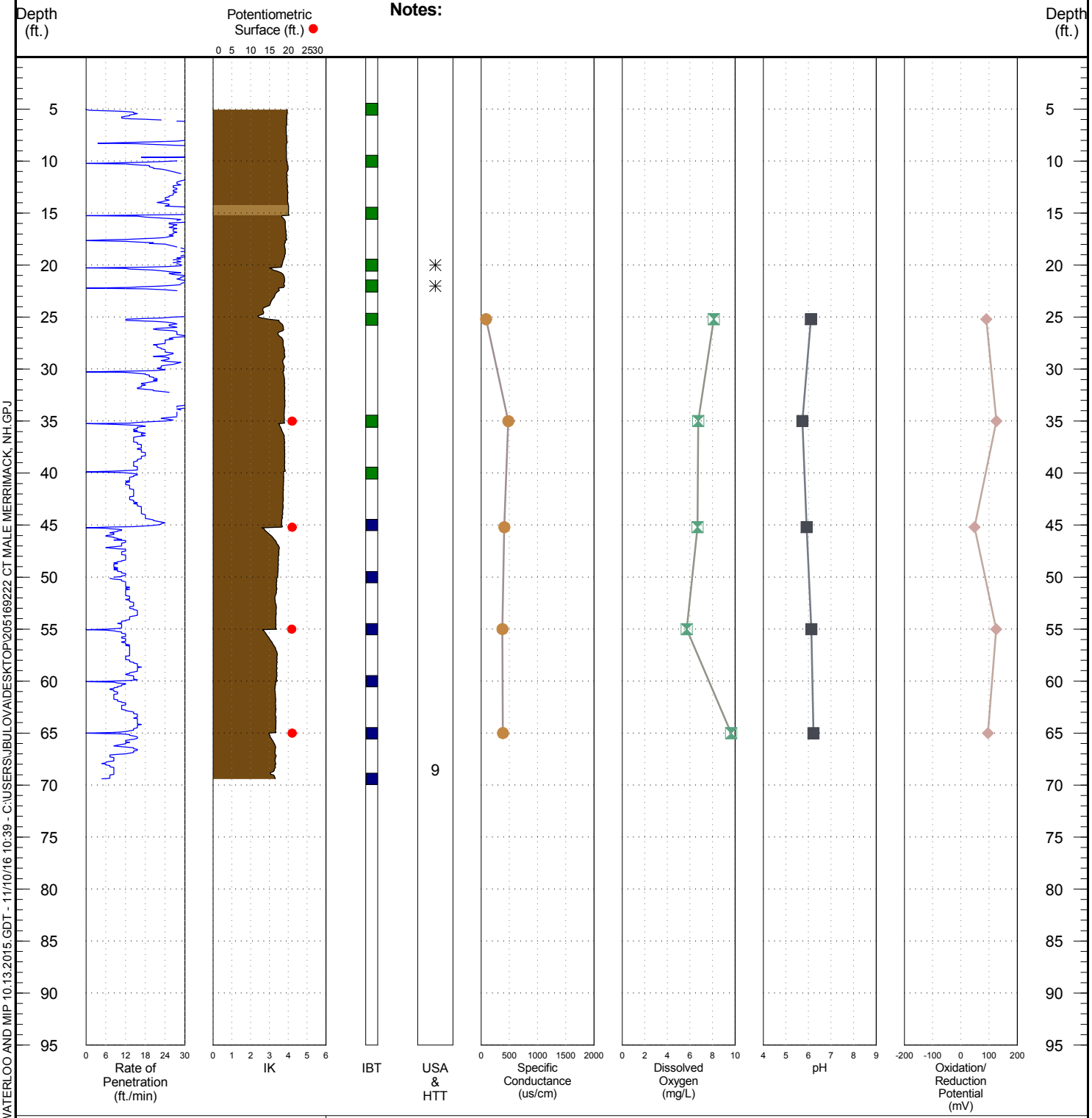
Total Depth 69.40 ft.

Waterloo APS-D™ 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
Gas Drive or Peri Pump Peri Pump

Notes:



IK Scale

0 to 0.1
0.1 to 2
2 to 4
4 to 6
>6

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- 10 = Sudden Hard Refusal

WATERLOO APS - WATERLOO AND MIP 10.13.2015.GDT - 11/10/16 10:39 - C:\USERS\JBULOVA\DESKTOP\205169222 CT MALE MERRIMACK, NH.GPJ

BORING NAME: AP04

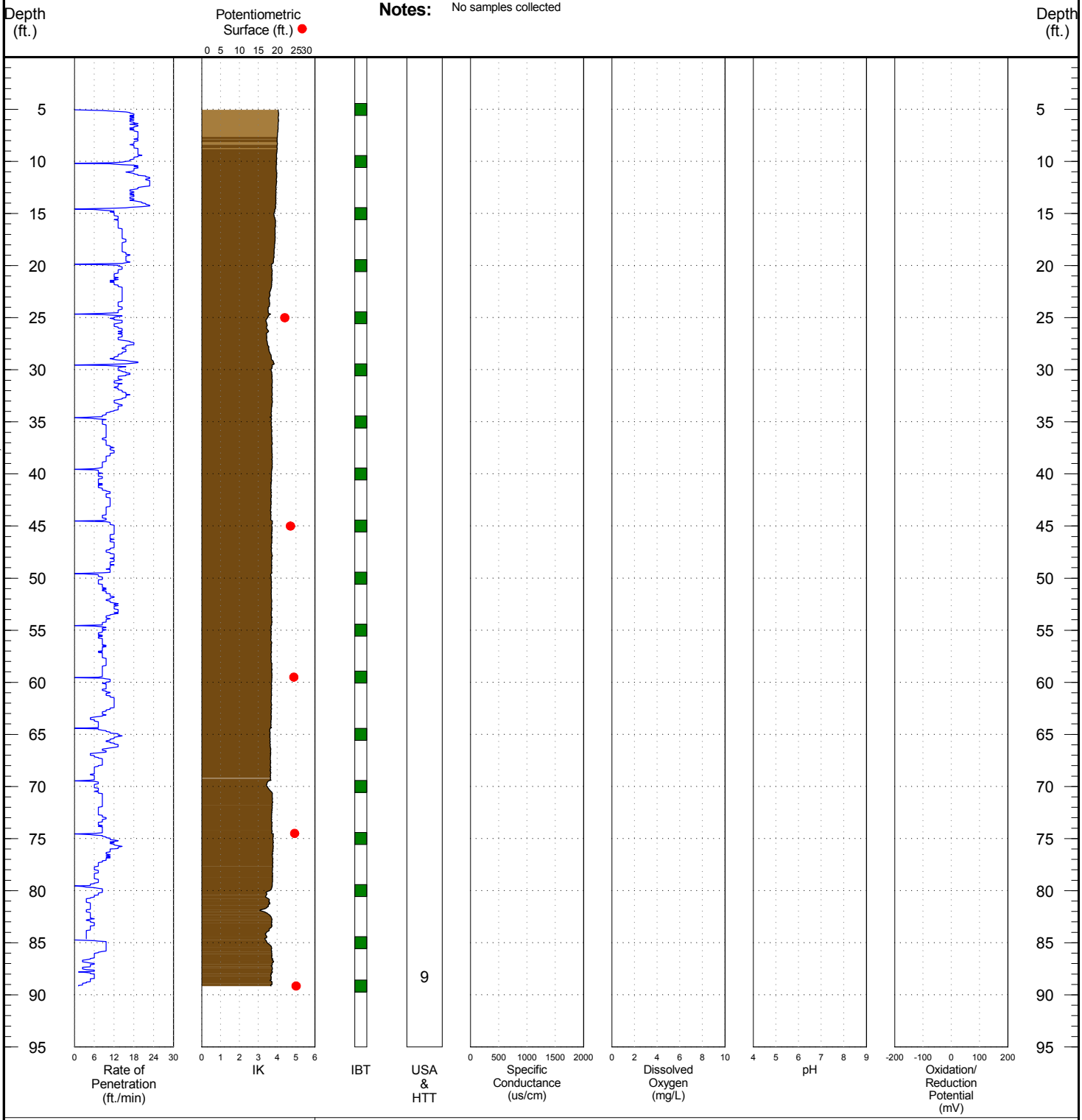
Total Depth 89.15 ft.

Waterloo APS-D™ 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
Gas Drive or Peri Pump Peri Pump

Notes: No samples collected



IK Scale

0 to 0.1
0.1 to 2
2 to 4
4 to 6
>6

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- 10 = Sudden Hard Refusal

WATERLOO APS - WATERLOO AND MIP 10.13.2015.GDT - 11/10/16 10:40 - C:\USERS\JBULOVA\DESKTOP\205169222 CT MALE MERRIMACK, NH.GPJ

BORING NAME: AP05

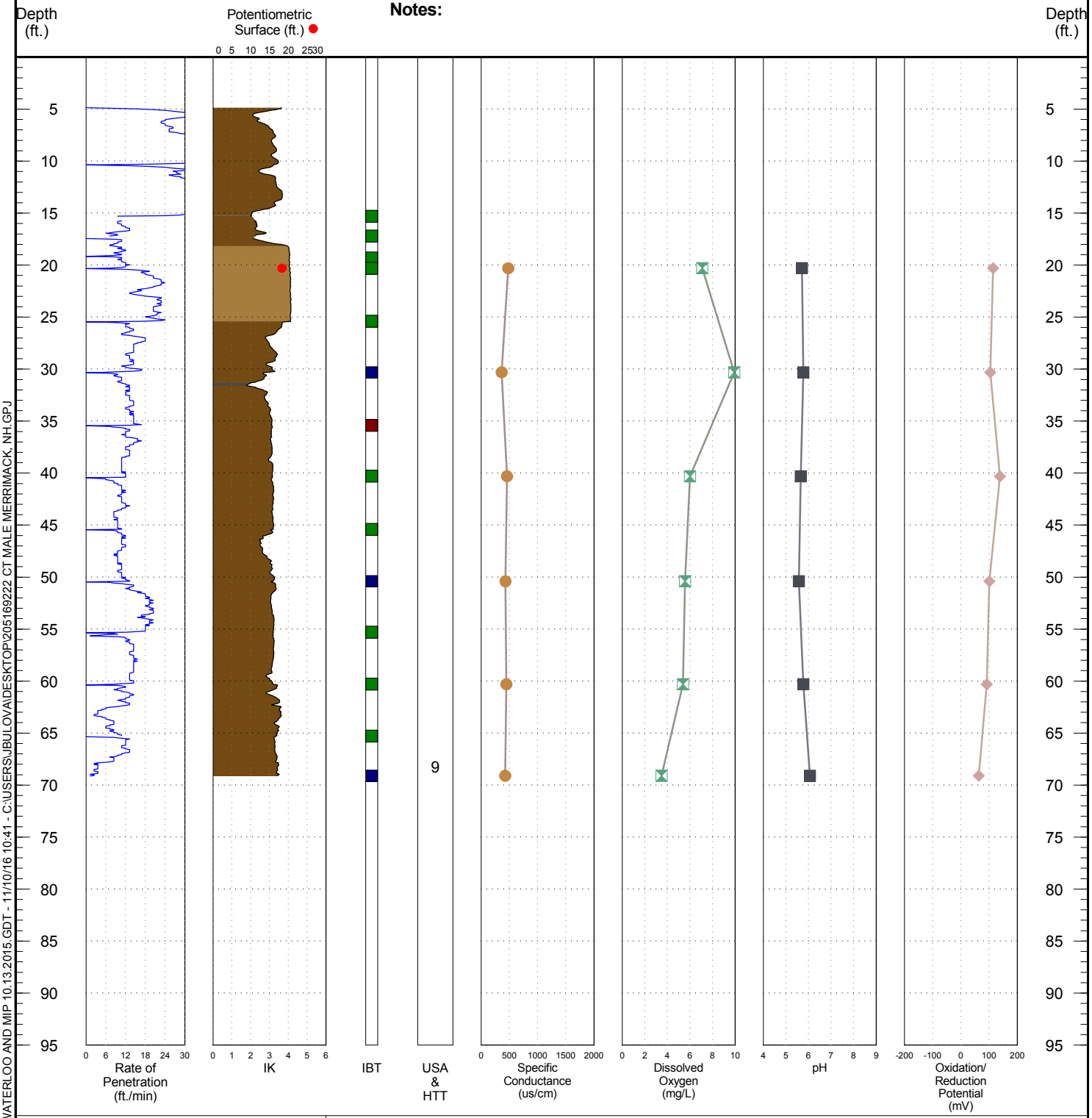
Total Depth 69.10 ft.

Waterloo APS-D™ ADVANCED PROFILING SYSTEM

Project Name CT Male Merrimack, NH
Client C.T. Male Associates
Cascade Project Number 205169222
Project Location Merrimack, NH

Date Completed 10/25/2016
Sampler(s) NFL/EC
Drilling Contractor Cascade
Gas Drive or Peri Pump Peri Pump

Notes:



IK Scale

0 to 0.1
0.1 to 2
2 to 4
4 to 6
>6

Legend

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- = IK decrease when hammer stops
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USA = Unsuccessful Sample Attempt
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- ▲ = Yield deemed too slow
- ■ = Equipment issue

HTT = Hole Termination Type
- 7 = Broken downhole equipment
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- 9 = ROP dropped below threshold
- 10 = Sudden Hard Refusal

WATERLOO APS - WATERLOO AND MIP 10.13.2015.GDT - 11/10/16 10:41 - C:\USERS\JBULOVA\DESKTOP\205169222 CT MALE MERRIMACK, NH.GPJ

BORING NAME: AP06

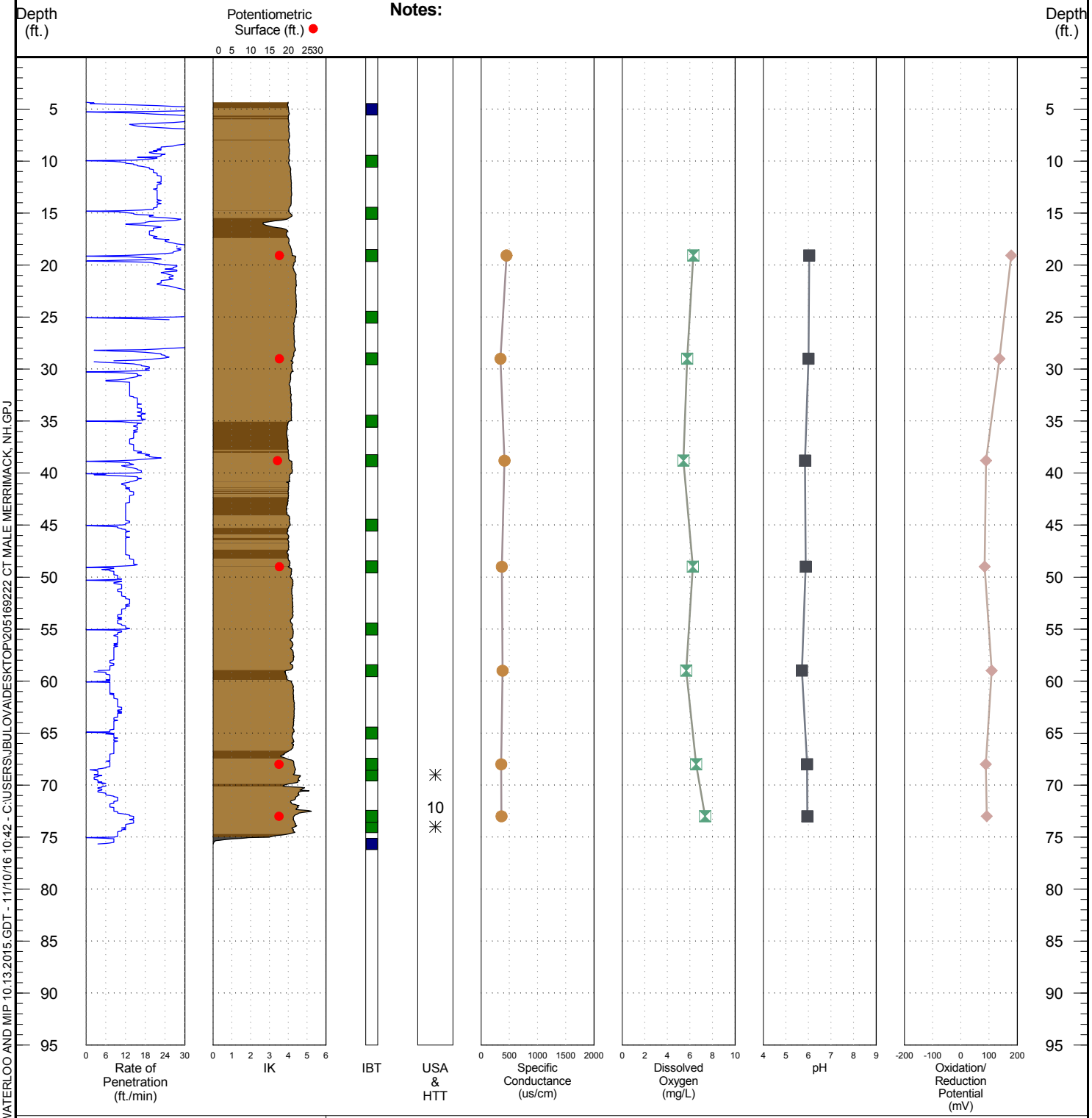
Total Depth 75.65 ft.

Waterloo APS-D™ ADVANCED PROFILING SYSTEM

Project Name CT Male Merrimack, NH
Client C.T. Male Associates
Cascade Project Number 205169222
Project Location Merrimack, NH

Date Completed 10/27/2016
Sampler(s) VLD
Drilling Contractor Cascade
Gas Drive or Peri Pump Peri Pump

Notes:



IK Scale

0 to 0.1
0.1 to 2
2 to 4
4 to 6
>6

Legend

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- 10 = Sudden Hard Refusal

WATERLOO APS - WATERLOO AND MIP 10.13.2015.GDT - 11/10/16 10:42 - C:\USERS\JBULOVA\DESKTOP\205169222 CT MALE MERRIMACK, NH.GPJ

BORING NAME: AP07

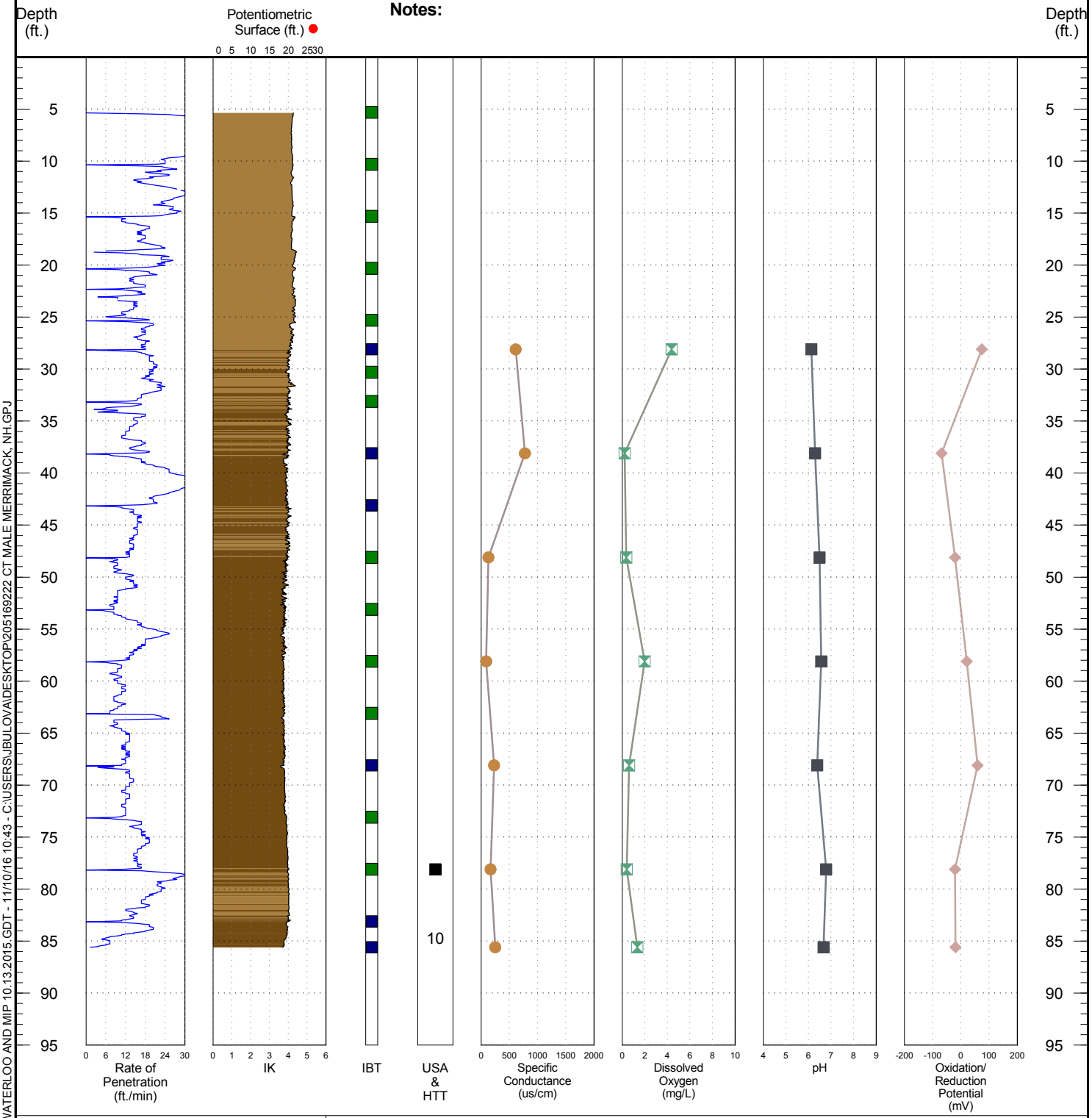
Total Depth 85.60 ft.

Waterloo APS-D™ ADVANCED PROFILING SYSTEM

Project Name CT Male Merrimack, NH
Client C.T. Male Associates
Cascade Project Number 205169222
Project Location Merrimack, NH

Date Completed 10/24/2016
Sampler(s) NFL/EC
Drilling Contractor Cascade
Gas Drive or Peri Pump Peri Pump

Notes:



IK Scale

0 to 0.1
0.1 to 2
2 to 4
4 to 6
>6

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- 10 = Sudden Hard Refusal

WATERLOO APS - WATERLOO AND MIP 10.13.2015.GDT - 11/10/16 10:43 - C:\USERS\JBULOVA\DESKTOP\205169222 CT MALE MERRIMACK, NH.GPJ

BORING NAME: AP08

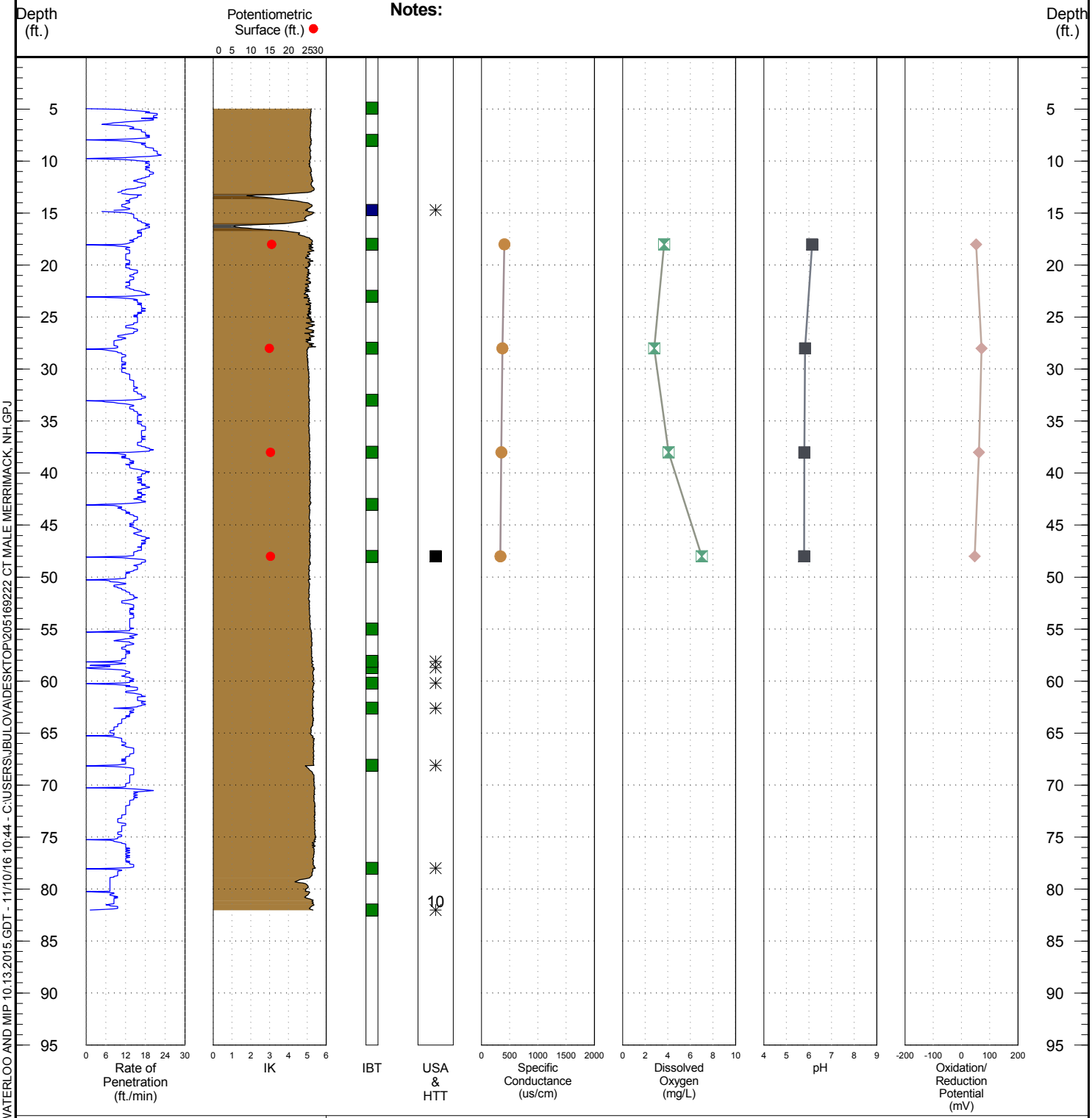
Total Depth 82.00 ft.

Waterloo APS-D™ ADVANCED PROFILING SYSTEM

Project Name CT Male Merrimack, NH
Client C.T. Male Associates
Cascade Project Number 205169222
Project Location Merrimack, NH

Date Completed 10/19/2016
Sampler(s) NFL / EC
Drilling Contractor Cascade
Gas Drive or Peri Pump Gas Drive

Notes:



IK Scale

0 to 0.1
0.1 to 2
2 to 4
4 to 6
>6

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- 10 = Sudden Hard Refusal

WATERLOO APS - WATERLOO AND MIP 10.13.2015.GDT - 11/10/16 10:44 - C:\USERS\JBULOVA\DESKTOP\205169222 CT MALE MERRIMACK, NH.GPJ

BORING NAME: AP09

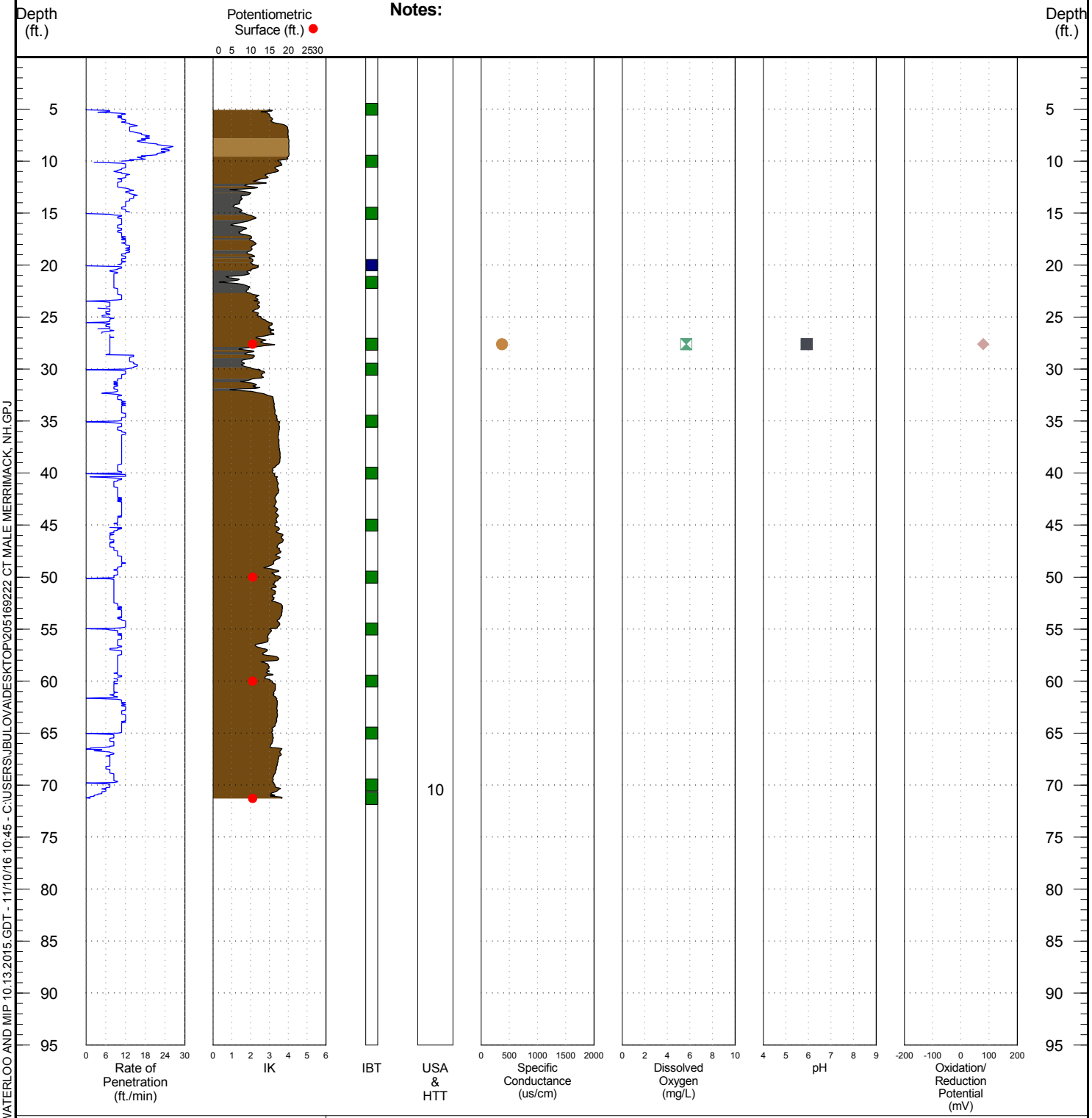
Total Depth 71.30 ft.

Waterloo APS-D™ ADVANCED PROFILING SYSTEM

Project Name CT Male Merrimack, NH
Client C.T. Male Associates
Cascade Project Number 205169222
Project Location Merrimack, NH

Date Completed 11/4/2016
Sampler(s) VLD
Drilling Contractor Cascade
Gas Drive or Peri Pump Peri Pump

Notes:



IK Scale

0 to 0.1
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WATERLOO APS - WATERLOO AND MIP 10.13.2015.GDT - 11/10/16 10:45 - C:\USERS\JBULOVA\DESKTOP\205169222 CT MALE MERRIMACK, NH.GPJ

BORING NAME: AP10

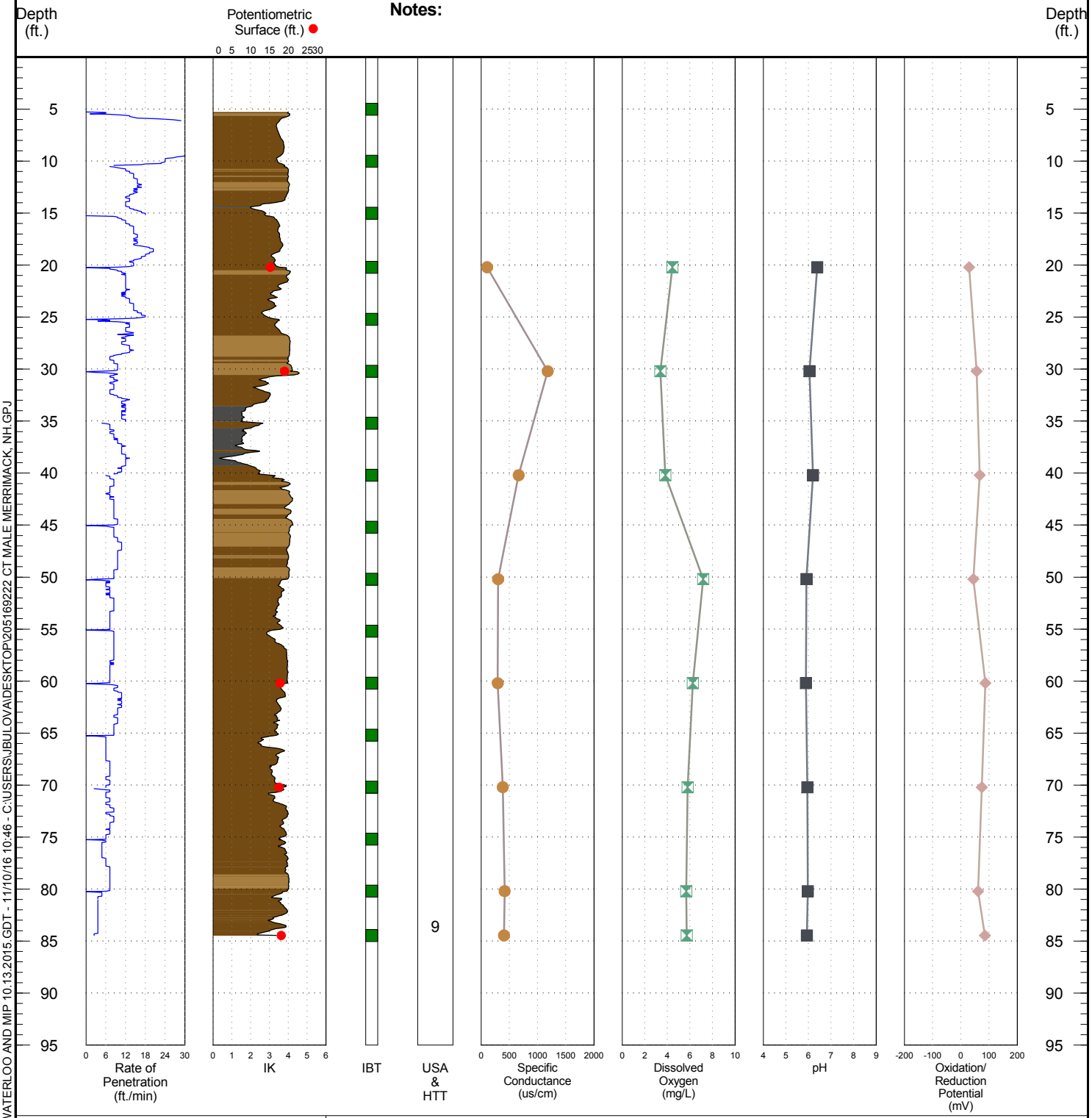
Total Depth 84.45 ft.

Waterloo APS-D™ 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
Gas Drive or Peri Pump Peri Pump

Notes:



IK Scale

0 to 0.1
0.1 to 2
2 to 4
4 to 6
>6

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WATERLOO APS - WATERLOO AND MIP 10.13.2015.GDT - 11/10/16 10:46 - C:\USERS\JBULOVA\DESKTOP\205169222 CT MALE MERRIMACK, NH.GPJ

2. PHYSIOCHEMICAL DAILY LOGS

GROUNDWATER PROFILE LOG

Client: CT Male

Profile Location: AP01

CASCADE DRILLING | TECHNICAL SERVICES

	Started	Completed				
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:	34.50
SEI #:	205169222		Drilling Contractor:	Cascade	KPRO N_2 Pressure (set via P transducer):	69.97
Sampler(s):	VLD		Average Depth to Water:	-23.55	Gas Drive Pump N_2 Pressure:	NA

PHYSICOCHEMICAL PARAMETERS

Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pH	ORP (mV)	COMMENTS
-24.50			-23.30					
-39.50			-23.80					
-54.50			>25					Cannot collect head greater than 25' bgs
No samples collected per CT Male **Upon trip out rods had broken 45' below ground surface. IK data past 87.51' most likely comprimised due to broken rods.**								

GROUNDWATER PROFILE LOG

Client: CT Male

Profile Location: AP02

CASCADE DRILLING | TECHNICAL SERVICES

	Started	Completed					
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:	34.78	
SEI #:	205169222		Drilling Contractor:	Cascade	KPRO N_2 Pressure (set via P transducer):	69.81	
Sampler(s):	VLD		Average Depth to Water:	-23.05	Gas Drive Pump N_2 Pressure:	NA	

PHYSICOCHEMICAL PARAMETERS

Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pH	ORP (mV)	COMMENTS
-24.50			-23.00					
-39.50			-23.00					
-54.50			-23.00					
-64.90			-23.20					
No samples collected per CT Male								

GROUNDWATER PROFILE LOG

Client: CT Male

Profile Location: AP03

CASCADE DRILLING | TECHNICAL SERVICES

	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 N_2 Pressure (set via P transducer):	68.56
Sampler(s):	VLD		Average Depth to Water:	-20.98	Gas Drive Pump N_2 Pressure:	NA

PHYSICOCHEMICAL PARAMETERS

Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pH	ORP (mV)	COMMENTS
-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

GROUNDWATER PROFILE LOG

Client: CT Male

Profile Location: AP04

CASCADE DRILLING | TECHNICAL SERVICES

	Started	Completed					
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		Drilling Contractor:	Cascade	KPRO N_2 Pressure (set via P transducer):	67.83	
Sampler(s):	VLD		Average Depth to Water:	-23.90	Gas Drive Pump N_2 Pressure:	NA	

PHYSICOCHEMICAL PARAMETERS

Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pH	ORP (mV)	COMMENTS
-25.00			-22.00					
-45.00			-23.50					
-59.50			-24.40					
-74.50			-24.60					
-89.15			-25.00					
No samples collected per CT Male								

GROUNDWATER PROFILE LOG

Client: CT Male

Profile Location: AP05

CASCADE DRILLING | TECHNICAL SERVICES

	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 N_2 Pressure (set via P transducer):	69.33
Sampler(s):	NFL/EC		Average Depth to Water:	-18.30	Gas Drive Pump N_2 Pressure:	NA

PHYSICOCHEMICAL PARAMETERS

Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pH	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

GROUNDWATER PROFILE LOG

Client: CT Male

Profile Location: AP06

CASCADE DRILLING | TECHNICAL SERVICES

	Started	Completed					
Dates:	10/26/2016	10/27/2016	KPRO Box Serial # / Acquisition Laptop:	800/ Rasc 6	Gas Drive or Peri Pump:	Peri Pump	
Location:	Merrimack, NH		Sonde Serial #:	YSI 4024	Atmospheric Pressure:	35.31	
SEI #:	205169222		Drilling Contractor:	Cascade	KPRO N_2 Pressure (set via P transducer):	68.2	
Sampler(s):	VLD		Average Depth to Water:	-17.48	Gas Drive Pump N_2 Pressure:	NA	

PHYSICOCHEMICAL PARAMETERS

Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pH	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
-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

GROUNDWATER PROFILE LOG

Client: CT Male

CASCADE DRILLING | TECHNICAL SERVICES

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	
SEI #:	205169222		Drilling Contractor:	Cascade	KPRO N_2 Pressure (set via P transducer):	70.34	
Sampler(s):	NFL/EC		Average Depth to Water:	NC	Gas Drive Pump N_2 Pressure:	60-80	

PHYSICOCHEMICAL PARAMETERS

Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pH	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

GROUNDWATER PROFILE LOG

Client: CT Male

Profile Location: AP08

CASCADE DRILLING | TECHNICAL SERVICES

	Started	Completed				
Dates:	10/17/2016	10/19/2016	KPRO Box Serial # / Acquisition Laptop:	800/Rasc 6	Gas Drive or Peri Pump:	Gas Drive
Location:	Merrimack, NH		Sonde Serial #:	YSI 4024	Atmospheric Pressure:	34.53
CTS #:	205169222		Drilling Contractor:	Cascade	KPRO N_2 Pressure (set via P transducer):	68.81
Sampler(s):	NFL / EC		Average Depth to Water:	-15.20	Gas Drive Pump N_2 Pressure:	60-80

PHYSICOCHEMICAL PARAMETERS

Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pH	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	

GROUNDWATER PROFILE LOG

Client: CT Male

Profile Location: AP09

CASCADE DRILLING | TECHNICAL SERVICES

Dates: Started 11/4/2016 Completed 11/4/2016	KPRO Box Serial # / Acquisition Laptop: 800/Rasc6	Gas Drive or Peri Pump: Peri Pump
Location: Merrimack, NH	Troll Serial #: YSI 4024	Atmospheric Pressure: 34.62
SEI #: 205169222	Drilling Contractor: Cascade	KPRO N_2 Pressure (set via P transducer): 68.94
Sampler(s): VLD	Average Depth to Water: -10.50	Gas Drive Pump N_2 Pressure: NA

PHYSICOCHEMICAL PARAMETERS

Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pH	ORP (mV)	COMMENTS
-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					

GROUNDWATER PROFILE LOG

Client: CT Male

CASCADE DRILLING | TECHNICAL SERVICES

Profile Location: AP10

	Started	Completed					
Dates:	11/2/2016	11/3/2016	KPRO Box Serial # / Acquisition Laptop:	800/ Rasc 6	Gas Drive or Peri Pump:	Peri Pump	
Location:	Merrimack, NH		Sonde Serial #:	YSI 4024	Atmospheric Pressure:	34.67	
SEI #:	205169222		Drilling Contractor:	Cascade	KPRO N_2 Pressure (set via P transducer):	70.52	
Sampler(s):	VLD		Average Depth to Water:	-17.52	Gas Drive Pump N_2 Pressure:	NA	

PHYSICOCHEMICAL PARAMETERS

Depth (ft)	Date / Time	Volume Purged (mL)	Head (ft)	SC (uS/cm)	DO (PPM)	pH	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
-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	11/3/16 16:31	600	-18.10	404	5.70	5.93	85	Turbidity 1.58