GLOBALFOUNDRIES U.S. 2 LLC – Fab 10
HOPEWELL JUNCTION, NEW YORK

WORK PLAN FOR DECONTAMINATION/CLOSURE OF BUILDING 320B SOLID WASTE MANAGEMENT UNITS (SWMUs)

Prepared for:

THE WHITING-TURNER CONTRACTING COMPANY
HOPEWELL JUNCTION, NEW YORK

Prepared by:

D&B ENGINEERS AND ARCHITECTS, P.C.
WOODBURY, NEW YORK

MAY 2020

WORK PLAN FOR DECONTAMINATION/CLOSURE OF BUILDING 320B SOLID WASTE MANAGEMENT UNITS (SWMUs) GLOBALFOUNDRIES U.S. 2 LLC – Fab 10 HOPEWELL JUNCTION, NEW YORK

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1.0 INTRODUCTION

1.1 Project Background

GLOBALFOUNDRIES U.S. 2 LLC – Fab 10 is located on State Route 52 in Hopewell Junction, Dutchess County, New York. The facility is bordered on the north by State Route 52 and on the south by U.S. Interstate 84 and is located approximately 10 miles east of the Hudson River.

As part of the manufacturing operations conducted at the facility, both hazardous and nonhazardous waste is generated. In order to properly manage hazardous waste at the facility, the facility obtained a 6 NYCRR Part 373 Permit from the New York State Department of Environmental Conservation (NYSDEC) for the storage of hazardous waste in containers within Building 309 located on the East Complex.

As part of the permit application process, all solid waste management units (SWMUs) located at the facility were required to be identified. SWMUs are defined as any discernible unit in which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of hazardous or solid wastes.

At this time, The Whiting-Turner Contracting Company (Whiting-Turner) is working on a project at the facility which involves the renovation of an existing space within Building 320B that will require the demolition and removal of under-slab piping that has been abandoned in-place. This existing piping has been identified as SWMUs in the Corrective Action Module of the facility’s 6 NYCRR Part 373 Permit and will therefore require proper identification, notification and reporting to be removed from the permit.

1.2 Project Scope and Objective

As mentioned above, this project involves the renovation of an existing space within Building 320B. The project will involve the demolition of portions of the existing slab and will expose existing transfer piping beneath the slab that has been abandoned in-place. Based on the review of construction drawings for the building, it is believed that the transfer pipes are located within separate sand-filled concrete trenches. The existing transfer pipes in Building 320B have been identified on the SWMU Table in the Permit for the site as “inaccessible” and therefore require proper identification, notification and reporting to the NYSDEC in order be properly closed.

Specifically, this project will address the following SWMUs:

Unit ID #	Unit	Building	RCRA Status	Constituents of Concern
B320-FL	Fluoride/Heavy Metals Wastewater Transfer Piping	B/320	Inaccessible SWMU	• Chromium, lead, nickel • Fluoride
B320-IW	Industrial Wastewater Transfer Piping	B/320	Inaccessible SWMU	• pH
B320-SO	Solvent Waste Transfer Piping	B/320	Inaccessible SWMU	• Volatile organic compounds • Isopropyl alcohol, n-butyl acetate, N-methyl-2-pyrrolidone, total phenols

The purpose of this project is to oversee the removal of the piping, assess any potential impacts the piping may have had to the subsurface soil through the collection and analysis of samples. These activities will then be documented in a report to the NYSDEC to allow the removal of the transfer piping from the SWMU list contained in the Corrective Action Module of the facility’s Part 373 Permit.

While closure requirements are not specified under the regulations, GLOBALFOUNDRIES intends to close these SWMUs in accordance with general policy guidelines obtained from the NYSDEC. This work plan presents the decontamination method, the procedures used to accomplish each decontamination method, and protocols to verify and document that the decontamination of each unit has been effectively completed.

2.0 DECONTAMINATION/CLOSURE PLAN

The SWMUs to be decontaminated and closed as part of this work plan include three sets of transfer piping that have been abandoned in-place beneath the existing slab of B/320B. Based on the review of construction drawings for the building, it is believed that the transfer pipes are located within separate sand-filled concrete trenches.

The closure of these SWMUs will be conducted in accordance with closure performance standards found at 6 NYCRR 373-3.7(b) and underground piping removed from Building 320B will be decontaminated by chemical or physical extraction to a Clean Debris Surface per 6 NYCRR 376.4(g). If a Clean Debris Surface cannot be achieved, the units will be flushed with water and rinse water samples collected and analyzed for volatile organic compounds for comparison to Class GA Groundwater Standards.

The following is a discussion of the general procedures to be followed in the decontamination and closure of the three SWMUs.

1. The concrete covers of the pipe trenches will be removed to expose the underlying trench. The overlying sand will be removed from the trench to expose the transfer piping.

2. The transfer piping will be removed from the trench and cut into manageable lengths to facilitate decontamination. Care must be taken in removing the transfer piping to ensure that any residual liquid that may be present in the transfer piping is contained and not allowed to be released to the trench.

3. If the interior surface of the transfer piping is heavily coated, as may be the case with the Fluoride/Heavy Metal and Industrial Wastewater Transfer piping, pretreatment may be required before the surface of the transfer piping can be decontaminated. This pretreatment may consist of physical treatment to knock or scrape scale off the SWMU surface and/or chemical treatment such as use of Rydlyme water scale cleaner to dissolve the scale. Any solids or sludge generated as a result of this treatment will be removed, containerized, and transferred to B/309 where they will be staged for proper characterization and disposal.

4. Once the interior surface of the transfer piping is no longer coated with scale, the entire interior surface will be decontaminated with an appropriate, environmentally

safe detergent such as Simple Green utilizing a high pressure washing system applied at a distance of 1 to 2 inches from the surface.

5. After decontamination, the entire surface of the SWMU will be visually inspected to verify that it meets the Clean Debris Surface per 6 NYCRR 376.4(g) in accordance with the following definition:

   "As defined 'Clean debris surface' means the surface, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits shall be limited to no more than 5% of each square inch of surface area."

6. Once the surface is certified as meeting this standard, the transfer piping will be recycled off-site as scrap metal. If the surface cannot be certified as meeting this standard, rinse water samples will be collected in accordance with the rinse water collection procedures found in Quality Assurance Project Plan provided in Appendix A. Rinse water sample analytical results for hazardous constituents of concern will be compared to the Class GA Groundwater Standards and Guidance Values listed in the NYSDEC Division of Water's Technical and Operational Guidance Series (TOGS) 1.1.1-"Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations." If the rinse water sample results exceed the Class GA Groundwater Standards, the decontamination process will be repeated. If results are below the Class GA Standards decontamination will be deemed complete.

7. Following removal of the transfer piping, D&B will be responsible for evaluating potential impacts from the transfer piping to the underlying sand in the trench. This will be accomplished by collecting samples of the sand in accordance with the collection procedures found in the Quality Assurance Project Plan provided in Appendix A. The sand sample analytical results for hazardous constituents of concern will be compared to the soil cleanup objectives for commercial facilities contained at 6 NYCRR 375-6.8(b). If the sand sample results are below the soil cleanup objectives decontamination will be deemed complete.

8. If the sand samples exceed the soil cleanup objectives, a Phase II Work Plan will be prepared to investigate the impacted area.

3.0 CLOSURE CERTIFICATION

Upon completion of removal of the SWMUs, documentation will be submitted to the NYSDEC to certify that the process is complete. The submittal will include a certification signed and stamped by a Professional Engineer licensed to practice in New York State that the SWMUs have been closed in accordance with the specifications presented in the NYSDEC-approved work plan.

APPENDIX A

QUALITY ASSURANCE PROJECT PLAN

GLOBALFOUNDRIES U.S. 2 LLC – FAB 10
HOPEWELL JUNCTION, NEW YORK

QUALITY ASSURANCE PROJECT PLAN FOR DECONTAMINATION/CLOSURE OF VARIOUS SOLID WASTE MANAGEMENT UNITS (SWMUs)

Prepared for:

THE WHITING-TURNER CONTRACTING COMPANY
HOPEWELL JUNCTION, NEW YORK

Prepared by:

D&B ENGINEERS AND ARCHITECTS, P.C.
WOODBURY, NEW YORK

MAY 2020

GLOBALFOUNDRIES U.S. 2 LLC – FAB 10
HOPEWELL JUNCTION, NEW YORK
QUALITY ASSURANCE PROJECT PLAN FOR
DECONTAMINATION/CLOSURE OF VARIOUS
SOLID WASTE MANAGEMENT UNITS

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1.0 QUALITY ASSURANCE PROJECT PLAN

1.1 Project Identification

Facility Name:	GLOBALFOUNDRIES U.S. 2 LLC – Fab 10 (GLOBALFOUNDRIES) Hudson Valley Research Park Hopewell Junction, New York
Project Name:	Decontamination/Closure of Various Solid Waste Management Units (SWMUs)
Project Managers:	Tracy Williams *(GLOBALFOUNDRIES)* Keith R. Brower *(D&B Engineers and Architects, P.C.)*
Quality Assurance Officer:	Robbin A. Petrella *(D&B Engineers and Architects, P.C.)*
Field Operations Manager:	Alex Pugliese (D&B Engineers and Architects, P.C.)

1.2 Objective and Scope

The objective of this program is to decontaminate and close three Solid Waste Management Units (SWMUs) located at Building 320B of GLOBALFOUNDRIES U.S. 2 LLC-Fab 10 located in Hopewell Junction, New York. As part of the decontamination and closure activities, soil/sand, rinse water and/or rinse water blank samples may be collected to verify the effectiveness of the decontamination procedures. The purpose of this Quality Assurance Project Plan (QAPP) is to develop and describe the detailed sample collection and analytical procedures that will ensure high quality data.

Note that the remainder of this plan has been written to address the variety of solid waste management units typically encountered at the GLOBALFOUNDRIES facility (e.g. Bulk Waste

Solvent, Industrial Wastewater, Fluoride/Heavy Metal Wastewater, etc.). Not all of the sampling and analytical procedures contained in this plan will be applicable to every project.

1.3 Data Usage

The data generated from the field sampling will be used to verify the effectiveness of the decontamination activities performed on the SWMUs and associated piping. Specifically, the samples will be used to determine whether the decontamination activities were successful in removing any contamination present in the SWMUs and associated piping. If the samples indicate that contamination remains present, then additional decontamination may be required before the unit can be considered decontaminated.

1.4 Sampling Program Design and Rationale

The following presents a general discussion of the sampling to be conducted during the sampling portion of the program.

- Soil/Sand Samples: Soil/sand samples may be collected from certain underground SWMUs during this project. In addition, one blind duplicate will be collected each day a soil/sand sample is collected.

- Rinse Water Samples: Rinse water samples will be collected from certain SWMUs being decontaminated during this project. In addition, one blind duplicate will be collected each day a rinse water sample is collected.

- Rinse Water Blank Sample: One rinse water blank sample will be collected each day during this decontamination project. The rinse water sample will be collected directly from the water supply (i.e. hose or spigot) utilized to decontaminate the SWMUs.

1.5 Analytical Methods

Laboratory analysis of the rinse water and rinse water blank samples will consist of analyzing for pH, fluoride, chromium, lead, nickel and/or volatile organic compounds (VOCs) , depending on sample location, in accordance with the 2005 NYSDEC Analytical Services Protocol (ASP).

Table 1-1 presents a summary of the parameters/sample fractions to be analyzed for each type of SWMU. The table also lists the sample location, type of sample, sample matrix, number of samples and frequency of sample collection, type of sample container, method of preservation, holding time and analytical method.

1.6 Data Quality Requirements and Assessment

Data quality requirements and assessments are provided in the 2005 NYSDEC ASP, which includes the detection limit for each parameter and sample matrix (see Exhibit A). Note that quantification limits, estimated accuracy, accuracy protocol, estimated precision and precision protocol are determined by the laboratory and will be in conformance with the requirements of the 2005 NYSDEC ASP, where applicable. **Table 1-2** presents a summary of the data quality requirements. Surrogate and matrix spike compounds for VOCs are listed in **Table 1-3.**

In addition to meeting the requirements provided in the 2005 NYSDEC ASP, the data must also be useful in evaluating the nature and extent of contamination. Data obtained during the field program will be compared to specific Standards, Criteria and Guidelines (SCGs). The SCGs to be utilized include:

Matrix	SCG
Soil/Sand Samples	NYSDEC 6NYCRR Part 375 Commercial Use Soil Cleanup Objectives dated December 14, 2006.
Rinse Water and Blank Samples	NYSDEC Class GA Groundwater Standards found at Division of Water Technical and Operational Guidance Series (1.1.1) dated June 1998.

Table 1-1

GLOBALFOUNDRIES U.S. 2 LLC – FAB 10
DECONTAMINATION/CLOSURE OF VARIOUS SWMUs
SUMMARY OF MONITORING PARAMETERS/SAMPLE FRACTIONS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	No. of Samples(1)	Frequency(2)	Container Type/Size/No.	Sample Preservation	Maximum Holding Time(3)	Analytical Method(4)
Fluoride/Heavy Metals and select Industrial Wastewater SWMUs	Grab	Water	Fluoride	3	0	Plastic/50 ml/1 ICHEM 300 series or equivalent	Cool to 4°C	26 days for analysis	7/05 NYSDEC ASP, Method 9214
			Metals(5)	3	0	Plastic/500 ml/1 ICHEM 300 series or equivalent	HNO_3 to pH <2 Cool to 4°C	6 months for analysis	7/05 NYSDEC ASP Method 6010D
			pH	3	0	Plastic/50 ml/1 ICHEM 300 series or equivalent	Cool to 4°C	analyze immediately	7/05 NYSDEC ASP, Method 9040C
Fluoride/Heavy Metals and select Industrial Wastewater Underground Piping	Grab	Soil/Sand	Fluoride	3	3	Plastic/8 oz/1 ICHEM 200 series or equivalent	Cool to 4°C	26 days for analysis	7/05 NYSDEC ASP, Method 9214
			Metals(5)	3	3	Plastic/8 oz/1 ICHEM 320 series or equivalent	HNO3 to pH <2 Cool to 4°C	6 months for analysis	7/05 NYSDEC ASP Method 6010D
			pH	3	3	Plastic/8 oz/1 ICHEM 200 series or equivalent	Cool to 4°C	analyze immediately	7/05 NYSDEC ASP, Method 9040C

Notes:

(1) Number of samples includes a rinse water blank and/or rinse water or soil/sand duplicate.
(2) Frequency equals number of discrete sampling locations.
(3) Holding times based upon Verified Time of Sample Receipt at the laboratory.
(4) Most recent version being utilized a NYSDOH ELAP Certified laboratory
(5) Metals limited to chromium, lead and nickel.

Table 1-1 (continued)

GLOBALFOUNDRIES U.S. 2 LLC – FAB 10
DECONTAMINATION/CLOSURE OF VAROUS SWMUs
SUMMARY OF MONITORING PARAMETERS/SAMPLE FRACTIONS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	No. of Samples[1]	Frequency[2]	Container Type/Size/No.	Sample Preservation	Maximum Holding Time[3]	Analytical Method[4]
Industrial Wastewater SWMUs	Grab	Water	pH	3	0	Plastic/50 ml/1 ICHEM 300 series or equivalent	Cool to 4°C	analyze immediately	7/05 NYSDEC ASP, Method 9040C
Industrial Wastewater Underground Piping	Grab	Soil/Sand	pH	3	3	Plastic/50 ml/1 ICHEM 300 series or equivalent	Cool to 4°C	analyze immediately	7/05 NYSDEC ASP, Method 9040C

Notes:

(1) Number of samples includes a rinse water or soil/sand duplicate and/or rinse water blank.
(2) Frequency equals number of discrete sampling locations.
(3) Holding times based upon Verified Time of Sample Receipt at the laboratory.
(4) Most recent version being utilized a NYSDOH ELAP Certified laboratory

Table 1-1 (continued)

GLOBALFOUNDRIES U.S. 2 LLC – FAB 10
DECONTAMINATION/CLOSURE OF VAROUS SWMUs
SUMMARY OF MONITORING PARAMETERS/SAMPLE FRACTIONS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	No. of Samples(1)	Frequency(2)	Container Type/Size/No.	Sample Preservation	Maximum Holding Time(3)	Analytical Method(4)
Hazardous Waste Solvent Storage Tanks	Grab	Water	Volatile Organics	3	0	Glass/40 ml/3 ICHEM 300 series or equivalent	Cool to 4°C	5 days	7/05 NYSDEC ASP, Method 8260B
Hazardous Waste Solvent Underground Piping	Grab	Soil/Sand	Volatile Organics	3	3	Glass/40 ml/3 ICHEM 300 series or equivalent	Cool to 4°C	5 days	7/05 NYSDEC ASP, Method 8260B

Notes:

(1) Number of samples includes a rinse water or soil/sand duplicate and/or rinse water blank.

(2) Frequency equals number of discrete sampling locations.

(3) Holding times based upon Verified Time of Sample Receipt at the laboratory.

(4) Most recent version being utilized a NYSDOH ELAP Certified laboratory.

Table 1-2

GLOBALFOUNDRIES U.S. 2 LLC – FAB 10
DECONTAMINATION/CLOSURE OF VAROUS SWMUs
DATA QUALITY REQUIREMENTS

Parameter	Sample Matrix	CRDL[1]	Estimated Accuracy	Accuracy Protocol	Estimated Precision	Precision Protocol
Volatile Organics	Liquid	5-10 (ug/l) 5-10(ug/l)	0.87 - 2.48 ug/l	Vol. IB, Chapter 4, Method 8260B, Table 7	0.11 - 4.00 ug/l	Vol. IB, Chapter 4, Method 8260B, Table 7
	Solid	5-10 (ug/kg) 5-10 (ug/kg)	0.87 - 2.48 ug/kg	Vol. IB, Chapter 4, Method 8260B, Table 7	0.11 - 4.00 ug/kg	Vol. IB, Chapter 4, Method 8260B, Table 7
Metals	Liquid	0.2-200(ug/l)	--	Vol. IA, Chapter 3, Method 6010D, Table 4	--	Vol. IA, Chapter 3, Method 6010D, Table 4
	Solid	0.2-200(ug/k)	--	Vol. IA, Chapter 3, Method 6010D, Table 4	--	Vol. IA, Chapter 3, Method 6010D, Table 4

Notes:
(1) Contract Required Detection Limits.

Table 1-2 (continued)

GLOBALFOUNDRIES U.S. 2 LLC – FAB 10
DECONTAMINATION/CLOSURE OF VAROUS SWMUs
DATA QUALITY REQUIREMENTS
OBJECTIVES FOR PRECISION, ACCURACY, AND COMPLETENESS

Matrix/Parameter	**Precision (%)**	**Accuracy (%)**
Rinse Water		
VOCs[(a)]	See Table 1-3	See Table 1-3
Metals[(b)]	± 25%	75-125
Soil/Sand		
VOCs[(a)]	See Table 1-3	See Table 1-3
Metals[(b)]	± 25%	75-125

Notes:

(a) Accuracy will be determined as percent recovery of surrogate spike compounds and matrix spike compounds. Precision will be estimated as the relative standard deviation of the percent recoveries per matrix.

(b) Accuracy will be determined as percent recovery of matrix spikes when appropriate or the percent recovery of a QC sample if spiking is inappropriate. Precision will be determined as relative percent difference of matrix spike duplicate samples, or duplicate samples if spiking is inappropriate.

Source: NYSDEC ASP

Table 1-3

GLOBALFOUNDRIES U.S. 2 LLC – FAB 10
DECONTAMINATION/CLOSURE OF VAROUS SWMUs
SPIKE RECOVERY LIMITS FOR
SURROGATE AND MATRIX SPIKE COMPOUNDS

Compound	Spike Recovery Limits (%)	
	Water	Soil/Sand
Surrogate Compound		
Toluene-d8	88-110	81-117
4-Bromofluorobenzene	86-115	74-121
1,2-Dichloroethane-d4	80-120	80-120
Dibromofluormethane	86-118	80-120
Matrix Spike Compound		
1,1-Dichloroethene	61-145	59-172
Trichloroethane	71-120	62-137
Chlorobenzene	75-130	60-133
Toluene	76-125	59-139
Benzene	76-127	66-142

Source: NYSDEC ASP

1.6.1 Data Representativeness

Representative samples will be collected as follows:

- Soil/Sand – Samples will be collected utilizing disposable sterile sample scoops from a minimum of 3 separate locations along the exposed section of underground pipe.
- Rinse Water – Samples will be collected utilizing rinse water from the same source utilize to collect the rinse water blank (i.e. hose, spigot, etc.). Rinse water will be poured into the SWMU, allowed to stand for approximately 10 minutes and then collected utilizing sterile plastic pipettes or similar equipment.
- Rinse Water Blank – Samples of the water utilized to decontaminate the area will be collected directly from the water source (i.e. hose, spigot, etc.) and passed through a sterile plastic pipette into the sample container.
- Equipment Decontamination – Non-sterile sampling equipment will be decontaminated prior to use at each location according to the NYSDEC-approved procedures described in Section 1.8 of this QAPP.

1.6.2 Data Comparability

All data will be presented in the units designated by the methods specified by a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory, and the 2005 NYSDEC ASP. In addition, sample locations, collection procedures and analytical methods from earlier studies will be evaluated for comparability with current procedures/methods.

1.6.3 Data Completeness

The acceptability of 100% of the data is desired as a goal for this project. The acceptability of less than 100% complete data, meeting all laboratory Quality Assurance/Quality Control (QA/QC) protocols/standards, will be evaluated on a case-by-case basis.

The laboratory utilized to perform the analyses on the rinse water, rinse water blank and duplicate samples will provide NYSDEC ASP Category B data deliverables.

1.7 Detailed Sampling Procedures

Soil/Sand and duplicate samples will be collected from the soil/sand beneath underground piping in order to verify the effectiveness of the piping removal activities. One soil/sand sample and one duplicate sample will be collected from certain underground, previously inaccessible SWMUs which are removed as part of this program. Sampling procedures and equipment to be utilized are described in this QAPP. Sample collection will be performed in conformance with the procedures outlined in this QAPP.

Rinse water, rinse water blank and duplicate samples will be collected following the decontamination activities in order to verify the effectiveness of the decontamination activities. One rinse water sample, one rinse water blank sample and one duplicate sample will be collected from certain SWMUs which are decontaminated as part of this program. Sampling procedures and equipment to be utilized are described in this QAPP. Sample collection will be performed in conformance with the procedures outlined in this QAPP.

When collecting the samples, care will be taken to maintain sample integrity by preserving its physical form and chemical composition to as great an extent as possible. First, the equipment utilized to collect the samples must be new and sterile or properly decontaminated. An appropriate piece of sampling equipment (e.g., disposable pipette) will be utilized to collect the sample and transfer it to the laboratory-supplied sample container. The sample should reflect and contain a good representation of the area from which it was collected. The sample will be transferred into the sample container as quickly as possible.

There are several steps performed after the transfer of the sample into the sample container that are necessary to properly complete the collection activities. Once the sample is transferred into the appropriate container, the container will be capped and, if necessary, the outside of the container will be wiped with a clean paper towel to remove any grime. A clean paper towel moistened with distilled/deionized water will be used for this purpose.

Prior to sample collection, the sample container will be properly labeled. Information such as the sample identification number, location, collection time and sample description will be recorded in the field log book. Associated paper work (e.g., Chain of Custody forms) will then be completed and will stay with the sample. The samples will be packaged in a manner that will allow the appropriate storage temperature to be maintained during transportation to the laboratory. Samples will be delivered to the laboratory within 48 hours of collection.

Proper personal protective equipment and monitoring equipment (if determined to be necessary) will be used at all times during sample collection to further maintain sample integrity and protection of worker health and safety.

1.7.1 Sample Identification

All samples collected during the field activities undertaken at GLOBALFOUNDRIES will be labeled with a sample identification code. The code will identify the sample location, sample type (sample matrix) and series numbers for the sample locations. Samples will be labeled according to the following system:

Location Identification: - The sample location will be assigned an identifier based on the SWMU from which the sample was collected. Samples collected from a Fluoride/Heavy Metal Tank will be denoted "FHM SWMU number" (e.g., samples associated with F/HM tank number "10" would be "FHM 10").

Sample Type: - "R" for rinse water and duplicate samples and "RB" for rinse water blank sample.

Sample Number: - In the field, each sample location will be designated with a number. The number will correspond with the number of the sample collected. Therefore, the first blank collected from an SWMU will be denoted "1." If the SWMU requires further decontamination, the second rinse blank will be denoted "2" and so on.

Based on the above sample identification procedures, an example of a sample label collected from a F/HM tank number “10”, would be:

Sample Type Sample Number

FHM 10-R-1

Location Identification

1.7.2 Sample Handling, Packaging and Shipping

All analytical samples will be placed in the appropriate sample containers as specified in the NYSDEC July 2005 ASP. The holding time criteria identified in the ASP will be followed, as specified in Table 1-1.

Prior to packaging any samples for transportation to the laboratory, the sample containers will be checked for proper identification and compared to the field log book for accuracy. The samples will then be wrapped with a cushioning material (e.g., bubble wrap) and placed in a cooler (or laboratory shuttle) with a sufficient quantity of bagged ice or “blue ice” packs to maintain the samples at 4°C until arrival at the laboratory.

All necessary documentation required to accompany the samples during transportation will be placed in a sealed plastic bag and taped to the underside of the cooler lid. The cooler will then be sealed with fiber (duct) tape, and custody seals will be placed in such a manner that any opening of the cooler prior to arrival at the laboratory can be detected.

All samples will be shipped to ensure receipt at the laboratory within 48 hours of sample collection in accordance with ASP requirements.

1.7.3 Soil and Sand/Blind Duplicate Samples

The following protocol will be adhered to for the collection of soil/sand samples and associated blind duplicate samples:

1. Be certain that the sample location is noted on a sample location sketch (see Section 1.10).
2. Be certain that the sampling equipment is either new or has been decontaminated utilizing the procedures outlined in Section 1.8.
3. Select a sample location within the area. A minimum of three soil/sand samples and one duplicate will be collected from each SWMU.
4. Remove a set of laboratory-supplied, precleaned sample containers from the sample cooler, label containers with an indelible marker and fill out a Chain of Custody form (refer to Section 1.10.2).
5. Don a new pair of disposable laboratory gloves (nitrile).
6. Utilize a sterile, disposable sample scoop to collect sufficient sample volume to fill the container.
7. Once each sample container has been filled, replace the sample container cap.
8. Return the sample containers to the cooler.
9. Record notes in field log book as described in Section 1.10.3.
10. If reusable sampling equipment was utilized, decontaminate the sampling equipment according to the procedures described in Section 1.8.
11. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum or other approved container for disposal.

1.7.4 Rinse Water/Blind Duplicate Samples

The following protocol will be adhered to for the collection of rinse water samples and the blind duplicate sample:

1. Be certain that the sample location is noted on a sample location sketch (see Section 1.10).

2. Be certain that the sampling equipment is either new or has been decontaminated utilizing the procedures outlined in Section 1.8.

3. Select a sample location within the area. One rinse water sample and one duplicate will be collected from each SWMU.

4. Remove a set of laboratory-supplied, precleaned sample containers from the sample cooler, label containers with an indelible marker and fill out a Chain of Custody form (refer to Section 1.10.2).

5. Don a new pair of disposable laboratory gloves (nitrile).

6. Slowly pour water into the SWMU from hose. The minimum amount of water necessary to properly fill all of the sample containers should be utilized. Note: Since it is not possible to extract all of the water poured into the SWMU, the volume of the sample containers plus additional water will have to be poured into the SWMU in order to properly fill all of the sample containers. Record the approximate volume of water utilized in the field log book.

   Note: If water will not pool within the SWMU, construct a berm to ensure pooling. Absorbent material or similar means should be used to construct berm.

7. Allow the water to remain within the SWMU for approximately 10 minutes.

8. Collect the rinse water duplicate samples from the SWMU utilizing a new or decontaminated pipette. If the liquid level is of sufficient depth, containers may be filled by dunking the unpreserved container into the pooled liquid, or utilizing a dedicated unpreserved container to then fill the preserved sample container.

9. Once each sample container has been filled, replace the sample container cap.

10. Return the sample containers to the cooler.

11. Measure the wetted area of SWMU in each sample location and record in the field log book.

12. Record notes in field log book as described in Section 1.10.3.

13. If reusable sampling equipment was utilized, decontaminate the sampling equipment according to the procedures described in Section 1.8.

14. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum or other approved container for disposal.

1.7.5 Rinse Water Blank Sample

The following protocol will be adhered to for the collection of the rinse water blank sample:

1. Be certain that the sample location is noted on a sample location sketch (see Section 1.10).
2. Be certain that the sampling equipment is either new or has been decontaminated utilizing the procedures outlined in Section 1.8.
3. Remove a set of laboratory-supplied, precleaned sample containers from the sample cooler, label containers with an indelible marker and fill out a Chain of Custody form (refer to Section 1.10.2).
4. Don a new pair of disposable laboratory gloves (nitrile).
5. Collect the rinse water blank sample by filling each container directly from the hose or other source utilized to supply water to the area for the decontamination activities. The hose water should be passed from the hose through a sterile disposable syringe/pipette (the same type utilized for collecting the rinse water samples) into the sample container.
6. Once each sample container has been filled, replace the sample container cap.
7. Return the sample containers to the cooler.
8. Record notes in field log book as described in Section 1.10.3.
9. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum or other approved container for disposal.

1.8 Decontamination Procedures

Whenever feasible, all field sampling equipment should be dedicated to a particular sampling location. In instances where this is not possible, a field cleaning (decontamination) procedure will be used in order to reduce the risk of cross-contamination between sample locations. A decontamination station will be established for all field activities if field decontamination is necessary. This will be an area located at some distance from the sampling locations so as not to adversely impact the decontamination procedure while still allowing the sampling team to keep equipment handling to a minimum.

1.8.1 Field Decontamination Procedures

All nondisposable equipment will be decontaminated at appropriate intervals (e.g., prior to initial use, prior to moving to a new sampling interval or location, and prior to leaving the site). Different decontamination procedures are used for the various types of equipment utilized to perform the field activities. When designing a field decontamination program, it is advisable to initiate environmental sampling in the area of the site with the lowest contaminant probability and proceed through to the areas of highest suspected contamination.

1.8.2 Decontamination Procedure for Sampling Equipment

All Teflon, polyvinyl chloride (PVC), high density polyethylene (HDPE) and stainless steel sampling equipment will be decontaminated utilizing the following procedure:

- Wash thoroughly with nonresidual detergent (e.g., alconox) and clean potable tap water using a brush to remove particulate matter or surface film.
- Rinse thoroughly utilizing distilled or deionized water.
- Wrap completely in clean aluminum foil with dull side against the equipment.

The first step, a soap and water wash, is designed to remove all visible particulate matter and residual oil and grease. The distilled/deionized water rinse ensures complete removal of residual cleaning products and the aluminum wrap protects the equipment from contamination and keeps it clean for use at another sampling location.

1.9 Laboratory Sample Custody Procedures

A NYSDOH ELAP certified laboratory meeting the requirements for sample custody procedures, including cleaning and handling sample containers and analytical equipment, will be used. The Standard Operating Procedures of the laboratory selected to undertake the analysis of environmental samples for this program will be available upon request.

1.10 Field Management Documentation

Proper management and documentation of field activities is essential to ensure that all necessary work is conducted in accordance with this Quality Assurance Project Plan in an efficient and high quality manner. Field management procedures include following proper chain of custody procedures to track a sample from collection through analysis, noting when and how samples are split (if required), completing Chain of Custody forms and maintaining a daily field log book. Proper completion of the Chain of Custody and the field log book are necessary to support the future actions that may result from the sample analysis. This documentation will support that the samples were properly collected and handled.

1.10.1 Location Sketch

Each sampling point shall have its own location sketch with measurements and permanent references if possible. This sketch will be recorded in the field log book.

1.10.2 Chain of Custody

A Chain of Custody (COC) form is initiated at the laboratory with container preparation and transportation to the site. The COC must remain with the samples at all times and bear the name of the person assuming responsibility for the samples. This person is tasked with ensuring secure and proper handling of the containers and samples. When the form is complete, it should indicate that there were no lapses in sample accountability.

A sample is considered to be in an individual's custody if any of the following conditions are met:

- It is in the individual's physical possession, or

- It is in the individual’s view after being in his or her physical possession, or
- It is secured by the individual so that no one can tamper with it, or
- The individual puts it in a designated and identified secure area.

In general, Chain of Custody forms are provided by the laboratory contracted to perform the analytical services. At a minimum, the following information shall be provided on these forms:

- Project name and address
- Project number
- Sample identification number of each sample contained in the sample cooler
- Date of sample collection
- Time of sample collection
- Sample location
- Sample type/matrix
- Analyses requested
- Number of containers and volume collected
- Remarks (e.g., preservation, special handling, etc.)
- Sampler(s) name(s) and signature(s)
- Spaces for relinquished by/received by signature and date/time.

For this particular study, Chain of Custody forms provided by the laboratory will be utilized.

The Chain of Custody form is completed and signed by the person performing the sampling activities. The original form travels with the samples and is signed and dated each time the samples are relinquished to another party, until it reaches the laboratory or analysis is completed. The field sampler maintains a copy of the Chain of Custody form and a copy is retained for the project file. Each sample container must also be labeled with an indelible marker with a minimum of the following information:

- Sample identification number
- Project name/location
- Analysis to be performed
- Date and time of collection
- Sampler's initials

A copy of the completed Chain of Custody form is returned by the laboratory with the analytical results.

1.10.3 Field Log Book

Field log books must be bound and should have consecutively numbered, water resistant pages. All pertinent information regarding the site, project and sampling procedures must be documented. Notations should be made in log book fashion, noting the time and date of all entries. Information recorded in the log book should include, but is not necessarily be limited to, the following:

The first page of the log contains the following information:

- Project name and address
- Name, address and phone number of field contact
- Name, address and phone number of subcontractors and contact persons

Daily entries are made for the following information:

- Purpose of sampling
- Sampling location
- Number and volume(s) of sample(s) collected
- Description of sample location and sampling methodology
- Date and time of sample collection and personnel arrival and departure
- Geologic description of each sample interval, if applicable
- Collector's sample identification number(s)
- Sample distribution and method of storage and transportation
- References, such as sketches of the sample location or photographs of sample collection with dimensions
- Field observations such as weather conditions, visual signs of staining and/or stressed vegetation
- Signature of personnel responsible for completing log entries

1.11 Calibration Procedures and Preventive Maintenance

The following information regarding equipment will be maintained at the project site if monitoring is deemed necessary for health and safety purposes:

1. Equipment calibration and operating procedures which will include provisions for documentation of frequency, conditions, standards and records reflecting the calibration procedures, methods of usage and repair history of the measurement system. Calibration of field equipment will be completed daily at the sampling site so that any background contamination can be taken into consideration and the instrument calibrated accordingly.

2. A schedule of preventive maintenance tasks, consistent with the instrument manufacturer's specific operation manuals, that will be carried out to minimize down time of the equipment.

3. Critical spare parts, necessary tools and manuals will be on hand to facilitate equipment maintenance and repair.

1.12 Performance of Field Audits

During field activities, if determined to be necessary, the QA/QC Officer will accompany sampling personnel into the field, verify that the site sampling program is being properly implemented and detect and define problems so that resolutions can be determined and implemented. All findings will be documented and provided to the Field Operations Manager.

1.13 Control and Disposal of Contaminated Material

Contaminated materials generated during this field program will primarily be limited to spent protective clothing, spent disposable sampling equipment and wastes generated as a result of equipment decontamination.

Any contaminated materials generated as a result of the field program will be contained in U.S. Department of Transportation (DOT) 55-gallon drums and staged in a designated area for subsequent waste characterization. Each drum will be identified by the type of material contained.

Decisions regarding the disposal of drummed material will be made, at least in part, based on the analytical results of the samples collected during this program. At the present time, there is no provision for separate analysis of contained material.

Decontamination water and sediment, if any, will be contained in 55-gallon drums. A decision regarding disposal of this material will be made following receipt of the sample results. Analysis of decontamination water/sediment may be required for proper management.

DOT-approved 55-gallon drums will be available for disposal of spent protective clothing and disposable sampling equipment, if any. These drums will be marked and labeled as containing personnel protective and sampling equipment. These drums will not be sampled. All drums will be sealed and staged on site to await proper off-site disposal.

1.14 Data Validation

Data validation will be performed in order to define and document analytical data quality in accordance with NYSDEC requirements that project data must be of known and acceptable quality. The analytical and validation processes will be conducted in conformance with the July 2005 NYSDEC ASP and USEPA CLP Statements of Work (SOW) dated September 2016. The validation will be performed by an individual meeting the qualification requirements for a data validator for the NYSDEC.

The USEPA Functional Guidelines for Evaluating Organics and Inorganics Analyses for the CLP will be used for the data validation process. The data validation process will ensure that all analytical requirements specific to this sampling program, including this Quality Assurance Project Plan, are followed. Procedures will address validation of routine analytical services (RAS) results based on the NYSDEC Target Compound List (TCL) for standard sample matrices.

The data validation process will provide an informed assessment of the laboratory's performance based upon contractual requirements and applicable analytical criteria. The report generated as a result of the data validation process will provide a base upon which the usefulness of the data can be evaluated by the end user of the analytical results. The overall level of effort and specific data validation procedure to be used will be equivalent to a "20% validation" of all analytical data in any given data package.

During the review process, it will be determined whether the contractually-required laboratory submittals for sample results are supported by sufficient back-up data and QA/QC results to enable the reviewer to conclusively determine the quality of data. Each data package will be checked for completeness and technical adequacy of the data. Upon completion of the review, the reviewer will develop a QA/QC data validation report for each analytical data package.

"Qualified" analytical results for any one field sample are established and presented based on the results of specific QC samples and procedures associated with its sample analysis group or batch. Precision and accuracy criteria (i.e., QC acceptance limits) are used in determining the need for qualifying data. Where test data have been reduced by the laboratory, the method of reduction will be described in the report. Reduction of laboratory measurements and laboratory reporting of analytical parameters shall be verified in accordance with the procedures specified in the NYSDEC program documents for each analytical method (i.e., recreate laboratory calculations and data reporting in accordance with the method specific procedure). The standard operating guideline manuals and any special analytical methodology required are expected to specify documentation needs and technical criteria and will be taken into consideration in the validation process. Copies of the complete ASP Category B deliverables will be submitted to the NYSDEC for review. Copies of the validation report, including the laboratory result data report sheets, with any qualifiers deemed appropriate by the data reviewer, and a supplementary field QC sample result summary statement, will be submitted to the NYSDEC, if requested.

Examples of standard organic and inorganic data validation reporting formats and completeness inventory lists which are proposed for use on this project are contained in Exhibit B. These report forms will be modified as necessary and made appropriate for any project specific or NYSDEC requirements.

The following is a description of the two-phased approach to data validation planned to be used on this project. The first phase is called "checklisting" and the second phase is the analytical quality review, with the former being a subset of the latter.

- Checklisting - The data package is checked for correct submission of the contract required deliverables, correct transcription from the raw data to the required deliverable summary forms and proper calculation of a number of parameters.

- Analytical Quality Review - The data package is closely examined to recreate the analytical process and verify that proper and acceptable analytical techniques have been performed. Additionally, overall data quality and laboratory performance is evaluated by applying the appropriate data quality criteria to the data to reflect conformance with the specified, accepted QA/QC standards and contractual requirements.

At the completion of the data validation, a Summary Data Validation/Usability Report will be prepared and submitted to the NYSDEC, if requested.

1.15 Performance and System Audits

A NYSDOH ELAP certified laboratory, which has satisfactorily completed performance audits and performance evaluation samples, shall be used on this project.

1.16 Corrective Action

A NYSDOH ELAP certified laboratory shall meet the requirements for corrective action protocols, including sample "cleanup" to attempt to eliminate/mitigate "matrix interference." Sample "cleanup" is not required for samples to be analyzed for volatile organic compounds or select metals. However, sample "cleanup" is required for samples to be analyzed for semivolatile organic compounds.

1.17 Duplicate

The primary purpose of a duplicate sample is to determine the analytical precision of the laboratory contracted to perform the sample analyses. A duplicate sample is collected in the same manner as one of the environmental samples and analyzed for the same constituents. In this manner, the precision of the laboratory can be checked. One duplicate of a rinse water and/or soil/sand sample will be collected and analyzed during decontamination of each SWMU identified in this decontamination program.

EXHIBIT A

DETECTION LIMITS

Volatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Aqueous Samples

	Volatile Analyte	CAS Number	Trace Water By SIM (µg/L)	Trace Level Water (µg/L)	Low Level Water (µg/L)
1.	Dichlorodifluoromethane	75-71-8		0.50	5.0
2.	Chloromethane	74-87-3		0.50	5.0
3.	Vinyl Chloride	75-01-4		0.50	5.0
4.	Bromomethane	74-83-9		0.50	5.0
5.	Chloroethane	75-00-3		0.50	5.0
6.	Trichlorofluoromethane	75-69-4		0.50	5.0
7.	1,1-Dichloroethene	75-35-4		0.50	5.0
8.	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1		0.50	5.0
9.	Acetone	67-64-1		5.0	10.0
10.	Carbon Disulfide	75-15-0		0.50	5.0
11.	Methyl Acetate	79-20-9		0.50	5.0
12.	Methylene chloride	75-09-2		0.50	5.0
13.	trans-1,2-Dichloroethene	156-60-5		0.50	5.0
14.	Methyl tert-Butyl Ether	1634-04-4		0.50	5.0
15.	1,1-Dichloroethane	75-34-3		0.50	5.0
16.	cis-1,2-Dichloroethene	156-59-2		0.50	5.0
17.	2-Butanone	78-93-3		5.0	10.0
18.	Bromochloromethane	74-97-5		0.50	5.0
19.	Chloroform	67-66-3		0.50	5.0
20.	1,1,1-Trichloroethane	71-55-6		0.50	5.0
21.	Cyclohexane	110-82-7		0.50	5.0
22.	Carbon tetrachloride	56-23-5		0.50	5.0
23.	Benzene	71-43-2		0.50	5.0
24.	1,2-Dichloroethane	107-06-2		0.50	5.0
25.	1,4-Dioxane	123-91-1	1.0	25	125
26.	Trichloroethane	79-01-6		0.50	5.0

Volatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Aqueous Samples (Continued)

	Volatile Analyte	CAS Number	Trace Water By SIM (µg/L)	Trace Level Water (µg/L)	Low Level Water (µg/L)
27.	Methylcyclohexane	108-87-2		0.50	5.0
28.	1,2-Dichloropropane	78-87-5		0.50	5.0
29.	Bromodichloromethane	75-27-4		0.50	5.0
30.	cis-1,3-Dichloropropene	10061-01-5		0.50	5.0
31.	4-methyl-2-pentanone	108-10-1		5.0	10.0
32.	Toluene	108-88-3		0.50	5.0
33.	Trans-1,3-Dichloropropene	10061-02-6		0.50	5.0
34.	1,1,2-Trichloroethane	79-00-5		0.50	5.0
35.	Tetrachloroethene	127-18-4		0.50	5.0
36.	2-Hexanone	591-78-6		5.0	10.0
37.	Dibromochloromethane	124-48-1		0.50	5.0
38.	1,2-Dibromoethane	106-93-4	0.05	0.50	5.0
39.	Chlorobenzene	108-90-7		0.50	5.0
40.	Ethylbenzene	100-41-4		0.50	5.0
41.	Xylenes (Total)	1330-20-7		0.50	5.0
42.	Styrene	100-42-5		0.50	5.0
43.	Bromoform	75-25-2		0.50	5.0
44.	Isopropylbenzene	98-82-8		0.50	5.0
45.	1,1,2,2-Tetrachloroethane	79-34-5		0.50	5.0
46.	1,3-Dichlorobenzene	541-73-1		0.50	5.0
47.	1,4-Dichlorobenzene	106-46-7		0.50	5.0
48.	1,2-Dichlorobenzene	95-50-1		0.50	5.0
49.	1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.50	5.0
50.	1,2,4-Trichlorobenzene	120-82-1		0.50	5.0
51.	1,2,3-Trichlorobenzene	87-61-6		0.50	5.0

Volatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Solid Samples

	Volatile Analyte	CAS Number	Low Level Soil (µg/Kg)	Med. Level Soil (µg/Kg)
1.	Dichlorodifluoromethane	75-71-8	5.0	500
2.	Chloromethane	74-87-3	5.0	500
3.	Vinyl Chloride	75-01-4	5.0	500
4.	Bromomethane	74-83-9	5.0	500
5.	Chloroethane	75-00-3	5.0	500
6.	Trichlorofluoromethane	75-69-4	5.0	500
7.	1,1-Dichloroethene	75-35-4	5.0	500
8.	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	5.0	500
9.	Acetone	67-64-1	10.0	1000
10.	Carbon Disulfide	75-15-0	5.0	500
11.	Methyl Acetate	79-20-9	5.0	500
12.	Methylene chloride	75-09-2	5.0	500
13.	trans-1,2-Dichloroethene	156-60-5	5.0	500
14.	Methyl tert-Butyl Ether	1634-04-4	5.0	500
15.	1,1-Dichloroethane	75-34-3	5.0	500
16.	cis-1,2-Dichloroethene	156-59-2	5.0	500
17.	2-Butanone	78-93-3	10.0	1000
18.	Bromochloromethane	74-97-5	5.0	500
19.	Chloroform	67-66-3	5.0	500
20.	1,1,1-Trichloroethane	71-55-6	5.0	500
21.	Cyclohexane	110-82-7	5.0	500
22.	Carbon tetrachloride	56-23-5	5.0	500
23.	Benzene	71-43-2	5.0	500
24.	1,2-Dichloroethane	107-06-2	5.0	500
25.	1,4-Dioxane	123-91-1	125	12500
26.	Trichloroethane	79-01-6	5.0	500
27.	Methylcyclohexane	108-87-2	5.0	500
28.	1,2-Dichloropropane	78-87-5	5.0	500

Volatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Solid Samples (Continued)

	Volatile Analyte	CAS Number	Low Level Soil (µg/Kg)	Med. Level Soil (µg/Kg)
29.	Bromodichloromethane	75-27-4	5.0	500
30.	cis-1,3-Dichloropropene	10061-01-5	5.0	500
31.	4-methyl-2-pentanone	108-10-1	10.0	1000
32.	Toluene	108-88-3	5.0	500
33.	Trans-1,3-Dichloropropene	10061-02-6	5.0	500
34.	1,1,2-Trichloroethane	79-00-5	5.0	500
35.	Tetrachloroethene	127-18-4	5.0	500
36.	2-Hexanone	591-78-6	10.0	1000
37.	Dibromochloromethane	124-48-1	5.0	500
38.	1,2-Dibromoethane	106-93-4	5.0	500
39.	Chlorobenzene	108-90-7	5.0	500
40.	Ethylbenzene	100-41-4	5.0	500
41.	Xylenes (Total)	1330-20-7	5.0	500
42.	Styrene	100-42-5	5.0	500
43	Bromoform	75-25-2	5.0	500
44.	Isopropylbenzene	98-82-8	5.0	500
45.	1,1,2,2-Tetrachloroethane	79-34-5	5.0	500
46.	1,3-Dichlorobenzene	541-73-1	5.0	500
47.	1,4-Dichlorobenzene	106-46-7	5.0	500
48.	1,2-Dichlorobenzene	95-50-1	5.0	500
49.	1,2-Dibromo-3-chloropropane	96-12-8	5.0	500
50.	1,2,4-Trichlorobenzene	120-82-1	5.0	500
51.	1,2,3-Trichlorobenzene	87-61-6	5.0	500

Inorganic Target Compound List (TCL) and
Contract Required Quantitation Limits (CRQLs)
For Aqueous and Solid Samples

	Analyte	CAS Number	ICP-AES[1] CRQL for Water (µg/L)	ICP-AES[1] CRQL for Solids (mg/Kg)	ICP-MS[1] for Water (µg/L)
1.	Aluminum	7429-90-5	200	40	30
2.	Antimony	7440-36-0	60	12	2
3.	Arsenic	7440-38-2	15	3	1
4.	Barium	7440-39-3	200	40	10
5.	Beryllium	7440-41-7	5	1	1
6.	Cadmium	7440-43-9	5	1	1
7	Calcium	7440-70-2	5000	1000	--
8.	Chromium	7440-47-3	10	2	2
9.	Cobalt	7440-48-4	50	10	0.5
10.	Copper	7440-50-8	25	5	2
11.	Iron	7439-89-6	100	20	--
12.	Lead	7439-92-1	10	2	1
13.	Magnesium	7439-95-4	5000	1000	--
14.	Manganese	7439-96-5	15	3	0.5
15.	Mercury[2]	7439-97-6	0.2	0.1	--
16.	Nickel	7440-02-0	40	8	1
17.	Potassium	7440-09-7	5000	1000	--
18.	Selenium	7782-49-2	35	7	5
19.	Silver	7440-22-4	10	2	1
20.	Sodium	7440-23-5	5000	1000	--
21.	Thallium	7440-28-0	25	5	1
22.	Vanadium	7440-62-2	50	10	1
23.	Zinc	7440-66-6	60	12	1
24.	Cyanide[2]	57-12-5	10	1	--

EXHIBIT B

DATA VALIDATION FORMS

D&B ENGINEERS AND ARCHITECTS, P.C.

DATA VALIDATION CHECKLIST

Project Name:	
Project Number:	
Sample Date(s):	
Sample Team:	
Matrix/Number of Samples:	Water/ Soil/ Field Duplicates/ Trip Blanks / Field Blanks/
Analyzing Laboratory:	
Analyses:	Volatile organic compounds (VOCs), by USEPA method SW846 8260B Semi volatile organic compounds (SVOCs), by USEPA method SW846 8270C Polychlorinated biphenyls PCBs by USEPA SW846 Method 8082 RCRA Metals: by SW846 Method 6010 and mercury (Hg) by Method 7471
Laboratory Report No:	Date:

ANALYTICAL DATA PACKAGE DOCUMENTATION GENERAL INFORMATION

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Sample results					
2. Parameters analyzed					
3. Method of analysis					
4. Sample collection date					
5. Laboratory sample received date					
6. Sample analysis date					
7. Copy of chain-of-custody form signed by Lab sample custodian					
8. Narrative summary of QA or sample problems provided					

QA - quality assurance

Comments:

The data packages are reviewed in accordance with the NYSDEC 7/05 ASP Quality Assurance/Quality Control (QA/QC) requirements. A validation is conducted on the data package and any applicable qualification of the data is determined using the USEPA National Functional Guidelines of January 2017, or USEPA National Functional Guidelines of Inorganic Data Review, January 2017, method performance criteria, and D&B Engineers and Architects, P.C. professional judgment.

D&B Engineers and Architects, P.C.

Laboratory Report:
SAMPLE AND ANALYSIS LIST

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent ID	Analysis			
					VOC	SVOC	PCB	Metals

ORGANIC ANALYSES
VOCS

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Holding times					
2. Blanks					
A. Method blanks					
B. Trip blanks					
C. Field blanks					
3. Matrix spike (MS) %R					
4. Matrix spike duplicate (MSD) %R					
5. MS/MSD precision (RPD)					
6. Laboratory Control Sample (LCS) %R					
7. Surrogate spike recoveries					
8. Instrument performance check					
9. Internal standard retention times and areas					
10. Initial calibration RRF's and %RSD's					
11. Continuing calibration RRF's and %D's					
12. Transcriptions – quant report vs. Form I					
13. Tentatively Identified Compounds (TICs)					
14. Field duplicates RPD					

VOCs - volatile organic compounds
%R - percent recovery
%D - percent difference
%RSD - percent relative standard deviation
RRF - relative response factor
RPD - relative percent difference

Comments:

D&B ENGINEERS AND ARCHITECTS, P.C.

ORGANIC ANALYSES
SVOCS

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Holding times					
2. Blanks					
A. Method blanks					
B. Field blank					
3. Matrix spike (MS) %R					
4. Matrix spike duplicate (MSD) %R					
5. MS/MSD precision (RPD)					
6. Laboratory Control Sample (LCS) %R					
7. Surrogate spike recoveries					
8. Instrument performance check					
9. Internal standard retention times and areas					
10. Initial calibration RRF's and %RSD's					
11. Continuing calibration RRF's and %D's					
12. Transcriptions – quant report vs. Form I					
13. Tentatively identified compounds (TICs)					
14. Field duplicates RPD					

SVOCs –Semi- volatile organic compounds %D - percent difference RRF - relative response factor
%R - percent recovery %RSD - percent relative standard deviation RPD - relative percent difference

Comments:

D&B ENGINEERS AND ARCHITECTS, P.C.

ORGANIC ANALYSES
PCBs

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Holding times					
2. Blanks					
A. Method blanks					
B. Field blanks					
3. Matrix spike (MS) %R					
4. Matrix spike duplicate (MSD) %R					
5. MS/MSD precision (RPD)					
6. Laboratory Control Sample (LCS) %R					
7. Surrogate spike recoveries					
8. GC Surrogate retention time summary					
9. Initial calibration %RSD's					
10. Continuing calibration %D's					
11. Transcriptions – quant report vs. Form I					
12. Field duplicates RPD					

PCBs – Polychlorinated Biphenyls
%R - percent recovery
%D - percent difference
%RSD - percent relative standard deviation
RRF - relative response factor
RPD - relative percent difference

Comments:

D&B ENGINEERS AND ARCHITECTS, P.C.

INORGANIC ANALYSES
METALS

	Reported		Performance Acceptable		Not
	No	Yes	No	Yes	Required
1. Holding times					
2. Blanks					
A. Preparation and calibration blanks					
B. Field blanks					
3. Initial calibration verification %R					
4. Continuing calibration verification %R					
5. CRDL standard %R					
6. Interference check sample %R					
7. Laboratory control sample %R					
8. Spike sample %R					
9. Post digestive spike sample %R					
10. Duplicate RPD					
11. Serial dilution check %D					
12. Total verse dissolved results					
13. Field duplicates RPD					

%R - percent recovery %D - percent difference RPD - relative percent difference

Comments:

D&B ENGINEERS AND ARCHITECTS, P.C.

DATA VALIDATION AND QUALIFICATION SUMMARY **Laboratory Report:**

Sample ID	Analyte(s)	Qualifier	Reason(s)
VOCS			
SVOCS			
PCBs			
METALS			

VALIDATION PERFORMED BY & DATE:	
VALIDATION PERFORMED BY SIGNATURE:	