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Technical Memorandum

To	Greg Levesque, ATC Erika L. Biemann, ATC	Page 1 of 4
CC		
Subject	Preliminary Review of Initial PFAS Laboratory Data ATC Blount Transmission Substation, Madison Wisconsin	
From	Leo Linnemanstons, AECOM Dave Henderson, AECOM	
Date	July 30, 2019	

Background Information

On Friday, July 19, 2019, there was a fire incident involving a 138 kV transformer at the American Transmission Company (ATC) Blount Transmission (BLT) Substation located within the Madison Gas & Electric (MG&E) Blount Spot (BLS) Substation, 722 East Main Street, Madison Wisconsin.

The Madison Fire Department first responders reportedly used an aqueous film forming foam (AFFF) fire suppressant agent, Fire Service Plus, Inc., FireAde brand, 3% AFFF Liquid Foam Concentrate for firefighting.

After the first responders completed activities at the site, ATC mobilized its emergency response contractor, North Shore Environmental Construction, Inc. (NSEC), of Germantown Wisconsin.

NSEC obtained soil and water samples that day, Friday 7/19/2019, for laboratory analysis of Per- and Polyfluoroalkyl Substances (PFAS) to verify the use of the AFFF product and to determine if it contained PFAS.

The sample IDs and sample location descriptions are as follows:

- Catch Basin Oil, sample time 1:45 – oil obtained from the eastern on-site catch basin, inside the BLS substation fence/wall. This catch basin drains to the City of Madison storm sewer system.
- Catch Basin, sample time 2:00 – water obtained from the eastern on-site storm sewer catch basin, inside the BLS substation fence/wall. This catch basin drains to the City of Madison storm sewer system.
- Surface Water, sample time 3:00 – ponded surface water obtained from the gravel area northeast of the damaged transformer and within the firefighting area.
- Breaker Soil, sample time 3:30 – soil obtained from a “breaker” structure located northeast of the damaged transformer and within the firefighting area.
- LW (basin), sampled 4:20 – water sample obtained from the City of Madison’s storm sewer system at the southwest corner of E. Washington Ave and Livingston St., structure number IN 5247-117.

- Blount Street sampled 4:45 – water sample obtained from the City of Madison's storm sewer system approximately ½ block south of the intersection of E. Main Street and S. Blount Street, structure number IN 5248-009.

Draft field sample location maps as provide by NSEC are provided as Figures 1 and 2.

These samples were obtained after fire-fighting activities were complete, while NSEC was conducting full-scale storm water system water recovery efforts (i.e. oil skimming and water recovery). Therefore, the water samples should be representative of the water present in the storm sewer system immediately after firefighting activities. The surface water and soil samples should also be representative of conditions immediately after firefighting activities.

As reported by NSEC, the water and soil samples were collected in laboratory supplied PFAS free sample containers following laboratory provided PFAS free sampling protocols. The samples were shipped to Eurofins/TestAmerica Laboratory (Eurofins), Sacramento, CA under chain-of-custody (COC) control. Analysis was conducted following EPA Method 537 (Modified) isotope dilution. The PFAS laboratory report is attached and referenced as follows:

Client:	North Shore Environmental Constr Inc.
Project/Site:	ATC Blount SS – 9A326
Laboratory Job ID:	320-52453-1
Authorized for Release:	7/29/2019

The PFAS laboratory analytical results are summarized in Table 1, attached.

Discussion of PFAS Results

The goal of the PFAS sampling event on July 19, 2019, immediately following firefighting activities, was to document site conditions at that time and to verify if the AFFF product used during firefighting activities contained PFAS. The results presented in this memo should only be reviewed relative to that goal, especially since site conditions have changed since these PFAS samples were obtained (i.e. storm sewer water recovery efforts and initial surface soil removal activities have been conducted).

Field Observations

- No field blank was obtained during the sampling event. Since the lab data is being used as a site conditions check and not for site clearance confirmation, the lack of a field blank data should not limit the use of the laboratory data to determine general site conditions.
- A Catch Basin Oil sample was provided to the lab, as noted on the COC. In subsequent correspondence, the laboratory and NSEC determined that analysis of the oil was not practical. Therefore, while the oil sample is noted on the COC, there are no results reported for the oil sample.

Quality Control

- The laboratory analytical report includes multiple comments and QC qualifiers. See pages 4 and 5 of the laboratory report. While there are many qualifiers, the use of the data should not be limited to determine general site conditions at the time of sampling.
- AECOM conducted a preliminary QA/QC review of the laboratory data. See the attached Draft PFAS Data Quality Review SDG 320-52453-1 memo. The QA/QC review supports the use of the laboratory data to determine general site conditions at the time of sampling.
- The Login Sample Receipt Checklist provided on page 38 of 38 on the laboratory report includes a note that the sample bottle descriptions did not match the COC sample descriptions.

It is presumed that the laboratory was able to match label descriptions with COC descriptions and that the sample results are representative of the identified sample locations.

Review of Results

- A summary of the ATC Eurofins PFAS laboratory data is presented in the attached Table 1.
- A comparison of the laboratory analyte list to the WDNR's draft Wisconsin Laboratory Accreditation Program PFAS Certification list of PFAS should be made. In preliminary review, it appears that the laboratory analytical list may not match all 36 compounds on the draft Wisconsin list. This should not limit the use of the information presented on the laboratory report.
- The analytical results for the Breaker Soil sample are limited, see the original laboratory report for the soil results. When compared to the water results, the soil results were considered not as representative as the water. Therefore, no further review of the soil results was conducted.
- Water analytical results:
  - When the magnitude of on-site Surface Water results are compared to the off-site storm water system results – it appears that the concentration of compounds for on-site results are greater than the off-site results, indicating a concentration gradient from the source area, the fire location, to the off-site storm sewers.
  - The analytical results for the water samples obtained from the storm water system are consistent for the PFAS compounds present and the concentrations of those compounds, See Table 1.
  - AECOM was provided an analytical laboratory report that purportedly represents data provided by the AFFF manufacture, Fire Service Plus, Inc. A copy of the report is attached and refenced as follows:

    Laboratory: Maxxam Analytics International Corporation, Missisauga, Ontario, Canada
    Maxxam Job Number: B7G4803
    Maxxam Report Number: R4656951, Version 1-Final
    Client: AJ Stone Co LTD
    Client Project Number: FIREADE SAMPLE
    Client Location: FIREADE SAMPLE/WATER

    The Maxxam laboratory results indicate an analytical method of "EPA 537 m" with a Reportable Detection Limit (RDL) of 0.020 milligrams per liter (ug/l). The laboratory report provides results for 17 PFAS compounds. For Sample EWD695, the "Water Mixed with 0.0583ML Fireade" the only PFAS compound reported above RDL is Perfluorohexanoic Acid (PFHxA).

    When the Maxxam analytical results are compared to the Eurofins ATC water results the following observations can be made:

    - The amount of Fireade mixed with water for the Maxxam analysis will determine the concentration of PFAS compounds present in the laboratory results. There may be a difference in the sample volume mixed for the laboratory analysis and the manufacturer's recommended mix proportions used during firefighting activities.

    - While PFHxA is present in the ATC Eurofins data, it is not the only PFAS compound present nor is it the compound with the largest concentration. 6:2 Fluorotelomer sulfonic acid (6:2 FTS) is the PFAS present in the ATC Eurofins data at the largest concentration, see Table 1.

This suggests that the Maxxam results, with a RDL of 0.020 ug/l, did not quantify all PFAS compounds in the Fireade product and/or that the Maxxam analytical list of 17 PFAS compounds did not include the major PFAS compounds present in the Fireade product.

An analysis of the Fireade product using the ATC Eurofins laboratory methods with a similar method detection limit (i.e. RDL) and analyte list may provide a better equivalent comparison.

- As an emerging class of contaminants, to date, the EPA has not determined a Maximum Contaminant Level (MCL) for PFAS under the Safe Drinking Water Act. Additionally, there are currently no promulgated State of Wisconsin groundwater or surface water standards for PFAS.

  The ATC Eurofins laboratory analytical results indicated that PFAS were present in the surface water and storm water samples and that Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS) compounds are present as part of the mixture, see Table 1.

  The EPA has published a drinking water lifetime Health Advisory Level (HAL) for two PFAS compounds, PFOA and PFOS. The HAL serves as a technical guidance for federal, state, and local officials, but it is a non-enforceable federal limit. The lifetime HAL for PFOA and PFOS is 70 nanograms per liter (ng/l) or parts per trillion (ppt) and when both PFOA and PFOS are present in drinking water the combined levels should be compared with the 70 ppt advisory level. <u>As a drinking water advisory level the HAL does not apply to our surface water or storm water results. Additionally, the ATC Eurofins analytical results indicate that PFOA and PFOS concentrations in the surface water and storm water are below the HAL.</u>

  The Wisconsin Department of Health Services (WDHS) at the request of the WDNR has recently proposed new groundwater standards for PFOA and PFOS. The proposed standards are an Enforcement Standard (ES) of 20 nanograms per liter (ng/l) and a Preventative Action Limit (PAL) of 2 ng/l. At this time there are currently no surface water standards being proposed. <u>As a proposed groundwater standard, the ES and PAL do not apply to our surface water or storm water results. Additionally, the ATC Eurofins analytical results indicate that PFOA and PFOS concentrations in the surface water and storm water are below the proposed ES standard.</u>

Memo Attachments:

Figures 1 and 2, draft field sample location maps
Eurofins/TestAmerica PFAS laboratory report
Draft Table 1, PFAS Analytical Results
Draft PFAS Data Quality Review Memo
Maxxam Laboratory Analytical Results

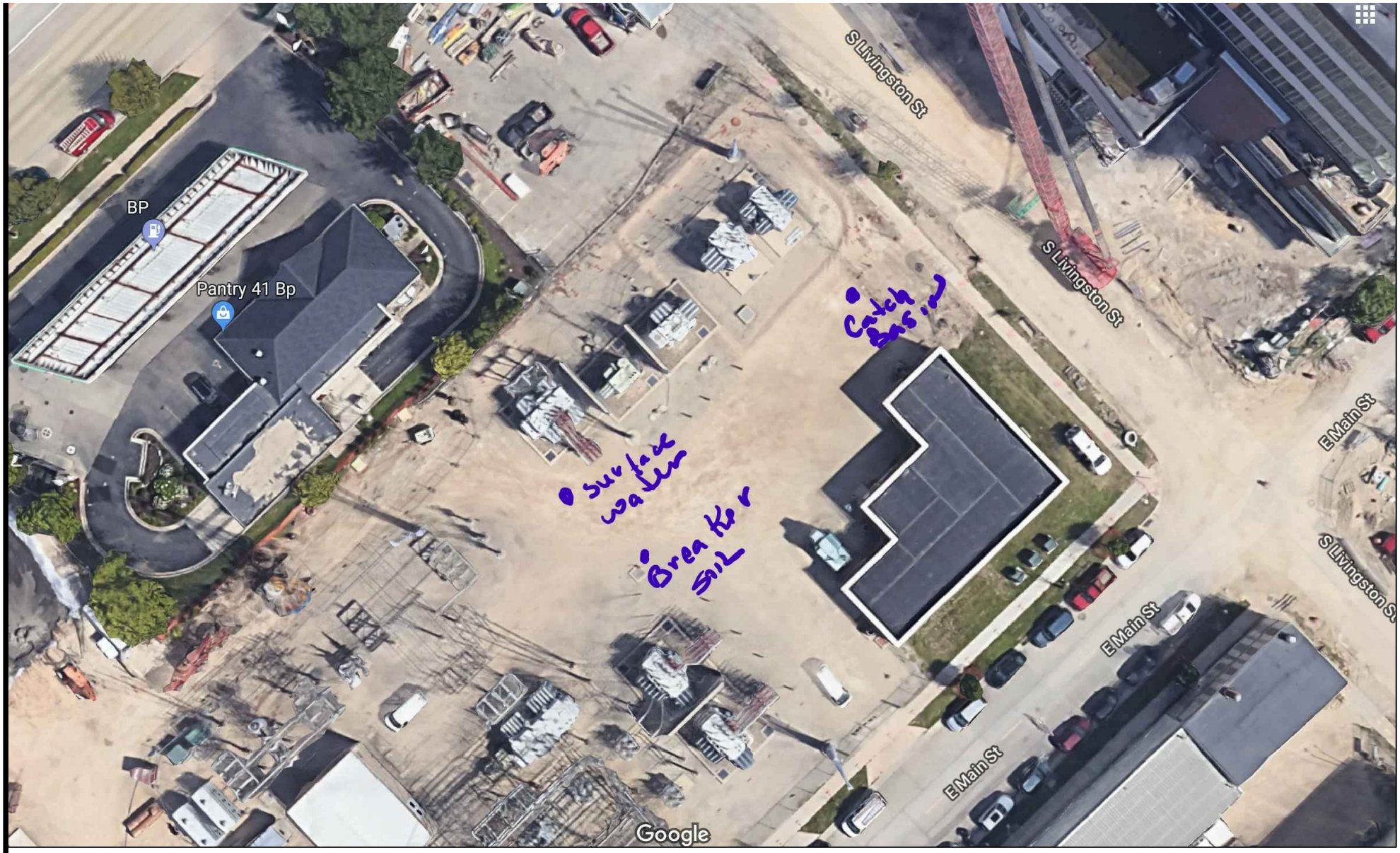

Photo Courtesy: North Shore Environmental Construction, Inc.

AECOM
Milwaukee Office
1555 RiverCenter Dr
Milwaukee, WI
414.944.6080

Blount Substation
722 E. Main St.
Madison, WI 53703

NSEC REPORTED SAMPLE LOCATIONS ON PROJECT PROPERTY

Project Number:	Drawn By:	Date:	Figure No.
60611431	EMS	7/30/2019	1

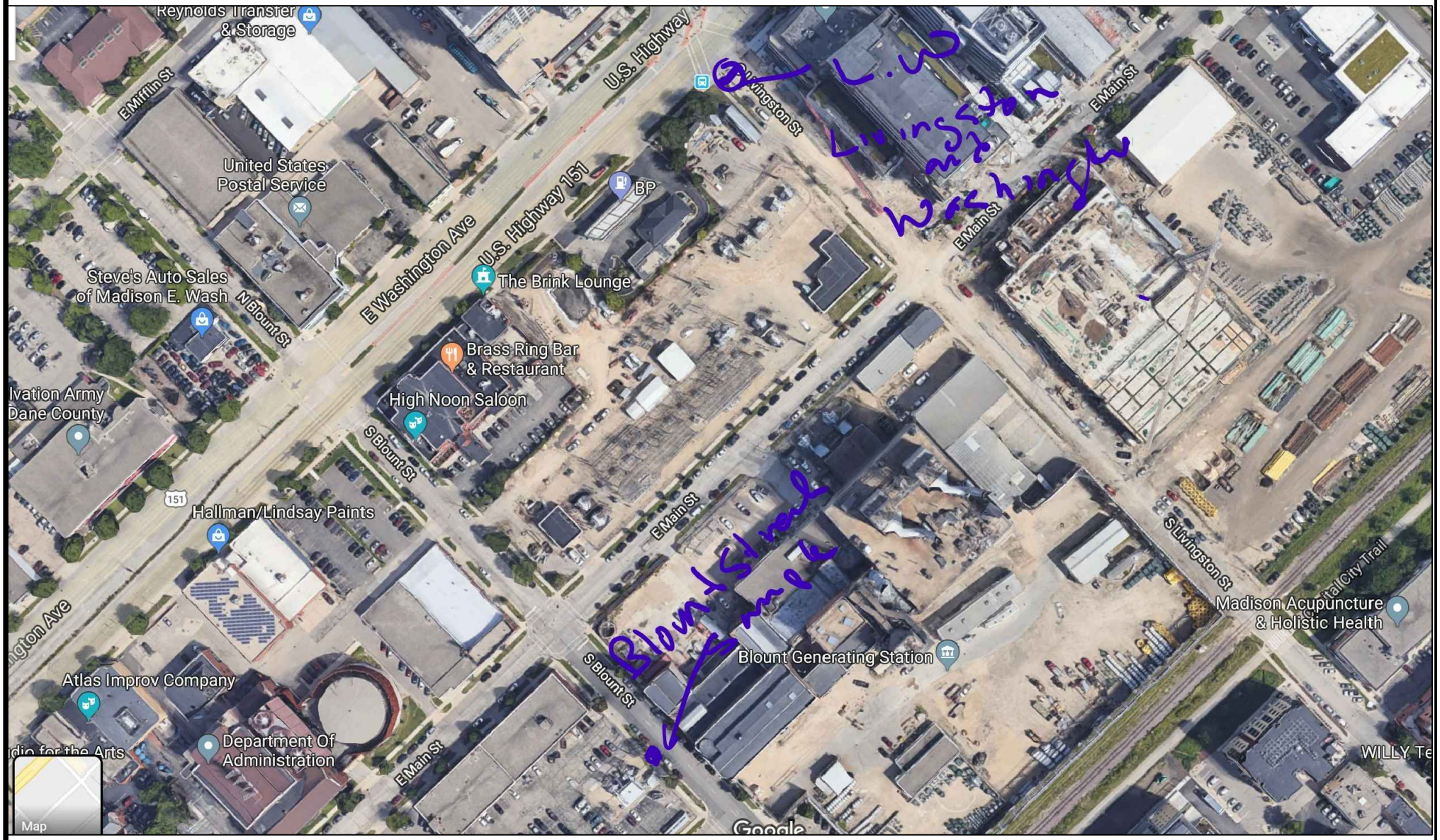

Photo Courtesy: North Shore Environmental Construction, Inc.

AECOM
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1555 RiverCenter Dr
Milwaukee, WI
414.944.6080

Blount Substation
722 E. Main St.
Madison, WI 53703

NSEC REPORTED SAMPLE LOCATIONS OUTSIDE PROJECT PROPERTY

Project Number:	Drawn By:	Date:	Figure No. 2
60611431	EMS	7/30/2019	

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-52453-1
Client Project/Site: ATC Blount SS - 9A326

For:
North Shore Environmental Constr Inc.
N117 W18493 Fulton Drive
Germantown, Wisconsin 53022

Attn: Dave Krueger

Sandie Fredrick

Authorized for release by:
7/29/2019 6:58:48 PM

Sandie Fredrick, Project Manager II
(920)261-1660
sandie.fredrick@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Definitions/Glossary

Client: North Shore Environmental Constr Inc. Job ID: 320-52453-1
Project/Site: ATC Blount SS - 9A326

Qualifiers

LCMS

Qualifier	Qualifier Description
*	Isotope Dilution analyte is outside acceptance limits.
*	LCS or LCSD is outside acceptance limits.
B	Compound was found in the blank and sample.
CI	The peak identified by the data system exhibited chromatographic interference that could not be resolved. There is reason to suspect there may be a high bias.
F1	MS and/or MSD Recovery is outside acceptance limits.
I	Value is EMPC (estimated maximum possible concentration).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 320-52453-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

Job Narrative
320-52453-1

Comments
No additional comments.

Receipt
The samples were received on 7/20/2019 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.6º C.

LCMS
Method(s) 537 (modified): Results for sample SURFACE WATER (320-52453-2) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits

Method(s) 537 (modified): The laboratory control sample (LCS) for preparation batch 320-309161 and analytical batch 320-309830 recovered outside control limits for the following analytes: Perfluoro-n-hexadecanoic acid (PFHxDA). These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method(s) 537 (modified): The matrix spike / matrix spike duplicate (MS/MSD) recoveries for several analytes in preparation batch 320-309161 and analytical batch 320-309913 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected.

Method(s) 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for M2-6:2 FTS and M2-8:2 FTS the following samples: BLOUNT STREET (320-52453-5). The samples were re-analyzed with concurring results. Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method(s) 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for M2-8:2 FTS the following samples: CATCH BASIN (320-52453-1). The samples were re-analyzed with concurring results. Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method(s) 537 (modified): The “I” qualifier means the transition mass ratio for the indicated analyte was outside of the established ratio limits. The qualitative identification of the analyte has/have some degree of uncertainty. However, analyst judgement was used to positively identify the analyte. CATCH BASIN (320-52453-1)

Method(s) 537 (modified): The laboratory control sample (LCS) for preparation batch 320-310125 and analytical batch 320-310513 recovered outside control limits for the following analytes: Perfluoro-n-hexadecanoic acid (PFHxDA) and Perfluoro-n-octadecanoic acid (PFODA). These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method(s) 537 (modified): The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 320-310125 and analytical batch 320-310513 were outside control limits for several analytes. Sample matrix interference is suspected.

Method(s) 537 (modified): The “I” qualifier means the transition mass ratio for the indicated analyte(s) was outside of the established ratio limits. The qualitative identification of the analyte(s) has/have some degree of uncertainty. However, analyst judgement was used to positively identify the analyte(s). SURFACE WATER (320-52453-2) and LW (BASIN) (320-52453-4)

Method(s) 537 (modified): The following samples have chromatographic interferences that could adversely impact the identification and quantitation of Perfluorooctanesulfonic acid (PFOS): CATCH BASIN (320-52453-1), SURFACE WATER (320-52453-2) and LW (BASIN) (320-52453-4) These interferences could cause false positive results.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Job ID: 320-52453-1 (Continued)

Laboratory: Eurofins TestAmerica, Sacramento (Continued)

Organic Prep

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-309122. Method Code: 3535 PFC

Method(s) 3535: The following sample was observed to be partially opaque prior to extraction:SURFACE WATER (320-52453-2). Method Code: 3535 PFC preparation batch 320-309122

Method(s) 3535: The following sample was observed to have very small black particles floating and partially opaque prior to extraction: BLOUNT STREET (320-52453-5). Method Code: 3535 PFC preparation batch 320-309122

Method(s) 3535: The following samples were observed to be a turbid light yellow color after extraction: BLOUNT STREET (320-52453-5). Method Code: 3535 PFC preparation batch 320-309122

Method(s) 3535: Due to the matrix of the following samples, they were fortified with IDA, centrifuged, decanted into the same bottle, then extracted: SURFACE WATER (320-52453-2) and BLOUNT STREET (320-52453-5). Eluting occurred in the 5 50mL centrifuge tubes used to centrifuge the sample and the container. Method Code: 3535 PFC preparation batch 320-309122

Method(s) SHAKE: After the final volume, the following sample exhibits a cloudy and yellow color: BREAKER SOIL (320-52453-3). Method: Shake_Bath_14D Matrix: Solid Prep-batch: 320-309161

Method(s) SHAKE: Due to potential high levels, the initial volumes used for the following samples deviated from the standard procedure: BREAKER SOIL (320-52453-3), (320-52453-A-3 MS) and (320-52453-A-3 MSD). The reporting limits (RLs) have been adjusted proportionately.
Method: Shake_Bath_14D Matrix: Solid Prep-batch: 320-309161

Method(s) SHAKE: The following samples were observed to be of a milky white color after Solid Phase Extraction: BREAKER SOIL (320-52453-3), (320-52453-A-3 MS) and (320-52453-A-3 MSD) preparation batch 320-310125 Method: PFC_IDA Matrix: Solid

Method(s) SHAKE: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-310125.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: North Shore Environmental Constr Inc.
Project/Site: ATC Blount SS - 9A326

Job ID: 320-52453-1

Client Sample ID: CATCH BASIN — Lab Sample ID: 320-52453-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.3		1.8	0.32	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	3.2		1.8	0.45	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	7.0		1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.67	J	1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.8		1.8	0.77	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.43	J	1.8	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.35	J	1.8	0.28	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.33	J	1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.81	J B	1.8	0.15	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	7.0	I CI	1.8	0.49	ng/L	1		537 (modified)	Total/NA
6:2 FTS	230		18	1.8	ng/L	1		537 (modified)	Total/NA
8:2 FTS	19		18	1.8	ng/L	1		537 (modified)	Total/NA
10:2 FTS	1.5	J	1.8	0.17	ng/L	1		537 (modified)	Total/NA
Ammonium Perfluorooctanoate (APFO)	1.9		1.9	0.80	ng/L	1		537 (modified)	Total/NA

Client Sample ID: SURFACE WATER — Lab Sample ID: 320-52453-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	14		1.9	0.32	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	12		1.9	0.45	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	26		1.9	0.54	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.0		1.9	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	2.7		1.9	0.79	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.60	J	1.9	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.68	J	1.9	0.29	ng/L	1		537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.60	J	1.9	0.27	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.71	J	1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.9	B	1.9	0.16	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	13	I CI	1.9	0.50	ng/L	1		537 (modified)	Total/NA
8:2 FTS	21		19	1.9	ng/L	1		537 (modified)	Total/NA
10:2 FTS	1.1	J	1.9	0.18	ng/L	1		537 (modified)	Total/NA
Ammonium Perfluorooctanoate (APFO)	2.8		1.9	0.82	ng/L	1		537 (modified)	Total/NA
6:2 FTS - DL	790		93	9.3	ng/L	5		537 (modified)	Total/NA

Client Sample ID: BREAKER SOIL — Lab Sample ID: 320-52453-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.16	J B	0.21	0.029	ug/Kg	1	☼	537 (modified)	Total/NA
6:2 FTS	7.7	F1	2.1	0.16	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: LW (BASIN) — Lab Sample ID: 320-52453-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	1.8		1.8	0.32	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	1.5	J	1.8	0.45	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	6.3		1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.41	J	1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.6	J	1.8	0.77	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.21	J	1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.40	J B	1.8	0.15	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.9	I CI	1.8	0.49	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: LW (BASIN) (Continued)

Lab Sample ID: 320-52453-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
6:2 FTS	80		18	1.8	ng/L	1		537 (modified)	Total/NA
8:2 FTS	2.5	J	18	1.8	ng/L	1		537 (modified)	Total/NA
10:2 FTS	0.87	J	1.8	0.17	ng/L	1		537 (modified)	Total/NA
Ammonium Perfluorooctanoate (APFO)	1.7	J	1.9	0.80	ng/L	1		537 (modified)	Total/NA

Client Sample ID: BLOUNT STREET

Lab Sample ID: 320-52453-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	9.5		1.7	0.30	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	2.8		1.7	0.42	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	3.9		1.7	0.50	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.5	J	1.7	0.22	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	3.2		1.7	0.74	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.55	J	1.7	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.73	J	1.7	0.27	ng/L	1		537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.44	J	1.7	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.8		1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	4.4	B	1.7	0.15	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	6.1		1.7	0.47	ng/L	1		537 (modified)	Total/NA
6:2 FTS	45		17	1.7	ng/L	1		537 (modified)	Total/NA
8:2 FTS	1.9	J	17	1.7	ng/L	1		537 (modified)	Total/NA
10:2 FTS	0.28	J	1.7	0.16	ng/L	1		537 (modified)	Total/NA
Ammonium Perfluorooctanoate (APFO)	3.4		1.8	0.76	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client: North Shore Environmental Constr Inc.
Project/Site: ATC Blount SS - 9A326

Job ID: 320-52453-1

Client Sample ID: CATCH BASIN

Date Collected: 07/19/19 14:00
Date Received: 07/20/19 09:40

Lab Sample ID: 320-52453-1

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**4.3**		1.8	0.32	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluoropentanoic acid (PFPeA)	**3.2**		1.8	0.45	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluorohexanoic acid (PFHxA)	**7.0**		1.8	0.53	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluoroheptanoic acid (PFHpA)	**0.67**	**J**	1.8	0.23	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluorooctanoic acid (PFOA)	**1.8**		1.8	0.77	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluorononanoic acid (PFNA)	**0.43**	**J**	1.8	0.25	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluorodecanoic acid (PFDA)	**0.35**	**J**	1.8	0.28	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluoroundecanoic acid (PFUnA)	<1.0		1.8	1.0	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluorododecanoic acid (PFDoA)	<0.50		1.8	0.50	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluorotridecanoic acid (PFTriA)	<1.2		1.8	1.2	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluorotetradecanoic acid (PFTeA)	<0.26		1.8	0.26	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.81		1.8	0.81	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluorobutanesulfonic acid (PFBS)	**0.33**	**J**	1.8	0.18	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.42		1.8	0.42	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluoropentanesulfonic acid (PFPeS)	<0.27		1.8	0.27	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluorohexanesulfonic acid (PFHxS)	**0.81**	**J B**	1.8	0.15	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.17		1.8	0.17	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluorooctanesulfonic acid (PFOS)	**7.0**	**I CI**	1.8	0.49	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluorononanesulfonic acid (PFNS)	<0.15		1.8	0.15	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluorodecanesulfonic acid (PFDS)	<0.29		1.8	0.29	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluorooctanesulfonamide (FOSA)	<0.32		1.8	0.32	ng/L		07/22/19 07:16	07/24/19 14:50	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<2.8		18	2.8	ng/L		07/22/19 07:16	07/24/19 14:50	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<1.7		18	1.7	ng/L		07/22/19 07:16	07/24/19 14:50	1
4:2 FTS	<4.7		18	4.7	ng/L		07/22/19 07:16	07/24/19 14:50	1
6:2 FTS	**230**		18	1.8	ng/L		07/22/19 07:16	07/24/19 14:50	1
8:2 FTS	**19**		18	1.8	ng/L		07/22/19 07:16	07/24/19 14:50	1
Perfluorododecanesulfonic acid (PFDoS)	<0.41		1.8	0.41	ng/L		07/22/19 07:16	07/24/19 14:50	1
ADONA	<0.17		1.9	0.17	ng/L		07/22/19 07:16	07/24/19 14:50	1
F-53B Major	<0.22		1.8	0.22	ng/L		07/22/19 07:16	07/24/19 14:50	1
HFPO-DA (GenX)	<1.4		3.6	1.4	ng/L		07/22/19 07:16	07/24/19 14:50	1
F-53B Minor	<0.29		1.8	0.29	ng/L		07/22/19 07:16	07/24/19 14:50	1
10:2 FTS	**1.5**	**J**	1.8	0.17	ng/L		07/22/19 07:16	07/24/19 14:50	1
NaDONA	<0.17		1.9	0.17	ng/L		07/22/19 07:16	07/24/19 14:50	1
DONA	<0.16		1.8	0.16	ng/L		07/22/19 07:16	07/24/19 14:50	1
Ammonium Perfluorooctanoate (APFO)	**1.9**		1.9	0.80	ng/L		07/22/19 07:16	07/24/19 14:50	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*105*		*25 - 150*	*07/22/19 07:16*	*07/24/19 14:50*	*1*
13C5 PFPeA	*114*		*25 - 150*	*07/22/19 07:16*	*07/24/19 14:50*	*1*
13C2 PFHxA	*117*		*25 - 150*	*07/22/19 07:16*	*07/24/19 14:50*	*1*
13C4 PFHpA	*112*		*25 - 150*	*07/22/19 07:16*	*07/24/19 14:50*	*1*
13C4 PFOA	*97*		*25 - 150*	*07/22/19 07:16*	*07/24/19 14:50*	*1*

Client: North Shore Environmental Constr Inc.
Project/Site: ATC Blount SS - 9A326

Job ID: 320-52453-1

Client Sample ID: CATCH BASIN
Date Collected: 07/19/19 14:00
Date Received: 07/20/19 09:40

Lab Sample ID: 320-52453-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	119		25 - 150	07/22/19 07:16	07/24/19 14:50	1
13C2 PFDA	133		25 - 150	07/22/19 07:16	07/24/19 14:50	1
13C2 PFHxDA	113		25 - 150	07/22/19 07:16	07/24/19 14:50	1
13C2 PFUnA	128		25 - 150	07/22/19 07:16	07/24/19 14:50	1
13C2 PFDoA	125		25 - 150	07/22/19 07:16	07/24/19 14:50	1
13C2 PFTeDA	131		25 - 150	07/22/19 07:16	07/24/19 14:50	1
13C3 PFBS	120		25 - 150	07/22/19 07:16	07/24/19 14:50	1
18O2 PFHxS	119		25 - 150	07/22/19 07:16	07/24/19 14:50	1
13C4 PFOS	115		25 - 150	07/22/19 07:16	07/24/19 14:50	1
13C8 FOSA	111		25 - 150	07/22/19 07:16	07/24/19 14:50	1
d3-NMeFOSAA	130		25 - 150	07/22/19 07:16	07/24/19 14:50	1
d5-NEtFOSAA	147		25 - 150	07/22/19 07:16	07/24/19 14:50	1
M2-6:2 FTS	117		25 - 150	07/22/19 07:16	07/24/19 14:50	1
M2-8:2 FTS	172	*	25 - 150	07/22/19 07:16	07/24/19 14:50	1
M2-4:2 FTS	150		25 - 150	07/22/19 07:16	07/24/19 14:50	1
13C3 HFPO-DA	99		25 - 150	07/22/19 07:16	07/24/19 14:50	1

Client: North Shore Environmental Constr Inc.
Project/Site: ATC Blount SS - 9A326

Job ID: 320-52453-1

Client Sample ID: SURFACE WATER

Date Collected: 07/19/19 15:00
Date Received: 07/20/19 09:40

Lab Sample ID: 320-52453-2

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**14**		1.9	0.32	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluoropentanoic acid (PFPeA)	**12**		1.9	0.45	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluorohexanoic acid (PFHxA)	**26**		1.9	0.54	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluoroheptanoic acid (PFHpA)	**3.0**		1.9	0.23	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluorooctanoic acid (PFOA)	**2.7**		1.9	0.79	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluorononanoic acid (PFNA)	**0.60**	**J**	1.9	0.25	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluorodecanoic acid (PFDA)	**0.68**	**J**	1.9	0.29	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluoroundecanoic acid (PFUnA)	<1.0		1.9	1.0	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluorododecanoic acid (PFDoA)	<0.51		1.9	0.51	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluorotridecanoic acid (PFTriA)	<1.2		1.9	1.2	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluorotetradecanoic acid (PFTeA)	**0.60**	**J**	1.9	0.27	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.83		1.9	0.83	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluorobutanesulfonic acid (PFBS)	**0.71**	**J**	1.9	0.19	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.43		1.9	0.43	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluoropentanesulfonic acid (PFPeS)	<0.28		1.9	0.28	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluorohexanesulfonic acid (PFHxS)	**1.9**	**B**	1.9	0.16	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.18		1.9	0.18	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluorooctanesulfonic acid (PFOS)	**13**	**I CI**	1.9	0.50	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluorononanesulfonic acid (PFNS)	<0.15		1.9	0.15	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluorodecanesulfonic acid (PFDS)	<0.30		1.9	0.30	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluorooctanesulfonamide (FOSA)	<0.32		1.9	0.32	ng/L		07/22/19 07:16	07/23/19 15:29	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<2.9		19	2.9	ng/L		07/22/19 07:16	07/23/19 15:29	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<1.8		19	1.8	ng/L		07/22/19 07:16	07/23/19 15:29	1
8:2 FTS	**21**		19	1.9	ng/L		07/22/19 07:16	07/23/19 15:29	1
Perfluorododecanesulfonic acid (PFDoS)	<0.42		1.9	0.42	ng/L		07/22/19 07:16	07/23/19 15:29	1
ADONA	<0.18		1.9	0.18	ng/L		07/22/19 07:16	07/23/19 15:29	1
F-53B Major	<0.22		1.9	0.22	ng/L		07/22/19 07:16	07/23/19 15:29	1
HFPO-DA (GenX)	<1.4		3.7	1.4	ng/L		07/22/19 07:16	07/23/19 15:29	1
F-53B Minor	<0.30		1.9	0.30	ng/L		07/22/19 07:16	07/23/19 15:29	1
10:2 FTS	**1.1**	**J**	1.9	0.18	ng/L		07/22/19 07:16	07/23/19 15:29	1
NaDONA	<0.18		1.9	0.18	ng/L		07/22/19 07:16	07/23/19 15:29	1
DONA	<0.17		1.9	0.17	ng/L		07/22/19 07:16	07/23/19 15:29	1
Ammonium Perfluorooctanoate (APFO)	**2.8**		1.9	0.82	ng/L		07/22/19 07:16	07/23/19 15:29	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*96*		*25 - 150*	*07/22/19 07:16*	*07/23/19 15:29*	*1*
13C5 PFPeA	*135*		*25 - 150*	*07/22/19 07:16*	*07/23/19 15:29*	*1*
13C2 PFHxA	*129*		*25 - 150*	*07/22/19 07:16*	*07/23/19 15:29*	*1*
13C4 PFHpA	*136*		*25 - 150*	*07/22/19 07:16*	*07/23/19 15:29*	*1*
13C4 PFOA	*97*		*25 - 150*	*07/22/19 07:16*	*07/23/19 15:29*	*1*
13C5 PFNA	*150*		*25 - 150*	*07/22/19 07:16*	*07/23/19 15:29*	*1*

Client: North Shore Environmental Constr Inc.
Project/Site: ATC Blount SS - 9A326

Job ID: 320-52453-1

Client Sample ID: SURFACE WATER

Date Collected: 07/19/19 15:00
Date Received: 07/20/19 09:40

Lab Sample ID: 320-52453-2

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	125		25 - 150	07/22/19 07:16	07/23/19 15:29	1
13C2 PFHxDA	83		25 - 150	07/22/19 07:16	07/23/19 15:29	1
13C2 PFUnA	135		25 - 150	07/22/19 07:16	07/23/19 15:29	1
13C2 PFDoA	126		25 - 150	07/22/19 07:16	07/23/19 15:29	1
13C2 PFTeDA	121		25 - 150	07/22/19 07:16	07/23/19 15:29	1
13C3 PFBS	141		25 - 150	07/22/19 07:16	07/23/19 15:29	1
18O2 PFHxS	134		25 - 150	07/22/19 07:16	07/23/19 15:29	1
13C4 PFOS	135		25 - 150	07/22/19 07:16	07/23/19 15:29	1
13C8 FOSA	110		25 - 150	07/22/19 07:16	07/23/19 15:29	1
d3-NMeFOSAA	128		25 - 150	07/22/19 07:16	07/23/19 15:29	1
d5-NEtFOSAA	138		25 - 150	07/22/19 07:16	07/23/19 15:29	1
M2-8:2 FTS	129		25 - 150	07/22/19 07:16	07/23/19 15:29	1
13C3 HFPO-DA	92		25 - 150	07/22/19 07:16	07/23/19 15:29	1

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4:2 FTS	<24		93	24	ng/L		07/22/19 07:16	07/23/19 15:21	5
6:2 FTS	**790**		93	9.3	ng/L		07/22/19 07:16	07/23/19 15:21	5

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-6:2 FTS	129		25 - 150	07/22/19 07:16	07/23/19 15:21	5
M2-4:2 FTS	133		25 - 150	07/22/19 07:16	07/23/19 15:21	5

Client Sample ID: BREAKER SOIL

Lab Sample ID: 320-52453-3
Date Collected: 07/19/19 13:30
Matrix: Solid
Date Received: 07/20/19 09:40
Percent Solids: 93.6

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**0.16**	**J B**	0.21	0.029	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluoropentanoic acid (PFPeA)	<0.080		0.21	0.080	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluorohexanoic acid (PFHxA)	<0.044		0.21	0.044	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluoroheptanoic acid (PFHpA)	<0.030		0.21	0.030	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluorooctanoic acid (PFOA)	<0.090		0.21	0.090	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluorononanoic acid (PFNA)	<0.038		0.21	0.038	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluorodecanoic acid (PFDA)	<0.023		0.21	0.023	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluoroundecanoic acid (PFUnA)	<0.038		0.21	0.038	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluorododecanoic acid (PFDoA)	<0.070		0.21	0.070	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluorotridecanoic acid (PFTriA)	<0.053		0.21	0.053	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluorotetradecanoic acid (PFTeA)	<0.056		0.21	0.056	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.046	* F1	0.21	0.046	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.029	* F1	0.21	0.029	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluorobutanesulfonic acid (PFBS)	<0.026		0.21	0.026	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluorohexanesulfonic acid (PFHxS)	<0.032		0.21	0.032	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.037		0.21	0.037	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluorodecanesulfonic acid (PFDS)	<0.041		0.21	0.041	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluorooctanesulfonic acid (PFOS)	<0.21		0.52	0.21	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluorooctanesulfonamide (FOSA)	<0.086		0.21	0.086	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluoropentanesulfonic acid (PFPeS)	<0.021		0.21	0.021	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluorononanesulfonic acid (PFNS)	<0.021		0.21	0.021	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<0.41		2.1	0.41	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<0.39		2.1	0.39	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
4:2 FTS	<0.39		2.1	0.39	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
6:2 FTS	**7.7**	**F1**	2.1	0.16	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
8:2 FTS	<0.26		2.1	0.26	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
10:2 FTS	<0.052	F1	0.21	0.052	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Perfluorododecanesulfonic acid (PFDoS)	<0.063		0.21	0.063	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
ADONA	<0.020		0.22	0.020	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
F-53B Major	<0.028		0.21	0.028	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
HFPO-DA (GenX)	<0.11		0.26	0.11	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
F-53B Minor	<0.023		0.21	0.023	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
NaDONA	<0.020		0.22	0.020	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
DONA	<0.019		0.21	0.019	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1
Ammonium Perfluorooctanoate (APFO)	<0.093		0.22	0.093	ug/Kg	☼	07/25/19 11:33	07/26/19 15:34	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*71*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:34*	*1*
13C4 PFBA	*87*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:34*	*1*
13C5 PFPeA	*88*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:34*	*1*
13C2 PFHxA	*77*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:34*	*1*
13C4 PFHpA	*88*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:34*	*1*
13C4 PFOA	*92*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:34*	*1*
13C5 PFNA	*96*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:34*	*1*

Client: North Shore Environmental Constr Inc.
Project/Site: ATC Blount SS - 9A326

Job ID: 320-52453-1

Client Sample ID: BREAKER SOIL

Date Collected: 07/19/19 13:30
Date Received: 07/20/19 09:40

Lab Sample ID: 320-52453-3

Matrix: Solid
Percent Solids: 93.6

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	94		25 - 150	07/25/19 11:33	07/26/19 15:34	1
13C2 PFUnA	96		25 - 150	07/25/19 11:33	07/26/19 15:34	1
13C2 PFDoA	93		25 - 150	07/25/19 11:33	07/26/19 15:34	1
13C2 PFTeDA	97		25 - 150	07/25/19 11:33	07/26/19 15:34	1
13C2 PFHxDA	92		25 - 150	07/25/19 11:33	07/26/19 15:34	1
13C3 PFBS	95		25 - 150	07/25/19 11:33	07/26/19 15:34	1
18O2 PFHxS	90		25 - 150	07/25/19 11:33	07/26/19 15:34	1
13C4 PFOS	92		25 - 150	07/25/19 11:33	07/26/19 15:34	1
d3-NMeFOSAA	96		25 - 150	07/25/19 11:33	07/26/19 15:34	1
d5-NEtFOSAA	107		25 - 150	07/25/19 11:33	07/26/19 15:34	1
M2-4:2 FTS	96		25 - 150	07/25/19 11:33	07/26/19 15:34	1
M2-6:2 FTS	112		25 - 150	07/25/19 11:33	07/26/19 15:34	1
M2-8:2 FTS	135		25 - 150	07/25/19 11:33	07/26/19 15:34	1
13C3 HFPO-DA	72		25 - 150	07/25/19 11:33	07/26/19 15:34	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	6.4		0.1	0.1	%			07/22/19 14:38	1
Percent Solids	93.6		0.1	0.1	%			07/22/19 14:38	1

Client: North Shore Environmental Constr Inc.
Project/Site: ATC Blount SS - 9A326

Job ID: 320-52453-1

Client Sample ID: LW (BASIN)
Date Collected: 07/19/19 16:20
Date Received: 07/20/19 09:40

Lab Sample ID: 320-52453-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**1.8**		1.8	0.32	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluoropentanoic acid (PFPeA)	**1.5**	**J**	1.8	0.45	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluorohexanoic acid (PFHxA)	**6.3**		1.8	0.53	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluoroheptanoic acid (PFHpA)	**0.41**	**J**	1.8	0.23	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluorooctanoic acid (PFOA)	**1.6**	**J**	1.8	0.77	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluorononanoic acid (PFNA)	<0.25		1.8	0.25	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluorodecanoic acid (PFDA)	<0.28		1.8	0.28	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluoroundecanoic acid (PFUnA)	<1.0		1.8	1.0	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluorododecanoic acid (PFDoA)	<0.50		1.8	0.50	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluorotridecanoic acid (PFTriA)	<1.2		1.8	1.2	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluorotetradecanoic acid (PFTeA)	<0.26		1.8	0.26	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.81		1.8	0.81	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluorobutanesulfonic acid (PFBS)	**0.21**	**J**	1.8	0.18	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.42		1.8	0.42	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluoropentanesulfonic acid (PFPeS)	<0.27		1.8	0.27	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluorohexanesulfonic acid (PFHxS)	**0.40**	**J B**	1.8	0.15	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.17		1.8	0.17	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluorooctanesulfonic acid (PFOS)	**2.9**	**I CI**	1.8	0.49	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluorononanesulfonic acid (PFNS)	<0.15		1.8	0.15	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluorodecanesulfonic acid (PFDS)	<0.29		1.8	0.29	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluorooctanesulfonamide (FOSA)	<0.32		1.8	0.32	ng/L		07/22/19 07:16	07/23/19 15:05	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<2.8		18	2.8	ng/L		07/22/19 07:16	07/23/19 15:05	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<1.7		18	1.7	ng/L		07/22/19 07:16	07/23/19 15:05	1
4:2 FTS	<4.7		18	4.7	ng/L		07/22/19 07:16	07/23/19 15:05	1
6:2 FTS	**80**		18	1.8	ng/L		07/22/19 07:16	07/23/19 15:05	1
8:2 FTS	**2.5**	**J**	18	1.8	ng/L		07/22/19 07:16	07/23/19 15:05	1
Perfluorododecanesulfonic acid (PFDoS)	<0.41		1.8	0.41	ng/L		07/22/19 07:16	07/23/19 15:05	1
ADONA	<0.17		1.9	0.17	ng/L		07/22/19 07:16	07/23/19 15:05	1
F-53B Major	<0.22		1.8	0.22	ng/L		07/22/19 07:16	07/23/19 15:05	1
HFPO-DA (GenX)	<1.4		3.6	1.4	ng/L		07/22/19 07:16	07/23/19 15:05	1
F-53B Minor	<0.29		1.8	0.29	ng/L		07/22/19 07:16	07/23/19 15:05	1
10:2 FTS	**0.87**	**J**	1.8	0.17	ng/L		07/22/19 07:16	07/23/19 15:05	1
NaDONA	<0.17		1.9	0.17	ng/L		07/22/19 07:16	07/23/19 15:05	1
DONA	<0.16		1.8	0.16	ng/L		07/22/19 07:16	07/23/19 15:05	1
Ammonium Perfluorooctanoate (APFO)	**1.7**	**J**	1.9	0.80	ng/L		07/22/19 07:16	07/23/19 15:05	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*79*		*25 - 150*	*07/22/19 07:16*	*07/23/19 15:05*	*1*
13C5 PFPeA	*96*		*25 - 150*	*07/22/19 07:16*	*07/23/19 15:05*	*1*
13C2 PFHxA	*96*		*25 - 150*	*07/22/19 07:16*	*07/23/19 15:05*	*1*
13C4 PFHpA	*103*		*25 - 150*	*07/22/19 07:16*	*07/23/19 15:05*	*1*
13C4 PFOA	*95*		*25 - 150*	*07/22/19 07:16*	*07/23/19 15:05*	*1*

Client: North Shore Environmental Constr Inc.
Project/Site: ATC Blount SS - 9A326

Job ID: 320-52453-1

Client Sample ID: LW (BASIN)
Date Collected: 07/19/19 16:20
Date Received: 07/20/19 09:40

Lab Sample ID: 320-52453-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	101		25 - 150	07/22/19 07:16	07/23/19 15:05	1
13C2 PFDA	107		25 - 150	07/22/19 07:16	07/23/19 15:05	1
13C2 PFHxDA	87		25 - 150	07/22/19 07:16	07/23/19 15:05	1
13C2 PFUnA	103		25 - 150	07/22/19 07:16	07/23/19 15:05	1
13C2 PFDoA	103		25 - 150	07/22/19 07:16	07/23/19 15:05	1
13C2 PFTeDA	113		25 - 150	07/22/19 07:16	07/23/19 15:05	1
13C3 PFBS	99		25 - 150	07/22/19 07:16	07/23/19 15:05	1
18O2 PFHxS	95		25 - 150	07/22/19 07:16	07/23/19 15:05	1
13C4 PFOS	92		25 - 150	07/22/19 07:16	07/23/19 15:05	1
13C8 FOSA	86		25 - 150	07/22/19 07:16	07/23/19 15:05	1
d3-NMeFOSAA	100		25 - 150	07/22/19 07:16	07/23/19 15:05	1
d5-NEtFOSAA	102		25 - 150	07/22/19 07:16	07/23/19 15:05	1
M2-6:2 FTS	122		25 - 150	07/22/19 07:16	07/23/19 15:05	1
M2-8:2 FTS	112		25 - 150	07/22/19 07:16	07/23/19 15:05	1
M2-4:2 FTS	127		25 - 150	07/22/19 07:16	07/23/19 15:05	1
13C3 HFPO-DA	90		25 - 150	07/22/19 07:16	07/23/19 15:05	1

Client: North Shore Environmental Constr Inc.
Project/Site: ATC Blount SS - 9A326

Job ID: 320-52453-1

Client Sample ID: BLOUNT STREET

Date Collected: 07/19/19 16:45
Date Received: 07/20/19 09:40

Lab Sample ID: 320-52453-5

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**9.5**		1.7	0.30	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluoropentanoic acid (PFPeA)	**2.8**		1.7	0.42	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluorohexanoic acid (PFHxA)	**3.9**		1.7	0.50	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluoroheptanoic acid (PFHpA)	**1.5**	**J**	1.7	0.22	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluorooctanoic acid (PFOA)	**3.2**		1.7	0.74	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluorononanoic acid (PFNA)	**0.55**	**J**	1.7	0.23	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluorodecanoic acid (PFDA)	**0.73**	**J**	1.7	0.27	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluoroundecanoic acid (PFUnA)	<0.95		1.7	0.95	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluorododecanoic acid (PFDoA)	<0.48		1.7	0.48	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluorotridecanoic acid (PFTriA)	<1.1		1.7	1.1	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluorotetradecanoic acid (PFTeA)	**0.44**	**J**	1.7	0.25	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.77		1.7	0.77	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluorobutanesulfonic acid (PFBS)	**1.8**		1.7	0.17	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.40		1.7	0.40	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluoropentanesulfonic acid (PFPeS)	<0.26		1.7	0.26	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluorohexanesulfonic acid (PFHxS)	**4.4**	**B**	1.7	0.15	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.16		1.7	0.16	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluorooctanesulfonic acid (PFOS)	**6.1**		1.7	0.47	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluorononanesulfonic acid (PFNS)	<0.14		1.7	0.14	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluorodecanesulfonic acid (PFDS)	<0.28		1.7	0.28	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluorooctanesulfonamide (FOSA)	<0.30		1.7	0.30	ng/L		07/22/19 07:16	07/24/19 14:58	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<2.7		17	2.7	ng/L		07/22/19 07:16	07/24/19 14:58	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<1.6		17	1.6	ng/L		07/22/19 07:16	07/24/19 14:58	1
4:2 FTS	<4.5		17	4.5	ng/L		07/22/19 07:16	07/24/19 14:58	1
6:2 FTS	**45**		17	1.7	ng/L		07/22/19 07:16	07/24/19 14:58	1
8:2 FTS	**1.9**	**J**	17	1.7	ng/L		07/22/19 07:16	07/24/19 14:58	1
Perfluorododecanesulfonic acid (PFDoS)	<0.39		1.7	0.39	ng/L		07/22/19 07:16	07/24/19 14:58	1
ADONA	<0.16		1.8	0.16	ng/L		07/22/19 07:16	07/24/19 14:58	1
F-53B Major	<0.21		1.7	0.21	ng/L		07/22/19 07:16	07/24/19 14:58	1
HFPO-DA (GenX)	<1.3		3.5	1.3	ng/L		07/22/19 07:16	07/24/19 14:58	1
F-53B Minor	<0.28		1.7	0.28	ng/L		07/22/19 07:16	07/24/19 14:58	1
10:2 FTS	**0.28**	**J**	1.7	0.16	ng/L		07/22/19 07:16	07/24/19 14:58	1
NaDONA	<0.16		1.8	0.16	ng/L		07/22/19 07:16	07/24/19 14:58	1
DONA	<0.16		1.7	0.16	ng/L		07/22/19 07:16	07/24/19 14:58	1
Ammonium Perfluorooctanoate (APFO)	**3.4**		1.8	0.76	ng/L		07/22/19 07:16	07/24/19 14:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*82*		*25 - 150*	*07/22/19 07:16*	*07/24/19 14:58*	*1*
13C5 PFPeA	*85*		*25 - 150*	*07/22/19 07:16*	*07/24/19 14:58*	*1*
13C2 PFHxA	*88*		*25 - 150*	*07/22/19 07:16*	*07/24/19 14:58*	*1*
13C4 PFHpA	*95*		*25 - 150*	*07/22/19 07:16*	*07/24/19 14:58*	*1*

Client: North Shore Environmental Constr Inc.
Project/Site: ATC Blount SS - 9A326

Job ID: 320-52453-1

Client Sample ID: BLOUNT STREET
Date Collected: 07/19/19 16:45
Date Received: 07/20/19 09:40

Lab Sample ID: 320-52453-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	100		25 - 150	07/22/19 07:16	07/24/19 14:58	1
13C5 PFNA	102		25 - 150	07/22/19 07:16	07/24/19 14:58	1
13C2 PFDA	108		25 - 150	07/22/19 07:16	07/24/19 14:58	1
13C2 PFHxDA	59		25 - 150	07/22/19 07:16	07/24/19 14:58	1
13C2 PFUnA	105		25 - 150	07/22/19 07:16	07/24/19 14:58	1
13C2 PFDoA	98		25 - 150	07/22/19 07:16	07/24/19 14:58	1
13C2 PFTeDA	74		25 - 150	07/22/19 07:16	07/24/19 14:58	1
13C3 PFBS	97		25 - 150	07/22/19 07:16	07/24/19 14:58	1
18O2 PFHxS	95		25 - 150	07/22/19 07:16	07/24/19 14:58	1
13C4 PFOS	99		25 - 150	07/22/19 07:16	07/24/19 14:58	1
13C8 FOSA	71		25 - 150	07/22/19 07:16	07/24/19 14:58	1
d3-NMeFOSAA	133		25 - 150	07/22/19 07:16	07/24/19 14:58	1
d5-NEtFOSAA	146		25 - 150	07/22/19 07:16	07/24/19 14:58	1
M2-6:2 FTS	158	*	25 - 150	07/22/19 07:16	07/24/19 14:58	1
M2-8:2 FTS	172	*	25 - 150	07/22/19 07:16	07/24/19 14:58	1
M2-4:2 FTS	123		25 - 150	07/22/19 07:16	07/24/19 14:58	1
13C3 HFPO-DA	83		25 - 150	07/22/19 07:16	07/24/19 14:58	1

Isotope Dilution Summary

Client: North Shore Environmental Constr Inc.
Project/Site: ATC Blount SS - 9A326

Job ID: 320-52453-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Solid

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFOSA (25-150)	PFBA (25-150)	PFPeA (25-150)	PFHxA (25-150)	PFHpA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)
320-52453-3	BREAKER SOIL	71	87	88	77	88	92	96	94
320-52453-3 MS	BREAKER SOIL	80	87	91	76	92	99	97	101
320-52453-3 MSD	BREAKER SOIL	73	83	84	78	86	91	96	97
LCS 320-310125/2-A	Lab Control Sample	74	81	85	84	89	84	88	86
MB 320-310125/1-A	Method Blank	64	71	74	72	74	76	78	78

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFUnA (25-150)	PFDoA (25-150)	PFTDA (25-150)	PFHxDA (25-150)	3C3-PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	-NMeFOSA (25-150)
320-52453-3	BREAKER SOIL	96	93	97	92	95	90	92	96
320-52453-3 MS	BREAKER SOIL	94	94	95	92	97	96	99	105
320-52453-3 MSD	BREAKER SOIL	97	96	102	87	93	92	91	112
LCS 320-310125/2-A	Lab Control Sample	86	87	92	84	92	90	87	82
MB 320-310125/1-A	Method Blank	78	80	84	83	84	82	76	81

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	-NEtFOSA (25-150)	M242FTS (25-150)	M262FTS (25-150)	M282FTS (25-150)	HFPODA (25-150)			
320-52453-3	BREAKER SOIL	107	96	112	135	72			
320-52453-3 MS	BREAKER SOIL	113	95	120	136	74			
320-52453-3 MSD	BREAKER SOIL	114	89	119	142	87			
LCS 320-310125/2-A	Lab Control Sample	89	108	105	97	78			
MB 320-310125/1-A	Method Blank	84	90	85	89	69			

Surrogate Legend

PFOSA = 13C8 FOSA
PFBA = 13C4 PFBA
PFPeA = 13C5 PFPeA
PFHxA = 13C2 PFHxA
PFHpA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDoA = 13C2 PFDoA
PFTDA = 13C2 PFTeDA
PFHxDA = 13C2 PFHxDA
13C3-PFBS = 13C3 PFBS
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS
d3-NMeFOSAA = d3-NMeFOSAA
d5-NEtFOSAA = d5-NEtFOSAA
M242FTS = M2-4:2 FTS
M262FTS = M2-6:2 FTS
M282FTS = M2-8:2 FTS
HFPODA = 13C3 HFPO-DA

Isotope Dilution Summary

Client: North Shore Environmental Constr Inc. Job ID: 320-52453-1
Project/Site: ATC Blount SS - 9A326

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFBA (25-150)	PFPeA (25-150)	PFHxA (25-150)	PFHpA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFHxDA (25-150)
320-52453-1	CATCH BASIN	105	114	117	112	97	119	133	113
320-52453-2 - DL	SURFACE WATER								
320-52453-2	SURFACE WATER	96	135	129	136	97	150	125	83
320-52453-4	LW (BASIN)	79	96	96	103	95	101	107	87
320-52453-5	BLOUNT STREET	82	85	88	95	100	102	108	59
LCS 320-309122/2-A	Lab Control Sample	94	98	95	97	97	99	101	85
LCSD 320-309122/3-A	Lab Control Sample Dup	95	95	95	96	95	98	103	87
MB 320-309122/1-A	Method Blank	91	95	94	94	96	99	99	85

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFUnA (25-150)	PFDoA (25-150)	PFTDA (25-150)	3C3-PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	PFOSA (25-150)	-NMeFOS (25-150)
320-52453-1	CATCH BASIN	128	125	131	120	119	115	111	130
320-52453-2 - DL	SURFACE WATER								
320-52453-2	SURFACE WATER	135	126	121	141	134	135	110	128
320-52453-4	LW (BASIN)	103	103	113	99	95	92	86	100
320-52453-5	BLOUNT STREET	105	98	74	97	95	99	71	133
LCS 320-309122/2-A	Lab Control Sample	96	93	106	97	99	93	87	97
LCSD 320-309122/3-A	Lab Control Sample Dup	96	101	102	97	96	94	85	92
MB 320-309122/1-A	Method Blank	94	92	109	92	90	89	83	88

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	-NEtFOSA (25-150)	M262FTS (25-150)	M282FTS (25-150)	M242FTS (25-150)	HFPODA (25-150)			
320-52453-1	CATCH BASIN	147	117	172 *	150	99			
320-52453-2 - DL	SURFACE WATER		129		133				
320-52453-2	SURFACE WATER	138		129		92			
320-52453-4	LW (BASIN)	102	122	112	127	90			
320-52453-5	BLOUNT STREET	146	158 *	172 *	123	83			
LCS 320-309122/2-A	Lab Control Sample	96	106	104	102	84			
LCSD 320-309122/3-A	Lab Control Sample Dup	96	104	98	101	86			
MB 320-309122/1-A	Method Blank	89	103	100	97	82			

Surrogate Legend

PFBA = 13C4 PFBA
PFPeA = 13C5 PFPeA
PFHxA = 13C2 PFHxA
PFHpA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFHxDA = 13C2 PFHxDA
PFUnA = 13C2 PFUnA
PFDoA = 13C2 PFDoA
PFTDA = 13C2 PFTeDA
13C3-PFBS = 13C3 PFBS
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS
PFOSA = 13C8 FOSA
d3-NMeFOSAA = d3-NMeFOSAA
d5-NEtFOSAA = d5-NEtFOSAA
M262FTS = M2-6:2 FTS

Isotope Dilution Summary

Client: North Shore Environmental Constr Inc.
Job ID: 320-52453-1
Project/Site: ATC Blount SS - 9A326

M282FTS = M2-8:2 FTS
M242FTS = M2-4:2 FTS
HFPODA = 13C3 HFPO-DA

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-309122/1-A
Matrix: Water
Analysis Batch: 309687

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 309122

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<0.35		2.0	0.35	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluoropentanoic acid (PFPeA)	<0.49		2.0	0.49	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluorohexanoic acid (PFHxA)	<0.58		2.0	0.58	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluoroheptanoic acid (PFHpA)	<0.25		2.0	0.25	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluorooctanoic acid (PFOA)	<0.85		2.0	0.85	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluorononanoic acid (PFNA)	<0.27		2.0	0.27	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluorodecanoic acid (PFDA)	<0.31		2.0	0.31	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluoroundecanoic acid (PFUnA)	<1.1		2.0	1.1	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluorododecanoic acid (PFDoA)	<0.55		2.0	0.55	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluorotridecanoic acid (PFTriA)	<1.3		2.0	1.3	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluorotetradecanoic acid (PFTeA)	<0.29		2.0	0.29	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.89		2.0	0.89	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluorobutanesulfonic acid (PFBS)	<0.20		2.0	0.20	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.46		2.0	0.46	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluorohexanesulfonic acid (PFHxS)	0.314	J	2.0	0.17	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.19		2.0	0.19	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluorooctanesulfonic acid (PFOS)	<0.54		2.0	0.54	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluorodecanesulfonic acid (PFDS)	<0.32		2.0	0.32	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluorooctanesulfonamide (FOSA)	<0.35		2.0	0.35	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluoropentanesulfonic acid (PFPeS)	<0.30		2.0	0.30	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluorononanesulfonic acid (PFNS)	<0.16		2.0	0.16	ng/L		07/22/19 07:16	07/23/19 14:33	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<3.1		20	3.1	ng/L		07/22/19 07:16	07/23/19 14:33	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<1.9		20	1.9	ng/L		07/22/19 07:16	07/23/19 14:33	1
4:2 FTS	<5.2		20	5.2	ng/L		07/22/19 07:16	07/23/19 14:33	1
6:2 FTS	<2.0		20	2.0	ng/L		07/22/19 07:16	07/23/19 14:33	1
8:2 FTS	<2.0		20	2.0	ng/L		07/22/19 07:16	07/23/19 14:33	1
Perfluorododecanesulfonic acid (PFDoS)	<0.45		2.0	0.45	ng/L		07/22/19 07:16	07/23/19 14:33	1
ADONA	<0.19		2.1	0.19	ng/L		07/22/19 07:16	07/23/19 14:33	1
F-53B Major	<0.24		2.0	0.24	ng/L		07/22/19 07:16	07/23/19 14:33	1
HFPO-DA (GenX)	<1.5		4.0	1.5	ng/L		07/22/19 07:16	07/23/19 14:33	1
10:2 FTS	<0.19		2.0	0.19	ng/L		07/22/19 07:16	07/23/19 14:33	1
F-53B Minor	<0.32		2.0	0.32	ng/L		07/22/19 07:16	07/23/19 14:33	1
NaDONA	<0.19		2.1	0.19	ng/L		07/22/19 07:16	07/23/19 14:33	1
DONA	<0.18		2.0	0.18	ng/L		07/22/19 07:16	07/23/19 14:33	1
Ammonium Perfluorooctanoate (APFO)	<0.88		2.1	0.88	ng/L		07/22/19 07:16	07/23/19 14:33	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*91*		*25 - 150*	*07/22/19 07:16*	*07/23/19 14:33*	*1*
13C5 PFPeA	*95*		*25 - 150*	*07/22/19 07:16*	*07/23/19 14:33*	*1*
13C2 PFHxA	*94*		*25 - 150*	*07/22/19 07:16*	*07/23/19 14:33*	*1*
13C4 PFHpA	*94*		*25 - 150*	*07/22/19 07:16*	*07/23/19 14:33*	*1*
13C4 PFOA	*96*		*25 - 150*	*07/22/19 07:16*	*07/23/19 14:33*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-309122/1-A
Matrix: Water
Analysis Batch: 309687

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 309122

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	99		25 - 150	07/22/19 07:16	07/23/19 14:33	1
13C2 PFDA	99		25 - 150	07/22/19 07:16	07/23/19 14:33	1
13C2 PFHxDA	85		25 - 150	07/22/19 07:16	07/23/19 14:33	1
13C2 PFUnA	94		25 - 150	07/22/19 07:16	07/23/19 14:33	1
13C2 PFDoA	92		25 - 150	07/22/19 07:16	07/23/19 14:33	1
13C2 PFTeDA	109		25 - 150	07/22/19 07:16	07/23/19 14:33	1
13C3 PFBS	92		25 - 150	07/22/19 07:16	07/23/19 14:33	1
18O2 PFHxS	90		25 - 150	07/22/19 07:16	07/23/19 14:33	1
13C4 PFOS	89		25 - 150	07/22/19 07:16	07/23/19 14:33	1
13C8 FOSA	83		25 - 150	07/22/19 07:16	07/23/19 14:33	1
d3-NMeFOSAA	88		25 - 150	07/22/19 07:16	07/23/19 14:33	1
d5-NEtFOSAA	89		25 - 150	07/22/19 07:16	07/23/19 14:33	1
M2-4:2 FTS	97		25 - 150	07/22/19 07:16	07/23/19 14:33	1
M2-6:2 FTS	103		25 - 150	07/22/19 07:16	07/23/19 14:33	1
M2-8:2 FTS	100		25 - 150	07/22/19 07:16	07/23/19 14:33	1
13C3 HFPO-DA	82		25 - 150	07/22/19 07:16	07/23/19 14:33	1

Lab Sample ID: LCS 320-309122/2-A
Matrix: Water
Analysis Batch: 309687

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 309122

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	40.0	42.0		ng/L		105	70 - 130
Perfluoropentanoic acid (PFPeA)	40.0	39.4		ng/L		98	66 - 126
Perfluorohexanoic acid (PFHxA)	40.0	39.3		ng/L		98	66 - 126
Perfluoroheptanoic acid (PFHpA)	40.0	39.5		ng/L		99	66 - 126
Perfluorooctanoic acid (PFOA)	40.0	38.5		ng/L		96	64 - 124
Perfluorononanoic acid (PFNA)	40.0	39.5		ng/L		99	68 - 128
Perfluorodecanoic acid (PFDA)	40.0	37.4		ng/L		93	69 - 129
Perfluoroundecanoic acid (PFUnA)	40.0	36.1		ng/L		90	60 - 120
Perfluorododecanoic acid (PFDoA)	40.0	38.0		ng/L		95	71 - 131
Perfluorotridecanoic acid (PFTriA)	40.0	41.4		ng/L		104	72 - 132
Perfluorotetradecanoic acid (PFTeA)	40.0	37.3		ng/L		93	68 - 128
Perfluoro-n-hexadecanoic acid (PFHxDA)	40.0	41.4		ng/L		103	72 - 132
Perfluorobutanesulfonic acid (PFBS)	35.4	34.7		ng/L		98	73 - 133
Perfluoro-n-octadecanoic acid (PFODA)	40.0	39.7		ng/L		99	74 - 134
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.6		ng/L		92	63 - 123
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	38.9		ng/L		102	68 - 128
Perfluorooctanesulfonic acid (PFOS)	37.1	35.6		ng/L		96	67 - 127
Perfluorodecanesulfonic acid (PFDS)	38.6	38.9		ng/L		101	68 - 128

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-309122/2-A
Matrix: Water
Analysis Batch: 309687

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 309122

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonamide (FOSA)	40.0	42.1		ng/L		105	70 - 130
Perfluoropentanesulfonic acid (PFPeS)	37.5	38.0		ng/L		101	70 - 130
Perfluorononanesulfonic acid (PFNS)	38.4	40.1		ng/L		105	70 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	40.0	37.5		ng/L		94	67 - 127
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	40.0	38.3		ng/L		96	65 - 125
4:2 FTS	37.4	34.1		ng/L		91	70 - 130
6:2 FTS	37.9	37.3		ng/L		98	66 - 126
8:2 FTS	38.3	39.7		ng/L		104	67 - 127
Perfluorododecanesulfonic acid (PFDoS)	38.7	39.8		ng/L		103	70 - 130
ADONA	39.5	44.0		ng/L		111	70 - 130
F-53B Major	37.3	39.2		ng/L		105	70 - 130
HFPO-DA (GenX)	40.0	41.8		ng/L		105	70 - 130
10:2 FTS	38.6	37.5		ng/L		97	70 - 130
F-53B Minor	37.7	41.2		ng/L		109	70 - 130
NaDONA	40.0	44.5		ng/L		111	70 - 130
DONA	37.7	41.9		ng/L		111	70 - 130
Ammonium Perfluorooctanoate (APFO)	41.6	40.0		ng/L		96	64 - 124

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFBA	*94*		*25 - 150*
13C5 PFPeA	*98*		*25 - 150*
13C2 PFHxA	*95*		*25 - 150*
13C4 PFHpA	*97*		*25 - 150*
13C4 PFOA	*97*		*25 - 150*
13C5 PFNA	*99*		*25 - 150*
13C2 PFDA	*101*		*25 - 150*
13C2 PFHxDA	*85*		*25 - 150*
13C2 PFUnA	*96*		*25 - 150*
13C2 PFDoA	*93*		*25 - 150*
13C2 PFTeDA	*106*		*25 - 150*
13C3 PFBS	*97*		*25 - 150*
18O2 PFHxS	*99*		*25 - 150*
13C4 PFOS	*93*		*25 - 150*
13C8 FOSA	*87*		*25 - 150*
d3-NMeFOSAA	*97*		*25 - 150*
d5-NEtFOSAA	*96*		*25 - 150*
M2-4:2 FTS	*102*		*25 - 150*
M2-6:2 FTS	*106*		*25 - 150*
M2-8:2 FTS	*104*		*25 - 150*
13C3 HFPO-DA	*84*		*25 - 150*

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-309122/3-A
Matrix: Water
Analysis Batch: 309687

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 309122

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	40.0	41.8		ng/L		105	70 - 130	0	30
Perfluoropentanoic acid (PFPeA)	40.0	39.3		ng/L		98	66 - 126	0	30
Perfluorohexanoic acid (PFHxA)	40.0	40.3		ng/L		101	66 - 126	3	30
Perfluoroheptanoic acid (PFHpA)	40.0	41.2		ng/L		103	66 - 126	4	30
Perfluorooctanoic acid (PFOA)	40.0	40.4		ng/L		101	64 - 124	5	30
Perfluorononanoic acid (PFNA)	40.0	40.0		ng/L		100	68 - 128	1	30
Perfluorodecanoic acid (PFDA)	40.0	37.4		ng/L		93	69 - 129	0	30
Perfluoroundecanoic acid (PFUnA)	40.0	37.2		ng/L		93	60 - 120	3	30
Perfluorododecanoic acid (PFDoA)	40.0	38.3		ng/L		96	71 - 131	1	30
Perfluorotridecanoic acid (PFTriA)	40.0	38.7		ng/L		97	72 - 132	7	30
Perfluorotetradecanoic acid (PFTeA)	40.0	38.6		ng/L		97	68 - 128	4	30
Perfluoro-n-hexadecanoic acid (PFHxDA)	40.0	40.2		ng/L		100	72 - 132	3	30
Perfluorobutanesulfonic acid (PFBS)	35.4	34.7		ng/L		98	73 - 133	0	30
Perfluoro-n-octadecanoic acid (PFODA)	40.0	40.9		ng/L		102	74 - 134	3	30
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.9		ng/L		93	63 - 123	1	30
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	39.7		ng/L		104	68 - 128	2	30
Perfluorooctanesulfonic acid (PFOS)	37.1	36.2		ng/L		97	67 - 127	2	30
Perfluorodecanesulfonic acid (PFDS)	38.6	39.8		ng/L		103	68 - 128	2	30
Perfluorooctanesulfonamide (FOSA)	40.0	44.7		ng/L		112	70 - 130	6	30
Perfluoropentanesulfonic acid (PFPeS)	37.5	37.6		ng/L		100	70 - 130	1	30
Perfluorononanesulfonic acid (PFNS)	38.4	38.5		ng/L		100	70 - 130	4	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	40.0	40.9		ng/L		102	67 - 127	9	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	40.0	40.7		ng/L		102	65 - 125	6	30
4:2 FTS	37.4	38.3		ng/L		102	70 - 130	12	30
6:2 FTS	37.9	36.0		ng/L		95	66 - 126	4	30
8:2 FTS	38.3	42.4		ng/L		111	67 - 127	7	30
Perfluorododecanesulfonic acid (PFDoS)	38.7	38.7		ng/L		100	70 - 130	3	30
ADONA	39.5	42.9		ng/L		109	70 - 130	2	30
F-53B Major	37.3	37.8		ng/L		101	70 - 130	4	30
HFPO-DA (GenX)	40.0	41.5		ng/L		104	70 - 130	1	30
10:2 FTS	38.6	39.4		ng/L		102	70 - 130	5	30
F-53B Minor	37.7	39.7		ng/L		105	70 - 130	4	30
NaDONA	40.0	43.4		ng/L		109	70 - 130	2	30
DONA	37.7	40.9		ng/L		109	70 - 130	2	30
Ammonium Perfluorooctanoate (APFO)	41.6	42.0		ng/L		101	64 - 124	5	30

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C4 PFBA	95		25 - 150
13C5 PFPeA	95		25 - 150
13C2 PFHxA	95		25 - 150
13C4 PFHpA	96		25 - 150
13C4 PFOA	95		25 - 150
13C5 PFNA	98		25 - 150
13C2 PFDA	103		25 - 150
13C2 PFHxDA	87		25 - 150
13C2 PFUnA	96		25 - 150
13C2 PFDoA	101		25 - 150
13C2 PFTeDA	102		25 - 150
13C3 PFBS	97		25 - 150
18O2 PFHxS	96		25 - 150
13C4 PFOS	94		25 - 150
13C8 FOSA	85		25 - 150
d3-NMeFOSAA	92		25 - 150
d5-NEtFOSAA	96		25 - 150
M2-4:2 FTS	101		25 - 150
M2-6:2 FTS	104		25 - 150
M2-8:2 FTS	98		25 - 150
13C3 HFPO-DA	86		25 - 150

Lab Sample ID: MB 320-310125/1-A
Matrix: Solid
Analysis Batch: 310513

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 310125

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.0511	J	0.20	0.028	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluoropentanoic acid (PFPeA)	<0.077		0.20	0.077	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluorohexanoic acid (PFHxA)	<0.042		0.20	0.042	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluoroheptanoic acid (PFHpA)	<0.029		0.20	0.029	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluorooctanoic acid (PFOA)	<0.086		0.20	0.086	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluorononanoic acid (PFNA)	<0.036		0.20	0.036	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluorodecanoic acid (PFDA)	<0.022		0.20	0.022	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluoroundecanoic acid (PFUnA)	<0.036		0.20	0.036	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluorododecanoic acid (PFDoA)	<0.067		0.20	0.067	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluorotridecanoic acid (PFTriA)	<0.051		0.20	0.051	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluorotetradecanoic acid (PFTeA)	<0.054		0.20	0.054	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.044		0.20	0.044	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluorobutanesulfonic acid (PFBS)	<0.025		0.20	0.025	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.028		0.20	0.028	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluorohexanesulfonic acid (PFHxS)	<0.031		0.20	0.031	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.035		0.20	0.035	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluorooctanesulfonic acid (PFOS)	<0.20		0.50	0.20	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluorodecanesulfonic acid (PFDS)	<0.039		0.20	0.039	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluorooctanesulfonamide (FOSA)	<0.082		0.20	0.082	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluoropentanesulfonic acid (PFPeS)	<0.020		0.20	0.020	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluorononanesulfonic acid (PFNS)	<0.020		0.20	0.020	ug/Kg		07/25/19 11:33	07/26/19 15:18	1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-310125/1-A
Matrix: Solid
Analysis Batch: 310513

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 310125

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<0.39		2.0	0.39	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<0.37		2.0	0.37	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
4:2 FTS	<0.37		2.0	0.37	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
6:2 FTS	<0.15		2.0	0.15	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
8:2 FTS	<0.25		2.0	0.25	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Perfluorododecanesulfonic acid (PFDoS)	<0.060		0.20	0.060	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
ADONA	<0.019		0.21	0.019	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
F-53B Major	<0.027		0.20	0.027	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
HFPO-DA (GenX)	<0.11		0.25	0.11	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
10:2 FTS	<0.050		0.20	0.050	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
F-53B Minor	<0.022		0.20	0.022	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
NaDONA	<0.019		0.21	0.019	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
DONA	<0.018		0.20	0.018	ug/Kg		07/25/19 11:33	07/26/19 15:18	1
Ammonium Perfluorooctanoate (APFO)	<0.089		0.21	0.089	ug/Kg		07/25/19 11:33	07/26/19 15:18	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*71*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
13C5 PFPeA	*74*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
13C2 PFHxA	*72*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
13C4 PFHpA	*74*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
13C4 PFOA	*76*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
13C5 PFNA	*78*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
13C2 PFDA	*78*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
13C2 PFHxDA	*83*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
13C2 PFUnA	*78*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
13C2 PFDoA	*80*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
13C2 PFTeDA	*84*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
13C3 PFBS	*84*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
18O2 PFHxS	*82*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
13C4 PFOS	*76*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
13C8 FOSA	*64*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
d3-NMeFOSAA	*81*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
d5-NEtFOSAA	*84*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
M2-4:2 FTS	*90*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
M2-6:2 FTS	*85*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
M2-8:2 FTS	*89*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*
13C3 HFPO-DA	*69*		*25 - 150*	*07/25/19 11:33*	*07/26/19 15:18*	*1*

Lab Sample ID: LCS 320-310125/2-A
Matrix: Solid
Analysis Batch: 310513

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 310125

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	2.00	2.28		ug/Kg		114	81 - 133
Perfluoropentanoic acid (PFPeA)	2.00	2.02		ug/Kg		101	79 - 120
Perfluorohexanoic acid (PFHxA)	2.00	2.11		ug/Kg		106	75 - 125

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-310125/2-A
Matrix: Solid
Analysis Batch: 310513

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 310125

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA)	2.00	2.05		ug/Kg		102	76 - 124
Perfluorooctanoic acid (PFOA)	2.00	2.34		ug/Kg		117	76 - 121
Perfluorononanoic acid (PFNA)	2.00	2.06		ug/Kg		103	74 - 126
Perfluorodecanoic acid (PFDA)	2.00	2.14		ug/Kg		107	74 - 124
Perfluoroundecanoic acid (PFUnA)	2.00	2.01		ug/Kg		100	74 - 114
Perfluorododecanoic acid (PFDoA)	2.00	2.09		ug/Kg		104	75 - 123
Perfluorotridecanoic acid (PFTriA)	2.00	2.12		ug/Kg		106	43 - 116
Perfluorotetradecanoic acid (PFTeA)	2.00	1.86		ug/Kg		93	22 - 129
Perfluoro-n-hexadecanoic acid (PFHxDA)	2.00	2.16	*	ug/Kg		108	10 - 100
Perfluorobutanesulfonic acid (PFBS)	1.77	1.76		ug/Kg		99	73 - 142
Perfluoro-n-octadecanoic acid (PFODA)	2.00	1.93	*	ug/Kg		97	10 - 84
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.76		ug/Kg		96	75 - 121
Perfluoroheptanesulfonic Acid (PFHpS)	1.90	2.04		ug/Kg		107	78 - 146
Perfluorooctanesulfonic acid (PFOS)	1.86	1.86		ug/Kg		100	69 - 131
Perfluorodecanesulfonic acid (PFDS)	1.93	1.98		ug/Kg		103	54 - 113
Perfluorooctanesulfonamide (FOSA)	2.00	2.17		ug/Kg		109	62 - 135
Perfluoropentanesulfonic acid (PFPeS)	1.88	1.82		ug/Kg		97	70 - 130
Perfluorononanesulfonic acid (PFNS)	1.92	1.98		ug/Kg		103	70 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	1.98	J	ug/Kg		99	65 - 135
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	1.99	J	ug/Kg		100	65 - 135
4:2 FTS	1.87	1.83	J	ug/Kg		98	50 - 150
6:2 FTS	1.90	1.89	J	ug/Kg		100	65 - 135
8:2 FTS	1.92	2.13		ug/Kg		111	65 - 135
Perfluorododecanesulfonic acid (PFDoS)	1.94	1.91		ug/Kg		99	70 - 130
ADONA	1.97	1.96		ug/Kg		99	70 - 130
F-53B Major	1.86	1.95		ug/Kg		105	70 - 130
HFPO-DA (GenX)	2.00	2.16		ug/Kg		108	70 - 130
10:2 FTS	1.93	1.97		ug/Kg		102	70 - 130
F-53B Minor	1.88	2.15		ug/Kg		114	70 - 130
NaDONA	2.00	1.99		ug/Kg		99	70 - 130
DONA	1.88	1.87		ug/Kg		99	70 - 130
Ammonium Perfluorooctanoate (APFO)	2.08	2.44		ug/Kg		117	76 - 121

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFBA	*81*		*25 - 150*

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-310125/2-A
Matrix: Solid
Analysis Batch: 310513

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 310125

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C5 PFPeA	85		25 - 150
13C2 PFHxA	84		25 - 150
13C4 PFHpA	89		25 - 150
13C4 PFOA	84		25 - 150
13C5 PFNA	88		25 - 150
13C2 PFDA	86		25 - 150
13C2 PFHxDA	84		25 - 150
13C2 PFUnA	86		25 - 150
13C2 PFDoA	87		25 - 150
13C2 PFTeDA	92		25 - 150
13C3 PFBS	92		25 - 150
18O2 PFHxS	90		25 - 150
13C4 PFOS	87		25 - 150
13C8 FOSA	74		25 - 150
d3-NMeFOSAA	82		25 - 150
d5-NEtFOSAA	89		25 - 150
M2-4:2 FTS	108		25 - 150
M2-6:2 FTS	105		25 - 150
M2-8:2 FTS	97		25 - 150
13C3 HFPO-DA	78		25 - 150

Lab Sample ID: 320-52453-3 MS
Matrix: Solid
Analysis Batch: 310513

Client Sample ID: BREAKER SOIL
Prep Type: Total/NA
Prep Batch: 310125

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	0.16	J B	2.14	2.55		ug/Kg	☼	112	81 - 133
Perfluoropentanoic acid (PFPeA)	<0.080		2.14	2.08		ug/Kg	☼	97	79 - 120
Perfluorohexanoic acid (PFHxA)	<0.044		2.14	2.34		ug/Kg	☼	109	75 - 125
Perfluoroheptanoic acid (PFHpA)	<0.030		2.14	2.28		ug/Kg	☼	107	76 - 124
Perfluorooctanoic acid (PFOA)	<0.090		2.14	2.20		ug/Kg	☼	103	76 - 121
Perfluorononanoic acid (PFNA)	<0.038		2.14	2.26		ug/Kg	☼	105	74 - 126
Perfluorodecanoic acid (PFDA)	<0.023		2.14	2.24		ug/Kg	☼	105	74 - 124
Perfluoroundecanoic acid (PFUnA)	<0.038		2.14	2.23		ug/Kg	☼	104	74 - 114
Perfluorododecanoic acid (PFDoA)	<0.070		2.14	2.31		ug/Kg	☼	108	75 - 123
Perfluorotridecanoic acid (PFTriA)	<0.053		2.14	2.36		ug/Kg	☼	110	43 - 116
Perfluorotetradecanoic acid (PFTeA)	<0.056		2.14	2.03		ug/Kg	☼	95	22 - 129
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.046	* F1	2.14	2.30	F1	ug/Kg	☼	107	10 - 100
Perfluorobutanesulfonic acid (PFBS)	<0.026		1.89	1.95		ug/Kg	☼	103	73 - 142
Perfluoro-n-octadecanoic acid (PFODA)	<0.029	* F1	2.14	2.00	F1	ug/Kg	☼	93	10 - 84
Perfluorohexanesulfonic acid (PFHxS)	<0.032		1.95	1.86		ug/Kg	☼	95	75 - 121
Perfluoroheptanesulfonic Acid (PFHpS)	<0.037		2.04	2.11		ug/Kg	☼	104	78 - 146

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-52453-3 MS
Matrix: Solid
Analysis Batch: 310513

Client Sample ID: BREAKER SOIL
Prep Type: Total/NA
Prep Batch: 310125

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	<0.21		1.99	1.85		ug/Kg	☼	93	69 - 131
Perfluorodecanesulfonic acid (PFDS)	<0.041		2.06	1.96		ug/Kg	☼	95	54 - 113
Perfluorooctanesulfonamide (FOSA)	<0.086		2.14	2.34		ug/Kg	☼	109	62 - 135
Perfluoropentanesulfonic acid (PFPeS)	<0.021		2.01	1.87		ug/Kg	☼	93	70 - 130
Perfluorononanesulfonic acid (PFNS)	<0.021		2.05	1.97		ug/Kg	☼	96	70 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<0.41		2.14	2.29		ug/Kg	☼	107	65 - 135
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<0.39		2.14	2.17		ug/Kg	☼	101	65 - 135
4:2 FTS	<0.39		2.00	1.97	J	ug/Kg	☼	99	50 - 150
6:2 FTS	7.7	F1	2.03	11.1	F1	ug/Kg	☼	170	65 - 135
8:2 FTS	<0.26		2.05	2.15		ug/Kg	☼	105	65 - 135
Perfluorododecanesulfonic acid (PFDoS)	<0.063		2.07	1.93		ug/Kg	☼	93	70 - 130
ADONA	<0.020		2.11	2.09		ug/Kg	☼	99	70 - 130
F-53B Major	<0.028		1.99	2.08		ug/Kg	☼	105	70 - 130
HFPO-DA (GenX)	<0.11		2.14	2.58		ug/Kg	☼	120	70 - 130
10:2 FTS	<0.052	F1	2.06	2.43		ug/Kg	☼	118	70 - 130
F-53B Minor	<0.023		2.02	2.19		ug/Kg	☼	109	70 - 130
NaDONA	<0.020		2.14	2.11		ug/Kg	☼	99	70 - 130
DONA	<0.019		2.02	1.99		ug/Kg	☼	99	70 - 130
Ammonium Perfluorooctanoate (APFO)	<0.093		2.23	2.29		ug/Kg	☼	103	76 - 121

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C4 PFBA	*87*		*25 - 150*
13C5 PFPeA	*91*		*25 - 150*
13C2 PFHxA	*76*		*25 - 150*
13C4 PFHpA	*92*		*25 - 150*
13C4 PFOA	*99*		*25 - 150*
13C5 PFNA	*97*		*25 - 150*
13C2 PFDA	*101*		*25 - 150*
13C2 PFHxDA	*92*		*25 - 150*
13C2 PFUnA	*94*		*25 - 150*
13C2 PFDoA	*94*		*25 - 150*
13C2 PFTeDA	*95*		*25 - 150*
13C3 PFBS	*97*		*25 - 150*
18O2 PFHxS	*96*		*25 - 150*
13C4 PFOS	*99*		*25 - 150*
13C8 FOSA	*80*		*25 - 150*
d3-NMeFOSAA	*105*		*25 - 150*
d5-NEtFOSAA	*113*		*25 - 150*
M2-4:2 FTS	*95*		*25 - 150*
M2-6:2 FTS	*120*		*25 - 150*
M2-8:2 FTS	*136*		*25 - 150*
13C3 HFPO-DA	*74*		*25 - 150*

Client: North Shore Environmental Constr Inc.
Project/Site: ATC Blount SS - 9A326

Job ID: 320-52453-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: 320-52453-3 MSD
Matrix: Solid
Analysis Batch: 310513

Client Sample ID: BREAKER SOIL
Prep Type: Total/NA
Prep Batch: 310125

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	0.16	J B	2.19	2.57		ug/Kg	☼	110	81 - 133	1	30
Perfluoropentanoic acid (PFPeA)	<0.080		2.19	2.15		ug/Kg	☼	98	79 - 120	3	30
Perfluorohexanoic acid (PFHxA)	<0.044		2.19	2.34		ug/Kg	☼	107	75 - 125	0	30
Perfluoroheptanoic acid (PFHpA)	<0.030		2.19	2.33		ug/Kg	☼	106	76 - 124	2	30
Perfluorooctanoic acid (PFOA)	<0.090		2.19	2.35		ug/Kg	☼	107	76 - 121	6	30
Perfluorononanoic acid (PFNA)	<0.038		2.19	2.18		ug/Kg	☼	99	74 - 126	3	30
Perfluorodecanoic acid (PFDA)	<0.023		2.19	2.21		ug/Kg	☼	101	74 - 124	1	30
Perfluoroundecanoic acid (PFUnA)	<0.038		2.19	2.21		ug/Kg	☼	101	74 - 114	1	30
Perfluorododecanoic acid (PFDoA)	<0.070		2.19	2.31		ug/Kg	☼	105	75 - 123	0	30
Perfluorotridecanoic acid (PFTriA)	<0.053		2.19	2.35		ug/Kg	☼	107	43 - 116	0	30
Perfluorotetradecanoic acid (PFTeA)	<0.056		2.19	2.13		ug/Kg	☼	97	22 - 129	5	30
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.046	* F1	2.19	2.36	F1	ug/Kg	☼	108	10 - 100	3	30
Perfluorobutanesulfonic acid (PFBS)	<0.026		1.94	1.94		ug/Kg	☼	100	73 - 142	0	30
Perfluoro-n-octadecanoic acid (PFODA)	<0.029	* F1	2.19	1.99	F1	ug/Kg	☼	91	10 - 84	0	30
Perfluorohexanesulfonic acid (PFHxS)	<0.032		2.00	1.91		ug/Kg	☼	96	75 - 121	3	30
Perfluoroheptanesulfonic Acid (PFHpS)	<0.037		2.09	2.26		ug/Kg	☼	108	78 - 146	7	30
Perfluorooctanesulfonic acid (PFOS)	<0.21		2.03	2.00		ug/Kg	☼	98	69 - 131	8	30
Perfluorodecanesulfonic acid (PFDS)	<0.041		2.11	2.21		ug/Kg	☼	104	54 - 113	12	30
Perfluorooctanesulfonamide (FOSA)	<0.086		2.19	2.42		ug/Kg	☼	111	62 - 135	4	30
Perfluoropentanesulfonic acid (PFPeS)	<0.021		2.06	2.05		ug/Kg	☼	100	70 - 130	9	30
Perfluorononanesulfonic acid (PFNS)	<0.021		2.11	2.17		ug/Kg	☼	103	70 - 130	10	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<0.41		2.19	2.26		ug/Kg	☼	103	65 - 135	1	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<0.39		2.19	2.21		ug/Kg	☼	101	65 - 135	2	30
4:2 FTS	<0.39		2.05	2.01	J	ug/Kg	☼	98	50 - 150	2	30
6:2 FTS	7.7	F1	2.08	12.0	F1	ug/Kg	☼	207	65 - 135	7	30
8:2 FTS	<0.26		2.10	1.98	J	ug/Kg	☼	94	65 - 135	9	30
Perfluorododecanesulfonic acid (PFDoS)	<0.063		2.12	1.99		ug/Kg	☼	94	70 - 130	3	30
ADONA	<0.020		2.16	2.19		ug/Kg	☼	101	70 - 130	5	30
F-53B Major	<0.028		2.04	2.39		ug/Kg	☼	117	70 - 130	14	30
HFPO-DA (GenX)	<0.11		2.19	2.07		ug/Kg	☼	95	70 - 130	22	30
10:2 FTS	<0.052	F1	2.11	2.83	F1	ug/Kg	☼	134	70 - 130	15	30
F-53B Minor	<0.023		2.07	2.44		ug/Kg	☼	118	70 - 130	11	30
NaDONA	<0.020		2.19	2.22		ug/Kg	☼	101	70 - 130	5	30
DONA	<0.019		2.07	2.09		ug/Kg	☼	101	70 - 130	5	30
Ammonium Perfluorooctanoate (APFO)	<0.093		2.28	2.44		ug/Kg	☼	107	76 - 121	6	30

Client: North Shore Environmental Constr Inc. Job ID: 320-52453-1
Project/Site: ATC Blount SS - 9A326

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C4 PFBA	83		25 - 150
13C5 PFPeA	84		25 - 150
13C2 PFHxA	78		25 - 150
13C4 PFHpA	86		25 - 150
13C4 PFOA	91		25 - 150
13C5 PFNA	96		25 - 150
13C2 PFDA	97		25 - 150
13C2 PFHxDA	87		25 - 150
13C2 PFUnA	97		25 - 150
13C2 PFDoA	96		25 - 150
13C2 PFTeDA	102		25 - 150
13C3 PFBS	93		25 - 150
18O2 PFHxS	92		25 - 150
13C4 PFOS	91		25 - 150
13C8 FOSA	73		25 - 150
d3-NMeFOSAA	112		25 - 150
d5-NEtFOSAA	114		25 - 150
M2-4:2 FTS	89		25 - 150
M2-6:2 FTS	119		25 - 150
M2-8:2 FTS	142		25 - 150
13C3 HFPO-DA	87		25 - 150

LCMS

Prep Batch: 309122

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-52453-1	CATCH BASIN	Total/NA	Water	3535	
320-52453-2	SURFACE WATER	Total/NA	Water	3535	
320-52453-2 - DL	SURFACE WATER	Total/NA	Water	3535	
320-52453-4	LW (BASIN)	Total/NA	Water	3535	
320-52453-5	BLOUNT STREET	Total/NA	Water	3535	
MB 320-309122/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-309122/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-309122/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 309687

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-52453-2 - DL	SURFACE WATER	Total/NA	Water	537 (modified)	309122
320-52453-2	SURFACE WATER	Total/NA	Water	537 (modified)	309122
320-52453-4	LW (BASIN)	Total/NA	Water	537 (modified)	309122
MB 320-309122/1-A	Method Blank	Total/NA	Water	537 (modified)	309122
LCS 320-309122/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	309122
LCSD 320-309122/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	309122

Analysis Batch: 309913

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-52453-1	CATCH BASIN	Total/NA	Water	537 (modified)	309122
320-52453-5	BLOUNT STREET	Total/NA	Water	537 (modified)	309122

Prep Batch: 310125

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-52453-3	BREAKER SOIL	Total/NA	Solid	SHAKE	
MB 320-310125/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-310125/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-52453-3 MS	BREAKER SOIL	Total/NA	Solid	SHAKE	
320-52453-3 MSD	BREAKER SOIL	Total/NA	Solid	SHAKE	

Analysis Batch: 310513

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-52453-3	BREAKER SOIL	Total/NA	Solid	537 (modified)	310125
MB 320-310125/1-A	Method Blank	Total/NA	Solid	537 (modified)	310125
LCS 320-310125/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	310125
320-52453-3 MS	BREAKER SOIL	Total/NA	Solid	537 (modified)	310125
320-52453-3 MSD	BREAKER SOIL	Total/NA	Solid	537 (modified)	310125

General Chemistry

Analysis Batch: 309229

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-52453-3	BREAKER SOIL	Total/NA	Solid	D 2216	

Lab Chronicle

Client: North Shore Environmental Constr Inc.
Project/Site: ATC Blount SS - 9A326

Job ID: 320-52453-1

Client Sample ID: CATCH BASIN
Lab Sample ID: 320-52453-1
Date Collected: 07/19/19 14:00
Matrix: Water
Date Received: 07/20/19 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			274.9 mL	10.00 mL	309122	07/22/19 07:16	MYV	TAL SAC
Total/NA	Analysis	537 (modified)		1			309913	07/24/19 14:50	S1M	TAL SAC

Client Sample ID: SURFACE WATER
Lab Sample ID: 320-52453-2
Date Collected: 07/19/19 15:00
Matrix: Water
Date Received: 07/20/19 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535	DL		269.3 mL	10.00 mL	309122	07/22/19 07:16	MYV	TAL SAC
Total/NA	Analysis	537 (modified)	DL	5			309687	07/23/19 15:21	D1R	TAL SAC
Total/NA	Prep	3535			269.3 mL	10.00 mL	309122	07/22/19 07:16	MYV	TAL SAC
Total/NA	Analysis	537 (modified)		1			309687	07/23/19 15:29	D1R	TAL SAC

Client Sample ID: BREAKER SOIL
Lab Sample ID: 320-52453-3
Date Collected: 07/19/19 13:30
Matrix: Solid
Date Received: 07/20/19 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			309229	07/22/19 14:38	SAD	TAL SAC

Client Sample ID: BREAKER SOIL
Lab Sample ID: 320-52453-3
Date Collected: 07/19/19 13:30
Matrix: Solid
Date Received: 07/20/19 09:40
Percent Solids: 93.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.12 g	10.00 mL	310125	07/25/19 11:33	BHT	TAL SAC
Total/NA	Analysis	537 (modified)		1			310513	07/26/19 15:34	S1M	TAL SAC

Client Sample ID: LW (BASIN)
Lab Sample ID: 320-52453-4
Date Collected: 07/19/19 16:20
Matrix: Water
Date Received: 07/20/19 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			274.6 mL	10.00 mL	309122	07/22/19 07:16	MYV	TAL SAC
Total/NA	Analysis	537 (modified)		1			309687	07/23/19 15:05	D1R	TAL SAC

Client Sample ID: BLOUNT STREET
Lab Sample ID: 320-52453-5
Date Collected: 07/19/19 16:45
Matrix: Water
Date Received: 07/20/19 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			288.3 mL	10.00 mL	309122	07/22/19 07:16	MYV	TAL SAC
Total/NA	Analysis	537 (modified)		1			309913	07/24/19 14:58	S1M	TAL SAC

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: North Shore Environmental Constr Inc. Job ID: 320-52453-1
Project/Site: ATC Blount SS - 9A326

Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
ANAB	DoD		L2468	01-20-21
ANAB	DOE		L2468.01	01-20-21
Arizona	State Program	9	AZ0708	08-11-19
Arkansas DEQ	State Program	6	88-0691	06-17-20
California	State Program	9	2897	01-31-20
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State		PH-0691	06-30-21
Connecticut	State Program	1	PH-0691	06-30-21
Florida	NELAP	4	E87570	06-30-20
Florida	NELAP		E87570	06-30-20
Hawaii	State Program	9	N/A	01-29-20
Illinois	NELAP	5	200060	03-17-20 *
Kansas	NELAP	7	E-10375	10-31-19
Louisiana	NELAP	6	30612	06-30-20
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
New Hampshire	NELAP	1	2997	04-20-20
New York	NELAP	2	11666	04-01-20
Oregon	NELAP	10	4040	01-29-20
Oregon	NELAP		4040	01-29-20
Pennsylvania	NELAP	3	68-01272	03-31-20
Pennsylvania	NELAP		68-01272	03-31-20
Texas	NELAP	6	T104704399	05-31-20
US Fish & Wildlife	Federal		LE148388-0	07-31-19
USDA	Federal		P330-18-00239	01-17-21
USEPA UCMR	Federal	1	CA00044	12-31-20
Utah	NELAP	8	CA00044	02-29-20
Vermont	State Program	1	VT-4040	04-16-20
Virginia	NELAP	3	460278	03-14-20
Washington	State Program	10	C581	05-05-20
West Virginia (DW)	State Program	3	9930C	12-31-19
Wyoming	State Program	8	8TMS-L	01-28-19 *

Laboratory: Eurofins TestAmerica, Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Wisconsin	State Program	5	999580010	08-31-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: North Shore Environmental Constr Inc.
Project/Site: ATC Blount SS - 9A326

Job ID: 320-52453-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
D 2216	Percent Moisture	ASTM	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC
SHAKE	Shake Extraction with Ultrasonic Bath Extraction	SW846	TAL SAC

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: North Shore Environmental Constr Inc.
Project/Site: ATC Blount SS - 9A326

Job ID: 320-52453-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-52453-1	CATCH BASIN	Water	07/19/19 14:00	07/20/19 09:40	
320-52453-2	SURFACE WATER	Water	07/19/19 15:00	07/20/19 09:40	
320-52453-3	BREAKER SOIL	Solid	07/19/19 13:30	07/20/19 09:40	
320-52453-4	LW (BASIN)	Water	07/19/19 16:20	07/20/19 09:40	
320-52453-5	BLOUNT STREET	Water	07/19/19 16:45	07/20/19 09:40	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

2417 Bond Street, University Park, IL 60484
Phone: 708.534.5200 Fax: 708.534.5211

(optional)
Report To
Contact:
Company:
Address:
Address:
Phone:
Fax:
E-Mail:

(optional)
Bill To
Contact:
Company:
Address:
Address:
Phone:
Fax:
PO#/Reference#

Chain of Custody Record

Lab Job #:
Chain of Custody Number:
Page ____ of ____
Temperature °C of Cooler: 0.1 corrected 0.6

Client: NorthShore Env. Consultants | Client Project #: 9A326
Project Name: ATC Blount SS
Project Location/State: WI | Lab Project #:
Sampler: DHL | Lab PM:

Preservative Key
1. HCL, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. NaHSO4
7. Cool to 4°
8. None
9. Other

Lab ID	MS/MSD	Sample ID	Sampling Date	Sampling Time	# of Containers	Matrix	Preservative / Parameter: WISC MODIFIED PFOS / PFOA	Comments
		CATCH BASIN	7/19	2:00	2	W	X	
		SURFACE WATER	7/19	3:00	2	W	X	
		BREAKER SOIL	7/19	3:30	2	S	X	
		LW (BASIN)	7/19	4:20	2	W	X	
		BLOUNT STREET	7/19	4:45	2	W	X	
		CATCH BASIN OIL	7/19	1:45	1	OL	X	

IF POSSIBLE

320-52453 Chain of Custody

Turnaround Time Required (Business Days)
___ 1 Day ___ 2 Days ___ 5 Days ___ 7 Days ___ 10 Days ___ 15 Days ____ Other
PER PRIOR DISCUSSION
Requested Due Date ____

Sample Disposal
☐ Return to Client ☐ Disposal by Lab ☐ Archive for ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
DHL	NSEC	7/19	6:50		ETA - Sac	7/20/19	940

Lab Courier
Shipped
Hand Delivered

Matrix Key
WW – Wastewater
W – Water
S – Soil
SL – Sludge
MS – Miscellaneous
OL – Oil
A – Air
SE – Sediment
SO – Soil
L – Leachate
WI – Wipe
DW – Drinking Water
O – Other

Client Comments
Please Report to
davek@nsecinc.com

Lab Comments:

Labeled Blount DH 7/20/19

TAL-4124-500 (1209)

7/29/2019

Login Sample Receipt Checklist

Client: North Shore Environmental Constr Inc.

Job Number: 320-52453-1

Login Number: 52453
List Number: 1
Creator: Her, David A

List Source: Eurofins TestAmerica, Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	IDs on containers do not match the COC. Logged in per COC.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

AECOM

[DRAFT] Table 1
PFAS Analytical Results
ATC Blount Transformer - Environmental Emergency Spill Response
Blount Substation; 722 E. Main Street Madison, WI 53703

		Sample ID:	Catch Basin	Surface Water	Blount	LW
		Sample Date:	7/19/2019	7/19/2019	7/19/2019	7/19/2019
		Sampled By:	North Shore	North Shore	North Shore	North Shore
Abbreviation	**Analyte**	**CAS Number**				
4:2 FTS	4:2 Fluorotelomer Sulfonic Acid or 4:2 FTSA	757124-72-4	<4.7	-	<4.5	<4.7
6:2 FTS	6:2 Fluorotelomer sulfonic acid	27619-97-2	**230**	**790**	**45**	**80**
8:2 FTS	8:2 Fluorotelomer sulfonic acid	39108-34-4	**19**	**21**	**1.9 J**	**2.5 J**
10:2 FTS	10:2 FTS	120226-60-0	**1.5 J**	**1.1 J**	**0.28 J**	**0.87 J**
ADONA	ADONA	958445-44-8	<0.17	<0.18	<0.16	<0.17
APFO	Ammonium Perfluorooctanoate	-	**1.9**	**2.8**	**3.4**	**1.7 J**
DONA	DONA	919005-14-4	<0.16	<0.17	<0.16	<0.16
EtFOSAA	EtFOSAA	4151-50-2	<1.7	-	-	-
F-53B Major	F-53B Major	756426-58-1	<0.22	<0.22	<0.21	<0.22
F-53B Minor	F-53B Minor	763051-92-9	<0.29	<0.30	<0.28	<0.29
FOSA	Perfluorooctanesulfonamide	754-91-6	<0.32	<0.32	<0.30	<0.32
GenX	HFPO-DA	13252-13-6	<1.4	<1.4	<1.3	<1.4
NaDONA	NaDONA	-	<0.17	<0.18	<0.16	<0.17
NEtFOSAA	N-ethylperfluorooctanesulfonamidoacetic acid	2991-50-6	<1.7	<1.8	<1.6	<1.7
NMeFOSAA	N-methylperfluorooctanesulfonamidoacetic acid	2355-31-9	<2.8	<2.9	<2.7	<2.8
PFBA	Perfluorobutanoic acid	375-22-4	**4.3**	**14**	**9.5**	**1.8**
PFBS	Perfluorobutanesulfonic acid	375-73-5	**0.33 J**	**0.71 J**	**1.8**	**0.21 J**
PFDA	Perfluorodecanoic acid	335-76-2	**0.35 J**	**0.68 J**	**0.73 J**	<0.28
PFDoA	Perfluorododecanoic acid	307-55-1	<0.50	<0.51	<0.48	<0.50
PFDos	Perfluorododecanesulfonic acid	79780-39-5	<0.41	<0.42	<0.39	<0.41

AECOM

[DRAFT] Table 1
PFAS Analytical Results
ATC Blount Transformer - Environmental Emergency Spill Response
Blount Substation; 722 E. Main Street Madison, WI 53703

		Sample ID:	Catch Basin	Surface Water	Blount	LW
		Sample Date:	7/19/2019	7/19/2019	7/19/2019	7/19/2019
		Sampled By:	North Shore	North Shore	North Shore	North Shore
Abbreviation	**Analyte**	**CAS Number**				
PFDS	Perfluorodecanesulfonic acid	335-77-3	<0.29	<0.30	<0.28	<0.29
PFHpA	Perfluoroheptanoic acid	375-85-9	**0.67 J**	**3.0**	**1.5 J**	**0.41 J**
PFHpS	Perfluoroheptanesulfonic Acid	375-92-8	<0.17	<0.18	<0.16	<0.17
PFHxA	Perfluorohexanoic acid	307-24-4	**7.0**	**26**	**3.9**	**6.3**
PFHxDA	Perfluoro-n-hexadecanoic acid	67905-19-5	<0.81	<0.83	<0.77	<0.81
PFHxS	Perfluorohexanesulfonoic acid	355-46-4	**0.81 J B**	**1.9 B**	**4.4 B**	**0.40 J B**
PFNA	Perfluorononaoic acid	375-95-1	**0.43 J**	**0.60 J**	**0.55 J**	<0.25
PFNS	Perfluorononanesulfonic Acid	68259-12-1	<0.15	<0.15	<0.14	<0.15
PFOA	Perfluorooctanoic acid	335-67-1	**1.8**	**2.7**	**3.2**	**1.6 J**
PFODA	Perfluoro-n-octadecanoic acid	16517-11-6	<0.42	<0.43	<0.40	<0.42
PFOS	Perfluorooctanesulfonic acid	1763-23-1	**7 I CI**	**13 I CI**	**6.1**	**2.9 I CL**
PFPeA	Perfluoropentanoic acid	2706-90-3	**3.2**	**12**	**2.8**	**1.5 J**
PFPeS	Perfluoropentanesulfonic acid	2706-91-4	<0.27	<0.28	<0.26	<0.27
PFTeA	Perfluorotetradecanoic acid	376-06-7	<0.26	**0.60 J**	**0.44 J**	<0.26
PFTriA	Perfluorotridecanoic acid	72629-94-8	<1.2	<1.2	<1.1	<1.2
PFUnA	Perfluoroundecanoic acid	2058-94-8	<1.0	<1.0	<0.95	<1.0

Note:
ng/L - nanograms per liter
J - Estimated value (+/- indicates bias)
R - Rejected
UJ - Estimated limit of detection (LOD)
Non-detects reported as < LOD

[DRAFT] PFAS Data Quality Review SDG 320-52453-1

Summary of Qualifications

LCS exceedances did not impact data as recoveries were high, and associated results were nondetects. Results were qualified due to method blank detections, MS/MSDs, high labeled analog recoveries, and chromatographic interference (estimated maximum possible concentration - EMPCs) are listed below:

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Analyte	Units	Validation Qualifier	Reason Code
CATCH BASIN, SURFACE WATER LW (BASIN)	PFHxS	ng/L	U	mb
BLOUNT STREET	PFHxS	ng/L	J+	mb
BREAKER SOIL	6:2 FTS	ug/Kg	J+	ms
CATCH BASIN	8:2 FTS	ng/L	J+	la
BLOUNT STREET	6:2 FTS 8:2 FTS	ng/L	J+	la

Qualifier	Definition
J+	The result is an estimated quantity, and the result may be biased high.
U	The analyte was analyzed for, but was not detected.

Reason Codes	Description
la	Labeled analogs
mb	method blank
ms	Matrix spike

Details are provided in the sections below.

Blanks

PFHxS was detected in the aqueous method blank at a concentration on 0.313 ng/L. Associated detects at or below the reporting limit (RL) are qualified nondetect (U) - samples CATCH BASIN, SURFACE WATER, and LW (BASIN). The result for sample BLOUNT STREET (detected above the RL) is considered estimated biased high (J+).

PFBA was detected in the soil method blank at a concentration of 0.0511 J ug/kg. The detect for sample BREAKER SOIL was also below the reporting limit, and qualified nondetect (U).

Labeled Analogs

Some of the labeled analogs had high recoveries indicating a potential for high bias:

Sample	Labeled Analog	Recovery	Acceptable Limits	Qualifiers
CATCH BASIN	M2-8:2 FTS	172	25-150	8:2 FTS: J+
BLOUNT STREET	M2-6:2 FTS M2-8:2 FTS	158 172	25-150 25-150	6:2 FTS: J+ 8:2 FTS: J+

LCS (Soils)

The LCS associated with soil sample had high recoveries as summarized below:

Analyte	Recovery	Acceptable Limits	Qualifiers
PFHxDA	108	10-100	None (sample nondetect)
PFODA	97	10-84	None (sample nondetect)

MS/MSD (Soils)

An MS/MSD was performed on soil sample BREAKER SOIL. Recoveries were high as summarized below:

Analyte	Recovery	Acceptable Limits	Qualifiers
PFHxDA	**107/108**	10-100	None (sample nondetect)
PFODA	**93/91**	10-84	None (sample nondetect)
6:2 FTS	**170/207**	65-135	The detect for 6:2 FTS is considered biased high (J+)
10:2 FTS	118/**134**	70-130	None (sample nondetect)

Quantitation

Estimated (J) results due to chromatographic interference and EMPC (estimated maximum possible concentration):

Sample	Analyte	Lab Qualifier	Qualifiers
CATCH BASIN	PFOS	I and Cl	J
SURFACE WATER	PFOS	I and Cl	J
LW (BASIN)	PFOS	I and Cl	J

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Your P.O. #: 0000033373
Your Project #: FIREADE SAMPLE
Site Location: FIREADE SAMPLE/WATER
Your C.O.C. #: 622242-01-01

Attention:Jared Cassidy

AJ STONE CO LTD
62 Bradwick Drive
Vaughan, ON
CANADA L4K 1K8

Report Date: 2017/08/17
Report #: R4656951
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7G4803
Received: 2017/08/02, 09:07

Sample Matrix: LIQUID
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
PFOS and PFOA in water by SPE/LCMS (1)	2	2017/08/08	2017/08/16	CAM SOP-00894	EPA 537 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Per- and polyfluoroalkyl substances (PFAS) identified as surrogates on the certificate of analysis represent the extracted internal standard.

Encryption Key

Nazeema Rahaman
Project Manager
17 Aug 2017 12:53:43

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Nazeema Rahaman, Project Manager
Email: NRahaman@maxxam.ca
Phone# (905) 817-5700

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam Job #: B7G4803
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AJ STONE CO LTD
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RESULTS OF ANALYSES OF LIQUID

Maxxam ID		EWD694	EWD695	
Sampling Date		2017/08/01 13:00	2017/08/01 13:00	
COC Number		622242-01-01	622242-01-01	
	UNITS	STRAIGHT WATER, TAP WATER	WATER MIXED WITH 0.0583ML FIREADE	RDL
Perfluorobutane Sulfonate (PFBS)	ug/L	<0.020	<0.020	0.020
Perfluorobutanoic acid	ug/L	<0.020	<0.020	0.020
Perfluorodecane Sulfonate	ug/L	<0.020	<0.020	0.020
Perfluorodecanoic Acid (PFDA)	ug/L	<0.020	<0.020	0.020
Perfluorododecanoic Acid (PFDoA)	ug/L	<0.020	<0.020	0.020
Perfluoroheptane sulfonate	ug/L	<0.020	<0.020	0.020
Perfluoroheptanoic Acid (PFHpA)	ug/L	<0.020	<0.020	0.020
Perfluorohexane Sulfonate (PFHxS)	ug/L	<0.020	<0.020	0.020
Perfluorohexanoic Acid (PFHxA)	ug/L	<0.020	0.088	0.020
Perfluoro-n-Octanoic Acid (PFOA)	ug/L	<0.020	<0.020	0.020
Perfluorononanoic Acid (PFNA)	ug/L	<0.020	<0.020	0.020
Perfluorooctane Sulfonamide (PFOSA)	ug/L	<0.020	<0.020	0.020
Perfluorooctane Sulfonate (PFOS)	ug/L	<0.020	<0.020	0.020
Perfluoropentanoic Acid (PFPeA)	ug/L	<0.020	<0.020	0.020
Perfluorotetradecanoic Acid	ug/L	<0.020	<0.020	0.020
Perfluorotridecanoic Acid	ug/L	<0.020	<0.020	0.020
Perfluoroundecanoic Acid (PFUnA)	ug/L	<0.020	<0.020	0.020
Surrogate Recovery (%)				
13C4-Perfluorooctanesulfonate	%	82	81	
13C4-Perfluorooctanoic acid	%	90	47 (1)	
13C8-Perfluorooctane Sulfonamide	%	74	82	

RDL = Reportable Detection Limit

(1) Extracted internal standard analyte recovery was below the defined lower control limit (LCL). Laboratory spiked water resulted in satisfactory recovery of the extracted internal standard analyte. When considered together, these QC data suggest that matrix interferences may be biasing the data low. Because quantitation is performed using isotope dilution techniques, any losses of the native compound that may occur during any of the sample preparation, extraction, cleanup or determinative steps will be mirrored by a similar loss of the labeled standard, and as such can be accounted for and corrected. Therefore, the quantification of these target compounds is not affected by the low extracted internal standard analyte recovery.

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Maxxam
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Maxxam Job #: B7G4803
Report Date: 2017/08/17

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	21.0°C

Samples received above Maxxam's receiving temperature criteria of 10 celsius.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

AJ STONE CO LTD
Client Project #: FIREADE SAMPLE
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			SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5108375	13C4-Perfluorooctanesulfonate	2017/08/16	87	50 - 150	79	%		
5108375	13C4-Perfluorooctanoic acid	2017/08/16	99	50 - 150	89	%		
5108375	13C8-Perfluorooctane Sulfonamide	2017/08/16	81	50 - 150	80	%		
5108375	Perfluorobutane Sulfonate (PFBS)	2017/08/16	101	70 - 130	<0.020	ug/L	6.8	30
5108375	Perfluorobutanoic acid	2017/08/16	116	70 - 130	<0.020	ug/L	8.3	30
5108375	Perfluorodecane Sulfonate	2017/08/16	97	70 - 130	<0.020	ug/L	1.8	30
5108375	Perfluorodecanoic Acid (PFDA)	2017/08/16	104	70 - 130	<0.020	ug/L	5.2	30
5108375	Perfluorododecanoic Acid (PFDoA)	2017/08/16	111	70 - 130	<0.020	ug/L	3.7	30
5108375	Perfluoroheptane sulfonate	2017/08/16	106	70 - 130	<0.020	ug/L	0.32	30
5108375	Perfluoroheptanoic Acid (PFHpA)	2017/08/16	105	70 - 130	<0.020	ug/L	2.2	30
5108375	Perfluorohexane Sulfonate (PFHxS)	2017/08/16	98	70 - 130	<0.020	ug/L	6.0	30
5108375	Perfluorohexanoic Acid (PFHxA)	2017/08/16	108	70 - 130	<0.020	ug/L	5.7	30
5108375	Perfluoro-n-Octanoic Acid (PFOA)	2017/08/16	100	70 - 130	<0.020	ug/L	5.8	30
5108375	Perfluorononanoic Acid (PFNA)	2017/08/16	109	70 - 130	<0.020	ug/L	7.4	30
5108375	Perfluorooctane Sulfonamide (PFOSA)	2017/08/16	108	70 - 130	<0.020	ug/L	1.2	30
5108375	Perfluorooctane Sulfonate (PFOS)	2017/08/16	114	70 - 130	<0.020	ug/L	0.83	30
5108375	Perfluoropentanoic Acid (PFPeA)	2017/08/16	112	70 - 130	<0.020	ug/L	5.3	30
5108375	Perfluorotetradecanoic Acid	2017/08/16	105	70 - 130	<0.020	ug/L	1.2	30
5108375	Perfluorotridecanoic Acid	2017/08/16	107	70 - 130	<0.020	ug/L	1.5	30
5108375	Perfluoroundecanoic Acid (PFUnA)	2017/08/16	117	70 - 130	<0.020	ug/L	7.8	30

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Service Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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