Brown and Caldwell Associates
3 Marcus Blvd., Suite 106
Albany, New York 12205

T: 518.560.5910
F: 518.560.5920

June 20, 2019

Mr. Geoffrey Seibel
de maximis, inc.
1550 Pond Road, Suite 120
Allentown, Pennsylvania 18104

152682.200.002.6096

Subject: Post-Remedial Monitoring
Ecological Verification Sampling Report
Mercury Refining Superfund Site, Colonie, New York

Dear Mr. Seibel:

On behalf of the Mercury Refining Site Remedial Action Group ("the Group") and at your the direction as the Group's Project Coordinator, Brown and Caldwell Associates ("BC") submits to you the attached letter report summarizing the results of the 2018 ecological verification sampling event.

Please contact me with any questions or comments.

Very truly yours,

Brown and Caldwell Associates

Tamara L. Sorell

Tamara Sorell, Ph.D., BCES
Chief Scientist/National Risk Practice Lead

Attachments

Post-Remedial Monitoring
Ecological Verification Sampling Report
Mercury Refining Superfund Site
Colonie, New York

Prepared for

Mercury Refining Site Remedial Action Group

June 2019

Post-Remedial Monitoring
Ecological Verification Sampling Report
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Project Number: 152682.200.002.6096

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Attachments

Executive Summary

This report presents the results of the fourth of five annual sampling events conducted in accordance with the Ecological Verification Sampling Plan. The sampling results are summarized below. A comparison of the sampling results to baseline data and results of previous annual sampling events will be presented in the Periodic Review Report.

Sediment Sampling

- Sediment sampling was completed at all locations identified in the Operation and Maintenance Plan (O&M Plan).
- Total mercury concentrations ranged from 0.027 to 0.25 milligrams per kilogram (mg/kg), with the highest concentration observed at sample location MR-SD-10 in the I-90 Pond. No concentrations exceeded the ROD-specified sediment cleanup objective of 1.3 mg/kg.
- Total Organic Carbon (TOC) in the sediment samples was highly variable, ranging from 1,690 (0.17 percent) to 64,400 mg/kg (6.4 percent).
- Methyl mercury concentrations in sediment ranged from 0.095 micrograms per kilogram (µg/kg) (J qualified) at location MR-SD-09 to 1.3 µg/kg at location MR-SD-10. There is currently no New York State Department of Environmental Conservation (NYSDEC) or United States Environmental Protection Agency (USEPA) criterion for methyl mercury in sediment.

Surface Water Sampling

- Surface water samples were collected from the unnamed Tributary, Patroon Creek and the I-90 Pond as required in the O&M Plan.
- Total mercury was not detected in samples analyzed using laboratory Method 7471A at any of the three surface water sampling locations (at a minimum detection limit of 120 nanograms per liter [ng/L]). The NYSDEC chronic water quality criterion for mercury for the protection of aquatic life is 770 ng/L (dissolved).
- Using the more sensitive laboratory analytical Method 1630, methyl mercury was detected at MR-SW-07 (the Unnamed Tributary sampling location) at a concentration of 0.086 ng/L, MW-SW-09 (the Patroon Creek sampling location) at a concentration of 0.041 (J Qualified), and MR-SW-10 (the I-90 Pond sampling location) at a concentration of 0.075 ng/L. There is currently no NYSDEC criterion for methyl mercury. The Oak Ridge National Laboratory Tier II Secondary Chronic Value for freshwater aquatic life is 2.8 ng/L.

Fish Tissue Sampling

- Fish collection (location, type) and sample preparation (whole body) were completed in accordance with the requirements of the O&M Plan.
- Total mercury in fish tissue samples was detected at results ranging from 0.0.034 to 0.094 (J qualified) mg/kg. These results limits are below the USEPA target fish tissue concentration of 0.15 mg/kg for methyl mercury. Percent lipids and percent moisture were comparable in the three samples.

Section 1

Introduction

The Mercury Refining Superfund Site (Site) is located at 26 Railroad Avenue on the border of the Towns of Guilderland and Colonie, Albany County, New York. The Site is defined by the extent of potential contamination associated with past mercury reclamation processes conducted at the Mercury Refining Company, Inc. (MERECO) facility. The Superfund Site includes the MERECO property (located at 26 Railroad Avenue) and portions of the Allied Building property, portions of the SealMaster property, the former Albany Pallet Property and an additional property owned by MERECO that is located south of the SealMaster Property. The Site also includes the portion of the Unnamed Tributary that is located immediately south of the MERECO property. The Unnamed Tributary reportedly received contaminated stormwater drainage from the storm sewer system that formerly serviced the MERECO property. As part of the remedial action completed in 2013, sediments in the Unnamed Tributary containing mercury above the Record of Decision (ROD)-specified clean-up objective of 1.3 mg/kg total mercury in sediments were removed. The Unnamed Tributary discharges to Patroon Creek, which flows into the I-90 Pond. The implementation of the remedy for the Site, as specified in the ROD, is detailed in a document entitled "Remedial Action Report, Mercury Refining Superfund Site, 26 Railroad Avenue, Towns of Colonie and Guilderland, Albany, County, New York, Superfund ID No. NY00048148175," prepared by Brown and Caldwell Associates (BC) and dated August 2015.

Per the Ecological Verification Sampling Plan [Attachment C of the Operations and Maintenance (O&M) Plan; Appendix P of the USEPA-approved August 2013 Remedial Design Report (RDR)], five annual Ecological Verification Sampling events are required following the completion of the remediation. This report presents the results of the fourth of the five annual sampling events. The first was conducted in November 2015, the second in November 2016 and the third in November 2017. The monitoring program requires the collection of five sediment samples (two from the Unnamed Tributary, two from the Patroon Creek and one from the I-90 Pond), three surface water samples (one each from the Unnamed Tributary, the Patroon Creek and the I-90 Pond), and three fish tissue samples (two from the Patroon Creek and one from the I-90 Pond). A Site plan depicting the location of the ecological verification samples is provided as Figure 1 in Attachment A. Samples were collected per the procedures described in the O&M Plan.

Sample collection procedures and analytical results are presented in the ensuing sections. A comparison of the sampling results to baseline data and results of previous annual sampling events will be presented in the Periodic Review Report.

Section 2

Sediment Sampling

Sample Collection

The following sediment samples were collected on October 16 and 17, 2018:

- Two samples in the Unnamed Tributary at locations MR-SD-06 and MR-SD-07
- Two samples from the Patroon Creek at locations MR-SD-08 and MR-SD-09
- One sample from the I-90 Pond at location MR-SD-10

Sample locations are depicted on the Site Plan provided as Figure 1 in Attachment A. Sampling was completed to a depth of approximately six inches below the sediment surface. Sediment samples were collected in a "downstream" to "upstream" direction (i.e., in a direction opposite the flow), to minimize the chance of spreading disturbed sediment to unsampled locations.

Sediment sampling was completed via the use of a decontaminated stainless-steel sampling scoop. Sediment samples were collected with minimum disturbance and exposure to air. Samples were screened and logged in the field as described in Section 5.3 of the Quality Assurance Project Plan (QAPP, Appendix N of the RDR). Using a decontaminated scoop, the sediment was transferred directly to the laboratory-supplied sampling containers and stored and handled in accordance with the procedures outlined in Section 5.2 of the QAPP. Sampling equipment was decontaminated after the collection of each sample in accordance with the procedures outlined in Section 4.10 of the QAPP.

Sediment samples were analyzed for total mercury by USEPA Method SW-846 7471B, methyl mercury by USEPA Method 1630, Total Organic Carbon (TOC) by the Lloyd-Khan Method and particle size by ASTM D422 63.

Sediment samples analyzed for methyl mercury were sent to TestAmerica Canton, which holds a National Environmental Laboratory Accreditation Program (NELAP) certification and accreditation in the State of New York (Certification ID 10975).

Sediment samples analyzed for total mercury were sent to TestAmerica Buffalo, which holds a National NELAP certification and accreditation in the State of New York (Certification ID 10026).

Sediment samples analyzed for particle size were sent to TestAmerica Burlington, which holds a NELAP certification and accreditation in the State of New York (Certification ID 10391).

Sediment samples analyzed for TOC were sent to TestAmerica Pittsburgh, which holds a NELAP certification and accreditation in the State of New York (Certification ID 11182).

Analytical Data Validation

The analytical data were validated in accordance with the QAPP. A Data Usability Summary Report (DUSR; Attachment B) was prepared for the ecological verification sample data packages. The analytical data for sediment samples were determined to be acceptable for the intended purposes. No data were rejected during the validation. The methyl mercury result for sample MR-SD-09 is qualified as estimated (J flagged), due to the result being less than the reporting limit but greater or equal to the method detection limit.

The relative percent difference values for the DUP-SD-20181016 grain size results were outside of the acceptance limits for several particle sizes. The nature of the sediments is likely the cause of the imprecise sample duplicate analyses, therefore, no data validation qualifiers were added.

Analytical results appear in Attachment C and are discussed below.

Analytical Results

Analytical results of the sediment sampling are presented in Table 1 provided in Attachment C. Sample locations are shown on the Site plan provided as Figure 1 in Attachment A.

Total mercury concentrations ranged from 0.027 to 0.25 mg/kg with the highest concentrations observed at sample location MR-SD-10 in the I-90 Pond. No results exceeded the ROD-specified sediment cleanup objective of 1.3 mg/kg. A total mercury concentration of 0.16 mg/kg was detected at sample location MR-SD-06, the most upstream sample location (closest to the Site) in the remediated sediment area in the Unnamed Tributary. The two sampling locations in Patroon Creek, MR-SD-08 (more upstream) and MR-SD-09 (more downstream), had detections of mercury of 0.17 mg/kg and 0.027 mg/kg, respectively. The I-90 Pond sample (MR-SD-10) had a mercury concentration of 0.25 mg/kg.

Total Organic Carbon (TOC) in the sediment samples was highly variable, ranging from 1,690 mg/kg (0.17 percent) to 64,400 mg/kg (6.4 percent). As shown in Table 2, the samples consisted primarily of fine-to-coarse-grained sand. MR-SD-10 had the highest TOC, consistent with its considerable silt component (54.1%) and location in relatively stagnant water.

Methyl mercury concentrations in sediment ranged from 0.095 µg/kg (J qualified) at location MR-SD-09 to 1.3 µg/kg at location MR-SD-10. There is currently no NYSDEC or USEPA cleanup criterion for methyl mercury in sediment.

Section 3

Surface Water Sampling

Sample Collection

The following surface water samples were collected on October 16 and 17, 2018:

- One sample from the Unnamed tributary at location MR-SW-07
- One sample from the Patroon Creek at location MR-SW-09
- One sample from the I-90 Pond at location MR-SW-10

Sample locations are depicted on the Site Plan provided as Figure 1 in Attachment A.

The following procedure was used to collect surface water directly from the water bodies in sample containers provided by the project laboratory:

- Don a clean pair of latex gloves.
- Estimate sampling depth by visual observation (for shallow samples) or measure depth using a weighted, flexible measuring tape or a rigid gage.
- Invert the laboratory-supplied sample container (without preservatives), insert the sample container into the water to the desired level, and then turn the mouth of the sample container up and towards the upstream direction thus allowing the container to fill.
- Cap sample container while container is still underwater, if possible.
- Remove sample container from water body and cap if not already capped.
- Rinse the exterior of the sample container thoroughly with deionized water and label container.
- Add preservatives and check for appropriate pH.
- Record appropriate data (including sampling location, sampling depth, time of sampling, and description of sample) in field logbook or the Surface Water Sampling Log.

Surface water samples were analyzed for mercury by USEPA Method SW 846 7470A, methyl mercury by USEPA Method 1630, alkalinity by USEPA Method 310.2, hardness by USEPA Method 130.2 and Total Dissolved Solids (TDS) by USEPA Methods 160.1 and SM 2540C.

Surface water samples analyzed for methyl mercury were sent to TestAmerica Canton. The remaining surface water analyses were conducted at TestAmerica Buffalo.

Analytical Data Validation

The analytical data were validated in accordance with the QAPP. A Data Usability Summary Report (DUSR; Attachment B) was prepared for the ecological verification sample data packages. The analytical data for surface water samples were determined to be acceptable for the intended purposes and none of the data were rejected. The methyl mercury result for sample MR-SW-09 is qualified as estimated (J flagged) due to the result being less than the reporting limit but greater than the method detection limit.

Analytical results appear in Attachment C and are discussed below.

Analytical Results

Analytical results of the surface water sampling are presented in Table 1 and field parameters of surface water at all sample locations are presented in Table 3 provided in Attachment C.

Total mercury was not detected in samples analyzed using USEPA Method 7471A at any of the three surface water sampling locations (at a minimum detection limit of 120 ng/L). The NYSDEC chronic water quality criterion for mercury for the protection of aquatic life is 770 ng/L (dissolved). Although filtered samples were not collected, the total results are well below this dissolved criterion. Using the more sensitive laboratory analytical Method 1630, methyl mercury was detected at MR-SW-07, the Unnamed Tributary sampling location at a concentration of 0.086 ng/L, MW-SW-09, the Patroon Creek sampling location at a concentration of 0.041 (J Qualified), and MR-SW-10, the I-90 Pond sampling location at a concentration of 0.075 ng/L. There is currently no NYSDEC criterion for methyl mercury. The Oak Ridge National Laboratory Tier II Secondary Chronic Value for freshwater aquatic life is 2.8 ng/L[1]. Observed concentrations of methyl mercury detected at the three surface water sampling locations were well below this criterion.

[1] G. W. Suter, GW II and Tsao, CL. 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision. ES/ER/TM-96/R2. June.

Section 4

Fish Tissue Sampling

Sample Collection

Composite fish tissue samples were collected from two locations in Patroon Creek (MR-FT-08, immediately downstream from the Unnamed Tributary, and MR-FT-09, further downstream) and from one location in the I 90 Pond (MR-FT-10; Figure 1 in Attachment A). These sample stations are co-located with the sediment and surface water samples discussed above. Fish were captured by electroshocking (Model Smith-Root LR-24, 125 volts) and seining.

Timing of the fish tissue sampling is important. Periods of low to moderate stream flow (typically late summer or fall) are best for sampling fish tissue. Sampling in the late summer or fall also minimizes disturbance to the nests of fish as by this time most young are mobile and are free swimmers. Samples were collected on October 10, 2018.

Prior to sampling, standard water quality measurements were made at each sampling location. A Habitat Evaluation Sheet, which identifies physical and biological features of each habitat, was also completed for each location (Attachment D). These data sheets record the field variables that document habitat features for later comparison of species composition, abundance, and general health. During the fish sampling, for each individual fish, the following parameters were noted:

- Waterbody/location/depth or position in waterbody
- Species
- Length, in cm, measured from snout to lower part of tail
- Weight, in grams
- General appearance; special attention was given to readily observable physical malformations

Whole bodies of specimen fish were included in the sample. The composition of each sample (size, species, number of individuals) is summarized further below and on the evaluation sheets included in Attachment D.

Fish collected at the upstream sample location (MR-FT-08) included two pumpkin seed (*Lepomis gibbosus*). The the pumpkin seed ranged in size from 6.5 to 6.6 cm. Both pumpkin seeds were retained for chemical analysis. At the midstream sample (MR-FT-09) five pumpkin seeds (5.2 to 7.4 cm) were captured. Each of the pumpkin seeds species was retained for chemical analysis. At the I-90 Pond sample location (MR-FT-10), five pumpkinseeds (3.5 to 7.4 cm) were captured and retained for chemical analysis.

All fish appeared healthy upon gross examination with no abnormalities noted.

Once collected, fish samples were put on ice and shipped to the laboratory via overnight mail. All fish tissue samples were analyzed whole body for mercury by USEPA Method SW 846 7471A, percent lipid and percent solid.

Fish tissue samples were processed and analyzed at TestAmerica Pittsburgh.

Analytical Data Validation

The analytical data were validated in accordance with the QAPP. A Data Usability Summary Report (DUSR; Attachment B) was prepared for the ecological verification sample data packages. The analytical data for fish tissue samples were determined to be acceptable for the intended purposes and none of the data were rejected. Matrix spike duplicate recoveries were outside the control limits for mercury (low recovery). Sample matrix interference is suspected because the associated laboratory control sample recovery was within acceptance limits. All samples with a detected mercury concentration were qualified as estimated (J), due to the result being less than the reporting limit but greater or equal to the method detection limit.

Analytical results appear in Attachment C and are discussed below.

Analytical Results

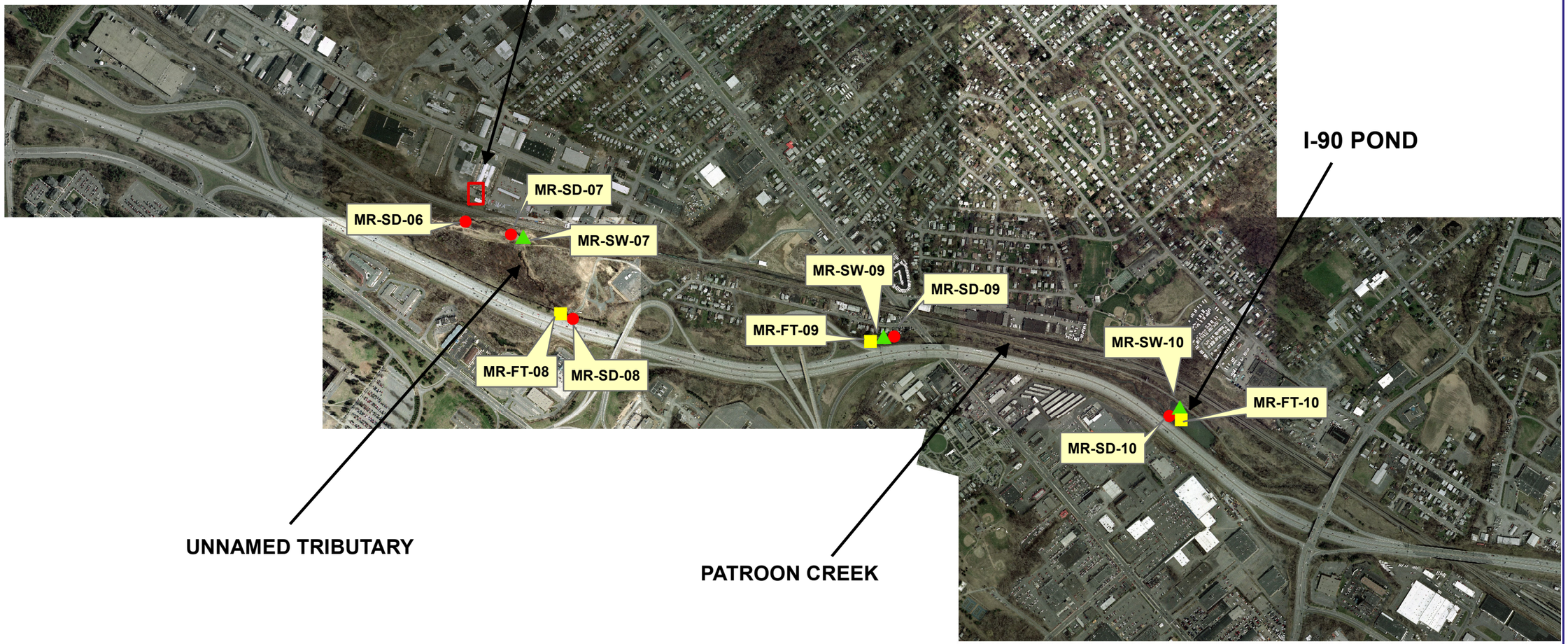
Results of the fish tissue analysis are provided in Table 1 of Attachment C. Total mercury concentrations in fish tissue samples was detected at results ranging from 0.034 (J qualified) to 0.094 mg/kg (J qualified). These results are below the USEPA target fish tissue concentration of 0.15 mg/kg for methyl mercury. Percent lipids and percent moisture were comparable in the three samples.

Attachment A: Site Plan

3/7/2016

N

MERCURY REFINING SITE



I-90 POND

UNNAMED TRIBUTARY

PATROON CREEK

Legend:

- MR-SD-04 Sediment Sample
- MR-SW-04 Surface Water Sample
- MR-FT-01 Fish Tissue Sample

Author: BFTaylor Path: P:\GIS\Mercury_Refining_Superfund\Eco_Samples_022916.mxd

Brown AND Caldwell

FIGURE 1
ECOLOGICAL SAMPLE LOCATIONS
MERCURY REFINING SUPERFUND SITE
COLONIE, NY

0 490 980
Feet

Attachment B: Data Usability Summary Report

QUALITATIVE
DATA USABILITY SUMMARY REPORT
Colonie, New York, Mercury Refining Site
October 2018 Groundwater

SDG Nos.: 480-143836

Laboratory: TestAmerica Laboratories, Inc., Amherst, New York

Site: Mercury Refining Site, Colonie, New York

Date: December 17, 2018

Data from the following samples were reviewed:

Client Sample ID	Laboratory Sample ID	Matrix
480-143836-1	MR-SW-10-20181016	Water
480-143836-2	DUP-SW-20181016	Water
480-143836-3	MR-SD-10-20181016	Solid
480-143836-4	MR-SW-09-20181016	Water
480-143836-5	MR-SD-09-20181016	Solid
480-143836-6	MR-SD-08-20181016	Solid
480-143836-7	DUP-SD-20181016	Solid
480-143836-8	MR-SW-07-20181017	Water
480-143836-9	MR-SD-07-20181017	Solid
480-143836-10	MR-SD-06-20181017	Solid
480-143836-11	FB-20181017	Water
480-143836-12	FB-SD-20181017	Water

A Qualitative Data Usability Review was performed on all analytical data from SDGs 480-143836. The samples were collected at the Mercury Refining Superfund Site, in Colonie, New York. The following table outlines the analytical methods used to analyze the samples;

Analysis	Method
Mercury	SW-846 Method 7470A
Methyl mercury	EPA Method 1630
General chemistry	EPA Method 2340C, 2540C, and 310.2
Total organic carbon (TOC)	Lloyd Kahn
Geotechnical	ASTM D422

Samples were analyzed for all methods requested on the COCs.

This review was performed in accordance with the general guidance provided by the National Functional Guidelines for Data Review.

Review Items

The following were reviewed for the analyses in this report:

- Chains of Custody (COCs)
- Case narrative
- Analysis data sheets (Form 1's)
- Holding time and sample preservation
- Lab Control Sample (LCS)/LCS duplicate (LCSD) recoveries and RPDs
- Matrix Spike/Matrix spike duplicate (MS/MSD) recoveries and RPDs
- Blank contamination
- Field duplicates

Chains of Custody

The Chains-of Custody (COCs) were reviewed for completeness and accuracy. The laboratory noted the field blank container was only for mercury by method 7470A.

Case Narrative

The case narratives were reviewed for completeness and accuracy. There were no discrepancies noted in the data that were not also mentioned in the case narratives.

Analysis Data Sheets (Form 1s)

The analysis data sheets were reviewed for completeness and accuracy. All requested results were present and accounted for.

Holding Time and Sample Preservation

None of the analysis holding times was violated and all samples were properly preserved.

LCS/LCSD Recoveries and RPDs

The duplicate for Lloyd Kahn batch 261405 were outside of the RPD limits (high). The laboratory noted the suspected cause of the QC issue is matrix interference. All other LCS/LCSD recoveries and RPDs

were within the laboratories statistically derived control limits.

MS/MSD Recoveries and RPDs

The matrix spike duplicate (MSD) recoveries were outside acceptance limits for Alkalinity, Total for batch 442655. The reported concentration for the sample used for the MS/MSD analysis is more than 4x the concentration of the spiked amount therefore, no data validation qualifiers were added.

Blank Contamination

All blanks were non-detect for mercury. The field blank detected concentrations of total dissolved solids (TDS) above the detection limit. All samples were more than 5x the detected amount in the blank samples therefore, no data validation qualifiers were added.

Field Duplicates

The RPD values for the field duplicate DUP-SW-2018016 were all within acceptance limits. The RPD values for DUP-SD-20181016 geotechnical results were outside of the acceptance limits for several particle sizes. The nature of the sediments is likely the cause of the imprecise sample duplicate analyses, therefore, no data validation qualifiers were added.

Inorganics				
Compound	MR-SD-08-20181016	DUP-SD-20181016	RPD	Qualifier
	mg/L	mg/L		
Mercury 7470A	<0.00010	<0.0001	0.00%	None
Mercury E1630	0.075	0.072	4.08%	None
Hardness (as CaCO3)	352	320	9.52%	None
Alkalinity, total (as CaCO3)	283	287	1.40%	None
Total dissolved solids (TDS)	504	491	2.61%	None

Inorganics				
Compound	MR-SD-08-20181016	DUP-SD-20181016	RPD	Qualifier
	ug/kg	ug/kg		
Mercury E1630	1.2	0.84	35.29%	None
Compound	MR-SD-08-20181016	DUP-SD-20181016	RPD	Qualifier
	mg/kg	mg/kg		
Total Organic Carbon	10900	7190	41.02%	None
Mercury 7471B	0.17	0.11	42.86%	None

Geotechnical Analysis				
Compound	MR-SD-08-20181016	DUP-SD-20181016	RPD	Qualifier
	Percent	Percent		
Clay	2.3	1.8	24.39%	None
Coarse Sand	0.5	0.6	18.18%	None
Fine Sand	73.8	59.2	21.95%	None
Gravel	2.0	1.6	22.22%	None
Hydrometer Reading 1	7.7	5.7	29.85%	None
Hydrometer Reading 2	5.7	4.2	30.30%	None
Hydrometer Reading 3	4.4	2.7	47.89%	None
Hydrometer Reading 4	3.0	2.2	30.77%	None
Hydrometer Reading 5	2.3	1.8	24.39%	None
Hydrometer Reading 6	1.0	1.3	26.09%	None
Hydrometer Reading 7	0.3	0.7	80.00%	None
Medium Sand	2.0	1.3	42.42%	None
Sand	76.3	61.1	22.13%	None
Sieve Size #10	97.5	97.8	0.31%	None
Sieve Size #100	65.5	66.8	1.97%	None
Sieve Size #20	96.4	97.1	0.72%	None
Sieve Size #200	21.7	37.3	52.88%	None
Sieve Size #4	98.0	98.4	0.41%	None
Sieve Size #40	95.5	96.5	1.04%	None
Sieve Size #60	90.6	90.5	0.11%	None
Sieve Size #80	77.4	78.3	1.16%	None
Sieve Size 0.375 inch	100.0	100	0.00%	None
Sieve Size 0.75 inch	100.0	100	0.00%	None
Sieve Size 1 inch	100.0	100	0.00%	None
Sieve Size 1.5 inch	100.0	100	0.00%	None
Sieve Size 2 inch	100.0	100	0.00%	None
Sieve Size 3 inch	100.0	100	0.00%	None
Silt	19.4	35.6	58.91%	None

Validation Qualifiers

The following validation qualifiers may have been applied to the data, as appropriate.

- J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ = The analyte was not detected above the sample method detection limit; and the method detection limit is approximate.
- U = The analyte was tested, but was not detected above the sample method detection limit.

- R = The sample result is rejected due to serious deficiencies. The presence or absence of the analyte cannot be verified.

Summary Evaluation of Data and Potential Usability Issues

The data are acceptable for the intended purposes. No data were rejected as a result of this review. Data qualification was warranted and applied as necessary. All data are considered usable for the intended purposes.

Signed Kelly Donahue Dated: 12/17/2018

Kelly Donahue
Senior Chemist

QUALITATIVE
DATA USABILITY SUMMARY REPORT
Colonie, New York, Mercury Refining Site
October 2018 Tissue

SDG Nos.: 180-82960

Laboratory: TestAmerica Laboratories, Inc., Amherst, New York

Site: Mercury Refining Site, Colonie, New York

Date: December 17, 2018

Data from the following samples were reviewed:

Client Sample ID	Laboratory Sample ID	Matrix
180-82960-1	MR-FT-10-20181010	Tissue
180-82960-2	MR-FT-09-20181010	Tissue
180-82960-3	MR-FT-08-20181010	Tissue

A Qualitative Data Usability Review was performed on all analytical data from SDGs 180-82960. The samples were collected at the Mercury Refining Superfund Site, in Colonie, New York. The following table outlines the analytical methods used to analyze the samples;

Analysis	Method
Mercury in Tissue	SW-846 Method 7471B
Percent Lipids	TestAmerica SOP

Samples were analyzed for all methods requested on the COCs.

This review was performed in accordance with the general guidance provided by the National Functional Guidelines for Data Review.

Review Items

The following were reviewed for the analyses in this report:

- Chains of Custody (COCs)
- Case narrative
- Analysis data sheets (Form 1's)
- Holding time and sample preservation
- Lab Control Sample (LCS)/LCS duplicate (LCSD) recoveries and RPDs
- Matrix Spike/Matrix spike duplicate (MS/MSD) recoveries and RPDs
- Blank contamination

Chains of Custody

The Chains-of Custody (COCs) were reviewed for completeness and accuracy. No issues were noted.

Case Narrative

The case narratives were reviewed for completeness and accuracy. The case narrative did not note the MSD recovery outside of the acceptance limits (low) for method 7471B.

Analysis Data Sheets (Form 1s)

The analysis data sheets were reviewed for completeness and accuracy. All requested results were present and accounted for.

Holding Time and Sample Preservation

None of the analysis holding times was violated and all samples were properly preserved.

LCS/LCSD Recoveries and RPDs

All LCS/LCSD recoveries and RPDs were within the laboratories statistically derived control limits.

MS/MSD Recoveries and RPDs

The matrix spike duplicate (MSD) recoveries for 259860 were outside the control limits for mercury (low recovery). Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits therefore, no data validation qualifiers were added.

Blank Contamination

All blanks were non-detect for mercury.

Validation Qualifiers

The following validation qualifiers may have been applied to the data, as appropriate.

- J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ = The analyte was not detected above the sample method detection limit; and the method detection limit is approximate.
- U = The analyte was tested, but was not detected above the sample method detection limit.
- R = The sample result is rejected due to serious deficiencies. The presence or absence of the analyte cannot be verified.

Summary Evaluation of Data and Potential Usability Issues

The data are acceptable for the intended purposes. No data were rejected as a result of this review. Data qualification was warranted and applied as necessary. All data are considered usable for the intended purposes.

Signed Kelly Donahue Dated: 12/17/2018

Kelly Donahue

Senior Chemist

Attachment C: Ecological Verification Sampling Results

TABLE 1
ECOLOGICAL ANALYTICAL RESULTS
MERCURY REFINING SUPERFUND SITE
POST-REMEDIAL MONITORING
COLONIE, NEW YORK

Analyte	Location / Sample Date / Units	MR-SD-06 10/17/2018	MR-SD-07 10/17/2018	MR-SD-08 10/16/2018	MR-SD-08 DUP 10/16/2018	MR-SD-09 10/16/2018	MR-SD-10 10/16/2018
Sediment Results							
Mercury	mg/kg	0.16	0.17	0.17	0.11	0.027	0.25
Methyl Mercury	µg/kg	0.31	0.91	1.2	0.84	0.095 J	1.3
Total Organic Carbon	mg/kg	5780	6830	10900	7190	1690	64400

Constituent	Location / Sample Date / Units	MW-SW-07 10/17/2018	MR-SW-09 10/16/2018	MR-SW-10 10/16/2018	MR-SW-10 DUP 10/16/2018
Surface Water Results					
Mercury	ng/L	120 U	120 U	120 U	120 U
Methyl Mercury	ng/L	0.086	0.041 J	0.075	0.072

Constituent	Location / Sample Date / Units	MR-FT-08 10/10/2018	MR-FT-09 10/10/2018	MR-FT-10 10/10/2018
Fish Tissue Results				
Mercury	mg/kg	0.087 J	0.034 J	0.094 J
Lipids	%	2.7	2.1	2.3
Solids	%	28.0	26.0	24.8

Notes:
U - The analyte was tested for, but was not deteted above the sample method detection limit.
J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
mg/kg - milligram per kilogram (parts-per-million)
µg/kg - microgram per kilogram (parts-per-billion)
ng/L - nanogram per liter (parts-per-trillion)

TABLE 2
ECOLOGICAL VERIFICATION SEDIMENT SAMPLE GRAIN SIZE RESULTS
MERCURY REFINING SUPERFUND SITE
POST-REMEDIAL MONITORING
COLONIE, NEW YORK

Location	Analyte	Results	Unit
MR-SD-06	Clay	1.5	%
	Silt	3.5	%
	Fine Sand	87.5	%
	Medium Sand	5.4	%
	Coarse Sand	1.3	%
	Total Sand	94.2	%
	Gravel	0.8	%
MR-SD-07	Clay	3.1	%
	Silt	13.6	%
	Fine Sand	80.8	%
	Medium Sand	2.3	%
	Coarse Sand	0.2	%
	Total Sand	83.3	%
	Gravel	0	%
MR-SD-08	Clay	2.3	%
	Silt	19.4	%
	Fine Sand	73.8	%
	Medium Sand	2	%
	Coarse Sand	0.5	%
	Total Sand	76.3	%
	Gravel	2	%
MR-SD-09	Clay	1.5	%
	Silt	0.8	%
	Fine Sand	62	%
	Medium Sand	27	%
	Coarse Sand	4.3	%
	Total Sand	93.3	%
	Gravel	4.4	%
MR-SD-10	Clay	4.5	%
	Silt	54.1	%
	Fine Sand	23.2	%
	Medium Sand	2.1	%
	Coarse Sand	1.7	%
	Total Sand	27	%
	Gravel	14.4	%

= Primary Grain Size

TABLE 3
SURFACE WATER FIELD PARAMETERS
MERCURY REFINING SUPERFUND SITE
POST-REMEDIAL MONITORING
COLONIE, NEW YORK

Parameter	Location / Sample Date / Units	MR-SD-06 10/17/2018	MR-SW/SD-07 10/17/2018	MR-SD-08 10/16/2018	MW-SW/SD-09 10/16/2018	MR-SW/SD-10 10/16/2018
Temperature	°C	11.21	11.85	12.39	12.57	12.77
pH	--	8.73	8.56	8.57	8.4	7.78
ORP	mV	133	142	79	131	45
COND	mS/cm	1.81	1.76	1.44	1.45	0.801
DO	mg/L	9.54	5.46	9.87	5.25	0.00
Turbidity	NTU	4.7	8.7	16.2	2.7	27.4

Notes:
°C - degrees centigrade
mS/cm - milli-Siemens per centimeter
mV - millivolts
mg/L - milligrams per liter
NTU - nephelometric turbidity units

Attachment D: Fish Tissue Sampling Field Data Sheets

Field Data Sheet

Project Site Info:	
Project/Site Location:	MERECO Sample Location MR-FT-08: Upstream
GPS location:	N 42.688167, W -73.8110794
River Basin:	N/A
Date:	10-Oct-18
Start/End Time:	1430-1545
Project Personnel:	E. Baird & D. Tompkins

Weather Conditions (Within Last 24 hours) :

Temp: 55 F **Wind:** Calm **Weather:** Sunny

Equipment Used:	Block Nets	Barrier Extent
☑ Backpack (Model: Smith-Root LR-24)	☐ Upstream	☐ Upstream
☐ Seine (size/mesh): 1/8-inch	☐ Downstream	☐ Downstream
☐ Other	☑ None	

Shocker Settings	
Sampling Duration:	1440-1530
Hertz:	30
Voltage:	125

Water Quality Data	
Spec. Cond. (µS/cm)	1.495
Water Temp. (°C)	18.2
DO (mg/L)	9.99
Turb. (NTU)	1.3
pH	7.21

Habitat Information

Coincident with habitat survey? ☐ Yes ☑ No

No Reference Reach Candidate? ☐ Yes ☑ No

Habitat Description:

Fast-flowing stream approximately 2-4' deep. Under cut bank with dense herbaceous and shrub vegetation overhanging into strea. Hard gravel bottom with some silt.

Habitat Types

Indicate the percentage of each habitat type present

% Riffles: 10	% Runs: 75	% Snags: 5
% Pools: 10	% Submerged Macrophytes:	% Other

Species	Length (mm)	Condition/Comments
Pumpkinseed (*Lepomis gibbosus*)	6.5	Healthy
Pumpkinseed	6.6	Healthy

TOTALS

Species	Number
Pumpkinseed	2

Field Data Sheet

Aquatic Habitat Assessment Sheet

Date: 10/10/2018
Sample Number: MR-FT-08
Waterbody Type: Stream
Waterbody Name: Patroon Creek

Area Description: Near highway. ☐ Forest ☐ Commercial ☐ Pasture ☐ Agricultural ☐ Residential ☑ Industrial
Instream Features (within 300 feet): cut bank - significant fish habitat, rocks on bottom, algae covered

Estimated Stream Width (ft):	Approx. 10 ft.
Estimated Stream Depth (ft):	1-3 ft where sampled.
Surface Velocity:	Moderate
State Water Quality Classification:	863-712 NYSDEC Standard C(T) Class C
Stream/River Segment:	N/A
Canopy Cover:	20% Trees 20% Shrubs (Total: 40)

Dominant Substrate(s):
☑ Boulder/Cobble
☐ Gravel
☐ Sand
☐ Silt/Mud
☐ Concrete
☐ Rip-rap

Water Odors:
☑ Normal/None
☐ Sewage
☐ Petroleum
☐ Chemical
☐ Fishy
☐ Other

Turbidity:
☑ Clear
☐ Slightly Turbid
☐ Turbid
☐ Opaque
☐ Stained
☐ Rip-rap

Fish Collected for Tissue Analysis: Yes; all.

Field Data Sheet

Project Site Info:	
Project/Site Location:	MERECO Sample Location MR-FT-09: Midstream (behind Auto Repair Facility)
GPS location:	N 42.411490, W -73.475825
River Basin:	N/A
Date:	10-Oct-18
Start/End Time:	1215-1345
Project Personnel:	E. Baird & D. Tompkins

Weather Conditions (Within Last 24 hours) :

Temp: 55 F **Wind:** Calm **Weather:** Sunny

Equipment Used:	Block Nets	Barrier Extent
☑ **Backpack (Model: Smith-Root LR-24)**	☐ **Upstream**	☐ **Upstream**
☐ **Seine (size/mesh): 1/8-inch**	☐ **Downstream**	☐ **Downstream**
☐ **Other**	☑ **None**	

Shocker Settings	
Sampling Duration:	1230-1330
Hertz:	30
Voltage:	125

Water Quality Data	
Spec. Cond. (µS/cm)	1.493
Water Temp. (°C)	18.31
DO (mg/L)	9.29
Turb. (NTU)	2.2
pH	7.57

Habitat Information

Coincident with habitat survey? ☐ **Yes** ☑ **No**

No Reference Reach Candidate? ☐ **Yes** ☑ **No**

Habitat Description:

Fast-flowing, deep channel stream. Large outfall discharges to stream in sampling location. In urban area. Danopy cover approximately 80%.

Habitat Types

Indicate the percentage of each habitat type present

% Riffles: 45	% Runs: 45	% Snags: 10
% Pools:	% Submerged Macrophytes:	% Other

Species	Length (mm)	Condition/Comments
Pumpkinseed (*Lepomis gibbosus*)	7.0	Healthy
Pumpkinseed	7.4	Healthy
Pumpkinseed	6.5	Healthy
Pumpkinseed	5.9	Healthy
Pumpkinseed	5.2	Healthy

TOTALS

Species	Number
Pumpkinseed	5

Field Data Sheet

Aquatic Habitat Assessment Sheet

Date: 10/10/2018
Sample Number: MR-FT-09
Waterbody Type: Stream
Waterbody Name: Patroon Creek

Area Description: Near highway & commercial land use ☐ Forest ☑ Commercial ☐ Pasture ☐ Agricultural ☐ Residential ☐ Industrial

Instream Features (within 300 feet): Significant wood debris in sections of sampling location. Some gravel bar/deposits present. Large outfall pipe, presumable stormwater.

Estimated Stream Width (ft):	Approx. 15-18 ft.
Estimated Stream Depth (ft):	0.5-3 ft where sampled.
Surface Velocity:	Moderate
State Water Quality Classification:	863-712 NYSDEC Standard C(T) Class C
Stream/River Segment:	N/A
Canopy Cover:	80% Trees Shrubs 0% (Total: 80)

Dominant Substrate(s):
☑ Boulder/Cobble
☑ Gravel
☑ Sand
☑ Silt/Mud
☐ Concrete
☐ Rip-rap

Water Odors:
☑ Normal/None
☐ Sewage
☐ Petroleum
☐ Chemical
☐ Fishy
☐ Other

Turbidity:
☑ Clear
☐ Slightly Turbid
☐ Turbid
☐ Opaque
☐ Stained
☐ Rip-rap

Fish Collected for Tissue Analysis: Yes; all.

Field Data Sheet

Project Site Info:	
Project/Site Location:	MERECO - Sample Location MR-FT-10: I90 Pond
GPS location:	N 42.687578, W -73.799507
River Basin:	Not Applicable
Date:	10-Oct-18
Start/End Time:	1000-1145
Project Personnel:	E. Baird & D. Tompkins

Weather Conditions (Within Last 24 hours) :

Temp: 50 F **Wind:** Calm **Weather:** Sunny

Equipment Used:	Block Nets	Barrier Extent
☑ Backpack (Model: Smith-Root LR-24)	☐ Upstream	☐ Upstream
☑ Seine (size/mesh): 1/8-inch	☐ Downstream	☐ Downstream
☐ Other	☑ None	

Shocker Settings	
Sampling Duration:	1030-1145
Hertz:	30
Voltage:	125

Water Quality Data	
Spec. Cond. (µS/cm)	1.421
Water Temp. (°C)	20.43
DO (mg/L)	14.74
Turb. (NTU)	12.9
pH	7.85

Habitat Information

Coincident with habitat survey? ☐ Yes ☑ No

No Reference reach candidate? ☐ Yes ☑ No

Habitat Description:

Large open, back water area. Deep much present; rip rap along bank in water. Large carp previously observed in 2010 sampling event. Stream channel to the south.

Habitat Types

Indicate the percentage of each habitat type present

% Riffles:	% Runs:	% Snags:
% Pools: 100	% Submerged Macrophytes:	% Other

Species	Length (mm)	Condition/Comments
Pumpkinseed (*Lepomis gibbosus*)	3.5	Healthy
Pumpkinseed	3.6	Healthy
Pumpkinseed	4.4	Healthy
Pumpkinseed	7.4	Healthy

TOTALS

Species	Number
Pumpkinseed	4

Field Data Sheet

Aquatic Habitat Assessment Sheet

Date: 10/10/2018
Sample Number: MR-FT-10
Waterbody Type: Pond/Stream
Waterbody Name: I90 Pond

Area Description: Near highway and rail line. ☐ Forest ☐ Commercial ☐ Pasture ☐ Agricultural ☐ Residential ☑ Industrial
Instream Features (within 300 feet): Mud flat located in middle of pond. Dense cattail area.

Estimated Stream Width (ft):	N/A
Estimated Stream Depth (ft):	2-3 ft where sampled - muck possible 3 ft
Surface Velocity (ft/sec):	None
State Water Quality Classification:	863-711 NYSDEC Standard C - Class C
Stream/River Segment:	N/A
Canopy Cover:	0%

Dominant Substrate(s):
☐ Boulder/Cobble
☐ Gravel
☐ Sand
☑ Silt/Mud
☐ Concrete
☐ Rip-rap

Water Odors:
☑ Normal/None
☐ Sewage
☐ Petroleum
☐ Chemical
☐ Fishy
☐ Other

Turbidity:
☐ Clear
☑ Slightly Turbid
☐ Turbid
☐ Opaque
☐ Stained
☐ Rip-rap

Fish Collected for Tissue Analysis: Yes; all.