



August 2, 2019

Via email:

Lower Mount Bethel Township Community Alliance

Northampton County, PA

RE: Surface Water Sampling

Dear LMBT Community Alliance:

Moonstone Environmental, LLC (Moonstone) recently completed surface water sampling activities in Lower Mount Bethel Township (LMBT) as part of an effort to assess potential impacts to surface water from agricultural runoff. Farmers in LMBT have begun applying a new form of fertilizer that consists of biosolids derived from heat-treated sewage material. The purpose of the surface water sampling was to screen the runoff for contaminants that may be leaching from the biosolids. On June 18, 2019 Moonstone mobilized to the study area during a significant rainstorm and collected surface runoff samples from three locations. The study area and sampling locations are indicated on Figure 1 (attached).

Sampling Methods

Moonstone arrived at the first sampling location (Route 611) approximately one-half hour after the start of a heavy rainfall. Significant overland flow was observed from an agricultural field known to have applied biosolids fertilizer onto a roadway. Moonstone collected a surface water runoff sample in the PA Route 611 right-of-way. Moonstone then moved to the second sampling location (Little Martins Creek), which consists of an ephemeral stream located at the bottom of a steep gully that is adjacent to agricultural fields which have received biosolids. During rainfall events this stream becomes swollen with runoff from the adjacent fields. Moonstone observed significant stream flow at the time of sampling. Moonstone then moved to the third sampling location (Martins Creek-Belvidere Highway), which consists of a storm water culvert that passes below the roadway and discharges to a drainage swale. The storm water in this culvert receives flow from nearby agricultural fields that have applied biosolids.

At each sampling location, the water sample was collected by submerging an unpreserved plastic sampling jar into the runoff water, and then decanting the sample water from that container into the other sampling jars. Once all containers were filled, the sampling jars were placed in a cooler with ice and remanded to Eurofins TestAmerica in Edison, NJ under chain of custody procedures. The samples were submitted for analysis of nitrates/nitrites, dioxins, per- and poly-fluorinated alkyl substances (PFAS), and ten metals (arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, zinc) that are regulated under 40 CFR part 503 (sewage sludge regulations).

Background on Water Regulations and Standards

Water in Pennsylvania is regulated by various agencies. Surface water standards are established in Pennsylvania under PA Code Chapter 93: Water Quality Standards. The samples collected for this investigation were surface water samples, so the Chapter 93 standards are the most appropriate standards for comparison. Unfortunately, Chapter 93 standards are only available for metals and nitrate/nitrite, not for dioxins or PFAS.

Groundwater standards in Pennsylvania are established under PA Code Chapter 250: Administration of Land Recycling Program. These standards include numeric limits for contaminants in groundwater. Because the samples collected by Moonstone are surface water samples, comparison to groundwater standards is not applicable, and again, the Chapter 250 standards are only available for metals and nitrate/nitrite, not dioxins or PFAS. The one exception is that a single dioxin, 2,3,7,8-tetrachloro-dibenzo-*p*-dioxin (TCDD), has a Chapter 250 standard of 30 ug/L in groundwater. This is the same numeric standard as the United States Environmental protection Agency's Maximum Contaminant Level, as discussed below. Chapter 250 standards are not included in this report because the results for metals and nitrate/nitrite are more accurately compared to the Chapter 93 standards for surface water, and the results for dioxins and PFAS have only one standard for comparison (TCDD), which is the same as the federal drinking water standard.

Drinking water standards in Pennsylvania are established under PA Code Chapter 109: Safe Drinking Water. Standards promulgated under Chapter 109 are primarily based on Maximum Contaminant Levels (MCLs) established at the federal level by the United State Environmental Protection Agency (EPA). MCLs are the maximum permissible level of a contaminant in water which is delivered to a user of a public water system. Because the samples collected by Moonstone are surface water samples, comparison to drinking water standards is not applicable. However,

Moonstone has included a discussion of EPA's limits for dioxins and PFAS in this report, if only to provide a frame of reference.

Dioxin Limits

Dioxins are a group of synthetic organic chemicals that contain several hundred structurally related individual chlorinated dibenzo-p-dioxins (CDDs), chlorinated dibenzofurans (CDFs), and certain polychlorinated biphenyls (PCBs) (collectively known as dioxin-like compounds). Rather than establish a drinking water standard for each dioxin-like compound, the EPA developed a standard for one of the most toxic compounds -- 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) -- and used TCDD as a reference standard to which other dioxin-like compounds could be compared. The EPA Maximum Contaminant Level (MCL) for TCDD is 30 picograms per liter (pg/L, or parts per quadrillion (ppq)).¹ As the reference compound, TCDD was assigned a Toxic Equivalency Factor (TEF) of 1.0. All other dioxin-like compounds are assigned a TEF lower than one to indicate their toxicity relative to TCDD. The TEFs that have been established through international agreements currently range from 1 to 0.0001.

The Toxic Equivalency (TEQ) of a compound is calculated by multiplying the concentration of the compound by its TEF (e.g., 20 grams X 0.1 TEF = 2 gram TEQ). The resulting TEQ provides a weighted value for toxicity so that the relative risk between dioxin-like substances can be compared. For mixtures of dioxin-like compounds, the TEQs of each individual dioxin-like compound may be added together to produce a cumulative TEQ for the mixture. The cumulative TEQs can then be compared to determine which mixture has a higher overall toxicity with respect to dioxin-like compounds.

For example, consider the following 60g mixture:

- 10g of compound A, with a TEF of 1 → TEQ_A = 10g
- 20g of compound B, with a TEF of 0.5 → TEQ_B = 10g
- 30g of compound C, with a TEF of 0.2 → TEQ_C = 6 g

The cumulative TEQ of this mixture would be:

$$(10g \times 1) + (20g \times 0.5) + (30g \times 0.2) = 26g \text{ cumulative TEQ}$$

In other words, this mixture of 60g of various compounds (A+B+C) would be as toxic as 26g of TCDD.

Moonstone has used this method to evaluate the dioxin results for surface water.

¹ This MCL of 30 pg/L has also been adopted by Pennsylvania as its groundwater standard for TCDD (0.00003 ug/L).

PFAS Limits

Perfluoroalkyl substances (PFASs) comprise a large group of fluorinated alkyl substances, including two that are the most commonly studied: perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). EPA has established health advisories for PFOA and PFOS based on the agency’s assessment of the latest peer-reviewed science. Health advisories provide information on contaminants that can cause human health effects and are known or anticipated to occur in drinking water. EPA’s health advisories are non-enforceable and non-regulatory and provide technical information to state agencies and other public health officials on health effects, analytical methodologies, and treatment technologies associated with drinking water contamination. EPA has not established national primary drinking water regulations for PFOA and PFOS. EPA is currently evaluating PFOA and PFOS as drinking water contaminants in accordance with the process required by the Safe Drinking Water Act.

In January 2009, EPA developed a provisional health advisory (HA) for PFOA in drinking water of 0.4 micrograms per liter (µg/L or ppb)² and a provisional HA for PFOS in drinking water of 0.2 µg/L³. The provisional HAs were developed to reflect an amount of PFOA or PFOS that could cause adverse health effects in the short term (weeks to months). The provisional HAs were intended as a guideline for public water suppliers while allowing time for EPA to develop a lifetime HA. The following tables from the May 2016 Health Advisories for PFOA and PFOS show the drinking water guideline values that were developed by several states.

State Guideline Values for PFOA		
State	Guideline (µg/L or ppb)	Source
Delaware Dept. of Resources and Environmental Control	0.4	DNREC (2016)
Maine Department of Health and Human Services	0.1	Maine DHHS (2014)
Michigan Department of Environmental Quality	0.42	Michigan DEQ (2013)
Minnesota Department of Health	0.3	MDH (2009)
New Jersey Department of Environmental Protection	0.04	NJDEP (2014)
North Carolina Division of Water Quality	2	NCDEQ (2013)
Vermont Agency of Natural Resources	0.02	Vermont ANR (2016)
State Guideline Values for PFOS		
State	Guideline (µg/L or ppb)	Source
Delaware Dept. of Resources and Environmental Control	0.2	DNREC (2016)
Michigan Department of Environmental Quality	0.011	Michigan DEQ (2013)
Minnesota Department of Health	0.3	MDH (2009)

² USEPA Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA) - May 2016

³ USEPA Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS) – May 2016

EPA later replaced the provisional HAs from 2009 with new lifetime health advisories. To provide a margin of protection for a lifetime of exposure to PFOA and PFOS in drinking water, EPA established lifetime HA levels at 70 parts per trillion (ppt). EPA currently recommends that when both PFOA and PFOS are found in drinking water, the combined concentrations of PFOA and PFOS should be compared with the 70 ppt lifetime HA level.

Findings

The analytical results for surface water are summarized in Tables 1 through 3 (attached). The laboratory report is also attached.

- The findings indicate there are no exceedances of the Chapter 93 Surface water standards for the 10 metals analyzed and for nitrate/nitrite (Table 1).
- The results for dioxins (Table 2) indicate that the concentrations of TCDD were all non-detect, so there were no exceedances of the EPA MCL/ Pennsylvania groundwater standard (30 pg/L). The sample from Route 611 has the highest concentrations of dioxins, and the highest relative dioxin toxicity based on the cumulative TEQ. The TEQ for the Route 611 sample is 4.1, compared to TEQs less than 0.2 for the other two samples.
- The results for PFAS (Table 3) are largely without standards for comparison, but none of the surface water samples exceed the lifetime HA of 70 ppt for PFOA or PFOS, either individually or in combination (PFOA+PFOS). PFOA (highlighted in the table) shows a maximum detection of 48.7 parts per trillion (ppt) in the sample from Little Martin's Creek, which is below the EPA lifetime HA level of 70 ppt. The results for PFOS (highlighted in the table) show a maximum detection of 31.4 ppt in the sample from Route 611, which is also below the EPA lifetime HA of 70 ppt. The maximum combined concentration of PFOA+PFOS is 52.63 ppt in the sample from Little Martins Creek; again, this is below the EPA lifetime HA of 70 ppt.

Lower regulatory guidelines do exist in other states. The state guideline values cited in the EPA's May 2016 reports show values as low as 0.02 ppb (20 ppt) for PFOA (Vermont) and 0.011 ppb (11 ppt) for PFOS (Michigan). When compared to these lower state guideline values, the result for surface water from Little Martins Creek exceeds 20 ppt for PFOA, and the sample from Route 611 exceeds 11 ppt for PFOS.

Again, these comparisons may be misleading because the guidelines are for drinking water and the samples are surface water, but the numbers are provided to give some context as to the level of risk associated with PFOA and PFOS. In general, drinking water standards are more stringent than surface water standards, and there would be some degree of attenuation expected between the concentrations detected in stormwater runoff and concentrations detected in a potable well. To accurately assess the levels of PFAS in drinking water, samples would need to be collected from drinking water sources, such as potable wells. However, the relatively low concentrations of PFAS in stormwater runoff suggest that the impacts to groundwater and drinking water may be minimal.

Conclusions

The purpose of this investigation was to screen stormwater runoff for contaminants that may be leaching from fields where biosolids have been applied. The sample results confirm that metals, nitrates/nitrites, dioxins, and PFAS compounds are present in surface water. Metals and nitrates/nitrites do not exceed the standards for surface water, but the other compounds have no regulatory standard for surface water to which they may be compared, so their potential effect on human health cannot be evaluated at this time. In addition, the presence of these compounds has not been directly correlated to the presence of biosolids. To determine whether the compounds are specifically related to biosolids and not other sources, runoff samples would need to be collected from areas where biosolids have not been applied (i.e., background or control sample).

If you have any questions or need additional information, please do not hesitate to contact me.

Sincerely,

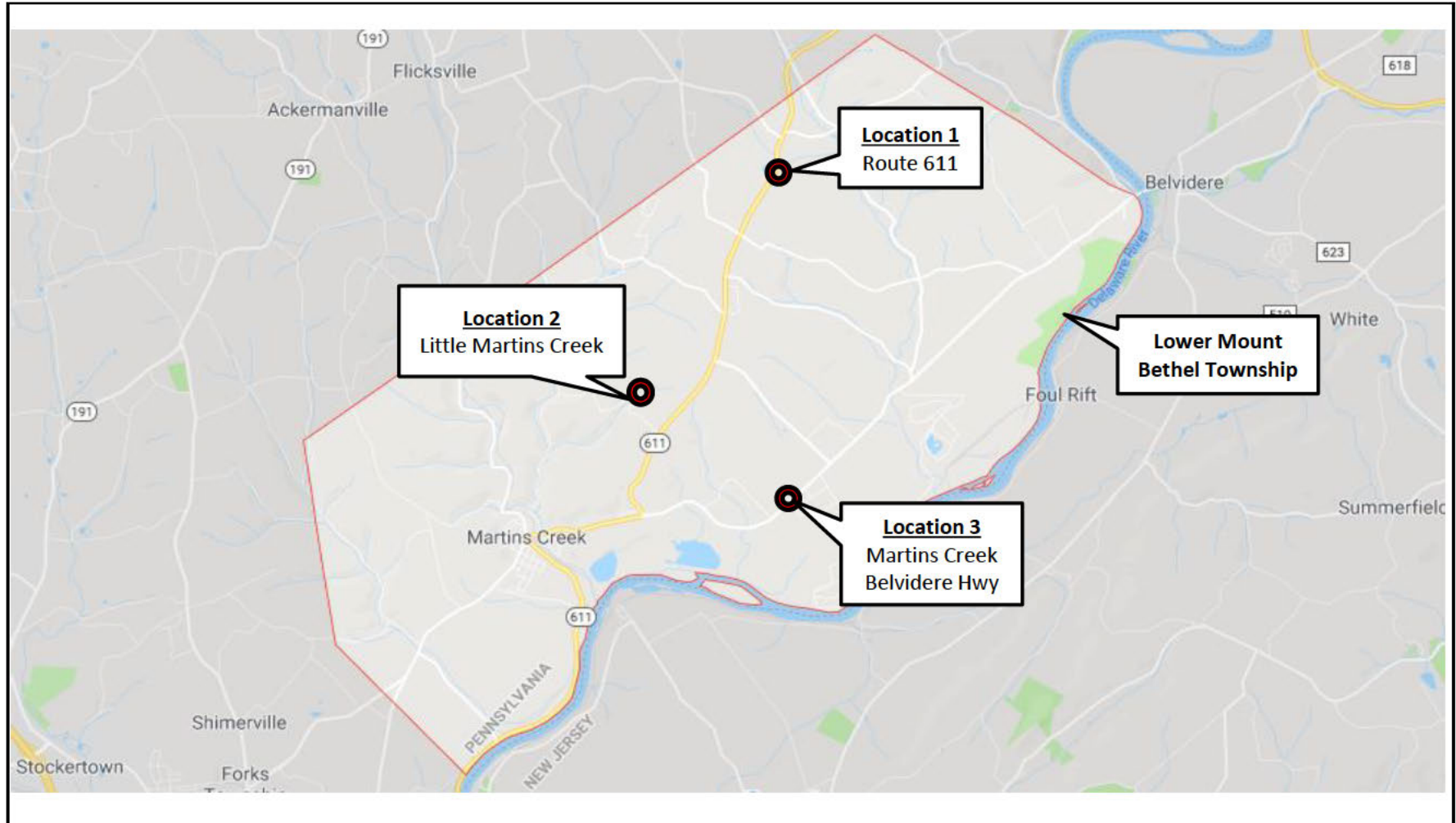


Bryan McAtee
Field Manager

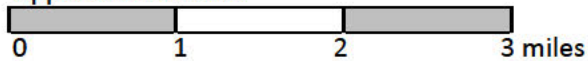
Attachments: Figure 1 – Study Area and Sampling Locations
Table 1 – Surface Water Analytical Results – Inorganics
Table 2 – Surface Water Analytical Results – Dioxins
Table 3 – Surface Water Analytical Results – PFAS
Laboratory Report

Figure 1
Study Area and Sampling Locations

Surface Water Sampling
Lower Mount Bethel Township
Northampton County, PA



Approximate Scale:



Map Source: Google Maps

Study Area Location



	PA Chap. 93 Regulatory Standard for Surface Water			Sample ID	Route 611	Little Martins Creek	Martins Creek Belvidere Hwy
	Fish and Aquatic Life		Human Health				
	Continuous	Maximum		Date	6/18/2019	6/18/2019	6/18/2019
Inorganics	ug/L	ug/L	ug/L	Units	ug/L	ug/L	ug/L
Arsenic, Dissolved	150 (As³⁺)	340 (As³⁺)	10		<2.7	<2.7	5.1
Cadmium, Dissolved *	0.25	2	NA		<0.22	<0.22	<0.22
Chromium, Dissolved *	74 (Cr³⁺)	570 (Cr³⁺)	NA		1.3	<1.3	1.9
Copper, Dissolved *	9	13	NA		<5.1	<5.1	<5.1
Lead, Dissolved *	2.5	65	NA		<2.5	<2.5	<2.5
Molybdenum, Dissolved	NA	NA	NA		<3.3	<3.3	<3.3
Nickel, Dissolved *	52	470	610		<1.7	<1.7	<1.7
Selenium, Dissolved	4.6	NA	NA		<6.6	<6.6	<6.6
Zinc, Dissolved *	120	120	NA		<3.6	3.7	5.1
Mercury, Dissolved	0.77 (Hg²⁺)	1.4 (Hg²⁺)	0.5		<0.12	<0.12	<0.12
Nitrate/Nitrite as N	NA	NA	10,000		3.4	4.4	2.6

NA - Compound does not have a standard listed in Chap 93 regulations

ug/L - micrograms per liter, or parts per billion (ppb)

< - Compound not detected above the laboratory reporting limit

BOLD - Bold values indicate compound was detected

* - standard is based on hardness = 100 mg/L CaCO₃; standard will vary with hardness

	Toxic Equivalent Factor (2005 WHO)	Sample ID	Analytical Results			Calculated TEQs		
			Route 611	Little Martins Creek	Martins Creek Belvidere Hwy	Route 611	Little Martins Creek	Martins Creek Belvidere Hwy
			Date	6/18/2019	6/18/2019	6/18/2019		
Dioxins and Furans		Units	pg/L	pg/L	pg/L	pg/L	pg/L	pg/L
1,2,3,4,6,7,8-HpCDD	NA		155	18.8	16.5	---	---	---
1,2,3,4,6,7,8-HpCDF	0.01		90.4	5.27	3.03	0.904	0.0527	0.0303
1,2,3,4,7,8,9-HpCDF	0.01		<4.63	<2.49	<2.47	---	---	---
1,2,3,4,7,8-HxCDD	0.1		3.40	<1.81	<1.68	0.34	---	---
1,2,3,4,7,8-HxCDF	0.1		9.73	<1.81	<1.45	0.973	---	---
1,2,3,6,7,8-HxCDD	0.1		3.56	<1.66	<1.54	0.356	---	---
1,2,3,6,7,8-HxCDF	0.1		3.58	<1.66	<1.33	0.358	---	---
1,2,3,7,8,9-HxCDD	0.1		<2.12	<1.63	<1.51	---	---	---
1,2,3,7,8,9-HxCDF	0.1		<3.66	<2.04	<1.63	---	---	---
1,2,3,7,8-PeCDD	1		<3.67	<2.21	<1.95	---	---	---
1,2,3,7,8-PeCDF	0.03		<2.25	<1.16	<1.13	---	---	---
2,3,4,6,7,8-HxCDF	0.1		<3.22	<1.79	<1.43	---	---	---
2,3,4,7,8-PeCDF	0.3		<2.29	<1.18	<1.15	---	---	---
2,3,7,8-TCDD EPA MCL = 30 pg/L (ppq)	1		<1.66	<1.54	<1.22	---	---	---
2,3,7,8-TCDF	0.1		<1.46	<0.97	<0.82	---	---	---
OCDD	0.0003		3,780	324	450	1.134	0.0972	0.135
OCDF	0.0003		113	10.9	9.75	0.0339	0.00327	0.002925
Total HpCDD	NA		328	59.4	35.3	---	---	---
Total HpCDF	NA		148	13.0	7.43	---	---	---
Total HxCDD	NA		40.0	<1.81	<1.68	---	---	---
Total HxCDF	NA		28.6	<2.04	<1.63	---	---	---
Total PeCDD	NA		8.15	<2.21	<1.95	---	---	---
Total PeCDF	NA		7.53	<1.43	<1.15	---	---	---
Total TCDD	NA		<1.66	<1.54	<1.22	---	---	---
Total TCDF	NA		4.59	<0.97	<0.82	---	---	---
CUMULATIVE TEQ:						4.10	0.15	0.17

NA - Compound not assigned a TEF

pg/L - picograms per liter, or parts per quadrillion (ppq)

< - Compound not detected above the laboratory reporting limit

BOLD - Bold values indicate compound was detected

	USEPA Health Advisory Levels	Sample ID	Route 611	Little Martins Creek	Martins Creek Belvidere Hwy
		Date	6/18/2019	6/18/2019	6/18/2019
Fluorinated Alkyl Substances	ng/L	Units	ng/L	ng/L	ng/L
4:2 FTS	NA		<4.89	<4.89	<4.80
6:2 FTS	NA		<1.88	<1.88	<1.84
8:2 FTS	NA		<1.88	<1.88	<1.84
N-ethylperfluorooctanesulfonamido acetic acid (NEtFOSAA)	NA		<1.79	<1.79	<1.75
N-methylperfluorooctanesulfonamido acetic acid (NMeFOSAA)	NA		<2.92	<2.92	<2.86
Perfluorobutanesulfonic acid (PFBS)	NA		20.1	19.9	9.05
Perfluorobutanoic acid (PFBA)	NA		7.31	66.3	11.7
Perfluorodecanesulfonic acid (PFDS)	NA		<0.30	<0.30	<0.3
Perfluorodecanoic acid (PFDA)	NA		0.57	0.29	0.65
Perfluorododecanoic acid (PFDoA)	NA		<0.52	<0.52	<0.51
Perfluoroheptanesulfonic Acid (PFHpS)	NA		0.60	<0.18	<0.18
Perfluoroheptanoic acid (PFHpA)	NA		4.50	21.7	4.30
Perfluorohexanesulfonic acid (PFHxS)	NA		3.88	1.07	1.02
Perfluorohexanoic acid (PFHxA)	NA		5.41	52.8	7.53
Perfluorononanesulfonic acid (PFNS)	NA		<0.15	<0.15	<0.15
Perfluorononanoic acid (PFNA)	NA		1.04	1.82	1.84
Perfluorooctanesulfonamide (FOSA)	NA		0.42	<0.33	<0.32
Perfluorooctanesulfonic acid (PFOS)	70		31.4	3.93	3.46
Perfluorooctanoic acid (PFOA)	70		13.4	48.7	16.4
Perfluoropentanesulfonic acid (PFPeS)	NA		0.57	<0.28	<0.28
Perfluoropentanoic acid (PFPeA)	NA		5.33	102	8.58
Perfluorotetradecanoic acid (PFTeA)	NA		0.32	<0.27	<0.27
Perfluorotridecanoic acid (PFTriA)	NA		<1.22	<1.22	<1.20
Perfluoroundecanoic acid (PFUnA)	NA		<1.03	<1.04	<1.01

NA - Compound not listed in EPA MCLs

ng/L - nanograms per liter, or parts per trillion (ppt)

< - Compound not detected above the laboratory reporting limit

BOLD - Bold values indicate compound was detected

ANALYTICAL REPORT

Eurofins TestAmerica, Edison
777 New Durham Road
Edison, NJ 08817
Tel: (732)549-3900

Laboratory Job ID: 460-184685-1
Client Project/Site: LMBT Surface Water

For:
Moonstone Environmental LLC
1150 Glenlivet Drive, Suite C-31
Allentown, Pennsylvania 18106

Attn: Bryan McAtee



Authorized for release by:
7/3/2019 8:59:51 AM

Julie Gilmore, Project Manager I
(484)685-0865
julie.gilmore@testamericainc.com

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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.



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Definitions/Glossary

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*	Isotope Dilution analyte is outside acceptance limits.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Dioxin

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
q	The reported result is the estimated maximum possible concentration of this analyte, quantitated using the theoretical ion ratio. The measured ion ratio does not meet qualitative identification criteria and indicates a possible interference.
U	Indicates the analyte was analyzed for but not detected.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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)

Case Narrative

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Job ID: 460-184685-1

Laboratory: Eurofins TestAmerica, Edison

Narrative

CASE NARRATIVE

Client: Moonstone Environmental LLC

Project: LMBT Surface Water

Report Number: 460-184685-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes or interferences which exceed the calibration range of the instrument.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 06/19/2019; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.2 C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

LCMS

Method(s) 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit for 13C2 PFTeDA: Martins Creek Belvidere Hwy (460-184685-3). The samples were re-analyzed with concurring results. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s).

PERFLUORINATED HYDROCARBONS (PFC)

Samples Route 611 (460-184685-1), Little Martins Creek (460-184685-2) and Martins Creek Belvidere Hwy (460-184685-3) were analyzed for Perfluorinated Hydrocarbons (PFC) in accordance with PFC. The samples were prepared on 06/26/2019 and analyzed on 06/28/2019.

Perfluorohexanesulfonic acid (PFHxS) was detected in method blank MB 320-303775/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No other difficulties were encountered during the Perfluorinated Hydrocarbons (PFC) analysis.

All other quality control parameters were within the acceptance limits.

ORGANIC PREP

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-303775.

Case Narrative

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Job ID: 460-184685-1 (Continued)

Laboratory: Eurofins TestAmerica, Edison (Continued)

Elevated reporting limits are provided for the following samples due to insufficient sample provided for 8290_P_Sep preparation/analysis: Samples were received in wide mouth amber glass bottles. Route 611 (460-184685-1) and Little Martins Creek (460-184685-2).

Elevated reporting limits are provided for the following samples due to insufficient sample provided for 8290_P_Sep preparation/analysis: Martins Creek Belvidere Hwy (460-184685-3). Sample 320-50975-D-6 was received in a narrow mouth amber glass bottle. Sample 460-184685-F-3 was received in a wide mouth amber glass bottle.

The following samples were observed to be a light yellow color and contained sediment prior to extraction: Route 611 (460-184685-1), Little Martins Creek (460-184685-2) and Martins Creek Belvidere Hwy (460-184685-3).

The following samples contain non-settleable particulate matter which plugged the solid-phase extraction column: preparation batch 320-303775.

The following samples were observed to be a light yellow color after extraction: Route 611 (460-184685-1), Little Martins Creek (460-184685-2) and Martins Creek Belvidere Hwy (460-184685-3).

DIOXINS AND FURANS (HRGC/HRMS)

Samples Route 611 (460-184685-1), Little Martins Creek (460-184685-2) and Martins Creek Belvidere Hwy (460-184685-3) were analyzed for Dioxins and Furans (HRGC/HRMS) in accordance with EPA SW-846 Method 8290A. The samples were prepared on 06/21/2019 and 06/24/2019 and analyzed on 06/27/2019.

Total TCDD was detected in method blank MB 320-302755/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. OCDD was detected in method blank MB 320-303266/1-A at a level exceeding the reporting limit. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No other difficulties were encountered during the dioxin/furans analysis.

All other quality control parameters were within the acceptance limits.

DISSOLVED METALS

Samples Route 611 (460-184685-1), Little Martins Creek (460-184685-2) and Martins Creek Belvidere Hwy (460-184685-3) were analyzed for dissolved metals in accordance with 6010D. The samples were prepared and analyzed on 06/24/2019.

for the duplicate of sample 460-184891-1. Refer to the QC report for details.

No other difficulties were encountered during the dissolved metals analysis.

All other quality control parameters were within the acceptance limits.

DISSOLVED MERCURY

Samples Route 611 (460-184685-1), Little Martins Creek (460-184685-2) and Martins Creek Belvidere Hwy (460-184685-3) were analyzed for dissolved mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 06/26/2019.

No difficulties were encountered during the dissolved Hg analysis.

All quality control parameters were within the acceptance limits.

NITRATE-NITRITE AS NITROGEN

Samples Route 611 (460-184685-1), Little Martins Creek (460-184685-2) and Martins Creek Belvidere Hwy (460-184685-3) were analyzed for nitrate-nitrite as nitrogen in accordance with EPA Method 353.2. The samples were analyzed on 06/20/2019.

Nitrate Nitrite as N failed the recovery criteria high for the MS/MSD of sample 460-184672-5 in batch 460-619058.

Refer to the QC report for details.

Case Narrative

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Job ID: 460-184685-1 (Continued)

Laboratory: Eurofins TestAmerica, Edison (Continued)

Nitrate Nitrite as N failed the recovery criteria high for the MSD of sample 460-184672-5 in batch 460-619058.

Refer to the QC report for details.

Samples Route 611 (460-184685-1)[2X], Little Martins Creek (460-184685-2)[5X] and Martins Creek Belvidere Hwy (460-184685-3)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No other difficulties were encountered during the nitrate-nitrite analysis.

All other quality control parameters were within the acceptance limits.

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Detection Summary

Client: Moonstone Environmental LLC
 Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Client Sample ID: Route 611

Lab Sample ID: 460-184685-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	7.31		1.88	0.33	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	5.33		1.88	0.46	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	5.41		1.88	0.55	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.50		1.88	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	13.4		1.88	0.80	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.04	J	1.88	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.57	J	1.88	0.29	ng/L	1		537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.32	J	1.88	0.27	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	20.1		1.88	0.19	ng/L	1		537 (modified)	Total/NA
Perfluoropentanesulfonic acid (PFPeS)	0.57	J	1.88	0.28	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	3.88	B	1.88	0.16	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	0.60	J	1.88	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	31.4		1.88	0.51	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonamide (FOSA)	0.42	J	1.88	0.33	ng/L	1		537 (modified)	Total/NA
1,2,3,4,7,8-HxCDD	3.40	J q	64.9	2.35	pg/L	1		8290A	Total/NA
1,2,3,6,7,8-HxCDD	3.56	J q	64.9	2.16	pg/L	1		8290A	Total/NA
1,2,3,4,7,8-HxCDF	9.73	J	64.9	3.26	pg/L	1		8290A	Total/NA
1,2,3,6,7,8-HxCDF	3.58	J	64.9	2.98	pg/L	1		8290A	Total/NA
1,2,3,4,6,7,8-HpCDD	155		64.9	4.56	pg/L	1		8290A	Total/NA
1,2,3,4,6,7,8-HpCDF	90.4		64.9	3.80	pg/L	1		8290A	Total/NA
OCDD	3780		130	5.26	pg/L	1		8290A	Total/NA
OCDF	113	J	130	3.31	pg/L	1		8290A	Total/NA
Total TCDF	4.59	J q	13.0	1.46	pg/L	1		8290A	Total/NA
Total PeCDD	8.15	J	64.9	3.67	pg/L	1		8290A	Total/NA
Total PeCDF	7.53	J	64.9	2.27	pg/L	1		8290A	Total/NA
Total HxCDD	40.0	J q	64.9	2.21	pg/L	1		8290A	Total/NA
Total HxCDF	28.6	J q	64.9	3.28	pg/L	1		8290A	Total/NA
Total HpCDD	328		64.9	4.56	pg/L	1		8290A	Total/NA
Total HpCDF	148		64.9	4.22	pg/L	1		8290A	Total/NA
Chromium	1.3	J	10.0	1.3	ug/L	1		6010D	Dissolved
Nitrate Nitrite as N	3.4		0.20	0.018	mg/L	2		353.2	Total/NA

Client Sample ID: Little Martins Creek

Lab Sample ID: 460-184685-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	66.3		1.88	0.33	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	102		1.88	0.46	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	52.8		1.88	0.55	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	21.7		1.88	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	48.7		1.88	0.80	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.82	J	1.88	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.29	J	1.88	0.29	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	19.9		1.88	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.07	J B	1.88	0.16	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.93		1.88	0.51	ng/L	1		537 (modified)	Total/NA
1,2,3,4,6,7,8-HpCDD	18.8	J	55.3	1.93	pg/L	1		8290A	Total/NA
1,2,3,4,6,7,8-HpCDF	5.27	J	55.3	2.04	pg/L	1		8290A	Total/NA
OCDD	324		111	2.94	pg/L	1		8290A	Total/NA
OCDF	10.9	J q	111	2.67	pg/L	1		8290A	Total/NA
Total HpCDD	59.4		55.3	1.93	pg/L	1		8290A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Edison

Detection Summary

Client: Moonstone Environmental LLC
 Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Client Sample ID: Little Martins Creek (Continued)

Lab Sample ID: 460-184685-2

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
Total HpCDF	13.0	J q	55.3	2.27	pg/L	1		8290A	Total/NA
Zinc	3.7	J	30.0	3.6	ug/L	1		6010D	Dissolved
Nitrate Nitrite as N	4.4		0.50	0.046	mg/L	5		353.2	Total/NA

Client Sample ID: Martins Creek Belvidere Hwy

Lab Sample ID: 460-184685-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	11.7		1.84	0.32	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	8.58		1.84	0.45	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	7.53		1.84	0.53	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.30		1.84	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	16.4		1.84	0.78	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.84		1.84	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.65	J	1.84	0.29	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	9.05		1.84	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.02	J B	1.84	0.16	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.46		1.84	0.50	ng/L	1		537 (modified)	Total/NA
1,2,3,4,6,7,8-HpCDD	16.5	J	55.0	1.30	pg/L	1		8290A	Total/NA
1,2,3,4,6,7,8-HpCDF	3.03	J q	55.0	2.03	pg/L	1		8290A	Total/NA
OCDD	450	B	110	2.12	pg/L	1		8290A	Total/NA
OCDF	9.75	J q	110	2.24	pg/L	1		8290A	Total/NA
Total HpCDD	35.3	J	55.0	1.30	pg/L	1		8290A	Total/NA
Total HpCDF	7.43	J q	55.0	2.25	pg/L	1		8290A	Total/NA
Arsenic	5.1	J	15.0	2.7	ug/L	1		6010D	Dissolved
Chromium	1.9	J	10.0	1.3	ug/L	1		6010D	Dissolved
Zinc	5.1	J	30.0	3.6	ug/L	1		6010D	Dissolved
Nitrate Nitrite as N	2.6		0.20	0.018	mg/L	2		353.2	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Edison

Client Sample Results

Client: Moonstone Environmental LLC
 Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Client Sample ID: Route 611

Lab Sample ID: 460-184685-1

Date Collected: 06/18/19 15:15

Matrix: Water

Date Received: 06/19/19 11:15

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	7.31		1.88	0.33	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluoropentanoic acid (PFPeA)	5.33		1.88	0.46	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluorohexanoic acid (PFHxA)	5.41		1.88	0.55	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluoroheptanoic acid (PFHpA)	4.50		1.88	0.24	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluorooctanoic acid (PFOA)	13.4		1.88	0.80	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluorononanoic acid (PFNA)	1.04	J	1.88	0.25	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluorodecanoic acid (PFDA)	0.57	J	1.88	0.29	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluoroundecanoic acid (PFUnA)	1.03	U	1.88	1.03	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluorododecanoic acid (PFDoA)	0.52	U	1.88	0.52	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluorotridecanoic acid (PFTriA)	1.22	U	1.88	1.22	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluorotetradecanoic acid (PFTeA)	0.32	J	1.88	0.27	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluorobutanesulfonic acid (PFBS)	20.1		1.88	0.19	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluoropentanesulfonic acid (PFPeS)	0.57	J	1.88	0.28	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluorohexanesulfonic acid (PFHxS)	3.88	B	1.88	0.16	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.60	J	1.88	0.18	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluorooctanesulfonic acid (PFOS)	31.4		1.88	0.51	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluorononanesulfonic acid (PFNS)	0.15	U	1.88	0.15	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluorodecanesulfonic acid (PFDS)	0.30	U	1.88	0.30	ng/L		06/26/19 07:15	06/28/19 07:22	1
Perfluorooctanesulfonamide (FOSA)	0.42	J	1.88	0.33	ng/L		06/26/19 07:15	06/28/19 07:22	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.92	U	18.8	2.92	ng/L		06/26/19 07:15	06/28/19 07:22	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	1.79	U	18.8	1.79	ng/L		06/26/19 07:15	06/28/19 07:22	1
4:2 FTS	4.89	U	18.8	4.89	ng/L		06/26/19 07:15	06/28/19 07:22	1
6:2 FTS	1.88	U	18.8	1.88	ng/L		06/26/19 07:15	06/28/19 07:22	1
8:2 FTS	1.88	U	18.8	1.88	ng/L		06/26/19 07:15	06/28/19 07:22	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	74		25 - 150	06/26/19 07:15	06/28/19 07:22	1
13C5 PFPeA	85		25 - 150	06/26/19 07:15	06/28/19 07:22	1
13C2 PFHxA	93		25 - 150	06/26/19 07:15	06/28/19 07:22	1
13C4 PFHpA	95		25 - 150	06/26/19 07:15	06/28/19 07:22	1
13C4 PFOA	91		25 - 150	06/26/19 07:15	06/28/19 07:22	1
13C5 PFNA	89		25 - 150	06/26/19 07:15	06/28/19 07:22	1
13C2 PFDA	89		25 - 150	06/26/19 07:15	06/28/19 07:22	1
13C2 PFUnA	78		25 - 150	06/26/19 07:15	06/28/19 07:22	1
13C2 PFDoA	70		25 - 150	06/26/19 07:15	06/28/19 07:22	1
13C2 PFTeDA	37		25 - 150	06/26/19 07:15	06/28/19 07:22	1
13C3 PFBS	91		25 - 150	06/26/19 07:15	06/28/19 07:22	1
18O2 PFHxS	98		25 - 150	06/26/19 07:15	06/28/19 07:22	1
13C4 PFOS	88		25 - 150	06/26/19 07:15	06/28/19 07:22	1
13C8 FOSA	72		25 - 150	06/26/19 07:15	06/28/19 07:22	1
d3-NMeFOSAA	79		25 - 150	06/26/19 07:15	06/28/19 07:22	1
d5-NEtFOSAA	91		25 - 150	06/26/19 07:15	06/28/19 07:22	1
M2-6:2 FTS	124		25 - 150	06/26/19 07:15	06/28/19 07:22	1

Eurofins TestAmerica, Edison

Client Sample Results

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Client Sample ID: Route 611

Lab Sample ID: 460-184685-1

Date Collected: 06/18/19 15:15

Matrix: Water

Date Received: 06/19/19 11:15

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-8:2 FTS	96		25 - 150	06/26/19 07:15	06/28/19 07:22	1
M2-4:2 FTS	119		25 - 150	06/26/19 07:15	06/28/19 07:22	1

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	1.66	U	13.0	1.66	pg/L		06/21/19 08:08	06/27/19 07:05	1
2,3,7,8-TCDF	1.46	U	13.0	1.46	pg/L		06/21/19 08:08	06/27/19 07:05	1
1,2,3,7,8-PeCDD	3.67	U	64.9	3.67	pg/L		06/21/19 08:08	06/27/19 07:05	1
1,2,3,7,8-PeCDF	2.25	U	64.9	2.25	pg/L		06/21/19 08:08	06/27/19 07:05	1
2,3,4,7,8-PeCDF	2.29	U	64.9	2.29	pg/L		06/21/19 08:08	06/27/19 07:05	1
1,2,3,4,7,8-HxCDD	3.40	J q	64.9	2.35	pg/L		06/21/19 08:08	06/27/19 07:05	1
1,2,3,6,7,8-HxCDD	3.56	J q	64.9	2.16	pg/L		06/21/19 08:08	06/27/19 07:05	1
1,2,3,7,8,9-HxCDD	2.12	U	64.9	2.12	pg/L		06/21/19 08:08	06/27/19 07:05	1
1,2,3,4,7,8-HxCDF	9.73	J	64.9	3.26	pg/L		06/21/19 08:08	06/27/19 07:05	1
1,2,3,6,7,8-HxCDF	3.58	J	64.9	2.98	pg/L		06/21/19 08:08	06/27/19 07:05	1
1,2,3,7,8,9-HxCDF	3.66	U	64.9	3.66	pg/L		06/21/19 08:08	06/27/19 07:05	1
2,3,4,6,7,8-HxCDF	3.22	U	64.9	3.22	pg/L		06/21/19 08:08	06/27/19 07:05	1
1,2,3,4,6,7,8-HpCDD	155		64.9	4.56	pg/L		06/21/19 08:08	06/27/19 07:05	1
1,2,3,4,6,7,8-HpCDF	90.4		64.9	3.80	pg/L		06/21/19 08:08	06/27/19 07:05	1
1,2,3,4,7,8,9-HpCDF	4.63	U	64.9	4.63	pg/L		06/21/19 08:08	06/27/19 07:05	1
OCDD	3780		130	5.26	pg/L		06/21/19 08:08	06/27/19 07:05	1
OCDF	113	J	130	3.31	pg/L		06/21/19 08:08	06/27/19 07:05	1
Total TCDD	1.66	U	13.0	1.66	pg/L		06/21/19 08:08	06/27/19 07:05	1
Total TCDF	4.59	J q	13.0	1.46	pg/L		06/21/19 08:08	06/27/19 07:05	1
Total PeCDD	8.15	J	64.9	3.67	pg/L		06/21/19 08:08	06/27/19 07:05	1
Total PeCDF	7.53	J	64.9	2.27	pg/L		06/21/19 08:08	06/27/19 07:05	1
Total HxCDD	40.0	J q	64.9	2.21	pg/L		06/21/19 08:08	06/27/19 07:05	1
Total HxCDF	28.6	J q	64.9	3.28	pg/L		06/21/19 08:08	06/27/19 07:05	1
Total HpCDD	328		64.9	4.56	pg/L		06/21/19 08:08	06/27/19 07:05	1
Total HpCDF	148		64.9	4.22	pg/L		06/21/19 08:08	06/27/19 07:05	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD	46		40 - 135	06/21/19 08:08	06/27/19 07:05	1
13C-2,3,7,8-TCDF	49		40 - 135	06/21/19 08:08	06/27/19 07:05	1
13C-1,2,3,7,8-PeCDD	47		40 - 135	06/21/19 08:08	06/27/19 07:05	1
13C-1,2,3,7,8-PeCDF	46		40 - 135	06/21/19 08:08	06/27/19 07:05	1
13C-1,2,3,6,7,8-HxCDD	49		40 - 135	06/21/19 08:08	06/27/19 07:05	1
13C-1,2,3,4,7,8-HxCDF	53		40 - 135	06/21/19 08:08	06/27/19 07:05	1
13C-1,2,3,4,6,7,8-HpCDD	54		40 - 135	06/21/19 08:08	06/27/19 07:05	1
13C-1,2,3,4,6,7,8-HpCDF	53		40 - 135	06/21/19 08:08	06/27/19 07:05	1
13C-OCDD	56		40 - 135	06/21/19 08:08	06/27/19 07:05	1

Method: 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.7	U	15.0	2.7	ug/L		06/24/19 08:32	06/24/19 23:25	1
Cadmium	0.22	U	4.0	0.22	ug/L		06/24/19 08:32	06/24/19 23:25	1
Chromium	1.3	J	10.0	1.3	ug/L		06/24/19 08:32	06/24/19 23:25	1
Lead	2.5	U	10.0	2.5	ug/L		06/24/19 08:32	06/24/19 23:25	1
Selenium	6.6	U	20.0	6.6	ug/L		06/24/19 08:32	06/24/19 23:25	1
Copper	5.1	U	25.0	5.1	ug/L		06/24/19 08:32	06/24/19 23:25	1
Molybdenum	3.3	U	20.0	3.3	ug/L		06/24/19 08:32	06/24/19 23:25	1

Eurofins TestAmerica, Edison

Client Sample Results

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Client Sample ID: Route 611

Date Collected: 06/18/19 15:15

Date Received: 06/19/19 11:15

Lab Sample ID: 460-184685-1

Matrix: Water

Method: 6010D - Metals (ICP) - Dissolved (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nickel	1.7	U	40.0	1.7	ug/L	-	06/24/19 08:32	06/24/19 23:25	1
Zinc	3.6	U	30.0	3.6	ug/L	-	06/24/19 08:32	06/24/19 23:25	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12	U	0.20	0.12	ug/L	-	06/26/19 13:52	06/26/19 15:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	3.4		0.20	0.018	mg/L	-		06/20/19 15:11	2

Client Sample ID: Little Martins Creek

Date Collected: 06/18/19 15:30

Date Received: 06/19/19 11:15

Lab Sample ID: 460-184685-2

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	66.3		1.88	0.33	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluoropentanoic acid (PFPeA)	102		1.88	0.46	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluorohexanoic acid (PFHxA)	52.8		1.88	0.55	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluoroheptanoic acid (PFHpA)	21.7		1.88	0.24	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluorooctanoic acid (PFOA)	48.7		1.88	0.80	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluorononanoic acid (PFNA)	1.82	J	1.88	0.25	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluorodecanoic acid (PFDA)	0.29	J	1.88	0.29	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluoroundecanoic acid (PFUnA)	1.04	U	1.88	1.04	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluorododecanoic acid (PFDoA)	0.52	U	1.88	0.52	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluorotridecanoic acid (PFTriA)	1.22	U	1.88	1.22	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluorotetradecanoic acid (PFTeA)	0.27	U	1.88	0.27	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluorobutanesulfonic acid (PFBS)	19.9		1.88	0.19	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluoropentanesulfonic acid (PFPeS)	0.28	U	1.88	0.28	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluorohexanesulfonic acid (PFHxS)	1.07	J B	1.88	0.16	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.18	U	1.88	0.18	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluorooctanesulfonic acid (PFOS)	3.93		1.88	0.51	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluorononanesulfonic acid (PFNS)	0.15	U	1.88	0.15	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluorodecanesulfonic acid (PFDS)	0.30	U	1.88	0.30	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Perfluorooctanesulfonamide (FOSA)	0.33	U	1.88	0.33	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.92	U	18.8	2.92	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	1.79	U	18.8	1.79	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
4:2 FTS	4.89	U	18.8	4.89	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
6:2 FTS	1.88	U	18.8	1.88	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
8:2 FTS	1.88	U	18.8	1.88	ng/L	-	06/26/19 07:15	06/28/19 07:30	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	74		25 - 150				06/26/19 07:15	06/28/19 07:30	1
13C5 PFPeA	80		25 - 150				06/26/19 07:15	06/28/19 07:30	1
13C2 PFHxA	85		25 - 150				06/26/19 07:15	06/28/19 07:30	1

Eurofins TestAmerica, Edison

Client Sample Results

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Client Sample ID: Little Martins Creek

Lab Sample ID: 460-184685-2

Date Collected: 06/18/19 15:30

Matrix: Water

Date Received: 06/19/19 11:15

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFHpA	96		25 - 150	06/26/19 07:15	06/28/19 07:30	1
13C4 PFOA	88		25 - 150	06/26/19 07:15	06/28/19 07:30	1
13C5 PFNA	88		25 - 150	06/26/19 07:15	06/28/19 07:30	1
13C2 PFDA	92		25 - 150	06/26/19 07:15	06/28/19 07:30	1
13C2 PFUnA	89		25 - 150	06/26/19 07:15	06/28/19 07:30	1
13C2 PFDoA	71		25 - 150	06/26/19 07:15	06/28/19 07:30	1
13C2 PFTeDA	34		25 - 150	06/26/19 07:15	06/28/19 07:30	1
13C3 PFBS	94		25 - 150	06/26/19 07:15	06/28/19 07:30	1
18O2 PFHxS	94		25 - 150	06/26/19 07:15	06/28/19 07:30	1
13C4 PFOS	90		25 - 150	06/26/19 07:15	06/28/19 07:30	1
13C8 FOSA	76		25 - 150	06/26/19 07:15	06/28/19 07:30	1
d3-NMeFOSAA	86		25 - 150	06/26/19 07:15	06/28/19 07:30	1
d5-NEtFOSAA	82		25 - 150	06/26/19 07:15	06/28/19 07:30	1
M2-6:2 FTS	117		25 - 150	06/26/19 07:15	06/28/19 07:30	1
M2-8:2 FTS	96		25 - 150	06/26/19 07:15	06/28/19 07:30	1
M2-4:2 FTS	109		25 - 150	06/26/19 07:15	06/28/19 07:30	1

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	1.54	U	11.1	1.54	pg/L		06/21/19 08:08	06/27/19 07:53	1
2,3,7,8-TCDF	0.97	U	11.1	0.97	pg/L		06/21/19 08:08	06/27/19 07:53	1
1,2,3,7,8-PeCDD	2.21	U	55.3	2.21	pg/L		06/21/19 08:08	06/27/19 07:53	1
1,2,3,7,8-PeCDF	1.16	U	55.3	1.16	pg/L		06/21/19 08:08	06/27/19 07:53	1
2,3,4,7,8-PeCDF	1.18	U	55.3	1.18	pg/L		06/21/19 08:08	06/27/19 07:53	1
1,2,3,4,7,8-HxCDD	1.81	U	55.3	1.81	pg/L		06/21/19 08:08	06/27/19 07:53	1
1,2,3,6,7,8-HxCDD	1.66	U	55.3	1.66	pg/L		06/21/19 08:08	06/27/19 07:53	1
1,2,3,7,8,9-HxCDD	1.63	U	55.3	1.63	pg/L		06/21/19 08:08	06/27/19 07:53	1
1,2,3,4,7,8-HxCDF	1.81	U	55.3	1.81	pg/L		06/21/19 08:08	06/27/19 07:53	1
1,2,3,6,7,8-HxCDF	1.66	U	55.3	1.66	pg/L		06/21/19 08:08	06/27/19 07:53	1
1,2,3,7,8,9-HxCDF	2.04	U	55.3	2.04	pg/L		06/21/19 08:08	06/27/19 07:53	1
2,3,4,6,7,8-HxCDF	1.79	U	55.3	1.79	pg/L		06/21/19 08:08	06/27/19 07:53	1
1,2,3,4,6,7,8-HpCDD	18.8	J	55.3	1.93	pg/L		06/21/19 08:08	06/27/19 07:53	1
1,2,3,4,6,7,8-HpCDF	5.27	J	55.3	2.04	pg/L		06/21/19 08:08	06/27/19 07:53	1
1,2,3,4,7,8,9-HpCDF	2.49	U	55.3	2.49	pg/L		06/21/19 08:08	06/27/19 07:53	1
OCDD	324		111	2.94	pg/L		06/21/19 08:08	06/27/19 07:53	1
OCDF	10.9	J q	111	2.67	pg/L		06/21/19 08:08	06/27/19 07:53	1
Total TCDD	1.54	U	11.1	1.54	pg/L		06/21/19 08:08	06/27/19 07:53	1
Total TCDF	0.97	U	11.1	0.97	pg/L		06/21/19 08:08	06/27/19 07:53	1
Total PeCDD	2.21	U	55.3	2.21	pg/L		06/21/19 08:08	06/27/19 07:53	1
Total PeCDF	1.43	U	55.3	1.43	pg/L		06/21/19 08:08	06/27/19 07:53	1
Total HxCDD	1.81	U	55.3	1.81	pg/L		06/21/19 08:08	06/27/19 07:53	1
Total HxCDF	2.04	U	55.3	2.04	pg/L		06/21/19 08:08	06/27/19 07:53	1
Total HpCDD	59.4		55.3	1.93	pg/L		06/21/19 08:08	06/27/19 07:53	1
Total HpCDF	13.0	J q	55.3	2.27	pg/L		06/21/19 08:08	06/27/19 07:53	1
Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac			
13C-2,3,7,8-TCDD	51		40 - 135	06/21/19 08:08	06/27/19 07:53	1			
13C-2,3,7,8-TCDF	52		40 - 135	06/21/19 08:08	06/27/19 07:53	1			
13C-1,2,3,7,8-PeCDD	49		40 - 135	06/21/19 08:08	06/27/19 07:53	1			
13C-1,2,3,7,8-PeCDF	50		40 - 135	06/21/19 08:08	06/27/19 07:53	1			

Eurofins TestAmerica, Edison

Client Sample Results

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Client Sample ID: Little Martins Creek

Lab Sample ID: 460-184685-2

Date Collected: 06/18/19 15:30

Matrix: Water

Date Received: 06/19/19 11:15

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,6,7,8-HxCDD	50		40 - 135	06/21/19 08:08	06/27/19 07:53	1
13C-1,2,3,4,7,8-HxCDF	53		40 - 135	06/21/19 08:08	06/27/19 07:53	1
13C-1,2,3,4,6,7,8-HpCDD	54		40 - 135	06/21/19 08:08	06/27/19 07:53	1
13C-1,2,3,4,6,7,8-HpCDF	54		40 - 135	06/21/19 08:08	06/27/19 07:53	1
13C-OCDD	56		40 - 135	06/21/19 08:08	06/27/19 07:53	1

Method: 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.7	U	15.0	2.7	ug/L		06/24/19 08:32	06/24/19 23:29	1
Cadmium	0.22	U	4.0	0.22	ug/L		06/24/19 08:32	06/24/19 23:29	1
Chromium	1.3	U	10.0	1.3	ug/L		06/24/19 08:32	06/24/19 23:29	1
Lead	2.5	U	10.0	2.5	ug/L		06/24/19 08:32	06/24/19 23:29	1
Selenium	6.6	U	20.0	6.6	ug/L		06/24/19 08:32	06/24/19 23:29	1
Copper	5.1	U	25.0	5.1	ug/L		06/24/19 08:32	06/24/19 23:29	1
Molybdenum	3.3	U	20.0	3.3	ug/L		06/24/19 08:32	06/24/19 23:29	1
Nickel	1.7	U	40.0	1.7	ug/L		06/24/19 08:32	06/24/19 23:29	1
Zinc	3.7	J	30.0	3.6	ug/L		06/24/19 08:32	06/24/19 23:29	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12	U	0.20	0.12	ug/L		06/26/19 13:52	06/26/19 15:47	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	4.4		0.50	0.046	mg/L			06/20/19 15:12	5

Client Sample ID: Martins Creek Belvidere Hwy

Lab Sample ID: 460-184685-3

Date Collected: 06/18/19 15:40

Matrix: Water

Date Received: 06/19/19 11:15

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	11.7		1.84	0.32	ng/L		06/26/19 07:15	06/28/19 07:38	1
Perfluoropentanoic acid (PFPeA)	8.58		1.84	0.45	ng/L		06/26/19 07:15	06/28/19 07:38	1
Perfluorohexanoic acid (PFHxA)	7.53		1.84	0.53	ng/L		06/26/19 07:15	06/28/19 07:38	1
Perfluoroheptanoic acid (PFHpA)	4.30		1.84	0.23	ng/L		06/26/19 07:15	06/28/19 07:38	1
Perfluorooctanoic acid (PFOA)	16.4		1.84	0.78	ng/L		06/26/19 07:15	06/28/19 07:38	1
Perfluorononanoic acid (PFNA)	1.84		1.84	0.25	ng/L		06/26/19 07:15	06/28/19 07:38	1
Perfluorodecanoic acid (PFDA)	0.65	J	1.84	0.29	ng/L		06/26/19 07:15	06/28/19 07:38	1
Perfluoroundecanoic acid (PFUnA)	1.01	U	1.84	1.01	ng/L		06/26/19 07:15	06/28/19 07:38	1
Perfluorododecanoic acid (PFDoA)	0.51	U	1.84	0.51	ng/L		06/26/19 07:15	06/28/19 07:38	1
Perfluorotridecanoic acid (PFTriA)	1.20	U	1.84	1.20	ng/L		06/26/19 07:15	06/28/19 07:38	1
Perfluorotetradecanoic acid (PFTeA)	0.27	U	1.84	0.27	ng/L		06/26/19 07:15	06/28/19 07:38	1
Perfluorobutanesulfonic acid (PFBS)	9.05		1.84	0.18	ng/L		06/26/19 07:15	06/28/19 07:38	1
Perfluoropentanesulfonic acid (PFPeS)	0.28	U	1.84	0.28	ng/L		06/26/19 07:15	06/28/19 07:38	1
Perfluorohexanesulfonic acid (PFHxS)	1.02	J B	1.84	0.16	ng/L		06/26/19 07:15	06/28/19 07:38	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.18	U	1.84	0.18	ng/L		06/26/19 07:15	06/28/19 07:38	1

Eurofins TestAmerica, Edison

Client Sample Results

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Client Sample ID: Martins Creek Belvidere Hwy

Lab Sample ID: 460-184685-3

Date Collected: 06/18/19 15:40

Matrix: Water

Date Received: 06/19/19 11:15

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	3.46		1.84	0.50	ng/L		06/26/19 07:15	06/28/19 07:38	1
Perfluorononanesulfonic acid (PFNS)	0.15	U	1.84	0.15	ng/L		06/26/19 07:15	06/28/19 07:38	1
Perfluorodecanesulfonic acid (PFDS)	0.30	U	1.84	0.30	ng/L		06/26/19 07:15	06/28/19 07:38	1
Perfluorooctanesulfonamide (FOSA)	0.32	U	1.84	0.32	ng/L		06/26/19 07:15	06/28/19 07:38	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.86	U	18.4	2.86	ng/L		06/26/19 07:15	06/28/19 07:38	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	1.75	U	18.4	1.75	ng/L		06/26/19 07:15	06/28/19 07:38	1
4:2 FTS	4.80	U	18.4	4.80	ng/L		06/26/19 07:15	06/28/19 07:38	1
6:2 FTS	1.84	U	18.4	1.84	ng/L		06/26/19 07:15	06/28/19 07:38	1
8:2 FTS	1.84	U	18.4	1.84	ng/L		06/26/19 07:15	06/28/19 07:38	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	62		25 - 150	06/26/19 07:15	06/28/19 07:38	1
13C5 PFPeA	74		25 - 150	06/26/19 07:15	06/28/19 07:38	1
13C2 PFHxA	84		25 - 150	06/26/19 07:15	06/28/19 07:38	1
13C4 PFHpA	91		25 - 150	06/26/19 07:15	06/28/19 07:38	1
13C4 PFOA	92		25 - 150	06/26/19 07:15	06/28/19 07:38	1
13C5 PFNA	86		25 - 150	06/26/19 07:15	06/28/19 07:38	1
13C2 PFDA	87		25 - 150	06/26/19 07:15	06/28/19 07:38	1
13C2 PFUnA	73		25 - 150	06/26/19 07:15	06/28/19 07:38	1
13C2 PFDoA	53		25 - 150	06/26/19 07:15	06/28/19 07:38	1
13C2 PFTeDA	16 *		25 - 150	06/26/19 07:15	06/28/19 07:38	1
13C3 PFBS	84		25 - 150	06/26/19 07:15	06/28/19 07:38	1
18O2 PFHxS	90		25 - 150	06/26/19 07:15	06/28/19 07:38	1
13C4 PFOS	84		25 - 150	06/26/19 07:15	06/28/19 07:38	1
13C8 FOSA	64		25 - 150	06/26/19 07:15	06/28/19 07:38	1
d3-NMeFOSAA	80		25 - 150	06/26/19 07:15	06/28/19 07:38	1
d5-NEtFOSAA	81		25 - 150	06/26/19 07:15	06/28/19 07:38	1
M2-6:2 FTS	125		25 - 150	06/26/19 07:15	06/28/19 07:38	1
M2-8:2 FTS	103		25 - 150	06/26/19 07:15	06/28/19 07:38	1
M2-4:2 FTS	129		25 - 150	06/26/19 07:15	06/28/19 07:38	1

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	1.22	U	11.0	1.22	pg/L		06/24/19 10:53	06/27/19 05:30	1
2,3,7,8-TCDF	0.82	U	11.0	0.82	pg/L		06/24/19 10:53	06/27/19 05:30	1
1,2,3,7,8-PeCDD	1.95	U	55.0	1.95	pg/L		06/24/19 10:53	06/27/19 05:30	1
1,2,3,7,8-PeCDF	1.13	U	55.0	1.13	pg/L		06/24/19 10:53	06/27/19 05:30	1
2,3,4,7,8-PeCDF	1.15	U	55.0	1.15	pg/L		06/24/19 10:53	06/27/19 05:30	1
1,2,3,4,7,8-HxCDD	1.68	U	55.0	1.68	pg/L		06/24/19 10:53	06/27/19 05:30	1
1,2,3,6,7,8-HxCDD	1.54	U	55.0	1.54	pg/L		06/24/19 10:53	06/27/19 05:30	1
1,2,3,7,8,9-HxCDD	1.51	U	55.0	1.51	pg/L		06/24/19 10:53	06/27/19 05:30	1
1,2,3,4,7,8-HxCDF	1.45	U	55.0	1.45	pg/L		06/24/19 10:53	06/27/19 05:30	1
1,2,3,6,7,8-HxCDF	1.33	U	55.0	1.33	pg/L		06/24/19 10:53	06/27/19 05:30	1
1,2,3,7,8,9-HxCDF	1.63	U	55.0	1.63	pg/L		06/24/19 10:53	06/27/19 05:30	1
2,3,4,6,7,8-HxCDF	1.43	U	55.0	1.43	pg/L		06/24/19 10:53	06/27/19 05:30	1
1,2,3,4,6,7,8-HpCDD	16.5	J	55.0	1.30	pg/L		06/24/19 10:53	06/27/19 05:30	1
1,2,3,4,6,7,8-HpCDF	3.03	J q	55.0	2.03	pg/L		06/24/19 10:53	06/27/19 05:30	1
1,2,3,4,7,8,9-HpCDF	2.47	U	55.0	2.47	pg/L		06/24/19 10:53	06/27/19 05:30	1

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Client Sample Results

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Client Sample ID: Martins Creek Belvidere Hwy

Lab Sample ID: 460-184685-3

Date Collected: 06/18/19 15:40

Matrix: Water

Date Received: 06/19/19 11:15

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
OCDD	450	B	110	2.12	pg/L	-	06/24/19 10:53	06/27/19 05:30	1
OCDF	9.75	J q	110	2.24	pg/L	-	06/24/19 10:53	06/27/19 05:30	1
Total TCDD	1.22	U	11.0	1.22	pg/L	-	06/24/19 10:53	06/27/19 05:30	1
Total TCDF	0.82	U	11.0	0.82	pg/L	-	06/24/19 10:53	06/27/19 05:30	1
Total PeCDD	1.95	U	55.0	1.95	pg/L	-	06/24/19 10:53	06/27/19 05:30	1
Total PeCDF	1.15	U	55.0	1.15	pg/L	-	06/24/19 10:53	06/27/19 05:30	1
Total HxCDD	1.68	U	55.0	1.68	pg/L	-	06/24/19 10:53	06/27/19 05:30	1
Total HxCDF	1.63	U	55.0	1.63	pg/L	-	06/24/19 10:53	06/27/19 05:30	1
Total HpCDD	35.3	J	55.0	1.30	pg/L	-	06/24/19 10:53	06/27/19 05:30	1
Total HpCDF	7.43	J q	55.0	2.25	pg/L	-	06/24/19 10:53	06/27/19 05:30	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C-2,3,7,8-TCDD	66		40 - 135			-	06/24/19 10:53	06/27/19 05:30	1
13C-2,3,7,8-TCDF	67		40 - 135			-	06/24/19 10:53	06/27/19 05:30	1
13C-1,2,3,7,8-PeCDD	62		40 - 135			-	06/24/19 10:53	06/27/19 05:30	1
13C-1,2,3,7,8-PeCDF	62		40 - 135			-	06/24/19 10:53	06/27/19 05:30	1
13C-1,2,3,6,7,8-HxCDD	67		40 - 135			-	06/24/19 10:53	06/27/19 05:30	1
13C-1,2,3,4,7,8-HxCDF	72		40 - 135			-	06/24/19 10:53	06/27/19 05:30	1
13C-1,2,3,4,6,7,8-HpCDD	74		40 - 135			-	06/24/19 10:53	06/27/19 05:30	1
13C-1,2,3,4,6,7,8-HpCDF	75		40 - 135			-	06/24/19 10:53	06/27/19 05:30	1
13C-OCDD	77		40 - 135			-	06/24/19 10:53	06/27/19 05:30	1

Method: 6010D - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.1	J	15.0	2.7	ug/L	-	06/24/19 08:32	06/24/19 23:33	1
Cadmium	0.22	U	4.0	0.22	ug/L	-	06/24/19 08:32	06/24/19 23:33	1
Chromium	1.9	J	10.0	1.3	ug/L	-	06/24/19 08:32	06/24/19 23:33	1
Lead	2.5	U	10.0	2.5	ug/L	-	06/24/19 08:32	06/24/19 23:33	1
Selenium	6.6	U	20.0	6.6	ug/L	-	06/24/19 08:32	06/24/19 23:33	1
Copper	5.1	U	25.0	5.1	ug/L	-	06/24/19 08:32	06/24/19 23:33	1
Molybdenum	3.3	U	20.0	3.3	ug/L	-	06/24/19 08:32	06/24/19 23:33	1
Nickel	1.7	U	40.0	1.7	ug/L	-	06/24/19 08:32	06/24/19 23:33	1
Zinc	5.1	J	30.0	3.6	ug/L	-	06/24/19 08:32	06/24/19 23:33	1

Method: 7470A - Mercury (CVAA) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12	U	0.20	0.12	ug/L	-	06/26/19 13:52	06/26/19 15:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	2.6		0.20	0.018	mg/L	-		06/20/19 15:13	2

Isotope Dilution Summary

Client: Moonstone Environmental LLC
 Project/Site: LMBT Surface Water

Job ID: 460-184685-1

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)	PFUnA (25-150)
460-184685-1	Route 611	74	85	93	95	91	89	89	78
460-184685-2	Little Martins Creek	74	80	85	96	88	88	92	89
460-184685-3	Martins Creek Belvidere Hwy	62	74	84	91	92	86	87	73
LCS 320-303775/2-A	Lab Control Sample	98	102	99	105	100	98	113	105
LCSD 320-303775/3-A	Lab Control Sample Dup	93	94	103	102	101	98	108	105
MB 320-303775/1-A	Method Blank	89	98	101	100	102	99	111	104

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFDaA (25-150)	PFTDA (25-150)	3C3-PFB: (25-150)	PFHxS (25-150)	PFOS (25-150)	PFOSA (25-150)	-NMeFOS/ (25-150)	-NEtFOS/ (25-150)
460-184685-1	Route 611	70	37	91	98	88	72	79	91
460-184685-2	Little Martins Creek	71	34	94	94	90	76	86	82
460-184685-3	Martins Creek Belvidere Hwy	53	16 *	84	90	84	64	80	81
LCS 320-303775/2-A	Lab Control Sample	106	106	99	103	100	88	102	110
LCSD 320-303775/3-A	Lab Control Sample Dup	104	112	98	99	100	89	102	97
MB 320-303775/1-A	Method Blank	100	111	97	98	99	88	102	101

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	M262FTS (25-150)	M282FTS (25-150)	M242FTS (25-150)
460-184685-1	Route 611	124	96	119
460-184685-2	Little Martins Creek	117	96	109
460-184685-3	Martins Creek Belvidere Hwy	125	103	129
LCS 320-303775/2-A	Lab Control Sample	116	111	108
LCSD 320-303775/3-A	Lab Control Sample Dup	108	106	112
MB 320-303775/1-A	Method Blank	123	108	107

Surrogate Legend

- PFBA = 13C4 PFBA
- PFPeA = 13C5 PFPeA
- PFHxA = 13C2 PFHxA
- PFHpA = 13C4 PFHpA
- PFOA = 13C4 PFOA
- PFNA = 13C5 PFNA
- PFDA = 13C2 PFDA
- PFUnA = 13C2 PFUnA
- PFDaA = 13C2 PFDaA
- 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
- M282FTS = M2-8:2 FTS
- M242FTS = M2-4:2 FTS

Isotope Dilution Summary

Client: Moonstone Environmental LLC
 Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Matrix: Water

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TCDD (40-135)	TCDF (40-135)	PeCDD (40-135)	PeCDF (40-135)	HxDD (40-135)	HxCDF (40-135)	HpCDD (40-135)	HpCDF (40-135)
460-184685-1	Route 611	46	49	47	46	49	53	54	53
460-184685-2	Little Martins Creek	51	52	49	50	50	53	54	54
460-184685-3	Martins Creek Belvidere Hwy	66	67	62	62	67	72	74	75
LCS 320-302755/2-A	Lab Control Sample	82	82	85	86	77	80	81	77
LCS 320-303266/2-A	Lab Control Sample	82	84	84	84	85	89	86	90
LCSD 320-302755/3-A	Lab Control Sample Dup	90	92	90	91	85	89	89	88
LCSD 320-303266/3-A	Lab Control Sample Dup	75	76	71	73	72	76	74	76
MB 320-302755/1-A	Method Blank	71	73	67	70	69	71	68	71
MB 320-303266/1-A	Method Blank	79	79	75	76	78	84	79	86

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	OCDD (40-135)
460-184685-1	Route 611	56
460-184685-2	Little Martins Creek	56
460-184685-3	Martins Creek Belvidere Hwy	77
LCS 320-302755/2-A	Lab Control Sample	80
LCS 320-303266/2-A	Lab Control Sample	85
LCSD 320-302755/3-A	Lab Control Sample Dup	90
LCSD 320-303266/3-A	Lab Control Sample Dup	72
MB 320-302755/1-A	Method Blank	66
MB 320-303266/1-A	Method Blank	80

Surrogate Legend

- TCDD = 13C-2,3,7,8-TCDD
- TCDF = 13C-2,3,7,8-TCDF
- PeCDD = 13C-1,2,3,7,8-PeCDD
- PeCDF = 13C-1,2,3,7,8-PeCDF
- HxDD = 13C-1,2,3,6,7,8-HxCDD
- HxCDF = 13C-1,2,3,4,7,8-HxCDF
- HpCDD = 13C-1,2,3,4,6,7,8-HpCDD
- HpCDF = 13C-1,2,3,4,6,7,8-HpCDF
- OCDD = 13C-OCDD

QC Sample Results

Client: Moonstone Environmental LLC
 Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-303775/1-A
Matrix: Water
Analysis Batch: 304404

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 303775

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.35	U	2.00	0.35	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluoropentanoic acid (PFPeA)	0.49	U	2.00	0.49	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluorohexanoic acid (PFHxA)	0.58	U	2.00	0.58	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluoroheptanoic acid (PFHpA)	0.25	U	2.00	0.25	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluorooctanoic acid (PFOA)	0.85	U	2.00	0.85	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluorononanoic acid (PFNA)	0.27	U	2.00	0.27	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluorodecanoic acid (PFDA)	0.31	U	2.00	0.31	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluoroundecanoic acid (PFUnA)	1.10	U	2.00	1.10	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluorododecanoic acid (PFDoA)	0.55	U	2.00	0.55	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluorotridecanoic acid (PFTriA)	1.30	U	2.00	1.30	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluorotetradecanoic acid (PFTeA)	0.29	U	2.00	0.29	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluorobutanesulfonic acid (PFBS)	0.20	U	2.00	0.20	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluoropentanesulfonic acid (PFPeS)	0.30	U	2.00	0.30	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluorohexanesulfonic acid (PFHxS)	0.297	J	2.00	0.17	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.19	U	2.00	0.19	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluorooctanesulfonic acid (PFOS)	0.54	U	2.00	0.54	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluorononanesulfonic acid (PFNS)	0.16	U	2.00	0.16	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluorodecanesulfonic acid (PFDS)	0.32	U	2.00	0.32	ng/L		06/26/19 07:15	06/28/19 04:10	1
Perfluorooctanesulfonamide (FOSA)	0.35	U	2.00	0.35	ng/L		06/26/19 07:15	06/28/19 04:10	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	3.10	U	20.0	3.10	ng/L		06/26/19 07:15	06/28/19 04:10	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	1.90	U	20.0	1.90	ng/L		06/26/19 07:15	06/28/19 04:10	1
4:2 FTS	5.20	U	20.0	5.20	ng/L		06/26/19 07:15	06/28/19 04:10	1
6:2 FTS	2.00	U	20.0	2.00	ng/L		06/26/19 07:15	06/28/19 04:10	1
8:2 FTS	2.00	U	20.0	2.00	ng/L		06/26/19 07:15	06/28/19 04:10	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	89		25 - 150	06/26/19 07:15	06/28/19 04:10	1
13C5 PFPeA	98		25 - 150	06/26/19 07:15	06/28/19 04:10	1
13C2 PFHxA	101		25 - 150	06/26/19 07:15	06/28/19 04:10	1
13C4 PFHpA	100		25 - 150	06/26/19 07:15	06/28/19 04:10	1
13C4 PFOA	102		25 - 150	06/26/19 07:15	06/28/19 04:10	1
13C5 PFNA	99		25 - 150	06/26/19 07:15	06/28/19 04:10	1
13C2 PFDA	111		25 - 150	06/26/19 07:15	06/28/19 04:10	1
13C2 PFUnA	104		25 - 150	06/26/19 07:15	06/28/19 04:10	1
13C2 PFDoA	100		25 - 150	06/26/19 07:15	06/28/19 04:10	1
13C2 PFTeDA	111		25 - 150	06/26/19 07:15	06/28/19 04:10	1
13C3 PFBS	97		25 - 150	06/26/19 07:15	06/28/19 04:10	1
18O2 PFHxS	98		25 - 150	06/26/19 07:15	06/28/19 04:10	1
13C4 PFOS	99		25 - 150	06/26/19 07:15	06/28/19 04:10	1
13C8 FOSA	88		25 - 150	06/26/19 07:15	06/28/19 04:10	1
d3-NMeFOSAA	102		25 - 150	06/26/19 07:15	06/28/19 04:10	1
d5-NEtFOSAA	101		25 - 150	06/26/19 07:15	06/28/19 04:10	1
M2-6:2 FTS	123		25 - 150	06/26/19 07:15	06/28/19 04:10	1
M2-8:2 FTS	108		25 - 150	06/26/19 07:15	06/28/19 04:10	1
M2-4:2 FTS	107		25 - 150	06/26/19 07:15	06/28/19 04:10	1

Eurofins TestAmerica, Edison

QC Sample Results

Client: Moonstone Environmental LLC
 Project/Site: LMBT Surface Water

Job ID: 460-184685-1

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

Lab Sample ID: LCS 320-303775/2-A
Matrix: Water
Analysis Batch: 304404

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 303775

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorobutanoic acid (PFBA)	40.0	41.64		ng/L		104	70 - 130
Perfluoropentanoic acid (PFPeA)	40.0	38.09		ng/L		95	66 - 126
Perfluorohexanoic acid (PFHxA)	40.0	39.14		ng/L		98	66 - 126
Perfluoroheptanoic acid (PFHpA)	40.0	41.22		ng/L		103	66 - 126
Perfluorooctanoic acid (PFOA)	40.0	42.68		ng/L		107	64 - 124
Perfluorononanoic acid (PFNA)	40.0	42.70		ng/L		107	68 - 128
Perfluorodecanoic acid (PFDA)	40.0	39.09		ng/L		98	69 - 129
Perfluoroundecanoic acid (PFUnA)	40.0	38.27		ng/L		96	60 - 120
Perfluorododecanoic acid (PFDoA)	40.0	43.63		ng/L		109	71 - 131
Perfluorotridecanoic acid (PFTriA)	40.0	42.71		ng/L		107	72 - 132
Perfluorotetradecanoic acid (PFTeA)	40.0	41.80		ng/L		104	68 - 128
Perfluorobutanesulfonic acid (PFBS)	35.4	38.16		ng/L		108	73 - 133
Perfluoropentanesulfonic acid (PFPeS)	37.5	41.11		ng/L		110	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.96		ng/L		93	63 - 123
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	40.11		ng/L		105	68 - 128
Perfluorooctanesulfonic acid (PFOS)	37.1	36.70		ng/L		99	67 - 127
Perfluorononanesulfonic acid (PFNS)	38.4	41.00		ng/L		107	70 - 130
Perfluorodecanesulfonic acid (PFDS)	38.6	41.43		ng/L		107	68 - 128
Perfluorooctanesulfonamide (FOSA)	40.0	47.40		ng/L		119	70 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	40.0	42.85		ng/L		107	67 - 127
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	40.0	35.31		ng/L		88	65 - 125
4:2 FTS	37.4	36.17		ng/L		97	70 - 130
6:2 FTS	37.9	40.15		ng/L		106	66 - 126
8:2 FTS	38.3	38.35		ng/L		100	67 - 127

Isotope Dilution	LCS LCS		Limits
	%Recovery	Qualifier	
13C4 PFBA	98		25 - 150
13C5 PFPeA	102		25 - 150
13C2 PFHxA	99		25 - 150
13C4 PFHpA	105		25 - 150
13C4 PFOA	100		25 - 150
13C5 PFNA	98		25 - 150
13C2 PFDA	113		25 - 150
13C2 PFUnA	105		25 - 150
13C2 PFDoA	106		25 - 150
13C2 PFTeDA	106		25 - 150
13C3 PFBS	99		25 - 150
18O2 PFHxS	103		25 - 150

Eurofins TestAmerica, Edison

QC Sample Results

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

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

Lab Sample ID: LCS 320-303775/2-A
Matrix: Water
Analysis Batch: 304404

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 303775

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
13C4 PFOS	100		25 - 150
13C8 FOSA	88		25 - 150
d3-NMeFOSAA	102		25 - 150
d5-NEtFOSAA	110		25 - 150
M2-6:2 FTS	116		25 - 150
M2-8:2 FTS	111		25 - 150
M2-4:2 FTS	108		25 - 150

Lab Sample ID: LCSD 320-303775/3-A
Matrix: Water
Analysis Batch: 304404

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 303775

<i>Analyte</i>	<i>Spike Added</i>	<i>LCSD Result</i>	<i>LCSD Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec. Limits</i>	<i>RPD</i>	<i>RPD Limit</i>
Perfluorobutanoic acid (PFBA)	40.0	42.84		ng/L		107	70 - 130	3	30
Perfluoropentanoic acid (PFPeA)	40.0	38.81		ng/L		97	66 - 126	2	30
Perfluorohexanoic acid (PFHxA)	40.0	38.92		ng/L		97	66 - 126	1	30
Perfluoroheptanoic acid (PFHpA)	40.0	41.70		ng/L		104	66 - 126	1	30
Perfluorooctanoic acid (PFOA)	40.0	41.83		ng/L		105	64 - 124	2	30
Perfluorononanoic acid (PFNA)	40.0	41.81		ng/L		105	68 - 128	2	30
Perfluorodecanoic acid (PFDA)	40.0	39.14		ng/L		98	69 - 129	0	30
Perfluoroundecanoic acid (PFUnA)	40.0	37.65		ng/L		94	60 - 120	2	30
Perfluorododecanoic acid (PFDoA)	40.0	42.80		ng/L		107	71 - 131	2	30
Perfluorotridecanoic acid (PFTriA)	40.0	42.94		ng/L		107	72 - 132	1	30
Perfluorotetradecanoic acid (PFTeA)	40.0	40.69		ng/L		102	68 - 128	3	30
Perfluorobutanesulfonic acid (PFBS)	35.4	35.66		ng/L		101	73 - 133	7	30
Perfluoropentanesulfonic acid (PFPeS)	37.5	38.41		ng/L		102	70 - 130	7	30
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.55		ng/L		98	63 - 123	5	30
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	39.36		ng/L		103	68 - 128	2	30
Perfluorooctanesulfonic acid (PFOS)	37.1	36.73		ng/L		99	67 - 127	0	30
Perfluorononanesulfonic acid (PFNS)	38.4	40.79		ng/L		106	70 - 130	1	30
Perfluorodecanesulfonic acid (PFDS)	38.6	39.17		ng/L		102	68 - 128	6	30
Perfluorooctanesulfonamide (FOSA)	40.0	46.76		ng/L		117	70 - 130	1	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	40.0	38.28		ng/L		96	67 - 127	11	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	40.0	42.48		ng/L		106	65 - 125	18	30
4:2 FTS	37.4	38.76		ng/L		104	70 - 130	7	30
6:2 FTS	37.9	39.24		ng/L		103	66 - 126	2	30
8:2 FTS	38.3	41.72		ng/L		109	67 - 127	8	30

QC Sample Results

Client: Moonstone Environmental LLC
 Project/Site: LMBT Surface Water

Job ID: 460-184685-1

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

Isotope Dilution	LCSD		Limits
	%Recovery	Qualifier	
13C4 PFBA	93		25 - 150
13C5 PFPeA	94		25 - 150
13C2 PFHxA	103		25 - 150
13C4 PFHpA	102		25 - 150
13C4 PFOA	101		25 - 150
13C5 PFNA	98		25 - 150
13C2 PFDA	108		25 - 150
13C2 PFUnA	105		25 - 150
13C2 PFDoA	104		25 - 150
13C2 PFTeDA	112		25 - 150
13C3 PFBS	98		25 - 150
18O2 PFHxS	99		25 - 150
13C4 PFOS	100		25 - 150
13C8 FOSA	89		25 - 150
d3-NMeFOSAA	102		25 - 150
d5-NEtFOSAA	97		25 - 150
M2-6:2 FTS	108		25 - 150
M2-8:2 FTS	106		25 - 150
M2-4:2 FTS	112		25 - 150

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Lab Sample ID: MB 320-302755/1-A
 Matrix: Water
 Analysis Batch: 303930

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 302755

Analyte	MB	MB	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
2,3,7,8-TCDD	1.42	U	10.0	1.42	pg/L		06/21/19 08:08	06/26/19 15:15	1
2,3,7,8-TCDF	0.91	U	10.0	0.91	pg/L		06/21/19 08:08	06/26/19 15:15	1
1,2,3,7,8-PeCDD	2.11	U	50.0	2.11	pg/L		06/21/19 08:08	06/26/19 15:15	1
1,2,3,7,8-PeCDF	1.08	U	50.0	1.08	pg/L		06/21/19 08:08	06/26/19 15:15	1
2,3,4,7,8-PeCDF	1.10	U	50.0	1.10	pg/L		06/21/19 08:08	06/26/19 15:15	1
1,2,3,4,7,8-HxCDD	1.30	U	50.0	1.30	pg/L		06/21/19 08:08	06/26/19 15:15	1
1,2,3,6,7,8-HxCDD	1.19	U	50.0	1.19	pg/L		06/21/19 08:08	06/26/19 15:15	1
1,2,3,7,8,9-HxCDD	1.17	U	50.0	1.17	pg/L		06/21/19 08:08	06/26/19 15:15	1
1,2,3,4,7,8-HxCDF	1.24	U	50.0	1.24	pg/L		06/21/19 08:08	06/26/19 15:15	1
1,2,3,6,7,8-HxCDF	1.13	U	50.0	1.13	pg/L		06/21/19 08:08	06/26/19 15:15	1
1,2,3,7,8,9-HxCDF	1.39	U	50.0	1.39	pg/L		06/21/19 08:08	06/26/19 15:15	1
2,3,4,6,7,8-HxCDF	1.22	U	50.0	1.22	pg/L		06/21/19 08:08	06/26/19 15:15	1
1,2,3,4,6,7,8-HpCDD	1.11	U	50.0	1.11	pg/L		06/21/19 08:08	06/26/19 15:15	1
1,2,3,4,6,7,8-HpCDF	1.44	U	50.0	1.44	pg/L		06/21/19 08:08	06/26/19 15:15	1
1,2,3,4,7,8,9-HpCDF	1.75	U	50.0	1.75	pg/L		06/21/19 08:08	06/26/19 15:15	1
OCDD	1.77	U	100	1.77	pg/L		06/21/19 08:08	06/26/19 15:15	1
OCDF	2.84	U	100	2.84	pg/L		06/21/19 08:08	06/26/19 15:15	1
Total TCDD	1.699	J q	10.0	1.42	pg/L		06/21/19 08:08	06/26/19 15:15	1
Total TCDF	0.91	U	10.0	0.91	pg/L		06/21/19 08:08	06/26/19 15:15	1
Total PeCDD	2.11	U	50.0	2.11	pg/L		06/21/19 08:08	06/26/19 15:15	1
Total PeCDF	1.10	U	50.0	1.10	pg/L		06/21/19 08:08	06/26/19 15:15	1
Total HxCDD	1.30	U	50.0	1.30	pg/L		06/21/19 08:08	06/26/19 15:15	1
Total HxCDF	1.39	U	50.0	1.39	pg/L		06/21/19 08:08	06/26/19 15:15	1
Total HpCDD	2.45	U	50.0	2.45	pg/L		06/21/19 08:08	06/26/19 15:15	1
Total HpCDF	1.75	U	50.0	1.75	pg/L		06/21/19 08:08	06/26/19 15:15	1

Eurofins TestAmerica, Edison

QC Sample Results

Client: Moonstone Environmental LLC
 Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C-2,3,7,8-TCDD	71		40 - 135	06/21/19 08:08	06/26/19 15:15	1
13C-2,3,7,8-TCDF	73		40 - 135	06/21/19 08:08	06/26/19 15:15	1
13C-1,2,3,7,8-PeCDD	67		40 - 135	06/21/19 08:08	06/26/19 15:15	1
13C-1,2,3,7,8-PeCDF	70		40 - 135	06/21/19 08:08	06/26/19 15:15	1
13C-1,2,3,6,7,8-HxCDD	69		40 - 135	06/21/19 08:08	06/26/19 15:15	1
13C-1,2,3,4,7,8-HxCDF	71		40 - 135	06/21/19 08:08	06/26/19 15:15	1
13C-1,2,3,4,6,7,8-HpCDD	68		40 - 135	06/21/19 08:08	06/26/19 15:15	1
13C-1,2,3,4,6,7,8-HpCDF	71		40 - 135	06/21/19 08:08	06/26/19 15:15	1
13C-OCDD	66		40 - 135	06/21/19 08:08	06/26/19 15:15	1

Lab Sample ID: LCS 320-302755/2-A
Matrix: Water
Analysis Batch: 303930

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 302755

<i>Analyte</i>	<i>Spike Added</i>	<i>LCS Result</i>	<i>LCS Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec. Limits</i>
2,3,7,8-TCDD	200	175.4		pg/L		88	64 - 142
2,3,7,8-TCDF	200	193.6		pg/L		97	71 - 142
1,2,3,7,8-PeCDD	1000	879.3		pg/L		88	71 - 140
1,2,3,7,8-PeCDF	1000	933.4		pg/L		93	76 - 135
2,3,4,7,8-PeCDF	1000	916.4		pg/L		92	74 - 137
1,2,3,4,7,8-HxCDD	1000	862.0		pg/L		86	56 - 146
1,2,3,6,7,8-HxCDD	1000	882.1		pg/L		88	73 - 144
1,2,3,7,8,9-HxCDD	1000	925.8		pg/L		93	71 - 151
1,2,3,4,7,8-HxCDF	1000	858.8		pg/L		86	75 - 131
1,2,3,6,7,8-HxCDF	1000	839.2		pg/L		84	76 - 133
1,2,3,7,8,9-HxCDF	1000	1017		pg/L		102	77 - 142
2,3,4,6,7,8-HxCDF	1000	928.6		pg/L		93	80 - 137
1,2,3,4,6,7,8-HpCDD	1000	859.3		pg/L		86	78 - 139
1,2,3,4,6,7,8-HpCDF	1000	904.5		pg/L		90	79 - 133
1,2,3,4,7,8,9-HpCDF	1000	956.5		pg/L		96	83 - 130
OCDD	2000	1656		pg/L		83	80 - 132
OCDF	2000	1689		pg/L		84	72 - 140

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
13C-2,3,7,8-TCDD	82		40 - 135
13C-2,3,7,8-TCDF	82		40 - 135
13C-1,2,3,7,8-PeCDD	85		40 - 135
13C-1,2,3,7,8-PeCDF	86		40 - 135
13C-1,2,3,6,7,8-HxCDD	77		40 - 135
13C-1,2,3,4,7,8-HxCDF	80		40 - 135
13C-1,2,3,4,6,7,8-HpCDD	81		40 - 135
13C-1,2,3,4,6,7,8-HpCDF	77		40 - 135
13C-OCDD	80		40 - 135

Lab Sample ID: LCSD 320-302755/3-A
Matrix: Water
Analysis Batch: 303930

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 302755

<i>Analyte</i>	<i>Spike Added</i>	<i>LCSD Result</i>	<i>LCSD Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec. Limits</i>	<i>RPD</i>	<i>RPD Limit</i>
2,3,7,8-TCDD	200	185.4		pg/L		93	64 - 142	6	20
2,3,7,8-TCDF	200	189.7		pg/L		95	71 - 142	2	20
1,2,3,7,8-PeCDD	1000	952.3		pg/L		95	71 - 140	8	20

Eurofins TestAmerica, Edison

QC Sample Results

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCSD 320-302755/3-A
Matrix: Water
Analysis Batch: 303930

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 302755

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,7,8-PeCDF	1000	969.0		pg/L		97	76 - 135	4	20
2,3,4,7,8-PeCDF	1000	999.6		pg/L		100	74 - 137	9	20
1,2,3,4,7,8-HxCDD	1000	940.0		pg/L		94	56 - 146	9	20
1,2,3,6,7,8-HxCDD	1000	960.2		pg/L		96	73 - 144	8	20
1,2,3,7,8,9-HxCDD	1000	995.9		pg/L		100	71 - 151	7	20
1,2,3,4,7,8-HxCDF	1000	922.7		pg/L		92	75 - 131	7	20
1,2,3,6,7,8-HxCDF	1000	939.4		pg/L		94	76 - 133	11	20
1,2,3,7,8,9-HxCDF	1000	1057		pg/L		106	77 - 142	4	20
2,3,4,6,7,8-HxCDF	1000	973.6		pg/L		97	80 - 137	5	20
1,2,3,4,6,7,8-HpCDD	1000	938.4		pg/L		94	78 - 139	9	20
1,2,3,4,6,7,8-HpCDF	1000	965.8		pg/L		97	79 - 133	7	20
1,2,3,4,7,8,9-HpCDF	1000	1040		pg/L		104	83 - 130	8	20
OCDD	2000	1843		pg/L		92	80 - 132	11	20
OCDF	2000	1906		pg/L		95	72 - 140	12	20

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	LCSD Limits
13C-2,3,7,8-TCDD	90		40 - 135
13C-2,3,7,8-TCDF	92		40 - 135
13C-1,2,3,7,8-PeCDD	90		40 - 135
13C-1,2,3,7,8-PeCDF	91		40 - 135
13C-1,2,3,6,7,8-HxCDD	85		40 - 135
13C-1,2,3,4,7,8-HxCDF	89		40 - 135
13C-1,2,3,4,6,7,8-HpCDD	89		40 - 135
13C-1,2,3,4,6,7,8-HpCDF	88		40 - 135
13C-OCDD	90		40 - 135

Lab Sample ID: MB 320-303266/1-A
Matrix: Water
Analysis Batch: 304050

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 303266

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	1.08	U	10.0	1.08	pg/L		06/24/19 10:53	06/27/19 01:33	1
2,3,7,8-TCDF	0.74	U	10.0	0.74	pg/L		06/24/19 10:53	06/27/19 01:33	1
1,2,3,7,8-PeCDD	1.52	U	50.0	1.52	pg/L		06/24/19 10:53	06/27/19 01:33	1
1,2,3,7,8-PeCDF	0.95	U	50.0	0.95	pg/L		06/24/19 10:53	06/27/19 01:33	1
2,3,4,7,8-PeCDF	0.97	U	50.0	0.97	pg/L		06/24/19 10:53	06/27/19 01:33	1
1,2,3,4,7,8-HxCDD	1.34	U	50.0	1.34	pg/L		06/24/19 10:53	06/27/19 01:33	1
1,2,3,6,7,8-HxCDD	1.23	U	50.0	1.23	pg/L		06/24/19 10:53	06/27/19 01:33	1
1,2,3,7,8,9-HxCDD	1.21	U	50.0	1.21	pg/L		06/24/19 10:53	06/27/19 01:33	1
1,2,3,4,7,8-HxCDF	1.14	U	50.0	1.14	pg/L		06/24/19 10:53	06/27/19 01:33	1
1,2,3,6,7,8-HxCDF	1.05	U	50.0	1.05	pg/L		06/24/19 10:53	06/27/19 01:33	1
1,2,3,7,8,9-HxCDF	1.29	U	50.0	1.29	pg/L		06/24/19 10:53	06/27/19 01:33	1
2,3,4,6,7,8-HxCDF	1.13	U	50.0	1.13	pg/L		06/24/19 10:53	06/27/19 01:33	1
1,2,3,4,6,7,8-HpCDD	1.03	U	50.0	1.03	pg/L		06/24/19 10:53	06/27/19 01:33	1
1,2,3,4,6,7,8-HpCDF	1.14	U	50.0	1.14	pg/L		06/24/19 10:53	06/27/19 01:33	1
1,2,3,4,7,8,9-HpCDF	1.40	U	50.0	1.40	pg/L		06/24/19 10:53	06/27/19 01:33	1
OCDD	2.896	J q	100	1.64	pg/L		06/24/19 10:53	06/27/19 01:33	1
OCDF	2.70	U	100	2.70	pg/L		06/24/19 10:53	06/27/19 01:33	1
Total TCDD	1.66	U	10.0	1.66	pg/L		06/24/19 10:53	06/27/19 01:33	1

Eurofins TestAmerica, Edison

QC Sample Results

Client: Moonstone Environmental LLC
 Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: MB 320-303266/1-A
Matrix: Water
Analysis Batch: 304050

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 303266

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
Total TCDF	0.74	U	10.0	0.74	pg/L		06/24/19 10:53	06/27/19 01:33	1
Total PeCDD	1.52	U	50.0	1.52	pg/L		06/24/19 10:53	06/27/19 01:33	1
Total PeCDF	0.97	U	50.0	0.97	pg/L		06/24/19 10:53	06/27/19 01:33	1
Total HxCDD	3.73	U	50.0	3.73	pg/L		06/24/19 10:53	06/27/19 01:33	1
Total HxCDF	1.29	U	50.0	1.29	pg/L		06/24/19 10:53	06/27/19 01:33	1
Total HpCDD	1.03	U	50.0	1.03	pg/L		06/24/19 10:53	06/27/19 01:33	1
Total HpCDF	1.40	U	50.0	1.40	pg/L		06/24/19 10:53	06/27/19 01:33	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD	79		40 - 135	06/24/19 10:53	06/27/19 01:33	1
13C-2,3,7,8-TCDF	79		40 - 135	06/24/19 10:53	06/27/19 01:33	1
13C-1,2,3,7,8-PeCDD	75		40 - 135	06/24/19 10:53	06/27/19 01:33	1
13C-1,2,3,7,8-PeCDF	76		40 - 135	06/24/19 10:53	06/27/19 01:33	1
13C-1,2,3,6,7,8-HxCDD	78		40 - 135	06/24/19 10:53	06/27/19 01:33	1
13C-1,2,3,4,7,8-HxCDF	84		40 - 135	06/24/19 10:53	06/27/19 01:33	1
13C-1,2,3,4,6,7,8-HpCDD	79		40 - 135	06/24/19 10:53	06/27/19 01:33	1
13C-1,2,3,4,6,7,8-HpCDF	86		40 - 135	06/24/19 10:53	06/27/19 01:33	1
13C-OCDD	80		40 - 135	06/24/19 10:53	06/27/19 01:33	1

Lab Sample ID: LCS 320-303266/2-A
Matrix: Water
Analysis Batch: 304050

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 303266

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
2,3,7,8-TCDD	200	186.4		pg/L		93	64 - 142
2,3,7,8-TCDF	200	195.8		pg/L		98	71 - 142
1,2,3,7,8-PeCDD	1000	941.5		pg/L		94	71 - 140
1,2,3,7,8-PeCDF	1000	993.5		pg/L		99	76 - 135
2,3,4,7,8-PeCDF	1000	980.7		pg/L		98	74 - 137
1,2,3,4,7,8-HxCDD	1000	907.3		pg/L		91	56 - 146
1,2,3,6,7,8-HxCDD	1000	987.1		pg/L		99	73 - 144
1,2,3,7,8,9-HxCDD	1000	1003		pg/L		100	71 - 151
1,2,3,4,7,8-HxCDF	1000	924.9		pg/L		92	75 - 131
1,2,3,6,7,8-HxCDF	1000	912.3		pg/L		91	76 - 133
1,2,3,7,8,9-HxCDF	1000	1045		pg/L		104	77 - 142
2,3,4,6,7,8-HxCDF	1000	953.1		pg/L		95	80 - 137
1,2,3,4,6,7,8-HpCDD	1000	953.5		pg/L		95	78 - 139
1,2,3,4,6,7,8-HpCDF	1000	965.0		pg/L		97	79 - 133
1,2,3,4,7,8,9-HpCDF	1000	982.1		pg/L		98	83 - 130
OCDD	2000	1850		pg/L		92	80 - 132
OCDF	2000	1887		pg/L		94	72 - 140

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C-2,3,7,8-TCDD	82		40 - 135
13C-2,3,7,8-TCDF	84		40 - 135
13C-1,2,3,7,8-PeCDD	84		40 - 135
13C-1,2,3,7,8-PeCDF	84		40 - 135
13C-1,2,3,6,7,8-HxCDD	85		40 - 135
13C-1,2,3,4,7,8-HxCDF	89		40 - 135

QC Sample Results

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCS 320-303266/2-A
Matrix: Water
Analysis Batch: 304050

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 303266

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
13C-1,2,3,4,6,7,8-HpCDD	86		40 - 135
13C-1,2,3,4,6,7,8-HpCDF	90		40 - 135
13C-OCDD	85		40 - 135

Lab Sample ID: LCSD 320-303266/3-A
Matrix: Water
Analysis Batch: 304050

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 303266

<i>Analyte</i>	<i>Spike Added</i>	<i>LCSD Result</i>	<i>LCSD Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>Limits</i>	<i>RPD</i>	<i>RPD Limit</i>
2,3,7,8-TCDD	200	180.7		pg/L		90	64 - 142	3	20
2,3,7,8-TCDF	200	195.9		pg/L		98	71 - 142	0	20
1,2,3,7,8-PeCDD	1000	989.0		pg/L		99	71 - 140	5	20
1,2,3,7,8-PeCDF	1000	985.6		pg/L		99	76 - 135	1	20
2,3,4,7,8-PeCDF	1000	993.4		pg/L		99	74 - 137	1	20
1,2,3,4,7,8-HxCDD	1000	968.0		pg/L		97	56 - 146	6	20
1,2,3,6,7,8-HxCDD	1000	968.2		pg/L		97	73 - 144	2	20
1,2,3,7,8,9-HxCDD	1000	1015		pg/L		102	71 - 151	1	20
1,2,3,4,7,8-HxCDF	1000	982.7		pg/L		98	75 - 131	6	20
1,2,3,6,7,8-HxCDF	1000	935.4		pg/L		94	76 - 133	3	20
1,2,3,7,8,9-HxCDF	1000	1106		pg/L		111	77 - 142	6	20
2,3,4,6,7,8-HxCDF	1000	958.2		pg/L		96	80 - 137	1	20
1,2,3,4,6,7,8-HpCDD	1000	981.1		pg/L		98	78 - 139	3	20
1,2,3,4,6,7,8-HpCDF	1000	989.7		pg/L		99	79 - 133	3	20
1,2,3,4,7,8,9-HpCDF	1000	1018		pg/L		102	83 - 130	4	20
OCDD	2000	1910		pg/L		95	80 - 132	3	20
OCDF	2000	1957		pg/L		98	72 - 140	4	20

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
13C-2,3,7,8-TCDD	75		40 - 135
13C-2,3,7,8-TCDF	76		40 - 135
13C-1,2,3,7,8-PeCDD	71		40 - 135
13C-1,2,3,7,8-PeCDF	73		40 - 135
13C-1,2,3,6,7,8-HxCDD	72		40 - 135
13C-1,2,3,4,7,8-HxCDF	76		40 - 135
13C-1,2,3,4,6,7,8-HpCDD	74		40 - 135
13C-1,2,3,4,6,7,8-HpCDF	76		40 - 135
13C-OCDD	72		40 - 135

Method: 6010D - Metals (ICP)

Lab Sample ID: LCS 460-619813/2-A
Matrix: Water
Analysis Batch: 619922

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 619813

<i>Analyte</i>	<i>Spike Added</i>	<i>LCS Result</i>	<i>LCS Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>Limits</i>
Arsenic	2000	1861		ug/L		93	80 - 120
Cadmium	50.0	52.16		ug/L		104	80 - 120
Chromium	200	222.3		ug/L		111	80 - 120
Lead	500	512.0		ug/L		102	80 - 120

Eurofins TestAmerica, Edison

QC Sample Results

Client: Moonstone Environmental LLC
 Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: LCS 460-619813/2-A
Matrix: Water
Analysis Batch: 619922

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 619813

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Selenium	2000	1877		ug/L		94	80 - 120
Copper	250	238.5		ug/L		95	80 - 120
Molybdenum	500	499.8		ug/L		100	80 - 120
Nickel	500	502.0		ug/L		100	80 - 120
Zinc	500	526.2		ug/L		105	80 - 120

Lab Sample ID: MB 460-619811/1-B
Matrix: Water
Analysis Batch: 619922

Client Sample ID: Method Blank
Prep Type: Dissolved
Prep Batch: 619813

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.7	U	15.0	2.7	ug/L		06/24/19 08:32	06/24/19 22:07	1
Cadmium	0.22	U	4.0	0.22	ug/L		06/24/19 08:32	06/24/19 22:07	1
Chromium	1.3	U	10.0	1.3	ug/L		06/24/19 08:32	06/24/19 22:07	1
Lead	2.5	U	10.0	2.5	ug/L		06/24/19 08:32	06/24/19 22:07	1
Selenium	6.6	U	20.0	6.6	ug/L		06/24/19 08:32	06/24/19 22:07	1
Copper	5.1	U	25.0	5.1	ug/L		06/24/19 08:32	06/24/19 22:07	1
Molybdenum	3.3	U	20.0	3.3	ug/L		06/24/19 08:32	06/24/19 22:07	1
Nickel	1.7	U	40.0	1.7	ug/L		06/24/19 08:32	06/24/19 22:07	1
Zinc	3.6	U	30.0	3.6	ug/L		06/24/19 08:32	06/24/19 22:07	1

Lab Sample ID: 460-184891-A-1-C MS
Matrix: Water
Analysis Batch: 619922

Client Sample ID: Matrix Spike
Prep Type: Dissolved
Prep Batch: 619813

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	2.7	U	2000	1933		ug/L		97	75 - 125
Cadmium	0.22	U	50.0	52.76		ug/L		106	75 - 125
Chromium	1.3	U	200	228.6		ug/L		114	75 - 125
Lead	2.5	U	500	516.9		ug/L		103	75 - 125
Selenium	6.6	U	2000	1936		ug/L		97	75 - 125
Copper	5.1	U	250	246.1		ug/L		98	75 - 125
Molybdenum	3.3	U	500	512.0		ug/L		102	75 - 125
Nickel	8.0	J	500	515.4		ug/L		101	75 - 125
Zinc	29.4	J	500	562.0		ug/L		107	75 - 125

Lab Sample ID: 460-184891-A-1-B DU
Matrix: Water
Analysis Batch: 619922

Client Sample ID: Duplicate
Prep Type: Dissolved
Prep Batch: 619813

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	2.7	U	4.42	J	ug/L		NC	20
Cadmium	0.22	U	0.22	U	ug/L		NC	20
Chromium	1.3	U	1.39	J	ug/L		NC	20
Lead	2.5	U	2.5	U	ug/L		NC	20
Selenium	6.6	U	6.6	U	ug/L		NC	20
Copper	5.1	U	5.1	U	ug/L		NC	20
Molybdenum	3.3	U	3.3	U	ug/L		NC	20
Nickel	8.0	J	7.86	J	ug/L		2	20

Eurofins TestAmerica, Edison

QC Sample Results

Client: Moonstone Environmental LLC
 Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: 460-184891-A-1-B DU
 Matrix: Water
 Analysis Batch: 619922

Client Sample ID: Duplicate
 Prep Type: Dissolved
 Prep Batch: 619813

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Zinc	29.4	J	29.79	J	ug/L		1	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LCS 460-620464/3-A
 Matrix: Water
 Analysis Batch: 620520

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 620464

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	1.00	0.914		ug/L		91	80 - 120

Lab Sample ID: MB 460-620462/1-B
 Matrix: Water
 Analysis Batch: 620520

Client Sample ID: Method Blank
 Prep Type: Dissolved
 Prep Batch: 620464

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12	U	0.20	0.12	ug/L		06/26/19 13:52	06/26/19 15:17	1

Lab Sample ID: 460-184556-J-5-C MS
 Matrix: Water
 Analysis Batch: 620520

Client Sample ID: Matrix Spike
 Prep Type: Dissolved
 Prep Batch: 620464

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Mercury	0.12	U	1.00	0.892		ug/L		89	75 - 125

Lab Sample ID: 460-184556-J-5-B DU
 Matrix: Water
 Analysis Batch: 620520

Client Sample ID: Duplicate
 Prep Type: Dissolved
 Prep Batch: 620464

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Mercury	0.12	U	0.12	U	ug/L		NC	20

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 460-619058/11
 Matrix: Water
 Analysis Batch: 619058

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	0.0091	U	0.10	0.0091	mg/L			06/20/19 14:25	1

Lab Sample ID: MB 460-619058/49
 Matrix: Water
 Analysis Batch: 619058

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	0.0091	U	0.10	0.0091	mg/L			06/20/19 14:59	1

QC Sample Results

Client: Moonstone Environmental LLC
 Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Method: 353.2 - Nitrogen, Nitrate-Nitrite (Continued)

Lab Sample ID: LCSSRM 460-619058/12
Matrix: Water
Analysis Batch: 619058

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

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	1.63	1.63		mg/L		100.2	82.8 - 116.4

Lab Sample ID: LCSSRM 460-619058/50 ^N
Matrix: Water
Analysis Batch: 619058

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

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	1.63	1.63		mg/L		100.2	82.8 - 116.4

Lab Sample ID: 460-184672-H-5 MS
Matrix: Water
Analysis Batch: 619058

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	0.31	F1	1.00	1.47	F1	mg/L		116	85 - 115

Lab Sample ID: 460-184672-H-5 MSD
Matrix: Water
Analysis Batch: 619058

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Nitrate Nitrite as N	0.31	F1	1.00	1.47	F1	mg/L		116	85 - 115	0	10

QC Association Summary

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

LCMS

Prep Batch: 303775

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-184685-1	Route 611	Total/NA	Water	3535	
460-184685-2	Little Martins Creek	Total/NA	Water	3535	
460-184685-3	Martins Creek Belvidere Hwy	Total/NA	Water	3535	
MB 320-303775/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-303775/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-303775/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 304404

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-184685-1	Route 611	Total/NA	Water	537 (modified)	303775
460-184685-2	Little Martins Creek	Total/NA	Water	537 (modified)	303775
460-184685-3	Martins Creek Belvidere Hwy	Total/NA	Water	537 (modified)	303775
MB 320-303775/1-A	Method Blank	Total/NA	Water	537 (modified)	303775
LCS 320-303775/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	303775
LCSD 320-303775/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	303775

Specialty Organics

Prep Batch: 302755

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-184685-1	Route 611	Total/NA	Water	8290	
460-184685-2	Little Martins Creek	Total/NA	Water	8290	
MB 320-302755/1-A	Method Blank	Total/NA	Water	8290	
LCS 320-302755/2-A	Lab Control Sample	Total/NA	Water	8290	
LCSD 320-302755/3-A	Lab Control Sample Dup	Total/NA	Water	8290	

Prep Batch: 303266

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-184685-3	Martins Creek Belvidere Hwy	Total/NA	Water	8290	
MB 320-303266/1-A	Method Blank	Total/NA	Water	8290	
LCS 320-303266/2-A	Lab Control Sample	Total/NA	Water	8290	
LCSD 320-303266/3-A	Lab Control Sample Dup	Total/NA	Water	8290	

Analysis Batch: 303930

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-302755/1-A	Method Blank	Total/NA	Water	8290A	302755
LCS 320-302755/2-A	Lab Control Sample	Total/NA	Water	8290A	302755
LCSD 320-302755/3-A	Lab Control Sample Dup	Total/NA	Water	8290A	302755

Analysis Batch: 304050

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-184685-1	Route 611	Total/NA	Water	8290A	302755
460-184685-2	Little Martins Creek	Total/NA	Water	8290A	302755
460-184685-3	Martins Creek Belvidere Hwy	Total/NA	Water	8290A	303266
MB 320-303266/1-A	Method Blank	Total/NA	Water	8290A	303266
LCS 320-303266/2-A	Lab Control Sample	Total/NA	Water	8290A	303266
LCSD 320-303266/3-A	Lab Control Sample Dup	Total/NA	Water	8290A	303266

QC Association Summary

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Metals

Filtration Batch: 619811

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-184685-1	Route 611	Dissolved	Water	FILTRATION	
460-184685-2	Little Martins Creek	Dissolved	Water	FILTRATION	
460-184685-3	Martins Creek Belvidere Hwy	Dissolved	Water	FILTRATION	
MB 460-619811/1-B	Method Blank	Dissolved	Water	FILTRATION	

Prep Batch: 619813

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-184685-1	Route 611	Dissolved	Water	3010A	619811
460-184685-2	Little Martins Creek	Dissolved	Water	3010A	619811
460-184685-3	Martins Creek Belvidere Hwy	Dissolved	Water	3010A	619811
MB 460-619811/1-B	Method Blank	Dissolved	Water	3010A	619811
LCS 460-619813/2-A	Lab Control Sample	Total/NA	Water	3010A	
460-184891-A-1-C MS	Matrix Spike	Dissolved	Water	3010A	
460-184891-A-1-B DU	Duplicate	Dissolved	Water	3010A	

Analysis Batch: 619922

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-184685-1	Route 611	Dissolved	Water	6010D	619813
460-184685-2	Little Martins Creek	Dissolved	Water	6010D	619813
460-184685-3	Martins Creek Belvidere Hwy	Dissolved	Water	6010D	619813
MB 460-619811/1-B	Method Blank	Dissolved	Water	6010D	619813
LCS 460-619813/2-A	Lab Control Sample	Total/NA	Water	6010D	619813
460-184891-A-1-C MS	Matrix Spike	Dissolved	Water	6010D	619813
460-184891-A-1-B DU	Duplicate	Dissolved	Water	6010D	619813

Filtration Batch: 620462

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-184685-1	Route 611	Dissolved	Water	FILTRATION	
460-184685-2	Little Martins Creek	Dissolved	Water	FILTRATION	
460-184685-3	Martins Creek Belvidere Hwy	Dissolved	Water	FILTRATION	
MB 460-620462/1-B	Method Blank	Dissolved	Water	FILTRATION	

Prep Batch: 620464

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-184685-1	Route 611	Dissolved	Water	7470A	620462
460-184685-2	Little Martins Creek	Dissolved	Water	7470A	620462
460-184685-3	Martins Creek Belvidere Hwy	Dissolved	Water	7470A	620462
MB 460-620462/1-B	Method Blank	Dissolved	Water	7470A	620462
LCS 460-620464/3-A	Lab Control Sample	Total/NA	Water	7470A	
460-184556-J-5-C MS	Matrix Spike	Dissolved	Water	7470A	
460-184556-J-5-B DU	Duplicate	Dissolved	Water	7470A	

Analysis Batch: 620520

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-184685-1	Route 611	Dissolved	Water	7470A	620464
460-184685-2	Little Martins Creek	Dissolved	Water	7470A	620464
460-184685-3	Martins Creek Belvidere Hwy	Dissolved	Water	7470A	620464
MB 460-620462/1-B	Method Blank	Dissolved	Water	7470A	620464
LCS 460-620464/3-A	Lab Control Sample	Total/NA	Water	7470A	620464
460-184556-J-5-C MS	Matrix Spike	Dissolved	Water	7470A	620464
460-184556-J-5-B DU	Duplicate	Dissolved	Water	7470A	620464

Eurofins TestAmerica, Edison

QC Association Summary

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

General Chemistry

Analysis Batch: 619058

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-184685-1	Route 611	Total/NA	Water	353.2	
460-184685-2	Little Martins Creek	Total/NA	Water	353.2	
460-184685-3	Martins Creek Belvidere Hwy	Total/NA	Water	353.2	
MB 460-619058/11	Method Blank	Total/NA	Water	353.2	
MB 460-619058/49	Method Blank	Total/NA	Water	353.2	
LCSSRM 460-619058/12	Lab Control Sample	Total/NA	Water	353.2	
LCSSRM 460-619058/13	Lab Control Sample	Total/NA	Water	353.2	
LCSSRM 460-619058/50 ^N	Lab Control Sample	Total/NA	Water	353.2	
LCSSRM 460-619058/51	Lab Control Sample	Total/NA	Water	353.2	
460-184672-H-5 MS	Matrix Spike	Total/NA	Water	353.2	
460-184672-H-5 MSD	Matrix Spike Duplicate	Total/NA	Water	353.2	

Lab Chronicle

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Client Sample ID: Route 611

Lab Sample ID: 460-184685-1

Date Collected: 06/18/19 15:15

Matrix: Water

Date Received: 06/19/19 11:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			303775	06/26/19 07:15	MYV	TAL SAC
Total/NA	Analysis	537 (modified)		1	304404	06/28/19 07:22	D1R	TAL SAC
Total/NA	Prep	8290			302755	06/21/19 08:08	A1A	TAL SAC
Total/NA	Analysis	8290A		1	304050	06/27/19 07:05	AS	TAL SAC
Dissolved	Filtration	FILTRATION			619811	06/24/19 08:25	QZY	TAL EDI
Dissolved	Prep	3010A			619813	06/24/19 08:32	QZY	TAL EDI
Dissolved	Analysis	6010D		1	619922	06/24/19 23:25	YZH	TAL EDI
Dissolved	Filtration	FILTRATION			620462	06/26/19 13:48	RBS	TAL EDI
Dissolved	Prep	7470A			620464	06/26/19 13:52	RBS	TAL EDI
Dissolved	Analysis	7470A		1	620520	06/26/19 15:45	RBS	TAL EDI
Total/NA	Analysis	353.2		2	619058	06/20/19 15:11	RAK	TAL EDI

Client Sample ID: Little Martins Creek

Lab Sample ID: 460-184685-2

Date Collected: 06/18/19 15:30

Matrix: Water

Date Received: 06/19/19 11:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			303775	06/26/19 07:15	MYV	TAL SAC
Total/NA	Analysis	537 (modified)		1	304404	06/28/19 07:30	D1R	TAL SAC
Total/NA	Prep	8290			302755	06/21/19 08:08	A1A	TAL SAC
Total/NA	Analysis	8290A		1	304050	06/27/19 07:53	AS	TAL SAC
Dissolved	Filtration	FILTRATION			619811	06/24/19 08:25	QZY	TAL EDI
Dissolved	Prep	3010A			619813	06/24/19 08:32	QZY	TAL EDI
Dissolved	Analysis	6010D		1	619922	06/24/19 23:29	YZH	TAL EDI
Dissolved	Filtration	FILTRATION			620462	06/26/19 13:48	RBS	TAL EDI
Dissolved	Prep	7470A			620464	06/26/19 13:52	RBS	TAL EDI
Dissolved	Analysis	7470A		1	620520	06/26/19 15:47	RBS	TAL EDI
Total/NA	Analysis	353.2		5	619058	06/20/19 15:12	RAK	TAL EDI

Client Sample ID: Martins Creek Belvidere Hwy

Lab Sample ID: 460-184685-3

Date Collected: 06/18/19 15:40

Matrix: Water

Date Received: 06/19/19 11:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			303775	06/26/19 07:15	MYV	TAL SAC
Total/NA	Analysis	537 (modified)		1	304404	06/28/19 07:38	D1R	TAL SAC
Total/NA	Prep	8290			303266	06/24/19 10:53	A1A	TAL SAC
Total/NA	Analysis	8290A		1	304050	06/27/19 05:30	AS	TAL SAC
Dissolved	Filtration	FILTRATION			619811	06/24/19 08:25	QZY	TAL EDI
Dissolved	Prep	3010A			619813	06/24/19 08:32	QZY	TAL EDI
Dissolved	Analysis	6010D		1	619922	06/24/19 23:33	YZH	TAL EDI
Dissolved	Filtration	FILTRATION			620462	06/26/19 13:48	RBS	TAL EDI
Dissolved	Prep	7470A			620464	06/26/19 13:52	RBS	TAL EDI
Dissolved	Analysis	7470A		1	620520	06/26/19 15:48	RBS	TAL EDI
Total/NA	Analysis	353.2		2	619058	06/20/19 15:13	RAK	TAL EDI

Eurofins TestAmerica, Edison

Lab Chronicle

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Laboratory References:

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

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

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Accreditation/Certification Summary

Client: Moonstone Environmental LLC
 Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Laboratory: Eurofins TestAmerica, Edison

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
Connecticut	State Program	1	PH-0200	09-30-20
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	N/A	12-31-19
New Jersey	NELAP	2	12028	06-30-20
New York	NELAP	2	11452	04-01-20
Pennsylvania	NELAP	3	68-00522	02-28-20
Pennsylvania	NELAP		68-00522	02-28-20
Rhode Island	State Program	1	LAO00132	12-30-19
USDA	Federal		NJCA-003-08	05-03-21

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 Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-20
Hawaii	State Program	9	N/A	01-29-20
Illinois	NELAP	5	200060	03-17-19 *
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 Jersey	NELAP	2	CA005	06-30-19
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 *

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

Method Summary

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
8290A	Dioxins and Furans (HRGC/HRMS)	SW846	TAL SAC
6010D	Metals (ICP)	SW846	TAL EDI
7470A	Mercury (CVAA)	SW846	TAL EDI
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL EDI
3010A	Preparation, Total Metals	SW846	TAL EDI
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC
7470A	Preparation, Mercury	SW846	TAL EDI
8290	Separatory Funnel (Liquid-Liquid) Extraction of Dioxins and Furans	SW846	TAL SAC
FILTRATION	Sample Filtration	None	TAL EDI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

None = None

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

Laboratory References:

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

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

Sample Summary

Client: Moonstone Environmental LLC
Project/Site: LMBT Surface Water

Job ID: 460-184685-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
460-184685-1	Route 611	Water	06/18/19 15:15	06/19/19 11:15	
460-184685-2	Little Martins Creek	Water	06/18/19 15:30	06/19/19 11:15	
460-184685-3	Martins Creek Belvidere Hwy	Water	06/18/19 15:40	06/19/19 11:15	

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CHAIN OF CUSTODY / ANALYSIS REQUEST

3.2 KOP-2

Page of

Name (for report and invoice) Bryan Mattee		Samplers Name (Printed) Bryan Mattee		Site/Project Identification LMBT Surface Water	
Company Moonstone Environmental		P. O. #		State (Location of site): NJ: <input type="checkbox"/> NY: <input type="checkbox"/> Other: PA	
Address 1150 Glenlivet Dr. Suite A-23		Analysis Turnaround Time Standard <input checked="" type="checkbox"/> Rush Charges Authorized For: 2 Week <input type="checkbox"/> 1 Week <input type="checkbox"/> Other <input type="checkbox"/>		Regulatory Program: PA Ch. 93	
City Allentown		State PA		LAB USE ONLY Project No:	
Phone 484-664-7171		Fax		Job No: 184685	
Sample Identification		Date		Sample Numbers	
Route 611		6/18/19		-1	
Little Martins Creek		6/18/19		-2	
Martins Creek Belvidere Hwy		6/18/19		-3	
ANALYSIS REQUESTED (ENTER 'X' BELOW TO INDICATE REQUEST)		No. of Cont.		460-184685 Chain of Custody	
Nitrate/nitrite		6		Barcode	
Dioxins		6		460-184685 Chain of Custody	
PFAS		6			
Arsenic, Cadmium, Chromium, Copper, Lead, Manganese, Nickel, Polychlorinated Biphenyls, Selenium, Zinc		6			
Preservation Used: 1 = ICE, 2 = HCl, 3 = H ₂ SO ₄ , 4 = HNO ₃ , 5 = NaOH		Soil:			
6 = Other		Water:			

Special Instructions		Water Metals Filtered (Yes/No)?	
Relinquished by <i>[Signature]</i>	Company Moonstone	Date / Time 6/19/19 1045	Received by <i>[Signature]</i>
Relinquished by <i>[Signature]</i>	Company AKOP	Date / Time	Received by <i>[Signature]</i>
Relinquished by <i>[Signature]</i>	Company ETA	Date / Time 6/19/19 1930	Received by <i>[Signature]</i>
Relinquished by <i>[Signature]</i>	Company	Date / Time	Received by <i>[Signature]</i>
Relinquished by <i>[Signature]</i>	Company	Date / Time	Received by <i>[Signature]</i>
Relinquished by <i>[Signature]</i>	Company	Date / Time	Received by <i>[Signature]</i>

Laboratory Certifications: New Jersey (12028), New York (11452), Pennsylvania (68-522), Connecticut (PH-0200), Rhode Island (132), Massachusetts (M-NJ312), North Carolina (No. 578)

Login Sample Receipt Checklist

Client: Moonstone Environmental LLC

Job Number: 460-184685-1

Login Number: 184685

List Source: Eurofins TestAmerica, Edison

List Number: 1

Creator: Keehn, Jeffrey S

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
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.	True	
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.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Login Sample Receipt Checklist

Client: Moonstone Environmental LLC

Job Number: 460-184685-1

Login Number: 184685

List Number: 2

Creator: Rosas, Jaime

List Source: Eurofins TestAmerica, Sacramento

List Creation: 06/21/19 05:52 AM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	735825
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	1.4c
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?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
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 <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

