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March 20, 2018

Mr. Geoffrey Seibel
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Allentown, Pennsylvania 18104

151372.200.002.6096

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 2017 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

March 2018

Post-Remedial Monitoring
Ecological Verification Sampling Report
Mercury Refining Superfund Site
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Project Number: 151372.200.002.6096

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Table of Contents

Attachments

Executive Summary

Sediment Sampling

- Sediment sampling was completed at all locations identified in the Operation and Maintenance Plan (O&M Plan).
- Total mercury concentrations ranged from 0.041 (J qualified) to 0.39 mg/kg, with the highest concentrations observed at sample location MR-SD-07 in the Tributary. 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 5,060 to 127,000 mg/kg. There does not appear to be a correlation between sediment mercury concentrations and TOC or grain size.
- Methyl mercury concentrations in sediment ranged from 0.085 µg/kg (J qualified) at location MR-SD-09 DUP to 1.8 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), and the NYSDEC criterion for the protection of human health based on fish consumption is 0.7 ng/L
- 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 0.018 ng/L (J qualified), and MR-SW-10, the I-90 Pond sampling location at a concentration of 0.039 ng/L (J qualified). At the other location, MR-SW-09, the Patroon Creek sampling location, methyl mercury was non-detect at a minimum detection limit of 0.018 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 concentrations in fish tissue samples were non-detect at detection limits ranging from 0.14 (UJ qualified) to 0.15 (UJ qualified) mg/kg. These detection limits are below the USEPA target fish tissue concentration of 0.3 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) Site. 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 (Attachment A, Figure 1). 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 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 third of the five sampling events. The first was conducted in November 2015 and the second in November 2016. 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 Attachment A. Samples were collected per the procedures described in the O&M Plan.

Section 2

Sediment Sampling

Sample Collection

The following sediment samples were collected on November 6 and 7, 2017:

- 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 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. Matrix Spike/Matrix Spike Duplicate (MS/MSD) recovery Relative Percent Differences (RPDs) were outside of the control limits for mercury and total organic carbon for recoveries for sample MR-SD-08. The mercury and total organic carbon results for sample MR-SD-08 have been qualified as estimated (J flagged). Field duplicate precision for the sediment samples MR-SD-9 and

DUP-110617-SD exceeded the control limit for mercury, methyl mercury and total organic carbon. These results have been qualified as estimated (J flagged). Estimated results should be used with caution. However, none of the J qualifications affect the data usability for this sampling event.

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 Attachment A.

Total mercury concentrations ranged from 0.0.041 (J qualified) to 0.39 mg/kg with the highest concentrations observed at sample location MR-SD-07 in the Unnamed Tributary. No observations exceeded the ROD-specified sediment cleanup objective of 1.3 mg/kg. A total mercury concentration of 0.36 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 0.11 mg/kg (J qualified) and 0.079 (J qualified) mg/kg, respectively. The I-90 Pond sample (MR-SD-10) had a mercury concentration of 0.17 mg/kg.

Total Organic Carbon (TOC) in the sediment samples was highly variable, ranging from 5,060 to 127,000 mg/kg. 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 (24.7%) and location in relatively stagnant water. The MR-SD-06 location had a considerable gravel component (30.4%).

The mercury concentrations were relatively consistent across the sampled area. There does not appear to be a correlation between sediment mercury concentrations and TOC or grain size within this small data set.

Methyl mercury concentrations in sediment ranged from 0.085 µg/kg (J qualified) at location MR-SD-09 DUP to 1.8 µg/kg at location MR-SD-10. There is currently no NYSDEC or USEPA cleanup criterion for methyl mercury in sediment. The fraction of total mercury to methyl mercury represented by the methylated fraction appears to generally increase with distance downstream from around 0.1 percent in the tributary to 1 percent in the I-90 Pond.

Section 3

Surface Water Sampling

Sample Collection

The following surface water samples were collected on November 6 and 7, 2017:

- 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 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 was rejected or qualified.

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). Methyl mercury was only detected in samples using a more sensitive laboratory method, USEPA Method 1630. Methyl mercury was detected at concentrations of 0.018 ng/L (J qualified) at the Unnamed Tributary sampling location (MR-SW-07) and 0.039 ng/L (J qualified) at the I-90 Pond sampling location (MR-SW-10). Methyl mercury was non-detect at the Patroon Creek sampling location (MR-SW-09), with a minimum detection limit of 0.018 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. The NYSDEC criterion for the protection of human health based on fish consumption is 0.7 ng/L dissolved mercury; the dissolved concentration is unknown. 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; Attachment A). These sample stations are co-located with the sediment and surface water samples discussed above. Fish were captured by electroshocking (Model Halltech HT-2000 Battery Backpack Electrofisher, 300 volts).

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 November 9, 2017.

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 eight white suckers (*Catostomus commersoni*) and nine pumpkin seed (*Lepomis gibbosus*). The white suckers ranged in size from 15.9 to 36.6 centimeters (cm) and the pumpkin seed ranged in size from 3.5 to 8.6 cm. One white sucker was retained for chemical analysis. At the midstream sample (MR-FT-09), 16 white suckers (11.7 to 22.7 cm), 22 pumpkin seeds (4.4 to 10.2 cm) and one creek chub (*Semotilus atromaculatus*) (13.6 cm) were captured. One of each of the species was retained for chemical analysis. At the I-90 Pond sample location (MR-FT-10), 18 pumpkinseeds (4.1 to 8.6 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. Samples with no detections (all samples) were qualified as not detected with an estimated detection limit (UJ).

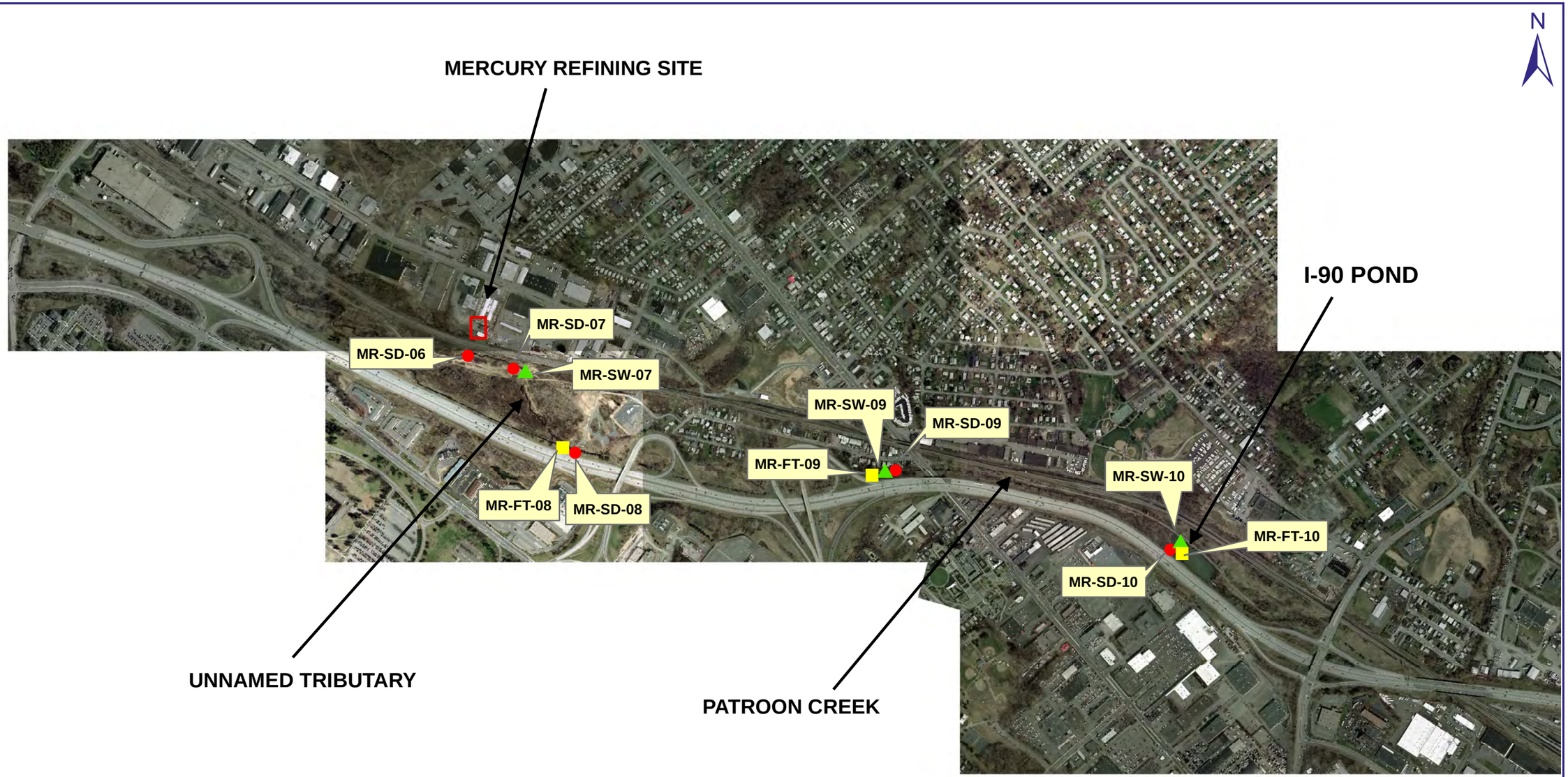
Analytical Results

Results of the fish tissue analysis are provided in Table 1 of Attachment C. Total mercury concentrations in fish tissue samples were non-detect at detection limits ranging from 0.14 (UJ qualified) to 0.15 (UJ qualified) mg/kg. These detection limits are below the USEPA target fish tissue concentration of 0.3 mg/kg[2] for methyl mercury.

[2] USEPA, 2009. Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, Final. January.

Attachment A: Site Plan

3/7/2016



Legend:

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

Brown AND Caldwell

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

0 490 980
Feet

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

Attachment B: Data Usability Summary Report

QUALITATIVE
DATA USABILITY SUMMARY REPORT
Colonie, New York, Mercury Refining Site
November 2017 Ecological Monitoring

SDG Nos.: 180-72364

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

Site: Mercury Refining Site, Colonie, New York

Date: January 4, 2018

Data from the following samples were reviewed:

Client Sample ID	Laboratory Sample ID	Matrix
480-127192-1	MR-SW-10	Water
480-127192-2	MR-SD-10	Solid
480-127192-3	MR-SW-09	Water
480-127192-4	MR-SD-09	Solid
480-127192-5	MR-SD-08	Solid
480-127192-6	DUP-110617-SW	Water
480-127192-7	DUP-110617-SD	Solid
480-127192-8	FB-110717-SD	Water
480-127192-9	FB-110717-SW	Water
480-127192-10	MR-SW-07	Water
480-127192-11	MR-SD-07	Solid
480-127192-12	MR-SD-06	Solid

A Qualitative Data Usability Review was performed on all analytical data from SDGs 480-127192. 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 74701A/7471B
Methyl Mercury	Method 1630
Inorganics	Method 310.2/9060A/SM 2340C/SM 2540C

Analysis	Method
Geotechnical Grain-size	Method 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
- Field duplicate precision
- 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. 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

LCS/LCSD recoveries and RPDs for the Geotechnical Grain-size analysis were outside of the

laboratories control limits.

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 for 480-127192-5 were outside the control limits for total organic carbon and mercury. Data for the parent sample have been flagged as estimated (J) by the reviewer.

Blank Contamination

All blanks were non-detect for mercury.

The field blank (480-127192-8) had a measured value for total organic carbon (TOC). Data for this sample have been flagged as estimated (J).

Field Duplicate Precision

Field duplicate results are shown in the table below. Data qualifiers (J) were added to the parent sample for the inorganic analysis for RPD values above 40%. No data qualifiers were added for the geotechnical samples based on the field duplicate results.

Inorganics				
Compound	MR-SW-09-20171106	DUP-110617-SW	RPD	Qualifier
	mg/L	mg/L		
Mercury 7470A	U	U	0%	None
Mercury E1630	U	U	0%	None
Hardness (as CaCO3)	312	300	4%	None
Alkalinity, total (as CaCO3)	219	223	2%	None
Total dissolved solids (TDS)	794	864	8%	None

Inorganics				
Compound	MR-SD-09-20171106	DUP-110617-SD	RPD	Qualifier
	ug/kg	ug/kg		
Mercury E1630	0.13	0.085J	42%	J
Compound	MR-SD-09-20171106	DUP-110617-SD	RPD	Qualifier
	mg/kg	mg/kg		

Total Organic Carbon	20800	82500	119%	J
Mercury 7471B	0.041	0.079	63%	J
Geotechnical Analysis				
Compound	MR-SD-09-20171106	DUP-110617-SD	RPD	Qualifier
	Percent	Percent		
Clay	0.0	1.5	200%	None
Coarse Sand	12.2	5.0	84%	None
Fine Sand	40.4	68.4	51%	None
Gravel	11.8	3.9	101%	None
Hydrometer Reading 1	1	2.0	67%	None
Hydrometer Reading 2	1	2.0	67%	None
Hydrometer Reading 3	1	2.0	67%	None
Hydrometer Reading 4	0.0	2.0	200%	None
Hydrometer Reading 5	0.0	1.5	200%	None
Hydrometer Reading 6	0.7	1.5	73%	None
Hydrometer Reading 7	0.6	1.4	80%	None
Medium Sand	32.9	20.9	45%	None
Sand	85.5	94.3	10%	None
Sieve Size #10	76.0	91.1	18%	None
Sieve Size #100	6.6	12.8	64%	None
Sieve Size #20	59.5	83.2	33%	None
Sieve Size #200	2.7	1.8	40%	None
Sieve Size #4	88.2	96.1	9%	None
Sieve Size #40	43.1	70.2	48%	None
Sieve Size #60	22.1	46.4	71%	None
Sieve Size #80	10.3	22.8	76%	None
Sieve Size 0.375 inch	97.7	99.1	1%	None
Sieve Size 0.75 inch	100.0	100.0	0%	None
Sieve Size 1 inch	100.0	100.0	0%	None
Sieve Size 1.5 inch	100.0	100.0	0%	None
Sieve Size 2 inch	100.0	100.0	0%	None
Sieve Size 3 inch	100.0	100.0	0%	None
Silt	2.7	0.3	160%	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  Dated: 1/4/2018

Kelly Donahue
Senior Chemist

QUALITATIVE
DATA USABILITY SUMMARY REPORT
Colonie, New York, Mercury Refining Site
November 2017 Ecological Monitoring

SDG Nos.: 180-72364

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

Site: Mercury Refining Site, Colonie, New York

Date: January 4, 2018

Data from the following samples were reviewed:

Client Sample ID	Laboratory Sample ID	Matrix
180-72364-1	MR-FT-10-20171109	Tissue
180-72364-2	MR-FT-09-20171109	Tissue
180-72364-3	MR-FT-08-20171109	Tissue

A Qualitative Data Usability Review was performed on all analytical data from SDGs 180-72364. 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. 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

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 229193 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. Samples with no detections were qualified as not detected with an estimated detection limit (UJ) by the reviewer.

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  Dated: 1/4/2018

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 11/7/2017	MR-SD-07 11/7/2017	MR-SD-08 11/6/2017	MR-SD-09 11/6/2017	MR-SD-09 DUP 11/6/2017	MR-SD-10 11/6/2017
Sediment Results							
Mercury	mg/kg	0.36	0.39	0.11 J	0.041 J	0.079 J	0.17
Methyl Mercury	µg/kg	0.43	0.89	0.64	0.13 J	0.085 J	1.8
Total Organic Carbon	mg/kg	5060	91800	31100 J	20800 J	82500 J	127000

Constituent	Location / Sample Date / Units	MW-SW-07 11/7/2017	MR-SW-09 11/6/2017	MR-SW-09 DUP 11/6/2017	MR-SW-10 11/6/2017
Surface Water Results					
Mercury	ng/L	120 U	120 U	120 U	120 U
Methyl Mercury	ng/L	0.018 J	0.018 U	0.018 U	0.039 J

Constituent	Location / Sample Date / Units	MR-FT-08 11/9/2017	MR-FT-09 11/9/2017	MR-FT-10 11/9/2017
Fish Tissue Results				
Mercury	mg/kg	0.15 UJ	0.15 UJ	0.14 UJ
Lipids	%	0.63	0.8	2.3
Solids	%	20.9	21.7	24.7

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.
UJ - The analyte was not detected above the sample method detection limit; and the method detecion limit is approximate.
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	1.4	%
	Silt	1.1	%
	Fine Sand	38.8	%
	Medium Sand	15.8	%
	Coarse Sand	12.5	%
	Total Sand	67.1	%
	Gravel	30.4	%
MR-SD-07	Clay	2.1	%
	Silt	12.5	%
	Fine Sand	70.2	%
	Medium Sand	2.3	%
	Coarse Sand	1.3	%
	Total Sand	73.8	%
	Gravel	11.6	%
MR-SD-08	Clay	1.8	%
	Silt	9.1	%
	Fine Sand	74.4	%
	Medium Sand	13.4	%
	Coarse Sand	0.8	%
	Total Sand	88.6	%
	Gravel	0.5	%
MR-SD-09	Clay	0	%
	Silt	2.7	%
	Fine Sand	40.4	%
	Medium Sand	32.9	%
	Coarse Sand	12.2	%
	Total Sand	85.5	%
	Gravel	11.8	%
MR-SD-10	Clay	3.2	%
	Silt	24.7	%
	Fine Sand	49.4	%
	Medium Sand	3.6	%
	Coarse Sand	6.4	%
	Total Sand	59.4	%
	Gravel	12.7	%

= Primary Grain Size

Notes:

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

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

Parameter	Location / Sample Date / Units	MR-SD-06 11/7/2017	MR-SW/SD-07 11/7/2017	MR-SD-08 11/6/2017	MW-SW/SD-09 11/6/2017	MR-SW/SD-10 11/6/2017
Temperature	°C	9.35	9.64	14.79	14.2	15.82
pH	--	7.72	7.79	7.75	7.57	7.06
ORP	mV	217	188	312	316	335
COND	S/m	1.26	1.25	1.79	1.73	1.64
DO	mg/L	6.99	6.3	4.75	6.61	5.27
Turbidity	NTU	11.1	10.7	2.4	4.1	3.8

Notes:
°C - degrees centigrade
S/m - Siemens per meter
mV - millivolts
mg/L - milligrams per liter
NTU - nephelometric turbidity units

Attachment D: Fish Tissue Sampling Field Data Sheets

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Fish Sampling Data Form

Study Area: Mereco Site upstream sample

Sample Number: MR- FT- 08
GPS location: Lat N '42.688167 Lon W '-73.810794
River basin: N/A

Date: 11/09/2017
Time: 10:45am - 11:15am

Investigators: D. Tompkins, E. Baird, A. Faust

Weather (Last 24 hours) :
Temperature: 36 degrees
Sky: Sunny
Wind: light from the north

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

Shocker Settings
Sampling Duration: Start time 10:45 End time 11:15
Shock Seconds: 30 Hz
Shocker Voltage: 125 Volts

Water Quality Data	
Specific Conductance (µS/cm)	1.512 µS/cm
Water temperature (°C)	8.37 °C
Dissolved Oxygen (mg/L)	10.77 mg/L
Turbidity (NTU)	N/A
pH	8.19

Habitat Information

Coincident with habitat survey? ☐ Yes ☑ No
No Reference reach candidate? ☐ Yes ☑ No

Habitat Description:
Swift flowing stream ~2-4 ft deep. Under cut bank with dense herbaceous and shrub vegetation right up to and overhanging stream. Hard gravel/rock bottom.

Habitat Types
Indicate the percentage of each habitat type present
☑ Riffles 10% ☑ Pools 10% ☑ Runs 80% ☐ Snags __%
☐ Submerged Macrophytes_____% ☐ Other ( )_____% None
Crayfish was observed.

Collected Data:

Species	Length (mm)	Condition	Total Number
White Sucker	366	healthy	
	246	healthy	
	217	healthy	
	245	healthy	
	199	healthy	
	197	healthy	
	187	healthy	
	159	healthy	8
Pumpkinseed	86	healthy	
	75	healthy	
	35	healthy	
	60	healthy	
	60	healthy	
	49	healthy	
	51	healthy	
	53	healthy	
	53	healthy	9
Total			17 Fish

Aquatic Habitat Assessment Sheet

Date: 11/09/2017

Sample Number: MR-FT-08
Waterbody Type: Stream
Waterbody Name: Patroon Creek

Area Description: Highway adjacent to stream, overhead electrical ☐ 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):	10-12 ft
Estimated Stream Depth (ft):	~3 ft
Surface Velocity (ft/sec):	moderate
State Water Quality Classification	863-712 NYSDEC Standard C(T) Class C
Stream/River Segment:	
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

Collected fish for tissue sampling:1 white sucker (70g), 15 grams of tissue required.

Fish Sampling Data Form

Study Area: Mereco stream sampling - midstream- behind Unique Auto

Sample Number: MR- FT- 09
GPS location: Lat N '42.687578 Lon W '-73.799507
River basin: N/A

Date: 11/09/2017
Time: 11:55am - 12:55pm

Investigators: D. Tompkins, E. Baird, A. Faust

Weather (Last 24 hours) :
Temperature: 38 degrees
Sky: Sunny
Wind: north 5-10 mph

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

Shocker Settings
Sampling Duration: Start time11:55 End time 12:55
Shock Seconds: 30 Hz
Shocker Voltage: 125 Volts

Water Quality Data	
Specific Conductance (µS/cm)	1.498 µS/cm
Water temperature (°C)	8.56 °C
Dissolved Oxygen (mg/L)	11.42 mg/L
Turbidity (NTU)	N/A
pH	8.30

Habitat Information

Coincident with habitat survey? ☐ Yes ☑ No
No Reference reach candidate? ☐ Yes ☑ No

Habitat Description:
Fast flowing deep channel stream, large pipe entering stream nearby, significant woody debris (logs) in stream, located in urban area. Very good canopy 70%+

Habitat Types
Indicate the percentage of each habitat type present
☑ Riffles 45% ☐ Pools __% ☑ Runs 45% ☑ Snags 10%
☐ Submerged Macrophytes_____% ☐ Other ( )_____% None

Collected Data:

Species	Length (mm)	Condition	Total Number
White Sucker	172	healthy	
	173	healthy	
	134	healthy	
	217	healthy	
	227	healthy	
	173	healthy	
	117	healthy	
	167	healthy	
	159	healthy	
	192	healthy	
	160	healthy	
	197	healthy	
	125	healthy	
	173	healthy	
	172	healthy	
	150	healthy	**16**
Pumpkinseed	86	healthy	
	87	healthy	
	83	healthy	
	82	healthy	
	77	healthy	
	44	healthy	
	65	healthy	
	102	healthy	
	68	healthy	
	80	healthy	
	75	healthy	
	77	healthy	
	81	healthy	
	96	healthy	
	82	healthy	
	75	healthy	
	77	healthy	
	48	healthy	
	71	healthy	
	65	healthy	
	81	healthy	
	79	healthy	**22**
Creek Chub	136	healthy	**1**
Total			**39 Fish**

Aquatic Habitat Assessment Sheet

Date: 11/09/2017

Sample Number: MR-FT-09
Waterbody Type: Stream- behind Unique Auto
Waterbody Name: Patroon Creek

Area Description: Highway, parking lots near by ☐ Forest ☑ Commercial ☐ Pasture ☐ Agricultural ☐ Residential ☐ Industrial
Instream Features (within 300 feet): significant woody debris, some gravel bar/deposits, large culvert pipe (storm overflow)

Estimated Stream Width (ft):	15 ft
Estimated Stream Depth (ft):	0.5-3 ft
Surface Velocity (ft/sec):	moderate
State Water Quality Classification	863-712 NYSDEC Standard C(T) Class C
Stream/River Segment:	
Canopy Cover:	70+%

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

Collected fish for tissue sampling:1 white sucker (32g), 1 pumpkinseed sunfish (5g), 1 creek chub (18g)

Fish Sampling Data Form

Study Area: I90 Pond

Sample Number: MR-FT-10
GPS location: Lat N '42.687578 Long W '-73.799507
River basin: N/A

Date: 11/09/2017
Time: 9:30am - 10:30am

Investigators: D. Tompkins, E. Baird, A. Faust

Weather (Last 24 hours) :
Temperature: 32 degrees
Sky: Sunny
Wind: light from the north

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

Shocker Settings
Sampling Duration: Start time 9:30 End time 10:30 Shock Seconds: 30 Hz Shocker Voltage: 125 Volts

Water Quality Data	
Specific Conductance (µS/cm)	1.397 µS/cm
Water temperature (°C)	6.74 °C
Dissolved Oxygen (mg/L)	11.02 mg/L
Turbidity (NTU)	28.9 NTU
pH	8.08

Habitat Information

Coincident with habitat survey? ☐ Yes ☑ No
No Reference reach candidate? ☐ Yes ☑ No

Habitat Description:
Large open, back water area - large carp previously observed in 2010 sampling event - deep muck present - stream channel to the south

Habitat Types
Indicate the percentage of each habitat type present
☐ Riffles_____% X Pools 100% ☐ Runs_____% ☐ Snags_____%
☐ Submerged Macrophytes_____% ☐ Other ( )_____% None

Collected Data:

Species	Length (mm)	Condition	Total Number
Pumpkinseed	86	healthy	
	62	healthy	
	84	healthy	
	73	healthy	
	71	healthy	
	65	healthy	
	67	healthy	
	63	healthy	
	77	healthy	
	72	healthy	
	77	healthy	
	66	healthy	
	41	healthy	
	84	healthy	
	79	healthy	
	70	healthy	
	68	healthy	
	81	healthy	
Total			18 fish

Aquatic Habitat Assessment Sheet

Date: 11/09/2017

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 - 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:	
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

Collected fish for tissue sampling: All 18 pumpkinseed sunfish sampled (5g each) were collected for analysis.