DES Waste Management Division 29 Hazen Drive; PO Box 95 Concord, NH 03302-0095

SPRING 2019 PFAS RECEPTOR SAMPLING REPORT

Tamworth Town Landfill
Durrell Road
Tamworth, NH 03886
NHDES Site #: 198704017
Project Type: GWP
Project Number: 135

Prepared For:
Town of Tamworth
84 Main Street
Tamworth, NH 03886
Phone Number (603) 323-7525
RP Contact Name: Board of Selectmen

RP Contact Email: admin@tamworthnh.org

Prepared By:
HEB Engineers, Inc.
PO Box 440
North Conway, NH 03860
Phone Number: (603) 356-6936

Contact Name: Jay J. Poulin, PE Contact Email: jpoulin@hebengineers.com

Date of Report: April 29, 2019

JAY JAY No. HOLLING



SPRING 2019 PFAS RECEPTOR SAMPLING REPORT

TAMWORTH LANDFILL, TAMWORTH, NEW HAMPSHIRE

NHDES GWP#198704017-T-005

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Town of Tamworth Tamworth Landfill, Durrell Road, Tamworth, NH Spring 2019 PFAS Receptor Sampling Report NHDES GWP#198704017-T-005 HEB Project #2000-097

I. BACKGROUND INFORMATION

A Groundwater Management Permit (GMP) was originally issued for the Tamworth Landfill on March 13, 1998 and revised December 27, 1999. The permit was renewed on November 24, 2008 and revised July 6, 2012. The permit was last renewed on February 4, 2019. To ensure adequate monitoring of the flow paths, the following sampling sites have been established: one up-gradient monitoring well (MW-1A) and three down-gradient monitoring wells (MW-2A, MW-3 and MW-4). In addition, there is one down-gradient surface water monitoring site (SW-2). The proposed Groundwater Management Zone (GMZ) and the location of well and surface water sampling points are depicted on the site plan prepared by HEB Engineers, Inc. (HEB) included in Appendix A.

In May 2017, the New Hampshire Department of Environmental Services (NHDES) notified the Town of Tamworth that all landfills subject to groundwater monitoring requirements would be required to complete an initial screening for the presence of per- and/or polyfluoroalkyl substances (PFAS). This initial screening was completed at the Tamworth Landfill in the fall of 2018, and results were submitted to NHDES on January 10, 2019. Exceedances of Ambient Groundwater Quality Standards (AGQS) found within the initial screening results necessitated the creation of a receptor survey for the area surrounding the landfill. NHDES reviewed and approved of the receptor survey (Appendix B) and investigatory sampling plan (Appendix C). Subsequently, investigatory sampling was coordinated at five nearby drinking water wells to evaluate the potential for off-site PFAS contamination.

Sampling locations were prioritized based on property use, presence of potentially sensitize human subpopulations, proximity to the landfill, and topography (downgradient sites were considered high priority). While the Receptor Survey (Appendix B) marks four sites as locations of potentially sensitive human subpopulations, Lot 206-85 (Kenneth A. Brett School) and Lot 206-65 (Tamworth Pre-School) were not included in the investigatory sampling plan. According to NHDES,

"Tamworth Pre-school (Parcel ID: 206-65) was previously sampled by NHDES during the Initial Public Water System Test for PFOA and PFOS on December 13, 2016. Results from the Tamworth Pre-school did not detect PFOA or PFOS above laboratory detection limits, <2 ng/L and <4 ng/L, respectively. Based on these prior results, and the location of the pre-school in an area that does not appear to be directly downgradient from the landfill, we do not require re-sampling of this well at this time."

-Jarred Swiontek, Email Correspondence, Feb. 28, 2019

Based on topography and relative distance from the landfill site and at the discretion of Town of Tamworth officials, Lot 206-85 was not included in the investigatory sampling.

II. RESULTS DISCUSSION

HEB received results on April 4, 2019 for samples collected at sites in the vicinity of the closed Tamworth Landfill on March 14, 2019 by Eastern Analytical, Inc. A total of five samples were collected from three different properties:

- One sample was collected from the Tamworth Recreation Department property (Lot 415-92) well. Results for this sample were non-detect (ND) for the 9 compounds analyzed.
- One sample was collected from the well on a property owned by Gail & Anthony Marrone (Lot 415-96). Results for this sample were non-detect (ND) for the 9 compounds analyzed.
- Three samples were collected from the Public Water System that supplies the Tamworth Mobile Home Park (Lot 415-90). The three wells that serve this system were sampled individually. Results for theses samples were non-detect (ND) for the 9 compounds analyzed.

In summary, no PFAS substances were detected through the analyses performed for these samples.

Town of Tamworth Tamworth Landfill, Durrell Road, Tamworth, NH Spring 2019 PFAS Receptor Sampling Report NHDES GWP#198704017-T-005 HEB Project #2000-097 April 29, 2019 Page 3 of 3

Analyses were performed by Vista Analytical Laboratory and reports were compiled by Eastern Analytical, Inc. Lab reports are included in Appendix D.

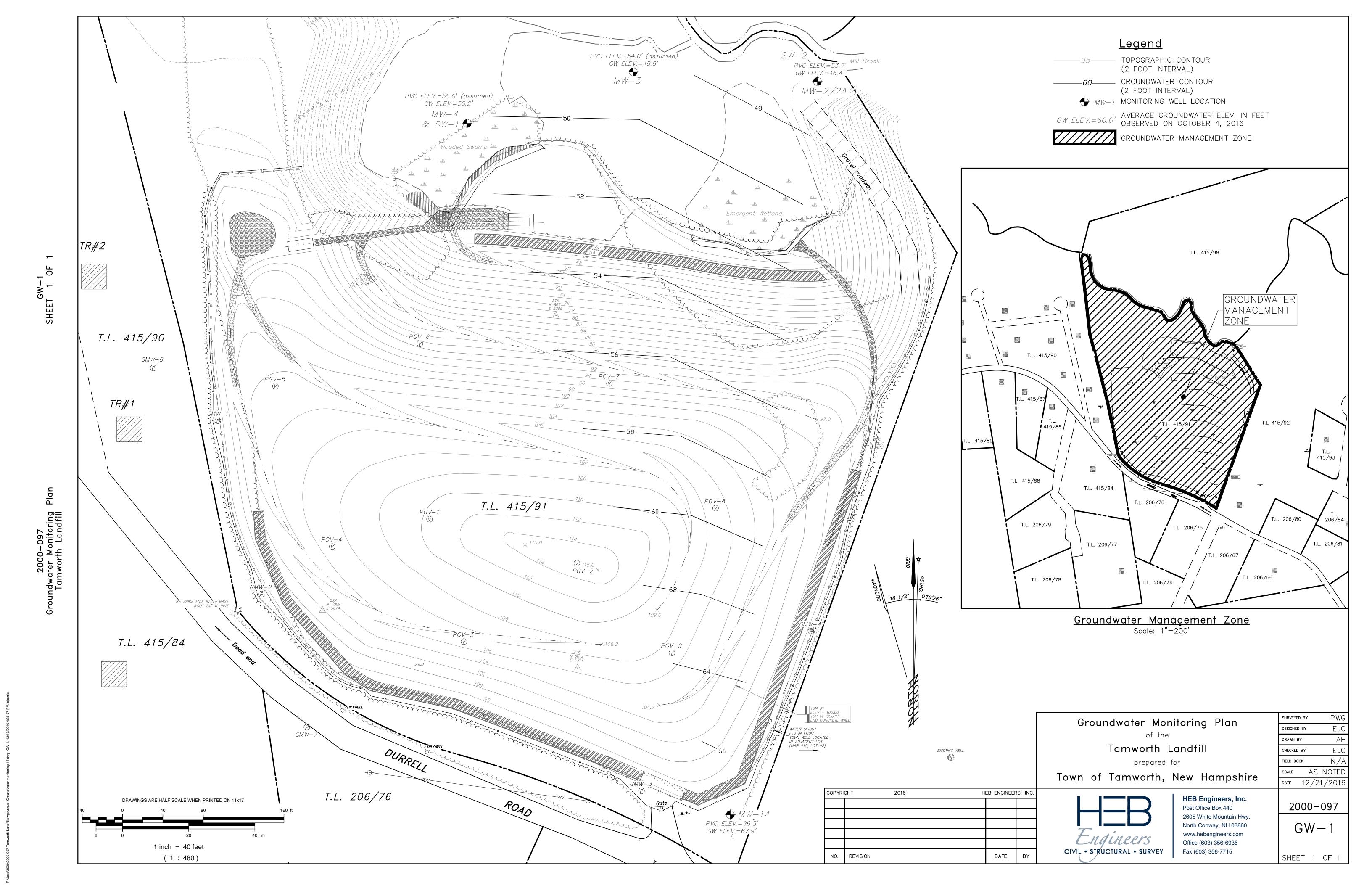
III. RECOMMENDATIONS

Based on the results described above, HEB has no further recommendations with regard to PFAS sampling at this time. At a minimum, routine groundwater monitoring should be continued in accordance with NHDES GWP#198704017-T-005. Additional sampling will be considered as required by NHDES. Should routine monitoring results display concerning concentrations or exceedances of AGQS, HEB will revise recommendations accordingly.

P:\Jobs\2000\2000-097 Tamworth Landfill\GROUNDWATER MONITORING\PFAS Testing\Data to Upload to NHDES 04-25-19\PFAS Receptor Survey Sampling Report 04-29-19.doc

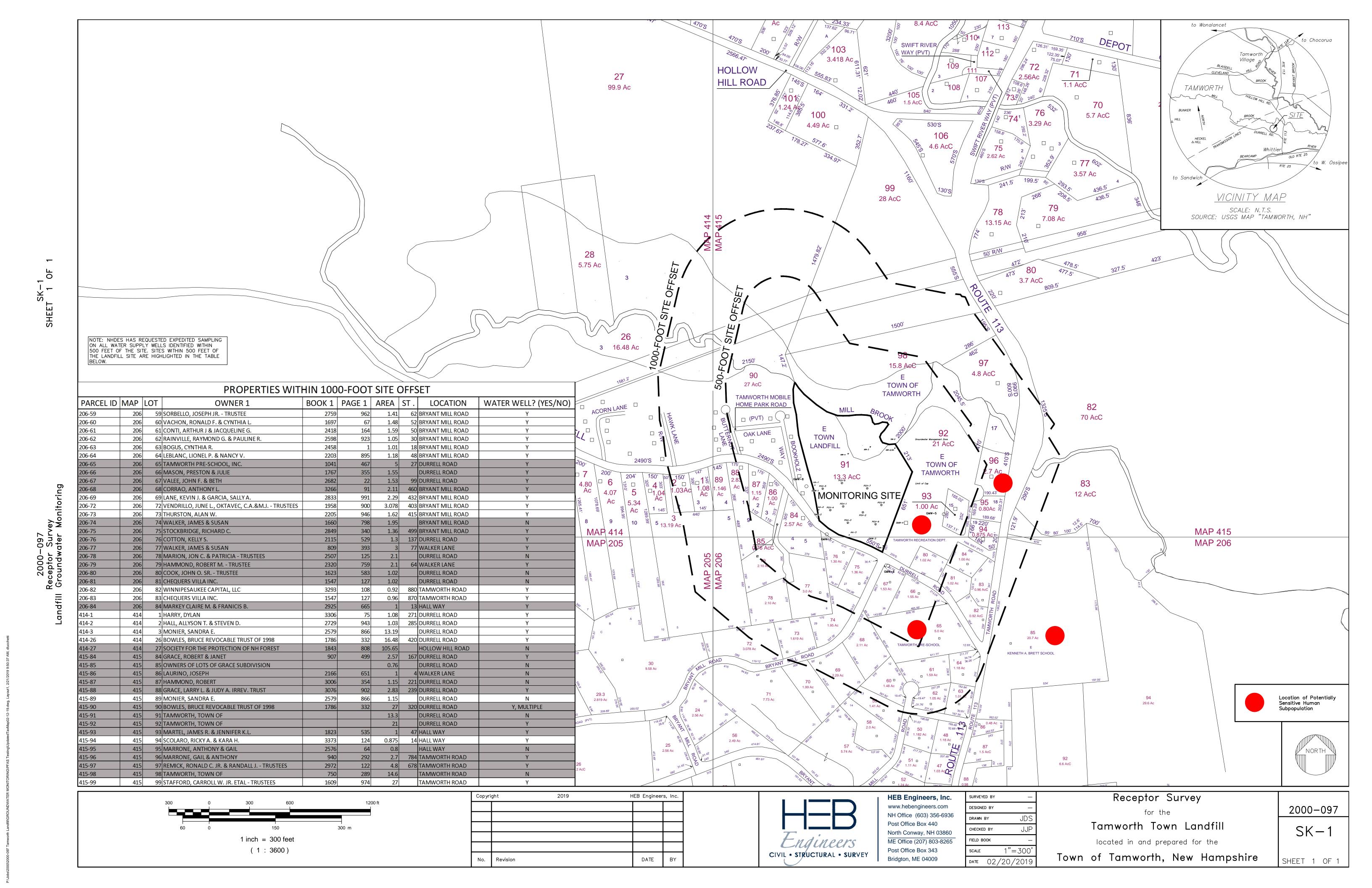
APPENDIX A

Groundwater Monitoring Plan



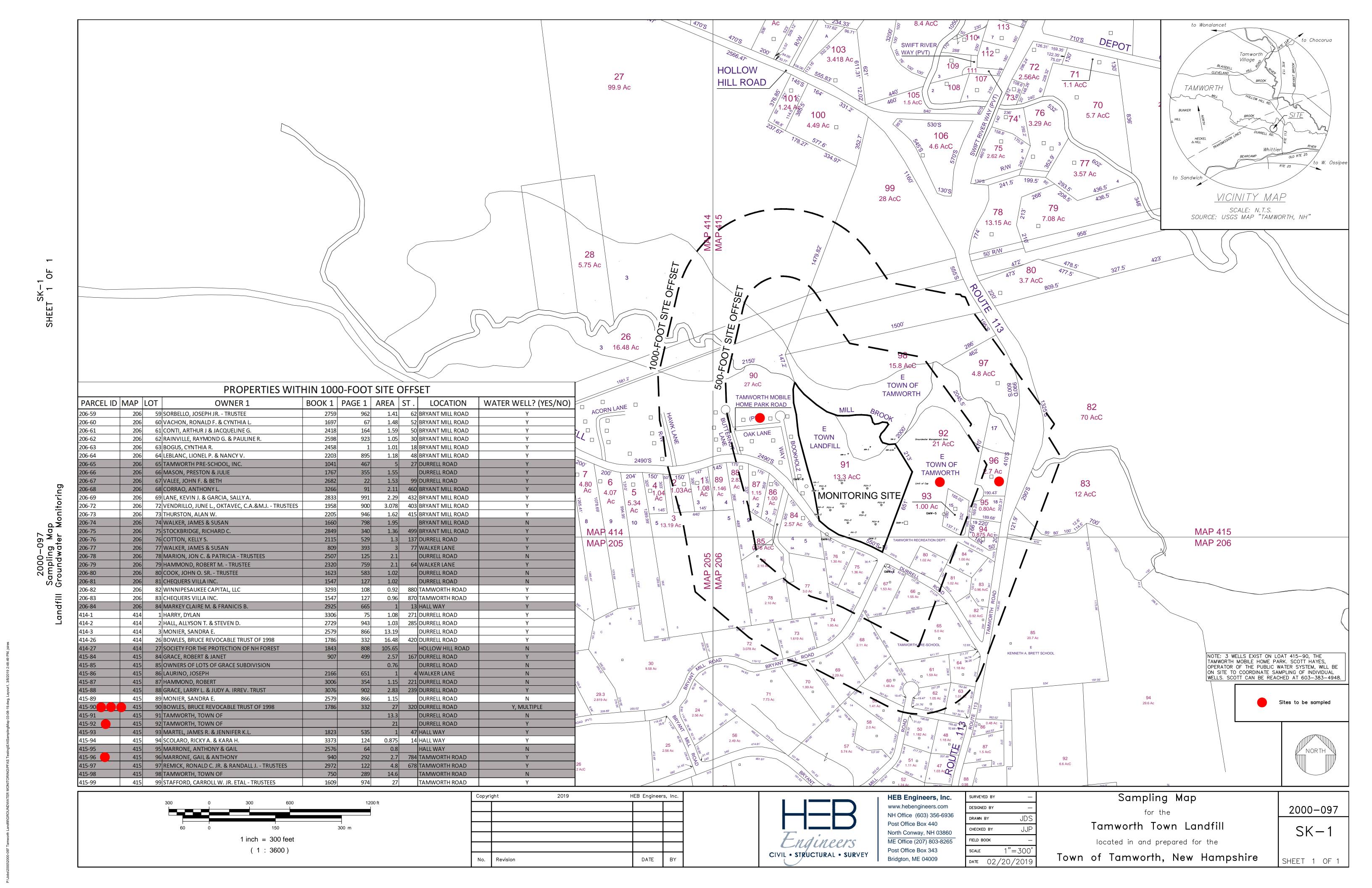
APPENDIX B

Receptor Survey



APPENDIX C

Sampling Map



APPENDIX D

Eastern Analytical, Inc. Lab Reports



Jeff Sires
HEB Engineers, Inc.
2605 White Mountain Highway, PO Box 440
North Conway, NH 03860



Subject: Laboratory Report

Eastern Analytical, Inc. ID: 193015

Client Identification: Tamworth LF PFAS Monitoring

Date Received: 3/14/2019

Dear Mr. Sires:

Enclosed please find the report of analysis for the above identified project. As discussed, analyses were subcontracted and are listed as follows:

Analysis: Subcontract - Perfluorinated Compounds EPA 537 (9

Compounds) Vista

Subcontractor Lab: Vista Analytical Laboratory

A complete copy of the report is attached. This report may not be reproduced except in full, without the written approval of the laboratory.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director

Date # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE



EAI ID#: 193015

Client: HEB Engineers, Inc.

Client Designation: Tamworth LF PFAS Monitoring

Temperature upon receipt (°C): 3.6

Received on ice or cold packs (Yes/No): Y

Acceptable temperature range (°C): 0-6

Sample ID

Lab ID

Date Date Sample % Dry

Received Sampled Matrix Weight Exceptions/Comments (other than thermal preservation)

193015.01 Rec Dept. 3/14/19

1/19 3/14/19 aqueous Adhe

Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.

Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

- 1) EPA 600/4-79-020, 1983
- 2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
- 3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
- 4) Hach Water Analysis Handbook, 4th edition, 1992



2

April 03, 2019

Vista Work Order No. 1200497

Ms. Jennifer Laramie Eastern Analytical, Inc. 25 Chennell Drive Concord, NH 03301

Dear Ms. Laramie,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on March 20, 2019 under your Project Name '193015 NH'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Cather.

Sincerely,

Martha Maier

Laboratory Director



Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

Vista Work Order No. 1900497 Case Narrative

Sample Condition on Receipt:

One aqueous sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

PFAS Isotope Dilution Method

The sample was extracted and analyzed for a selected list of PFAS using Modified EPA Method 537. The results for PFHxS, PFOA and PFOS include both linear and branched isomers. Results for all other analytes include the linear isomers only.

Holding Times

The sample was extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above the Reporting Limit. The OPR recoveries were within the method acceptance criteria.

The recoveries of all internal standards in the QC and field samples were within the acceptance criteria.

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Sample Inventory Report

Vista Sample ID

1900497-01

Client Sample ID

Rec Dept.

Sampled

Received

Components/Containers

14-Mar-19 11:45

20-Mar-19 11:18

HDPE Bottle, 125 mL HDPE Bottle, 125 mL

Vista Project: 1900497

Client Project: 193015 NH

ANALYTICAL RESULTS



	When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both	When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include	PFOA, PFOS, Me	orted, PFHxS, F	When rep		Results reported to RL.	RL - Reporting limit	RL -	
_	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		60 - 130	88.7	IS		13C8-PFOS
, -	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		50 - 130	80.1	15		13CS-PFNA
1	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		60 - 130		IS		13CZ-PFOA
	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		60 - 130	85,6			1802-PFHxS
_	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150	months and administration of the contents of the force of the contents of the force	60 - 150	83.9		Colored months and an analysis of colored control of the colored color	13C4-PFHpA
	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		70 - 130	96,9	ı S		13C2-PFHxA
_	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		60 - 150	109	SI		13C3-PFBS
-	28-Mar-19 17:45	$0.125\mathrm{L}$	26-Mar-19	B9C0150		60 - 150	92.9	S		13C3-PFPeA
_	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		60 - 130		IS	Halliand the state of the state	13C3-PFBA
Dilution	Analyzed I	Samp Size	Extracted	Batch	Qualifiers	Limits	% Recovery	Туре	ırds	Labeled Standards
1	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150	0	4.00	ND	1763-23-1		PFOS
ъ	28-Mar-19 17:45	$0.125\mathrm{L}$	26-Mar-19	B9C0150	0	4.0	ND	375-95-1	Antonia de la companya del companya de la companya del companya de la companya de	PFNA
-	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150	0	4.0	Ŋ	335-67-1		PFOA
	28-Mar-19 17:45	$0.125\mathrm{L}$	26-Mar-19	B9C0150		4.0		355-46-4	of 2001, 3 No. 501 (1988). Command addresses the below and in our Assesses and	PFHXS
	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150	0.11	4,0	ND	375-85-9		PFHpA
 -	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150	0	4.00		307-24-4		PFHxA
	28-Mar-19 17:45	$0.125\mathrm{L}$	26-Mar-19	B9C0150	0	4.0	Ą	375-73-5		PFBS
_	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150	0	4.0	ND	2706-90-3		PFPeA
1	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150	0	4.00	ND	375-22-4	And the second control of the second of the	PFBA
Dilution	Analyzed	Samp Size	Extracted	Batch	L Qualifiers	RL	Conc. (ng/L)	CAS Number	observant i kalt susualitetta sii ka susutaanatkitseeda liitteeta kaltaiseta kandassa ka	Analyte
	BEH C18	Column:	BLK1	B9C0150-BLK1	Laboratory Data Lab Sample:	Aqueous	Matrix: Aq	Ċ.	Eastern Analytical, Inc 193015 NH	Client Data Name: Project:
1ethod	PFAS Isotope Dilution Method	PFAS Iso							Sample ID: Method Blank	Sample ID: N
	,									

When reported, PFHXS, PFOA, PFOS, MeFOSAA and EffOSAA include bo linear and branched isomers. Only the linear isomer is reported for all other analytes.



Sample ID: OPR									PFAS Iso	PFAS Isotope Dilution Method	Method
Client Data						Laboratory Data					
Name: Eas Project: 193	Eastern Analytical, Inc. 193015 NH		Matrix:	Aqueous		Lab Sample:	B9C0150-BS1	BS1	Column:	BEH C18	
Analyte		CAS Number	Amt Found (ng/L)	Spike Amt %	% Rec L	Limits Qualifiers	Batch	Extracted	Samp Size	Analyzed I	Dilution
PFBA		375-22-4	82.4	80.0	103 7	70 - 130	B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:34	
PFPeA		2706-90-3	86.3		o de la companya de l	0 - 130	B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	1
PFBS		375-73-5	83.2			70 - 130	B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	H
PFHxA		307-24-4	82.3			70 - 130	B9C0150	B9C0150 26-Mar-19	0.125 L :	28-Mar-19 17:34	1
РЕНрА		375-85-9	79:1	80.0	98.9 7	70 - 130	B9C0150 26-Mar-19	26-Mar-19	0.125 L	28-Mar-19 17:34	
PFHxS		355-46-4	85.0			0 - 130	B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	-
PFOA		335-67-1	76.9			70 - 130	B9C0150 26-Mar-19	26-Mar-19	0.125 L	28-Mar-19 17:34	
PFNA	or continuous finales and protection of the finales and finales an	375-95-1	84.1			70 - 130	B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	-
PFOS		1763-23-1	59.6	80.0	74.6 7	70 - 130	B9C0150	B9C0150 26-Mar-19	$0.125\mathrm{L}$	28-Mar-19 17:34	1
Labeled Standards			Type	9	% Rec L	Limits Qualifiers	Batch	Extracted	Samp Size	Analyzed I	Dilution
13C3-PFBA	or done mornidadio editi dimani dinamini		IS			60- 130	B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:34	1
13C3-PFPeA			SI			60-150	B9C0150	B9C0150 26-Mar-19	0.125 L :	28-Mar-19 17:34	
13C3-PFBS	oniantrodución en com un cabanimistica laboran	et en inchlierken nordlicher ihabere toppe merein klassenningen	IS			0- 150	B9C0150	B9C0150 26-Mar-19	0.125 L 2	28-Mar-19 17:34	_
13C2-PFH _x A			IS			0- 130	B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	-
13C4-PFHpA	anni danini tanin diamanananananana i mamanananananana	natural del de la company de l	IS			0- 150	B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:34	Н
1802-PFHxS			IS		79.7 6	60- 130	B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34)—>
13C2-PFOA			SI			60- 130	B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:34	
13C5-PFNA			IS			0- 130	B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	
13C8-PFOS			IS		117 6	60- 130	B9C0150	26-Mar-19	0.125 L 2	28-Mar-19 17:34	<u>,</u>

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Client Data				Laboratory Data					
Name: Eastern Ana Project: 193015 NH	Eastern Analytical, Inc. 193015 NH	Matrix: Date Collected:	Aqueous 14-Mar-19 11:45	Lab Sample: Date Received:	1900497-01 20-Mar-19 11:18	11:18	Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)		RL Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	MD		4.22	B9C0150	26-Mar-19	0.119 L	28-Mar-19 21:47	
PFPeA	2706-90-3	ND		4.22	5	26-Mar-19	0.119 L	28-Mar-19 21:47	
PFBS	375-73-5	ð		4.22	в9С0150	26-Mar-19	0,119 L	28-Mar-19 21:47	
IxA	307-24-4	ND		4.22	B9C0150	26-Mar-19	0.119 L	28-Mar-19 21:47	-
ΙpΑ	375-85-9	Ð		4.22	B9C0150	26-Mar-19	0,119 L	28-Mar-19 21:47	
PFHxS			de trifferen en ende draid Vande die van verland des jeste de 15 Me	4.22		26-Mar-19	0.119 L	28-Mar-19 21:47	_
A	335-67-1	D		4.22	B9C0150 26-Mar-19	26-Mar-19	0.119L	28-Mar-19 21:47	1
PFNA	375-95-1	ND	e mirjon softweight gaminging gamin dathde maradatalianged consequences	4.22	B9C0150	26-Mar-19	$0.119\mathrm{L}$	28-Mar-19 21:47	_
S	1763-23-1	ND		4.22	B9C0150	26-Mar-19		28-Mar-19 21:47	1
Labeled Standards	Туре	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed I	Dilution
l3C3-PFBA		96.0	60 - 130		B9C0150	26-Mar-19	$0.119\mathrm{L}$	28-Mar-19 21:47	1
3C3-PFPeA	IS	94.5	60 - 150		B9C0150 26-Mar-19	26-Mar-19	$0.119\mathrm{L}$	28-Mar-19 21:47	
3C3-PFBS	SI	108	60 - 150	andria, as a flavorization and the American file of the form of th	B9C0150	26-Mar-19	$0.119\mathrm{L}$	28-Mar-19 21:47	_
3C2-PFHxA	\$	97.3	70 - 130		B9C0150	26-Mar-19	0.119 L	28-Mar-19 21:47	
3C4-PFHpA		92.2	60 - 150	a from accountry condition contribution and at some consider consenses	B9C0150	26-Mar-19	$0.119\mathrm{L}$	28-Mar-19 21:47	1
8OZ-PHHXS	\$	98.5	60 - 130		B9C0150	26-Mar-19	0.119 L	28-Mar-19 21:47	_
3C2-PFOA	SI		60 - 130		B9C0150	26-Mar-19	$0.119\mathrm{L}$	28-Mar-19 21:47	_
3C3-PFNA	2	84.7	50 - 130		B9C0150 26-Mar-19	26-Mar-19	0.119 L	28-Mar-19 21:47	<u>.</u>
3C8-PFOS	SI	94.1	60 - 130		B9C0150 26-Mar-19	26-Mar-19	$0.119\mathrm{L}$	28-Mar-19 21:47	_

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DATA QUALIFIERS & ABBREVIATIONS

B This compound was also detected in the method blank

Conc. Concentration

D Dilution

DL Detection limit

E The associated compound concentration exceeded the calibration range of the

instrument

H Recovery and/or RPD was outside laboratory acceptance limits

I Chemical Interference

J The amount detected is below the Reporting Limit/LOQ

LOD Limits of Detection

LOQ Limits of Quantitation

M Estimated Maximum Possible Concentration (CA Region 2 projects only)

NA Not applicable

ND Not Detected

P The reported concentration may include contribution from chlorinated diphenyl

ether(s).

Q The ion transition ratio is outside of the acceptance criteria.

TEQ Toxic Equivalency

U Not Detected (specific projects only)

* See Cover Letter

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

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Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	19-013-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1521520
New Hampshire Environmental Accreditation Program	207718
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-010
Pennsylvania Department of Environmental Protection	015
Texas Commission on Environmental Quality	T104704189-19-10
Virginia Department of General Services	9618
Washington Department of Ecology	C584-19
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

Work Order 1900497 Page 10 of 14 **11**

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	Method
Determination of Polychlorinated p-Dioxins & Polychlorinated	EPA 23
Dibenzofurans	
Determination of Polychlorinated p-Dioxins & Polychlorinated	EPA TO-9A
Dibenzofurans	

MATRIX: Biological Tissue	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope	EPA 1613B
Dilution GC/HRMS	
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue	EPA 1668A/C
by GC/HRMS	
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by	EPA 1699
HRGC/HRMS	
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by	EPA 8280A/B
GC/HRMS	
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	8290/8290A

MATRIX: Drinking Water	
Description of Test	Method
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA
	1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated	EPA 8280A/B
Dibenzofurans by GC/HRMS	
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	8290/8290A

MATRIX: Solids	
Description of Test	Method
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	8290/8290A

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Work Order 1900497 Page 12 of 14

CHAIN-OF-CUSTODY RECORD

Sample ID

Date Sampled Matrix

aParameters



Museum Andyting, 1104

professional laboratory and drilling services

EAIID# 193015 Sample Notes

Page 1

Rec Dept 3/14/2019 aqueous | Subcontract - Perfluctinated Compounds EPA Method 537 (9 Compounds)

Phor	Account#	Address	Address	Compa		EAID
Phone # (916) 673-1520	14#	ss El Dorado Hills, CA 95762	ss 1104 Windfield Way	Company Vista Analytical Laboratory	Pro	EAI ID# 193015 Project
-			······································		Project ID: QC De	Project State: NH Kesul
		แหน่เฉลาใน customerservice@easternane/lytical.com.	Email login confirmation, pdf of results and	Notes about project:	QC Deliverables NA TA+ TR TR+ TR TWO NOR	RUSH Dire Date: Standard
Kelinguished by	(Marie Johnson	Samples Collected I	Call prior to analyzin	Excel NH EMID E		PO#:49736

ale;	PO #:49736 EAI ID# 193015
O MA MCP	Data Deliverable (circle) Excel NH EMD EQuIS ME EGAD
results and ernanelytical.com.	Call prior to analyzing, if RUSH charges will be applied. Samples Collected by:

Eastern Analytical, Inc. 25 Chenell Dr. Concord, NH 03301

Phone: (603)228-0525

1-800-287-0525

Relinquished by

Date/Time

Received by

customerservice@easternanalytical.com

As a subcontract lab to EAI, you will defend, indemnify and hold Eastern Analytical, Inc., its officers, employees, and agents harmless from and against any and all liability, loss, expense or claims for injury or damages arising out of the performance against this chain of custody but only in proportion to and to the extent such liability, loss, expense, or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of you as a subcontract lab, your officers, agents or employees Work Order 1900497



Sample Log-In Checklist

Vista Work Orde	r#:	1004	Ŋŗ.	- Control of the Cont		***			Page# _TATU (30	-
Samples Arrival:	Date/Tin 03 20 19		•			itials: WS			ocation: WP-2	
Logged In:	Date/Tin 03 20 19		升			itials: WS			ocation: WR ⁺ 2 helf/Rack: <u>8</u> -3	i:
Delivered By:	FedEx	UPS)	On Trac)	GSO	DHI	-	Hand Delivered	Other
Preservation:	Cic	;e)		Blu	e l	lce		l	Dry Ice	None
Temp °C: 0.0	(uncorr		Pi	robe use	d:	Y 1(1)		Tì	nermometer ID	IK-Y

					YES	NO	NA
Adequate Sample Volume Re	ceived?				1		·
Holding Time Acceptable?	·				1		,
Shipping Container(s) Intact?		(1		
Shipping Custody Seals Intac	ť?						1
Shipping Documentation Pres	ent?				Į.		
Airbill Trk#	12 246 599 OI	9259 791)		1		
Sample Container Intact?		×:			1		
Sample Custody Seals Intact	?						1
Chain of Custody / Sample D	ocumentation P	resent?			1		
COC Anomaly/Sample Accep	tance Form cor	npleted?				1	1
If Chlorinated or Drinking Wat	er Samples, Ac	ceptable P	reservation	?			1
Preservation Documented:	Na₂S₂O₃ Other	Trizma	None		Yes	No	NA
Shipping Container	Vista	Client	Retair	ı / Re	turm)	Disp	ose

Comments:

ID.: LR - SLC

Rev No.: 3

Rev Date: 05 October 2018

Page: 1 of 1

CHAIN-OF-CUSTODY RECORD

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193015

Dissolved Sample Field Filtered	Circle preservative/s: HCL HNO, H,SO, NaOH MEOH Na,S,O, (CE)	are accurate	Sampler confirms ID and parameters are accurate	Sampler confi
		Grab or Comp	1145	
C.	AqTot/PFCs9CmpdsSubVAL	aqueous	13/41/9	Rec Dept.
# of container	Parameters and Sample Notes	Matrix	and stop dates/times	Sample IDs
			Date/Time Composites need start	

roje	
Project ID	Please ensure this auto COC is accurate, adheres to permit or sampling requirements for this
D	urate, adhere
Don't Nooded by Deferred Jef-	es to permit o
	r sampling r
	equirements for t
ReportingOptions	san
•	npling event, and modify as necessary.

EAI Project ID		Results Needed by: Preferred date	ReportingOptions		
Project Name Tamworth LF PFAS Monitoring	\S Monitoring		⊠ HC	□ NO FAX	PO# verbal
State NH			EDD PDF		Quote#: 101629
			EDD elliali	I PUF Invoice	
Client (Pro Mgr) Jeff Sires			PDF prelim, NO FAX	□ EQUIS	どんつ
Customer HEB Engineers, Inc.	Inc.		e-mail Login Confirmation		Temp 2.2
Address 2605 White Mountain Highway DO	ntain Highway DO		Samples Collected by:	Cam / TH	Ice Y N N I
	5				
City North Conway NH 03860	NH 03860		3/14/18 1400		and Morra
Phone 356-6936 Fax	Fax 356-7715	\	Relimburshed by	Date/Time	Received by
		QC deliverables	\		
Email: jsires@HEBEngineers.com		MA DA+ DB DB+ DC DMA MCP	Relinquished by	Date/Time	Received by
Direct 356-6936	Eastern Analytical. Inc.		1525 customersenice@east		,
		www.casternanalytical.com coc.zor.uszs customerservice@easternanalytical.com	JSZS customerservice@east	ernanalytical.com	



Jeff Sires
HEB Engineers, Inc.
2605 White Mountain Highway, PO Box 440
North Conway , NH 03860



Subject: Laboratory Report

Eastern Analytical, Inc. ID: 193016

Client Identification: Tamworth LF PFAS Monitoring

Date Received: 3/14/2019

Dear Mr. Sires:

Enclosed please find the report of analysis for the above identified project. As discussed, analyses were subcontracted and are listed as follows:

Analysis: Subcontract - Perfluorinated Compounds EPA 537 (9

Compounds) Vista

Subcontractor Lab: Vista Analytical Laboratory

A complete copy of the report is attached. This report may not be reproduced except in full, without the written approval of the laboratory.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Coursi Cla Shaw 4, 4, 19

Lorraine Olashaw, Lab Director Date # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

Client: HEB Engineers, Inc.

Client Designation: Tamworth LF PFAS Monitoring

Temperature upon receipt (°C): 3.6

Received on ice or cold packs (Yes/No): Y

EALID#: 193016

Acceptable temperature range (°C): 0-6

Sample ID

Lab ID

Date Date Sample % Dry

Received Sampled Matrix Weight Exceptions/Comments (other than thermal preservation)

193016.01 Marrone Property 3/14/19 aqueous Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.

Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the

All results contained in this report relate only to the above listed samples.

References include:

1) EPA 600/4-79-020, 1983

recommended 15 minute hold time.

- 2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
- 3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
- 4) Hach Water Analysis Handbook, 4th edition, 1992



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April 03, 2019

Vista Work Order No. 1900496

Ms. Jennifer Laramie Eastern Analytical, Inc. 25 Chennell Drive Concord, NH 03301

Dear Ms. Laramie,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on March 20, 2019 under your Project Name '193016 NH'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

CAR

Sincerely,

Martha Maier

Laboratory Director



Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

Vista Work Order No. 1900496 Case Narrative

Sample Condition on Receipt:

One aqueous sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

PFAS Isotope Dilution Method

The sample was extracted and analyzed for a selected list of PFAS using Modified EPA Method 537. The results for PFHxS, PFOA and PFOS include both linear and branched isomers. Results for all other analytes include the linear isomers only.

Holding Times

The sample was extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above the Reporting Limit. The OPR recoveries were within the method acceptance criteria.

The recoveries of all internal standards in the QC and field samples were within the acceptance criteria.

Work Order 1900496 Page 2 of 14

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TABLE OF CONTENTS

Case Narrative	1
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Sample Inventory	4
Analytical Results	5
Qualifiers	9
Certifications	10
Sample Receipt	13

Sample Inventory Report

Vista Sample ID

1900496-01

Client Sample ID

Marrone Property

Sampled

Received

Components/Containers

14-Mar-19 10:13

20-Mar-19 11:18

HDPE Bottle, 125 mL HDPE Bottle, 125 mL

Vista Project: 1900496

Client Project: 193016 NH

ANALYTICAL RESULTS

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Sample ID: Method Blank	ethod Blank							PFAS Isot	PFAS Isotope Dilution Method	1ethod
Client Data					Laboratory Data					
Name: Project:	Eastern Analytical, Inc. 193016 NH		Matrix:	Aqueous	Lab Sample:	B9C0150-BLK1	3LK1	Column:	BEH C18	
		7 A C Nambon	Cone (ng/I)	14		Patch	1	Comp Circ		
Analyte		CAS Number	Conc. (ng/L)	TAX	Quainters	Батеп	Extracted	Samp Size	Analyzed	Dilution
PFBA		375-22-4	M	4.00	0	B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:45	1
PFPeA		2706-90-3	A	4.0	0	B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:45	1
PEBS		375-73-5	ð	4.0	0	B9C0150	26-Mar-19		28-Mar-19 17:45	_
PFHxA		307-24-4	ND	4.0	0	B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:45	_
PFHpA		375-85-9	ä	4,00	0	B9C0150	26-Mar-19	0.125L	28-Mar-19 17:45	-
PFHxS		355-46-4	N	4.0	0	B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:45	_
PFOA		335-67-1	ð	4.0	0	B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:45	1
PFNA	NO THE PARTY AND	375-95-1	ND	4.0	0	B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:45	
PFOS		1763-23-1	N	4,00	0	B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:45	
Labeled Standards	ds	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA		IS	93.6	60 - 130		B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:45	1
13C3-PFPeA		S	92.9	60 - 150		B9C0150 26-Mar-19	26-Mar-19	0.125 L	28-Mar-19 17:45	_
13C3-PFBS		SI	109	60 - 150		B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:45	_
13C2-PFHxA		S	96,9	70 - 130		B9C0150	26-Mar-19	0.125 L	28-Mar-19 17;45	
13C4-PFHpA		SI	83.9	60 - 150	on consider a special contraction of the contractio	B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:45	-
1802-PFHxS	The state of the s	Z	85.6	60 - 130		B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:45	1
13C2-PFOA	Mindows A. San Crowds and American account on Mandellands and American Amer	SI	82.0	60 - 130		B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:45	
13C5-PFNA		S	80.1	50 - 130		B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:45	_
13C8-PFOS		IS	88.7	60 - 130		B9C0150	26-Mar-19	$0.125\mathrm{L}$	28-Mar-19 17:45	,
	RL - Rej	RL - Reporting limit	Results reported to RL	čť.	When rep	orted, PFHxS, P	FOA, PFOS, Mo	FOSAA and EtF	When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both	
					linear and analytes.	branched isome	rs. Only the lin	linear and branched isomers. Only the linear isomer is reported for all other analytes.	orted for all other	
					,					

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Sample ID: OPR								-		PFAS Is	PFAS Isotope Dilution Method	Method
Client Data						Labo	oratory Data					
Name: Ea Project: 19	Eastern Analytical, Inc. 193016 NH		Matrix:	Aqueous		Lab	Sample:	B9C0150-BS1	-BS1	Column:	BEH C18	
Analyte	CAS Number	nber	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	4	82.4	80,0	103	70 - 130		B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:34	
PFPeA	2706-90-3	5	86.3	80.0	108	70 - 130	de en debetat de la educació de consessió de la consessió de l	B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:34	1
PFBS	375-73-5	S	83.2	80.0	104	70 - 130		B9C0150	B9C0150 26-Mar-19	$0.125\mathrm{L}$	28-Mar-19 17:34	The second second
PFHxA	307-24-4	4	82.3	80.0	103	70 - 130		B9C0150	B9C0150 26-Mar-19	$0.125\mathrm{L}$	28-Mar-19 17:34	–
РЕНрА	375-85-9	9	79.1	80.0	98.9	70 - 130		B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:34	
PFHxS	355-46-4	4	85.0	80.0	106	70 - 130		B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:34	–
PFOA	335-67-1		76.9	80.0	96.1	70 - 130		B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:34	
PFNA	375-95-1	•1	84.1	80.0	105	70 - 130		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	
PFOS	1,763-23-1	1	59.6	80.0	74.6	70 - 130		B9C0150	B9C0150 26-Mar-19	$0.125\mathrm{L}$	28-Mar-19 17:34	
Labeled Standards			Type		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	movembonominist kalitiin ankaadar doorda ay maanaanaanaanaa		SI		90.0	60- 130		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	1
13C3-PFPeA			IS		85.6	60- 150		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	-
13C3-PFBS	e errer etkinisterrerere errereiteksinisterrikasınında errerere errerinisterriki ildiği ilk	indelinente manationere mente an mornelle	IS		100	60- 150		B9C0150	B9C0150 26-Mar-19	$0.125\mathrm{L}$	28-Mar-19 17:34	Ľ
13C2-PFHxA			SI		88.4	70- 130		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	
13C4-PFHpA	to be in the control of the control	oriente en frankriente en	SI		77.6	60- 150		B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:34	_
18O2-PFHxS			IS		79.7	60-130		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	
13C2-PFOA			SI		87.5	60- 130		B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:34	_
13C5-PFNA			IS		74.2	50-130		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	,-
13C8-PFOS			IS		117	60- 130		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	1



	When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other.	FOSAA and Et	When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include b linear and branched isomers. Only the linear isomer is reported for all other.	ported, PFHxS,	When rep	ŗ	Results reported to RL		RL - Reporting limit	RL - R	
,	28-Mar-19 18:28	$0.130~\mathrm{L}$		B9C0150		60 - 130	103		IS		3C8-PFOS
—	28-Mar-19 18:28	$0.130\mathrm{L}$	26-Mar-19	B9C0150		50 - 130	81.7		IS		3C5-PFNA
_	28-Mar-19 18:28	$0.130\mathrm{L}$	26-Mar-19	B9C0150		60 - 130	86.5		IS		3C2-PFOA
-	28-Mar-19 18:28	0.130 L	26-Mar-19	B9C0150		60 - 130	96.8		IS		8O2-PFHxS
_	28-Mar-19 18:28	0.130 L	26-Mar-19	B9C0150	ederment con morroundi i din medan como delegida.	60 - 150	89.5		IS ·	CONTROL TO REAL TO THE STATE OF THE CONTROL OF THE	3C4-PFHpA
	28-Mar-19 18:28	0.130 L	26-Mar-19	B9C0150		70 - 130	97.8		IS		3C2-PFHxA
_	28-Mar-19 18:28	$0.130\mathrm{L}$	26-Mar-19	B9C0150	and he tout and the training of the contract and the cont	60 - 150	104	and the second s	IS	is a majoration of farmer and the filter on the continues	3C3-PFBS
H	28-Mar-19 18:28	0.130 L	26-Mar-19	B9C0150		60 - 150	91.6		IS		3C3-PFPeA
_	28-Mar-19 18:28	0.130 L	26-Mar-19	B9C0150	ondonetas filatos celita filatos de la calda de la	60 - 130	97.3		IS	out or united the abstract of a monthly of the forest of the	l3C3-PFBA
Dilution	Analyzed L	Samp Size	Extracted	Batch	Qualifiers	Limits	% Recovery	%	Туре		Labeled Standards
-	28-Mar-19 18:28	0.130 L	B9C0150 26-Mar-19	B9C0150	0	4.0	A		1763-23-1		PFOS
1	28-Mar-19 18:28	$0.130\mathrm{L}$	26-Mar-19	B9C0150	0	4.0	A	district on the fact that the same of	375-95-1	obsolvina) - i a comolinga eleccione vindimento se canomicanima del	PFNA
	28-Mar-19 18:28	$0.130\mathrm{L}$	1000		0	4.00	J		335-67-1	and a state of the	FOA
_	28-Mar-19 18:28	0.130 L	26-Mar-19	B9C0150	0	4.0	ND	deline for Common deleteradados	355-46-4	a difference of management of makes of finish companies of the difference of the dif	PFHxS
	28-Mar-19 18:28	0.130 L	26-Mar-19	B9C0150	0	4.0	ð		375-85-9		PFHpA
_	28-Mar-19 18:28	$0.130\mathrm{L}$	26-Mar-19	B9C0150	ð	4.0	ND		307-24-4		$PFH_{x}A$
H	28-Mar-19 18:28	0.130 L	26-Mar-19	B9C0150	0	4.0	a		375-73-5		PFBS
1	28-Mar-19 18:28	$0.130\mathrm{L}$	26-Mar-19	B9C0150	0	4.0	ND		2706-90-3		PFPeA
	28-Mar-19 18:28	0.130 L	26-Mar-19	B9C0150	0		A		375-22-4		PFBA
Dilution	Analyzed I	Samp Size	Extracted	Batch	L Qualifiers	ŔL	Conc. (ng/L)	Con	CAS Number		Analyte
	BEH C18	Column:	91 9 11:18	1900496-01 20-Mar-19 11:18	Laboratory Data Lab Sample: Date Received:	Aqueous 14-Mar-19 10:13	Matrix: Date Collected:			Eastern Analytical, Inc. 193016 NH	Client Data Name: Ea Project: 1!
lethod	PFAS Isotope Dilution Method	PFAS Isc								rone Property	Sample ID: Marrone Property

Page 8 of 14

DATA QUALIFIERS & ABBREVIATIONS

B This compound was also detected in the method blank

Conc. Concentration

D Dilution

DL Detection limit

E The associated compound concentration exceeded the calibration range of the

instrument

H Recovery and/or RPD was outside laboratory acceptance limits

I Chemical Interference

J The amount detected is below the Reporting Limit/LOQ

LOD Limits of Detection

LOQ Limits of Quantitation

M Estimated Maximum Possible Concentration (CA Region 2 projects only)

NA Not applicable

ND Not Detected

P The reported concentration may include contribution from chlorinated diphenyl

ether(s).

Q The ion transition ratio is outside of the acceptance criteria.

TEQ Toxic Equivalency

U Not Detected (specific projects only)

* See Cover Letter

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

Work Order 1900496 Page 9 of 14

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Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	19-013-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1521520
New Hampshire Environmental Accreditation Program	207718
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-010
Pennsylvania Department of Environmental Protection	015
Texas Commission on Environmental Quality	T104704189-19-10
Virginia Department of General Services	9618
Washington Department of Ecology	C584-19
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

Work Order 1900496 Page 10 of 14

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NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	Method
Determination of Polychlorinated p-Dioxins & Polychlorinated	EPA 23
Dibenzofurans	
Determination of Polychlorinated p-Dioxins & Polychlorinated	EPA TO-9A
Dibenzofurans	

MATRIX: Biological Tissue	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope	EPA 1613B
Dilution GC/HRMS	
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	8290/8290A

MATRIX: Drinking Water	
Description of Test	Method
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA
	1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated	EPA 8280A/B
Dibenzofurans by GC/HRMS	
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	8290/8290A

MATRIX: Solids	
Description of Test	Method
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated	EPA 8280A/B
Dibenzofurans by GC/HRMS	
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	8290/8290A

CHAIN-OF-CUSTODY RECORD



professional laboratory and drilling services 1

Page 1

Date Sampled Matrix

a**Parameters**

EAI ID# 193016 Sample Notes

Sample ID Marrone Property 10:13 3/14/2019 aqueous | Subcontract - Perfluorinated Compounds EPA Method 537 (9 Compounds)

EAI ID# 193016	93016	Project State: NH	Results Needed: Preferred Date: Standard	PO #: 49737	EAI ID# 193016
		0 0 0 0	QC Deliverables	Data Deliverable (circle))ie)
			NA □A+ □B □B+ □C □MAMCP	Excel NH EMD EQUIS ME EGAD	QUIS ME EGAD
Company	Vista Anal	Vista Analytical Laboratory	Notes about project:		
Address	1104 Windfield Way	field Way	Email login confirmation, pdf of results and	Call prior to analyzing	Call prior to analyzing, if RUSH charges will be a
			invoice to customerservice@easternanalytical.com.	Samples Collected by:	***
Address	El Dorado	El Dorado Hills, CA 95/62		Was Homen	Amon 3/19/19 1500 C
Account #	·			Relinquished by	pate/Time Receiv
Phone #	Phone # (916) 673-1520	1520		5	03/2014 1118 11/03/2011/14 03

Relinquished by Date/Time Received by applied. Yed by

Eastern Analytical, Inc. 25 Chenell Dr. Concord, NH 03301

Phone: (603)228-0525

1-800-287-0525

customerservice@easternanalytical.com

arising out of the performance against this chain of custody but only in proportion to and to the extent such liability, loss, expense, or claims for injury or damages are caused by or result from the negligent or intentional As a subcontract lab to EAI, you will defend, indemnify and hold Eastern Analytical, Inc., its officers, employees, and agents harmless from and against any and all liability, loss, expense or claims for injury or damages acts or ornisplosts of New 198649 gontract lab, your officers, agents or employees



Sample Log-In Checklist

	101	אווא	n				Page#_			······································
Vista Work Orde	r#: <u>141</u>	<u> 1079</u>	<u>b</u>				TAT_	days	<u>.</u>	
Samples	Date/Time			Initials:	•	Loc	ation:	WR-2	-	
Arrival:	03/20/19	1118		ws		She	elf/Rack	. Na		
	Date/Time			Initials:		ı	ation:		•	
Logged In:	03/20/19	1249		wws.		She	elf/Rack	: <u>a-3</u> ,	F-6	······································
Delivered By:	FedEx (UPS)	On Tra	c GSO	DHI	÷	Hand Deliver		Oth	er
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		er per l'implication		The state of the s		in a		YES	NO	NA
Adequate Sample	e Volume Re	eceived?						1		
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Rev No.: 3

Rev Date: 05 October 2018

Page: 1 of 1

CHAIN-OF-CUSTODY RECORD

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Marrone Property Sample IDs

3/14/19

aqueous Grab or Comp

Matrix Parameters and Sample Notes

AqTot/PFCs9CmpdsSubVAL

of containers

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Sampler confirms ID and parameters are accurate	1013
rs are accurate C	
Circle preservative/s: HCL HNO, H,SO, NaOH MEOH Na,S,O, (ICE)	
Dissolved Sample Field Filtered	

Please ensure this auto COC is accurate, adheres to permit or sampling requirements for this sampling event, and modify as necessary.

Direct 356-6936	Email: jsires@HEBEngineers.com	Phone 356-6936 Fa	City North Conway NH 03860	Address 2605 White Mountain Highway, PO	Customer HEB Engineers, Inc.	Client (Pro Mgr) Jeff Sires	State NH	EAI Project ID Project Name Tamworth LF PFAS Monitoring	
Eastern Analytical, Inc.	m	Fax 356-7715	NH 03860	ıntain Highway, PO	, Inc.			AS Monitoring	,
Inc. www.easternanalytical.com 800.287.0525 customerservice@easternanalytical.com	MA □A+ □B □B+ □C □MAMCP	QC deliverables			lax replication	15-96 The Thirty The T	NHDES PFAS 9 compound list.	Results Needed by: Preferred dateNotes:	
.0525 customerservice@east	Relinquished by	Wallyduished by	4114/16	Samples Collected by: 3.624/12/ET		PDF prelim, NO FAX	☐ EDD PDF ☐ EDD email	ReportingOptions	
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Jeff Sires
HEB Engineers, Inc.
2605 White Mountain Highway, PO Box 440
North Conway , NH 03860



Subject: Laboratory Report

Eastern Analytical, Inc. ID: 193017

Client Identification: Tamworth LF PFAS Monitoring

Date Received: 3/14/2019

Dear Mr. Sires:

Enclosed please find the report of analysis for the above identified project. As discussed, analyses were subcontracted and are listed as follows:

Analysis: Subcontract - Perfluorinated Compounds EPA 537 (9

Compounds) Vista

Subcontractor Lab: Vista Analytical Laboratory

A complete copy of the report is attached. This report may not be reproduced except in full, without the written approval of the laboratory.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director

Date

of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE



EAI ID#: 193017

Client: HEB Engineers, Inc.

Client Designation: Tamworth LF PFAS Monitoring

Temperature upon receipt (°C): 3.6

Received on ice or cold packs (Yes/No): Y

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received		Sample Matrix	 Exceptions/Comments (other than thermal preservation)
193017.01	TMHP Well 1	3/14/19	3/14/19	aqueous	Adheres to Sample Acceptance Policy
193017.02	TMHP Well 2	3/14/19	3/14/19	aqueous	Adheres to Sample Acceptance Policy
193017.03	TMHP Well 3	3/14/19	3/14/19	aqueous	Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.

Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

- 1) EPA 600/4-79-020, 1983
- 2) Standard Methods for Examination of Water and Wastewater, 20th, 21st, 22nd & 23rd Edition or noted Revision year.
- 3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
- 4) Hach Water Analysis Handbook, 4th edition, 1992



2

April 03, 2019

Vista Work Order No. 1900495

Ms. Jennifer Laramie Eastern Analytical, Inc. 25 Chennell Drive Concord, NH 03301

Dear Ms. Laramie,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on March 20, 2019 under your Project Name '193017 NH'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier

Laboratory Director



Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

Vista Work Order No. 1900495 Case Narrative

Sample Condition on Receipt:

Three aqueous samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

PFAS Isotope Dilution Method

The samples were extracted and analyzed for a selected list of PFAS using the PFAS Isotope Dilution Method. The results for PFHxS, PFOA and PFOS include both linear and branched isomers. Results for all other analytes include the linear isomers only.

Holding Times

The samples were extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above the Reporting Limit. The OPR recoveries were within the method acceptance criteria.

The recoveries of all internal standards in the QC and field samples were within the acceptance criteria.

TABLE OF CONTENTS

Case Narrative	1
Table of Contents	3
Sample Inventory	4
Analytical Results	5
Qualifiers	11
Certifications	12
Sample Receipt	15

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1900495-01	TMHP Well 1	14-Mar-19 10:47	20-Mar-19 11:18	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL
1900495-02	TMHP Well 2	14-Mar-19 10:55	20-Mar-19 11:18	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL
1900495-03	TMHP Well 3	14-Mar-19 11:05	20-Mar-19 11:18	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL

Vista Project: 1900495 Client Project: 193017 NH

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ANALYTICAL RESULTS

	When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both	eFOSAA and Eti-	PFOA, PFOS, Me	ported, PFHxS,	When re		ed to RL.	Results reported to RL	RL - Reporting limit	RL - Re	
_	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		60 - 130		88.7	IS		13C8-PFOS
_	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		50 - 130		80,1	IS		13C5-PFNA
—	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		60 - 130		82.0	SI		13C2-PFOA
	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		60 - 130		85,6	8		1802-PFHxS
_	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		60 - 150	and the second control of the second control	83.9	IS	is and energy course country from the find manner and the first of the control of	13C4-PFHpA
	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		70 - 130		96.9	S		13C2-PFHxA
1	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		60 - 150		109	IS	and force and agent of the first construction of the first construction and the first construction of the first constructi	13C3-PFBS
4	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		60 - 150		92,9	SI		13C3-PFPeA
_	28-Mar-19 17:45	$0.125\mathrm{L}$	26-Mar-19	B9C0150		60 - 130		93.6	SI	tal habbed Saidh of an haming the Calebraic North Additional SAID Million (A. 1975).	13C3-PFBA
Dilution	Analyzed I	Samp Size	Extracted	Batch	Qualifiers	Limits		% Recovery	Type	ards	Labeled Standards
	28-Mar-19 17:45	$0.125\mathrm{L}$	B9C0150 26-Mar-19	B9C0150		4.00		ND	1763-23-1		PFOS
_	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		4.00		ND	375-95-1	de receives de constant estados estados confidences de confedences de confedences de la confedence de la con	PFNA
÷	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		4.00		M	335-67-1		PFOA
1	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		4.00	- And distriction of the Control of South Control of South S	ND	355-46-4	annia anadamanin'ila diakanda A.P. Rapak Naka Bandada ana Nakasaidh - a A.B.Ada A.A.	PFHxS
	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		4.00		ð	375-85-9		PFHpA
<u>, , , , , , , , , , , , , , , , , , , </u>	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		4.00		ND	307-24-4		PFHxA
-	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		4.00		ð	375-73-5		PFBS
	28-Mar-19 17:45	$0.125\mathrm{L}$	26-Mar-19	B9C0150		4.00		AN	2706-90-3		PFPeA
	28-Mar-19 17:45	0.125 L	26-Mar-19	B9C0150		4.00		J	375-22-4		PFBA
Dilution	Analyzed I	Samp Size	Extracted	Batch	Qualifiers	RL		Conc. (ng/L)	CAS Number		Analyte
	BEH C18	Column:	BLK1	B9C0150-BLK1	Laboratory Data Lab Sample:	La	Aqueous	Matrix:		Eastern Analytical, Inc. 193017 NH	Client Data Name: Project:
Tethod	PFAS Isotope Dilution Method	PFAS Iso								Sample ID: Method Blank	Sample ID:

linear and branched isomers. Only the linear isomer is reported for all other analytes.

Work Order 1900495

Page 6 of 16



Sample ID: OPR									PFAS Iso	PFAS Isotope Dilution Method	ı Method
Client Data					Lab	Laboratory Data					
Name: E Project: 1!	Eastern Analytical, Inc. 193017 NH	Matrix:	Aqueous		Lab	Lab Sample:	B9C0150-BS1	BS1	Column:	BEH C18	
Analyte	CAS Number	Amt Found (ng/L)	Spike Amt %	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	82.4	80.0	103	70 - 130		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	-
PFPeA	2706-90-3	86.3	Parket Street Street	108	70 - 130	Acception (Michael World and Accept to Committee of the C	B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:34	1
PFBS	375:73-5	83.2	80.0	104	70 - 130		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	
PFHxA	307-24-4	82.3			70 - 130		B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:34	1
PFHpA	375-85-9	79.1			70 - 130		B9C0150	B9C0150 26-Mar-19	$0.125\mathrm{L}$	28-Mar-19 17:34	
PFHxS	355-46-4	85.0			70 - 130		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	_
PFOA	335-67-1	76.9			70 - 130		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	
PFNA	375-95-1	84.1			70 - 130		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	-
PFOS	1763-23-1	59.6	80.0	74.6	70 - 130		B9C0150	B9C0150 26-Mar-19	$0.125\mathrm{L}$	28-Mar-19 17:34	-
Labeled Standards		Туре	9	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA		IS		90.0	60- 130		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	1 1
13C3-PFPeA		SI		85.6	60-150		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	+
13C3-PFBS		SI			60- 150		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	_
13C2-PFHxA		SI		88.4	70- 130		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	-
13C4-PFHpA	ominimas jauvaiminnas järikkanaan on taakulinn eli lähkkoma eks län saaluulinnuja missimaan	IS	Tribut manifestration resonantions and property of the second second		60- 150		B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:34	1
1802-PFHxS		$\mathbf{I}\mathbf{S}$		79.7	60-130		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	
13C2-PFOA		IS		87.5	60-130		B9C0150	26-Mar-19	0.125 L	28-Mar-19 17:34	+
13C5-PFNA		IS		74.2	50- 130		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	1
13C8-PFOS		SI		117	60- 130		B9C0150	B9C0150 26-Mar-19	0.125 L	28-Mar-19 17:34	1
3 ()		***		12.	100		0,00100	TO TATAL	0.14.0	ı	ı



	When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other	FOSAA and Etl	PFOA, PFOS, Me	orted, PFHxS,	When rep	L.	Results reported to RL	RL - Reporting limit	RL-	
_	28-Mar-19 17:55	$0.113\mathrm{L}$		B9C0150		60 - 130	91.2	IS		13C8-PFOS
	28-Mar-19 17:55	$0.113\mathrm{L}$	26-Mar-19	в9С0150		50 - 130	91.7	5		13C5-PFNA
1	28-Mar-19 17:55	$0.113\mathrm{L}$	26-Mar-19	B9C0150	THE PARTY AND TH	60 - 130	91.8	SI		13C2-PFOA
	28-Mar-19 17:55	$0.113\mathrm{L}$	26-Mar-19	B9C0150		60 - 130	102	S		18O2-PFHxS
1	28-Mar-19 17:55	$0.113~\mathrm{L}$	26-Mar-19	B9C0150	reference Concession or commensately a signer a modern page from European commensately	60 - 150	86.0	IS	and the sense of the second contract of the second	13C4-PFHpA
-	28-Mar-19 17:55	0.113 L	26-Mar-19	B9C0150		70-130	93,4	SI		13C2-PFHxA
1	28-Mar-19 17:55	0.113 L	26-Mar-19	B9C0150	en de la company	60 - 150		IS	e de andi obesece e madre i cal nata de estra e e data e na la manacidadada e e	13C3-PFBS
	28-Mar-19 17:55	$0.113\mathrm{L}$	26-Mar-19	B9C0150		60 - 150	91.7	SI		13C3-PFPeA
_	28-Mar-19 17:55	0.113 L	26-Mar-19	B9C0150	actionals by the Shakkachaning ediments from the	60 - 130		IS	nalis chashinding sa dan anima salam chanagana sa da da	13C3-PFBA
Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers	Limits	% Recovery	Туре	ards	Labeled Standards
	28-Mar-19 17:55	$0.113\mathrm{L}$	B9C0150 26-Mar-19	B9C0150	.43	4	Ä	1763-23-1		PFOS
_	28-Mar-19 17:55	0.113 L	26-Mar-19	B9C0150	1.43	4	ND	375-95-1	atar a haran and an an and defendance and an analysis of a sample of the analysis of the analy	PFNA
	28-Mar-19 17:55	$0.113\mathrm{L}$	26-Mar-19	B9C0150	4,43	A second section of the second section of the second section of the second section sec	Ä	335-67-1		PFOA
_	28-Mar-19 17:55	$0.113\mathrm{L}$	26-Mar-19	B9C0150	.43	4	ND	355-46-4	manakka san arbadanka modalan arabaman kathara makanda sankanda sankanda sankanda	PFHxS
	28-Mar-19 17:55	0.113 L	26-Mar-19	B9C0150	.43	4	N	375-85-9		PFHpA
_	28-Mar-19 17:55	0.113 L	26-Mar-19	B9C0150	.43	4	ND	307-24-4		PFHxA
-	28-Mar-19 17:55	$0.113\mathrm{L}$	B9C0150 26-Mar-19	в9С0150	,43	4	P	375-73-5		PFBS
_	28-Mar-19 17:55	$0.113~\mathrm{L}$	26-Mar-19	B9C0150	.43	4	ND	2706-90-3	Militari manakamakamakamakama Manaka ma maaka ma makaa Militari ma	PFPeA
	28-Mar-19 17:55	0.113 L	26-Mar-19	B9C0150	4.43	4	M	375-22-4		PFBA
Dilution	Analyzed	Samp Size	Extracted	Batch	RL Qualifiers		Conc. (ng/L)	CAS Number		Analyte
	BEH C18	Column:	01 9 11:18	1900495-01 20-Mar-19 11:18	Lab Sample: Date Received:	Aqueous 14-Mar-19 10:47	Matrix: Date Collected:	У	Eastern Analytical, Inc 193017 NH	Name: Project:
		-			Laboratory Data					Client Data
Method	PFAS Isotope Dilution Method	PFAS Iso							Sample ID: TMHP Well 1	Sample ID:



	When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both	FOSAA and EtF	PFOA, PFOS, Me	ported, PFHxS,	When re			Results reported to RL.	RL - Reporting limit	RL	
<u></u>	28-Mar-19 18:06	$0.114\mathrm{L}$	26-Mar-19	B9C0150			60 - 130	77.0	IS		13C8-PFOS
,	28-Mar-19 18:06	$0.114\mathrm{L}$	B9C0150 26-Mar-19	B9C0150			50 - 130	85.1	IS		13C5-PFNA
-	28-Mar-19 18:06	$0.114\mathrm{L}$	26-Mar-19	B9C0150			60130	84.9	IS		13C2-PFOA
	28-Mar-19 18:06	0.114 L	B9C0150 26-Mar-19	B9C0150			60-130	101	$\mathbf{I}\mathbf{S}$		1802-PFHxS
<u></u>	28-Mar-19 18:06	$0.114\mathrm{L}$	26-Mar-19	B9C0150			60 - 150	85.2	IS		13C4-PFHpA
	28-Mar-19 18:06	0.114 L	26-Mar-19	B9C0150			70 - 130	96,3	IS		13C2-PFHxA
_	28-Mar-19 18:06	$0.114\mathrm{L}$	26-Mar-19	B9C0150			60 - 150	118	IS	modern administration of the contract of the c	13C3-PFBS
	28-Mar-19 18:06	0.114L	B9C0150 26-Mar-19	B9C0150			60 - 150	91,9	IS		13C3-PFPeA
1	28-Mar-19 18:06	0.114 L	26-Mar-19	B9C0150			60 - 130	92.3	SI	, commence PS licht, alles ambiggioralles de la commence de la com	13C3-PFBA
Dilution	Analyzed I	Samp Size	Extracted	Batch	Qualifiers		Limits	% Recovery	Type	ards	Labeled Standards
_	28-Mar-19 18:06	0.114 L	B9C0150 26-Mar-19	B9C0150		4.40		ND	1763-23-1		PFOS
1	28-Mar-19 18:06	0.114 L	26-Mar-19	B9C0150	de metrice decennistications de la familia	4.40	dimension of the continuous desired in the c	ND	375-95-1	Annual Managaran Company of the Comp	PHNA
<u>.</u>	28-Mar-19 18:06	0.114L	B9C0150 26-Mar-19	B9C0150		4,40		18	335-67-1		PFOA
1	28-Mar-19 18:06	$0.114\mathrm{L}$	26-Mar-19	B9C0150	no dinomination of the Contraction and an order	4.40	achimical at bathala science Asias . is Seed		355-46-4	nderchina Mayori desk metama a nytantant'i Addison	PHHXS
	28-Mar-19 18:06	0.114 L	26-Mar-19	B9C0150		4.40		A	375-85-9		PFHpA
_	28-Mar-19 18:06	$0.114\mathrm{L}$	26-Mar-19	B9C0150		4.40		ND	307-24-4		PFHxA
-	28-Mar-19 18:06	0.114 L	26-Mar-19	B9C0150		4.40		Ъ	375-73-5		PFBS
1	28-Mar-19 18:06	$0.114\mathrm{L}$	26-Mar-19	B9C0150	A THE CASE OF THE	4.40	Annual contract the contract to the contract t		2706-90-3		PFPeA
1	28-Mar-19 18:06	$0.114\mathrm{L}$	26-Mar-19	B9C0150		4.40		A	375-22-4		PFBA
Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers	ŘL		Conc. (ng/L)	CAS Number		Analyte
) 11:18	20-Mar-19 11:18	e Received:	Date	14-Mar-19 10:55	Date Collected: 1		193017 NH	Project:
	BEH C18	Column:	12	1900495-02	Laboratory Data Lab Sample:	Lal	Aqueous	Matrix:	nc.	Eastern Analytical, Inc.	Client Data Name:
1ethod	PFAS Isotope Dilution Method	PFAS Iso								Sample ID: TMHP Well 2	Sample ID:

linear and branched isomers. Only the linear isomer is reported for all other analytes.

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Client Data					Laboratory Data					
Name: Project:	Eastern Analytical, Inc. 193017 NH		Matrix: Date Collected:	Aqueous 14-Mar-19 11:05	Lab Sample: Date Received:	1900495-03 20-Mar-19 11:18	3 11:18	Column:	BEH C18	
Analyte		CAS Number	Conc. (ng/L)		RL Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA		375-22-4	D		4.26	B9C0150	26-Mar-19	0.117 L	28-Mar-19 18:16	
PFPeA	The control of the co	2706-90-3	ND		.26	B9C0150	26-Mar-19	the second	28-Mar-19 18:16	- 5
PFBS		375-73-5	J	4	4.26	B9C0150	26-Mar-19	25	28-Mar-19 18:16	
PFHxA		307-24-4	ND	4,	.26	B9C0150	26-Mar-19		28-Mar-19 18:16	_
PFHpA		375-85-9	Ā	4	26	B9C0150	26-Mar-19		28-Mar-19 18:16	
PFHxS	dari i i me dalaman dari Yesi ada dasedandada i gibiyadi adi i isi si isini mad	355-46-4	ND	4.	.26	B9C0150	26-Mar-19		28-Mar-19 18:16	_
PFOA		335-67-1	Ъ		.26	B9C0150	26-Mar-19	0.117L	28-Mar-19 18:16	H
PFNA	TOTAL COLUMN TO COLUMN TO THE	375-95-1	ND	4	.26	B9C0150	26-Mar-19		28-Mar-19 18:16	1
PFOS		1763-23-1	ND ND	4	4.26	B9C0150	26-Mar-19	$0.117\mathrm{L}$	28-Mar-19 18:16	_
Labeled Standards	ds	Туре	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	sad dina disa Polandoni (k. d. 1.00), si dadaha disala adam dinaka	SI	99.1	60 - 130		B9C0150	26-Mar-19	0.117L	28-Mar-19 18:16	1
13C3-PFPeA		SI	95,2	60 - 150		B9C0150	26-Mar-19	0.117 L	28-Mar-19 18:16	
13C3-PFBS	months and contracts on a contract of the cont	IS	131	60 - 150		B9C0150	26-Mar-19	$0.117\mathrm{L}$	28-Mar-19 18:16	,
13C2-PFHxA		IS	97,2	70 - 130		B9C0150	26-Mar-19	0.117L	28-Mar-19 18:16	_
13C4-PFH _P A		IS	87.4	60 - 150	THE THE PERSON OF THE PERSON O	B9C0150	26-Mar-19	$0.117\mathrm{L}$	28-Mar-19 18:16	<u>,</u>
18O2-PFHxS		IS	103	60 - 130		B9C0150	26-Mar-19	$0.117\mathrm{L}$	28-Mar-19 18:16	
13C2-PFOA	of attribution page 195 of Subsequence (A trans. As facilities at 1954), and the facilities of the fac	SI	102	60 - 130		B9C0150	26-Mar-19	$0.117\mathrm{L}$	28-Mar-19 18:16	_
13C5-PFNA		SI	79.6	50 - 130		B9C0150	26-Mar-19	0.117 L	28-Mar-19 18:16	_
13C8-PFOS		IS	76.9	60 - 130		B9C0150	26-Mar-19	$0.117\mathrm{L}$	28-Mar-19 18:16	

DATA QUALIFIERS & ABBREVIATIONS

B This compound was also detected in the method blank

Conc. Concentration

D Dilution

DL Detection limit

E The associated compound concentration exceeded the calibration range of the

instrument

H Recovery and/or RPD was outside laboratory acceptance limits

I Chemical Interference

J The amount detected is below the Reporting Limit/LOQ

LOD Limits of Detection

LOQ Limits of Quantitation

M Estimated Maximum Possible Concentration (CA Region 2 projects only)

NA Not applicable

ND Not Detected

P The reported concentration may include contribution from chlorinated diphenyl

ether(s).

Q The ion transition ratio is outside of the acceptance criteria.

TEQ Toxic Equivalency

U Not Detected (specific projects only)

* See Cover Letter

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

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Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	19-013-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1521520
New Hampshire Environmental Accreditation Program	207718
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-010
Pennsylvania Department of Environmental Protection	015
Texas Commission on Environmental Quality	T104704189-19-10
Virginia Department of General Services	9618
Washington Department of Ecology	C584-19
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	Method
Determination of Polychlorinated p-Dioxins & Polychlorinated	EPA 23
Dibenzofurans	
Determination of Polychlorinated p-Dioxins & Polychlorinated	EPA TO-9A
Dibenzofurans	

MATRIX: Biological Tissue	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope	EPA 1613B
Dilution GC/HRMS	
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	8290/8290A

MATRIX: Drinking Water	
Description of Test	Method
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA
	1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	8290/8290A

MATRIX: Solids	
Description of Test	Method
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated	EPA 8280A/B
Dibenzofurans by GC/HRMS	
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	8290/8290A

CHAIN-OF-CUSTODY RECORD



professional laboratory and drilling services

	>
Sample ID	Date Sampled Matrix aParameters (✓(()()) (√()) Sample Notes
TMHP Well 1	3/14/2019 aqueous Subcontract - Perfluorinated Compounds EPA Method 537 (9 Compounds)
TMHP Well 2	3/14/2019 aqueous Subcontract - Perfluorinated Compounds EPA Method 537 (9 Compounds)
тімне Well 3	3/14/2019 aqueous Subcontract - Perfluorinated Compounds EPA Method 537 (9 Compounds)

Phone #	Account#	Address	Address	Company			I NOR HOLIVE	
Phone # (916) 673-1520		El Dorado Hills, CA 95762	1104 Windfield Way	Vista Analytical Laboratory	•	Project ID:	Project State: NH	
		нь оне то такина за тев Федзия паня) пратопи.	Email login confirmation, pdf of results and	Notes about project;	MA LA+ LB LB+ LC LMAMCP	QC Deliverables	RESE DIE Date	Results Needed: Preferred Date: Standard
	Relinguished by Date/Time Received by	Samples Collected by:	Call prior to analyzing, if RUSH charges will be applied	many and the second sec	EXCEL NH END FOLIS ME FRAD	Data Deliverable (circle)	TO # FO CO	

Relinquished by Date/Time-/ 500 000 Received by Received by

Eastern Analytical, Inc. 25 Chenell Dr. Concord, NH 03301

Phone: (603)228-0525

1-800-287-0525

customerservice@easternanalytical.com

As a subcontract lab to EAL, you will defend, indemnify and hold Eastern Analytical, Inc., its officers, employees, and agents harmless from and against any and all liability, loss, expense or claims for injury or damages are caused by or result from the negligent or intentional arising out of the performance against this chain of custody but only in proportion to and to the extent such liability, loss, expense, or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of your as a group gentract lab, your officers, agents or employees



Sample Log-In Checklist

Vista Work Order #: 1900495 Page # of							
Samples Arrival:	03/20/19 11/8		Initials: WS		Location: WR-		
Date/Time Logged In: 03/20 19 1240			Initials: WWS	Initials: Location: Wiz-2			
Delivered By:	FedEx UPS	On Tra			Hand Other		
Preservation: (Ice)			ue Ice		Dry Ice None		
Temp °C: 0,	(uncorrected)			1	Thermometer ID: IR-Y		
Temp °C: 0,0 (corrected) Probe used: Y /		ea: Y /(N)		I nermometer IL	: TE A		

				N. Constitution	YES	NO	NA
Adequate Sample Volume Re	eceived?						
Holding Time Acceptable?					¥″		
Shipping Container(s) Intact?					V		
Shipping Custody Seals Intac	t?						1
Shipping Documentation Pres	sent?				4		
Airbill Trk#	12 246 599 OI	9259 7910			1		
Sample Container Intact?					V		
Sample Custody Seals Intact	?						
Chain of Custody / Sample Do	ocumentation P	resent?			1		
COC Anomaly/Sample Accep	tance Form con	npleted?				1	J
If Chlorinated or Drinking Wat	er Samples, Ac	ceptable Pre	servation?				1
Preservation Documented:	Na₂S₂O₃ Other	Trizma	None		Yes	No	RA)
Shipping Container	Vista	(Client)	Retain	/ Re	turn)	Disp	ose

Comments:

ID.: LR - SLC

Rev No.: 3

Rev Date: 05 October 2018

Page: 1 of 1

Dissolved Sample Field Filtered	Circle preservative/s: HCL HNO, H,SO, NaOH MEOH Na,S,O, (ICE)	s are accurate	Sampler confirms ID and parameters are accurate	Sampler confirm
		(Grab or Comp	1/05	
ಬ	AqTot/PFCs9CmpdsSubVAL	aqueous	8/14/18	TMHP Well 3
Dissolved Sample Field Filtered	Circle preservative/s: HCL HNO, H,SO, NaOH MEOH Na,S,O, (ICE)	s are accurate	Sampler confirms ID and parameters are accurate	Sampler confirm
		Grab or Comp	1055]
え	AqTot/PFCs9CmpdsSubVAL	aqueous	3/14/19	TMHP Well 2
Dissolved Sample Field Filtered	Circle preservative/s: HCL HNO, H,SO, NaOH MEOH Na,S,O, ICE	s are accurate	Sampler confirms ID and parameters are accurate	Sampler confirm
		Grab/or Comp	1047	
ಬ	AqTot/PFCs9CmpdsSubVAL	aqueous	3/14/19	TMHP Well 1
# of containers	Parameters and Sample Notes	Matrix	and stop dates/times	Sample IDs
			Date/Time Composites need start	

Direct 300-0930	Email: jsires@HEBEngineers.com	Phone 356-6936 Fax 3	City North Conway NH 03860	Address 2605 White Mountain Highway, PO	Customer HEB Engineers, Inc.	Client (Pro Mgr) Jeff Sires	State NH	Project Name Tamworth LF PFAS Monitoring	EAI Project ID
Eastern Analytical, Inc.		Fax 356-7715	03860	iin Highway, PO	y			Monitoring	
, Inc. www.easternanalytical.com 800.287.0525 customerservice@easternanalytical.com	MA □A+ □B □B+ □C □MAMCP	QC deliverables					Tamworth Mobils Home Park	Results Needed by: Preferred dateNotes:	ect ID
0525 customerservice@ea	Relinquished by	cReunquished by	3/14/19 1400	Samples Collected by: J. Cagne 154	☐ e-mail Login Confirmation	PDF prelim, NO FAX	☐ EDD PDF ☑ EDD email	ReportingOptions MC	
sternanalytical.com	Date/Time	Date/Time	1400 /	Si Cagne 1 to 4	,	□ EQUIS	☐ Partial FAX ☐ PDF Invoice	□ NO FAX	•
	Received by	Received by	In Xlora			260	Quote#: /c/6274	PO# verbal	•