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Table A-1. Summary of Data Quality Objectives and Associated Measurement Performance Criteria

Data Quality Objective	Measurement Performance Criteria
Identify sediments where MPA meets or exceeds the specified thresholds	- Establish sampling domain measuring sediment type that accurately distinguishes cohesive, non-cohesive, and sediments in between - Define sampling density sufficient to maintain spatial correlation between MPA of neighboring samples and/or yield log mean MPA with upper 95% confidence limit no greater than 1.5 times the log mean - Core entire column of soft sediments in sampling domain - Coordinates of core locations must have less than 1-ft error - Measure PCB concentration, bulk density and moisture content in core samples to support calculation of PCB MPA - Total PCBs must be measured, but relationship to Tri+ PCBs must be established based on both homolog and Aroclor PCBs
Identify potential of River Section 3 sediments with MPA meeting or exceeding 10 g/m^2 Tri+ PCBs to be a significant source of PCBs to the water column and fish because of erodability	- Measure ^{137}Cs in 0-2 inch sediment layer using methods with detection limits no greater than 50 pCi/kg - Section one third of cores from River Section 3 Target Areas in 6 inch increments to observe erosional patterns and the depth of the buried PCB concentration peak - River Section 3 Screening Areas meeting or exceeding 10 g/m^2, second round of sampling at half of the unsampled 80 ft grid nodes - Section second round cores in 6 inch segments

Table A-1. Summary of Data Quality Objectives and Associated Measurement Performance Criteria

Data Quality Objective	Measurement Performance Criteria
Identify navigational channel areas that must be deepened for remedy implementation	- Measure water depths with sufficient spatial resolution to define boundaries of navigational channel and bathymetry within the channel (2-ft interval along cross-channel transects) - Measure the horizontal location of the soundings with accuracy of 1-2 inches
Identify the depth of sediments containing detectable Tri+PCBs in all sediment deposits targeted for removal	- Measure the depth of sediment below which Tri+ PCBs are not detected to accuracy of about 6 inches
Identify bathymetric contours	- Define sampling density sufficient to maintain spatial correlation between water depths of neighboring samples (a few feet across channel and several hundred feet along channel) - Measurement of water depth must have an error no greater than a few inches - Horizontal coordinates of measurement must have an error no greater than a few inches
Establish depth of soft sediment and whether PCBs are present in soft sediments abutting hard bottom	- Measurement must distinguish between dredgable sediments and hard bottom - Distance between depth in sediment bed below which PCBs are not detected and the soft sediment thickness will be determined at each sampling location
Identify locations where boulders and debris are present in sediments targeted for removal	- Sediment core sampling and manual probing must include recording of locations and depths of encounter with obstructions - Determine locations of large objects on side scan sonar

Table A-1. Summary of Data Quality Objectives and Associated Measurement Performance Criteria

Data Quality Objective	Measurement Performance Criteria
Determine variability of geotechnical properties to support determination of the need for a more comprehensive field investigation	- Measure geotechnical properties on 5% of sediment sampling cores collected for PCB analysis - Samples must be collected over the range of sediment types - Correlation between geotechnical data and property measurements on sediment cores collected to establish need for more detailed field investigation
Screen makeup and integrity of geologic strata to support decision regarding necessity of a detailed investigation	- Manual probing of sediments will include collection of depth of soft sediment and type of overlying sediment to assess the make-up and integrity of geologic strata - Spatial variability of sub-bottom geology and ability of probing to delineate sub-bottom geology are to be used to assess need and scope of detailed investigation to be conducted as part of remedial design
Collect chemical characterization data for preliminary assessment of dredge material disposal options	- Measure suite of chemicals and sediment properties needed to evaluate RCRA hazardous waste characteristics and dioxins/furans - Samples should be from sediments targeted for removal - Entire sediment column should be composited and analyzed
Collect sufficient data to identify the suite other pollutants present in sediments underlying PCB-containing sediments and range of concentrations present	- Measure concentrations in core segment just below the depth of PCB contamination specified by the 1 ppm threshold - Measure chemicals expected based on past practices in the watershed (RCRA metals; dioxins/furans) - Select samples at random from areas targeted for sediment removal to achieve unbiased sampling of range of conditions

TABLE A-2. Decision Criteria Used for Initial Disposal Classification of Sediments Under RCRA and TSCA Disposal Rules.

Measurement	Regulatory Criteria	Test Method	Regulatory Reference
Total PCBs	50 ppm	USEPA Method 8082	40 CFR § 761.61
RCRA Metals			
arsenic	5.0 mg/L		
barium	100.0 mg/L		
cadmium	1.0 mg/L		
chromium	5.0 mg/L	USEPA Method 1311	40 CFR § 261.24
lead	5.0 mg/L		
mercury	0.2 mg/L		
selenium	1.0 mg/L		
silver	5.0 mg/L		
RCRA Organics			
benzene	0.5 mg/L		
carbon tetrachloride	0.5 mg/L		
chlordane	0.03 mg/L		
chlorobenzene	100 mg/L		
chloroform	6.0 mg/L		
cresols (o-, m-, p-, total)	200.0 mg/L		
2,4-D	10.0 mg/L		
1,4-dichlorobenzene	7.5 mg/L		
1,2-dichloroethane	0.5 mg/L		
1,1-dichoroethylene	0.7 mg/L		
2,4-dinitrotoluene	0.13 mg/L		
Endrin	0.02 mg/L		
Heptachlor (+ it's epoxide)	0.008 mg/L		
hexachlorobenzene	0.13 mg/L		
hexachlorobutadiene	0.5 mg/L	USEPA Method 1311	40 CFR § 261.24
hexachloroethane	3.0 mg/L		
lindane	0.4 mg/L		
Methoxychlor	10.0 mg/L		
methyl ethyl ketone	200.0 mg/L		
nitrobenzene	2.0 mg/L		
pentachlorophenol	100.0 mg/L		
pyridine	5.0 mg/L		
tetrachloroethylene	0.7 mg/L		
Toxaphene	0.5 mg/L		
trichloroethylene	0.5 mg/L		
2,4,5-trichlorophenol	400.0 mg/L		
2,4,6-trichlorophenol	2.0 mg/L		
2,4,5-TP (Silvex)	1.0 mg/L		
vinyl chloride	0.2 mg/L		
Dioxins/Furans	> DL	EPA Method 1613B	40 CFR § 268.31
Ignitability	characteristic	none - regulatory definition	40 CFR § 261.23

Table B-1.
Example Sample ID and Horizontal Coordinates for 80 ft Nodal Spacing for Cores in River Section 1.

Sample ID[1]	Easting	Northing
195194_WS001	698440.00000	1188806.75000
195194_WS002	698400.00000	1188876.00000
195194_WS003	698480.00000	1188876.00000
195194_WS004	698560.00000	1188876.00000
195194_WS005	698440.00000	1188945.25000
195194_WS006	698520.00000	1188945.25000
195194_WS007	698600.00000	1188945.25000
195194_WS008	698680.00000	1188945.25000
195194_WS009	698400.00000	1189014.50000
195194_WS010	698480.00000	1189014.50000
195194_WS011	698560.00000	1189014.50000
195194_WS012	698640.00000	1189014.50000
195194_WS013	698720.00000	1189014.50000
195194_WS014	698800.00000	1189014.50000
195194_WS015	698360.00000	1189083.75000
195194_WS016	698440.00000	1189083.75000
195194_WS017	698520.00000	1189083.75000
195194_WS018	698600.00000	1189083.75000
195194_WS019	698680.00000	1189083.75000
195194_WS020	698760.00000	1189083.75000
195194_WS021	698320.00000	1189153.00000
195194_WS022	698400.00000	1189153.00000
195194_WS023	698480.00000	1189153.00000
195194_WS024	698640.00000	1189153.00000
195194_WS025	698720.00000	1189153.00000
195194_WS026	698800.00000	1189153.00000
195194_WS027	698280.00000	1189222.25000
195194_WS028	698360.00000	1189222.25000
195194_WS029	698440.00000	1189222.25000
195194_WS030	698600.00000	1189222.25000
195194_WS031	698680.00000	1189222.25000
195194_WS032	698760.00000	1189222.25000
195194_WS033	698240.00000	1189291.50000
195194_WS034	698320.00000	1189291.50000
195194_WS035	698400.00000	1189291.50000
195194_WS036	698560.00000	1189291.50000
195194_WS037	698640.00000	1189291.50000
195194_WS038	698720.00000	1189291.50000
195194_WT039	699440.00000	1189291.50000
195194_WS040	698200.00000	1189360.75000
195194_WS041	698280.00000	1189360.75000

[1]First 6 characters indicate river miles cores fall between
First character after the underscore indicates location relative to navigational channel:
W=west of channel
C=in channel
E=east of channel
Second character after the underscore indicates Target Area or Screening Area (T or S)
Last three numbers sequential between each river mile

TABLE B-2
SEDIMENT SAMPLING PROGRAM SUMMARY
RIVER SECTION 1

NOTE: NUMBERS OF CORES AND CORRESPONDING SAMPLES ARE ESTIMATES BASED ON HISTORICAL DATA. ACTUAL NUMBERS WILL VARY.

Areas to be Investigated	Number of Cores to be Collected		Analytical Program	Analysis *(Analytical Method)*	Sample Type	Environmental Samples *(2)*		Field Duplicates		Total Samples
	Phase 1	*Phase 2 (1)*				*Phase 1*	*Phase 2*	*Phase 1*	*Phase 2*	*Phase 1 + Phase 2*
Target Areas	**1865**	**0**	**Sediment Characterization For Area Delineation**	**Total PCBs as Aroclors** (*SOP GEHR8082*) **Moisture Content** *(ASTM D2216-98)* **Bulk Density** *(except top 2" segment, field measurement)*	Each Core Segment	11445	2120	572	106	14243
Areas to be Screened	**424**	**424**		**Total Organic Carbon** (*Lloyd Kahn Method*) **^{137}Cs** *(Gamma Ray Spectroscopy)* **Bulk Density** (*ASTM D4531-86, mod.*)	Top 2 Inch Core Segments Only	2289	424	114	21	2849
				Homolog PCBs (*USEPA 680)*	13% of Aroclor Samples (3)	400	0	20	0	420
					4% of Aroclor Samples *(4)*	458	85	23	4	990
				Total RCRA Metals *(SW-846 6010B/7471A)* **Dioxins/Furans** *(EPA Method 1613B)*	2% of Cores, Bottom Core Segments Only *(5)*	46	8	2	0	57
			Geotechnical Characterization	**Grain Size Distribution** *(ASTM D422)* **Atterberg Limit** *(ASTM D4318-00)* **Specific Gravity** *ASTM D854-001)* **USCS Classification** *(ASTM D2487)* **Total Organic Carbon** *(Lloyd Kahn Method)*	5% of Core Segments	572	106	29	5	712
			Disposal Characterization	**TCLP Metals** *(SW-846 1311/6010B/7470A)* **TCLP Volatiles** *(SW-846 1311/8260B)* **TCLP Semivolatiles** *(SW-846 1311/8270C)* **TCLP Pesticides** *(SW-846 1311/8081A)* **TCLP Herbicides** *(SW-846 1311/8151A)* **Ignitability** *(SW-846)* **Dioxins/Furans** *(EPA Method 1613B)*	Core Composites	20	0	1	0	21
			Side-Scan Sonar Survey Confirmation Sampling *(6)*	**Grain Size Distribution** *(ASTM D422)*	Top 1 Inch of Cores	150	0	8	0	158

(1) - Assumes all locations sampled in Phase 2.
(2) - Assumes 5 samples generated per core.
(3) - Selected randomly from positive sediment sample extracts in the first 2 weeks.
(4) - Selected randomly from positive sediment sample extracts after the first 2 weeks.
- Minimum of 350 sample extracts analyzed from all river sections.
(5) - First core segment immediately below the deepest segment in which PCBs are measured at >1 ppm.
(6) - Cores will be collected as part of a separate program conducted in 2003.

TABLE B-3
SEDIMENT SAMPLING PROGRAM SUMMARY
RIVER SECTION 2

NOTE: NUMBERS OF CORES AND CORRESPONDING SAMPLES ARE ESTIMATES BASED ON HISTORICAL DATA. ACTUAL NUMBERS WILL VARY.

Areas to be Investigated	Number of Cores to be Collected	Analytical Program	Analysis *(Analytical Method)*	Sample Type	Environmental Samples *(1)*	Field Duplicates	Total Samples
Target Areas	**534**	**Sediment Characterization For Area Delineation**	**Total PCBs as Aroclors** (*SOP GEHR8082)* **Moisture Content** *(ASTM D2216-98)* **Bulk Density** *(except top 2" segment, field measurement)*	Each Core Segment	5310	266	5576
Areas to be Screened	**528**		**Total Organic Carbon** (*Lloyd Kahn Method*) **^{137}Cs** *(Gamma Ray Spectroscopy)* **Bulk Density** (*ASTM D4531-86, mod.*)	Top 2 Inch Core Segments Only	1062	53	1115
			Homolog PCBs (USEPA 680*)*	4% of Aroclor Samples *(2)*	212	11	223
			Total RCRA Metals *(SW-846 6010B/7471A)* **Dioxins/Furans** *(EPA Method 1613B)*	2% of Cores, Bottom Core Segments Only *(3)*	21	1	22
		Geotechnical Characterization	**Grain Size Distribution** *(ASTM D422)* **Atterberg Limit** *(ASTM D4318-00)* **Specific Gravity** *ASTM D854-001)* **USCS Classification** *(ASTM D2487)* **Total Organic Carbon** *(Lloyd Kahn Method)*	5% of Core Segments	266	13	279
		Disposal Characterization	**TCLP Metals** *(SW-846 1311/6010B/7470A)* **TCLP Volatiles** *(SW-846 1311/8260B)* **TCLP Semivolatiles** *(SW-846 1311/8270C)* **TCLP Pesticides** *(SW-846 1311/8081A)* **TCLP Herbicides** *(SW-846 1311/8151A)* **Ignitability** *(SW-846)* **Dioxins/Furans** *(EPA Method 1613B)*	Core Composites	20	1	21
		Side-Scan Sonar Survey Confirmation Sampling *(4)*	**Grain Size Distribution** *(ASTM D422)*	Top 1 Inch of Cores	150	8	158

(1) - Assumes 5 samples generated per core.
(2) - Minimum of 350 positive sample extracts will be analyzed from all river sections.
(3) - First core segment immediately below the deepest segment in which PCBs are measured at >1 ppm.
(4) - Cores will be collected as part of a separate program conducted in 2003.

TABLE B-4
SEDIMENT SAMPLING PROGRAM SUMMARY
RIVER SECTION 3

NOTE: NUMBERS OF CORES AND CORRESPONDING SAMPLES ARE ESTIMATES BASED ON HISTORICAL DATA. ACTUAL NUMBERS WILL VARY.

Areas to be Investigated	Number of Cores to be Collected	Analytical Program	Analysis *(Analytical Method)*	Sample Type	Environmental Samples *(1)*	Field Duplicates	Total Samples
Target Areas	**944**	**Sediment Characterization For Area Delineation**	**Total PCBs as Aroclors** (*SOP GEHR8082)* **Moisture Content** *(ASTM D2216-98)* **Bulk Density** *(except top 2" segment, field measurement)*	Each Core Segment	10480	524	11004
Areas to be Screened	**1152**		**Total Organic Carbon** (*Lloyd Kahn Method*) **^{137}Cs** *(Gamma Ray Spectroscopy)* **Bulk Density** (*ASTM D4531-86, mod.*)	Top 2 Inch Core Segments Only	2096	105	2201
			Homolog PCBs (*USEPA 680)*	4% of Core Segments *(2)*	419	21	440
			Total RCRA Metals *(SW-846 6010B/7471A)* **Dioxins/Furans** *(EPA Method 1613B)*	2% of Cores, Bottom Core Segments Only *(3)*	42	2	44
		Geotechnical Characterization	**Grain Size Distribution** *(ASTM D422)* **Atterberg Limit** *(ASTM D4318-00)* **Specific Gravity** *ASTM D854-001)* **USCS Classification** *(ASTM D2487)* **Total Organic Carbon** *(Lloyd Kahn Method)*	5% of Core Segments	524	26	550
		Disposal Characterization	**TCLP Metals** *(SW-846 1311/6010B/7470A)* **TCLP Volatiles** *(SW-846 1311/8260B)* **TCLP Semivolatiles** *(SW-846 1311/8270C)* **TCLP Pesticides** *(SW-846 1311/8081A)* **TCLP Herbicides** *(SW-846 1311/8151A)* **Ignitability** *(SW-846)* **Dioxins/Furans** *(EPA Method 1613B)*	Core Composites	20	1	21
		Side-Scan Sonar Survey Confirmation Sampling *(4)*	**Grain Size Distribution** *(ASTM D422)*	Top 1 Inch of Cores	150	8	158

(1) - Assumes 5 samples generated per core.
(2) - Minimum of 350 positive sample extracts will be analyzed from all river sections.
(3) - First core segment immediately below the deepest segment in which PCBs are measured at >1 ppm.
(4) - Cores will be collected as part of separate program conducted in 2003

TABLE B-5: REQUIRED CONTAINERS, PRESERVATIVES AND ANALYSIS HOLDING TIMES FOR SEDIMENT SAMPLES

Fraction	Sediment Sample Bottle[1]	Preservative	Holding Time[2]
TCLP Volatiles	1 - 4 oz. glass w\ Teflon® lined enclosure. (Min. sample size needed = 25 g)	Cool to 4±2°C.	14 days till TCLP leachate generation; 14 days from leachate generation date to analyze TCLP leachate
TCLP Semivolatiles	1 – 8 oz. glass w\ Teflon® lined enclosure. (Min. sample size needed = 100 g)	Cool to 4±2°C.	14 days till TCLP leachate generation; 14 days till extraction/ 40 days to inject extract
TCLP Organochlorine Pesticides	from same 8 oz. as above. (Min. sample size needed = 100 g, same 100 g for all TCLP)	Cool to 4±2°C.	14 days till TCLP leachate generation; 14 days till extraction/ 40 days to inject extract
TCLP Herbicides	from same 8 oz. as above. (Min. sample size needed = 100 g, same 100 g for all TCLP)	Cool to 4°C.	14 days till TCLP leachate generation; 14 days till extraction/ 40 days to inject extract
TCLP Metals	from same 8 oz. as above. (Min. sample size needed = 100 g, same 100 g for all TCLP)	Cool to 4±2°C.	14 days till TCLP leachate generation; 180 days (28 days for Mercury) till analysis
PCBs (Aroclor or Homologs)	1 – 4 oz. glass w\ Teflon® lined enclosure. (Min. sample size needed = 10-20 g)	Cool to 4±2°C.	14 days till extraction/ 40 days to inject extract
TOC	from same 4 oz. as above (Min. sample size needed = 10-20 g)	Cool to 4±2°C.	28 days
Bulk Density and Moisture Content	from same 4 oz. as above (Min. sample size needed = 50 g)	Cool to 4±2°C.	Not applicable.
^{137}Ce	1 - 4 oz. glass w\ Teflon® lined enclosure (Min. sample size needed = 50 g)	Not applicable.	180 days
Total RCRA Metals	1 - 4 oz. glass w\ Teflon® lined enclosure. (Min. sample size needed = 10-g)	Cool to 4±2°C.	28 days Hg & 180 days all other metals
Dioxins/Furans	1 - 4 oz. Amber glass w\ Teflon® lined enclosure. (Min. sample size needed = 10-20 g)	Cool to 4±2°C.	30 days till extraction/ 45 days to complete analysis or freeze to <-10°C, then 1 year to extract; if extract if frozen <-10°C it may be stored for 1 year
Grain Size Distribution, Atterberg Limit, Specific Gravity, and USCS Classification	1 - 16 oz. glass w\ Teflon® lined enclosure[3].	Not applicable.	Not applicable.

NOTES:
1 - Depending on how sample analyses are distributed between the laboratories, additional sample bottles may be required.
2 - Holding times are from the date/time of sample collection unless otherwise stated.
3 - A larger volume (2-4 16 oz. containers) may be needed for very coarse sediment. See QAPP Section B.2.4.1.

Table B-6a
Hudson River Design Support Sediment Sampling and Analysis Program
Total PCBs as Aroclors
(Reference Limit and Evaluation Table)

Medium/Matrix: Sediment
Analytical Parameter: Total PCBs Aroclors
Concentration Level: Low to High
Fixed Laboratory Method/SOP: SOP GEHR8082 (see QAPP Appendix 5)

Analyte	CAS Number	Project Action Limit Goal* (mg/Kg – dry-weight)	Analytical Method[1]		Achievable Laboratory Limits [2] (mg/Kg – dry-weight)						
			MDLs (mg/kg)	Method Practical QLs (wet wt –mg/Kg)	Accutest Laboratories MDLs[3] (mg/kg)	Lancaster Laboratories MDLs[3] (mg/kg)	NEA Laboratories MDLs (mg/kg)	STL (Pittsburgh) MDLs[3] (mg/kg)	CT&E Laboratories MDLs[3] (mg/kg)	STL (Edison) MDLs[3] (mg/kg)	RLs[4] (mg/kg)
Aroclor-1016	12674-11-2	Not applicable	0.010	0.030	0.01128	0.00330	0.00911	Not Reported	Not Reported	0.02665	0.050
Aroclor-1221	11104-28-2	Not applicable	0.010	0.030	0.01341	0.00330	0.00900	0.01006	0.02810	0.01900	0.050
Aroclor-1232	11141-16-5	Not applicable	0.010	0.030	0.00383	0.00330	0.00816	Not Reported	Not Reported	0.00975	0.050
Aroclor-1242	53469-21-9	Not applicable	0.010	0.030	0.01119	0.00330	0.00861	0.00959	0.03270	0.03140	0.050
Aroclor-1248	12672-29-6	Not applicable	0.010	0.030	0.01055	0.00330	0.01037	Not Reported	Not Reported	0.04744	0.050
Aroclor-1254	11097-69-1	Not applicable	0.010	0.030	0.01098	0.00330	0.00994	0.01002	0.03370	0.03300	0.050
Aroclor-1260	11096-82-5	Not applicable	0.010	0.030	0.01453	0.00330	0.00943	Not Reported	Not Reported	0.02564	0.050
Total PCBs [5]	1336-36-3	Not available	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	0.200

[2] Data will be evaluated against sample specific MDLs and RLs. Non-detects, or values detected at a level below the sample specific MDL, will be reported as the sample specific MDL and U flagged. Values detected above the sample specific MDL and below the sample specific RL will be reported and J flagged.

[1] MDLs and PQLs are not cited in EPA SW-846 Method 8082.

[3] Estimated MDLs; the actual MDLs will be updated when the MDL studies are received by the selected laboratory(ies). Achievable MDLs are from a seven replicate MDL study (solid matrix such as sodium sulfate) in accordance with 40 CFR Part 136, Appendix B.

[4] The RLs are determined from the low calibration standard and will be adjusted for sample specific factors such as % solids, weights/volumes and dilutions that vary from the standard procedure. Sample –specific reporting limits are highly matrix dependent.
Base (unadjusted) RL = [(low calibration std., 0.02 mg/mL) * (pre-injection final extract volume, 25 mL) / (Sample dry wt., 10-g).

[5] Total Aroclor = sum of the detected Aroclors.

* A concentration based Project Action Limit Goal has not been identified to GE for this project.

Table B-6b

Hudson River Design Support Sediment Sampling and Analysis Program

Total PCBs as Homologs
(Reference Limit and Evaluation Table)

Medium/Matrix: Sediment
Analytical Parameter: Total PCBs Homologs
Concentration Level: Low to High
Fixed Laboratory Method/SOP: SOP GEHR680 (see QAPP Appendix 8)

Analyte	CAS Number	Project Action Limit Goal* (mg/Kg – dry-weight)	Analytical Method[1]		Achievable Laboratory Limits [2] (mg/Kg – dry-weight)	
			MDLs	Method Practical QLs (dry wt –mg/Kg)	MDLs[3] (mg/Kg)	RLs[4] (mg/Kg)
Monochlorobiphenyls	27323-18-8	Not applicable	Not available	0.25	0.0146	0.125
Dichlorobiphenyls	25512-42-9	Not applicable	As above	0.25	0.0134	0.125
Trichlorobiphenyls	25323-68-6	Not applicable	As above	0.25	0.0120	0.125
Tetrachlorobiphenyls	26914-33-0	Not applicable	As above	0.50	0.0227	0.250
Pentachlorobiphenyls	25429-29-2	Not applicable	As above	0.50	0.0249	0.250
Hexachlorobiphenyls	26601-64-9	Not applicable	As above	0.50	0.0247	0.250
Heptachlorobiphenyls	28655-71-2	Not applicable	As above	0.75	0.0435	0.375
Octachlorobiphenyls	31472-83-0	Not applicable	As above	0.75	0.0308	0.375
Nonachlorobiphenyls	53742-07-7	Not applicable	As above	0.75	0.1087	0.375
Decachlorobiphenyls	2051-24-3	Not applicable	As above	1.25	0.1087	#
Total PCBs [5]	1336-36-3	Not available	As above	1.25	Not applicable	0.375

[2] Data will be evaluated against sample specific MDLs and RLs. Non-detects, or values detected at a level below the sample specific MDL, will be reported as the sample specific MDL and U flagged. Values detected above the sample specific MDL and below the sample specific RL will be reported and J flagged.

[1] MDLs and PQLs are not cited in USEPA Method 680. The limits listed represent those that are typically achievable by this method.

[3] Achievable MDLs are from a seven replicate MDL study (solid matrix such as sodium sulfate) in accordance with 40 CFR Part 136, Appendix B.

[4] The RLs are determined from the low calibration standard and will be adjusted for sample specific factors such as % solids, weights/volumes and dilutions that vary from the standard procedure. Sample –specific reporting limits are highly matrix dependent.
Base (unadjusted) RL = [(low calibration std., [mg/mL]) * (pre-injection final extract volume, 25 mL) / (Sample dry wt., 10-g).

[5] Total PCBs = sum of the detected Homologs.

* A concentration based Project Action Limit Goal has not been identified to GE for this project.

Decachlorobiphenyl will not be reported since the surrogate for GEHR680 is the decachlorobiphenyl originating in the GEHR8082 extracts.

Table B-6c

Hudson River Design Support Sediment Sampling and Analysis Program

TCLP Volatiles, TCLP Semivolatiles, TCLP Pesticides, TCLP Herbicides and TCLP Metals (Reference Limit and Evaluation Table)

Medium/Matrix: Leachate
Analytical Parameter: TCLP Volatiles, TCLP Semivolatiles, TCLP Pesticides, TCLP Herbicides and TCLP Metals
Concentration Level: Low to High
Fixed Laboratory Methods/SOPs: SOP 8260B (see QAPP Appendix 22), SOP 8270C (see QAPP Appendix 23), SOP 8081A (see QAPP Appendix 24), SOP 8151A (see QAPP Appendix 25), and SOPs 7470A and 6010B (see QAPP Appendices 26 and 29, respectively)

TCLP Analyte	CAS Number	Project Action Limit Goal* (mg/L)	Analytical Method[1]		Achievable Laboratory Limits [2] (µg/L – dry-weight)	
			MDLs (mg/L)	Method Practical QLs (dry wt –mg/L)	MDLs[3] (mg/L)	RLs[4] (mg/L)
TCLP Volatiles						
Benzene	71-43-2	0.50	0.001	0.05	0.009	0.05
Methyl ethyl ketone	78-93-3	200	0.001	0.05	0.006	0.05
Carbon tetrachloride	56-23-5	0.50	0.001	0.05	0.013	0.05
Chlorobenzene	108-90-7	100	0.001	0.05	0.010	0.05
Chloroform	67-66-3	6	0.001	0.05	0.009	0.05
1,2-Dichloroethane	107-06-2	0.50	0.001	0.05	0.009	0.05
1,1-Dichloroethene	75-35-4	0.70	0.001	0.05	0.014	0.05
Tetrachloroethene	127-18-4	0.70	0.001	0.05	0.014	0.05
Trichloroethene	79-01-6	0.50	0.001	0.05	0.010	0.05
Vinyl chloride	75-01-4	0.20	0.001	0.05	0.011	0.05
TCLP Semivolatiles						
1,4-Dichlorobenzene	106-46-7	7.5	0.007	0.05	0.007	0.05
2,4-Dinitrotoluene	121-14-2	0.13	0.007	0.05	0.006	0.05
Hexachlorobenzene	118-74-1	0.13	0.007	0.05	0.006	0.05
Hexachlorobutadiene	87-68-3	0.50	0.007	0.05	0.007	0.05
Hexachloroethane	67-72-1	3	0.007	0.05	0.007	0.05
2-Methylphenol	95-48-7	200	0.007	0.05	0.018	0.05
3 or 4-Methylphenol	108-39-4/ 106-44-5	200	0.007	0.05	0.018	0.05
Nitrobenzene	98-95-3	2	0.007	0.05	0.007	0.05
Pentachlorophenol	87-86-5	100	0.01	0.25	0.004	0.25
Pyridine	110-86-1	5	0.007	0.10	0.003	0.10
2,4,5-Trichlorophenol	95-95-4	400	0.01	0.05	0.007	0.05
2,4,6-Trichlorophenol	88-06-2	2	0.01	0.05	0.007	0.05
TCLP Pesticides						
gamma-BHC/Lindane	58-89-9	0.40	0.0001	0.0005	0.00007	0.0005
Endrin	72-20-8	0.02	0.0001	0.0005	0.0001	0.0005
Heptachlor	76-44-8	0.008	0.0001	0.0005	0.00007	0.0005
Methoxychlor	72-43-5	10	0.0001	0.0005	0.0001	0.0005
Toxaphene	8001-35-2	0.50	0.002	0.02	0.0016	0.02
Technical Chlordane	12789-03-6	0.03	0.001	0.005	0.0005	0.005
TCLP Herbicides						
2,4-D	94-75-7	10	0.01	0.04	0.0056	0.04
2,4,5-TP (Silvex)	93-72-1	1	0.005	0.01	0.0014	0.01

TCLP Analyte	CAS Number	Project Action Limit Goal* (mg/L)	Analytical Method[1]		Achievable Laboratory Limits [2] (µg/L – dry-weight)	
			MDLs (mg/L)	Method Practical QLs (dry wt –mg/L)	MDLs[3] (mg/L)	RLs[4] (mg/L)
TCLP Metals						
Arsenic	7440-38-2	0.005	0.005	0.500	0.0024	0.500
Barium	7440-39-3	0.10	0.005	10	0.0011	10
Cadmium	7440-43-9	0.001	0.005	0.100	0.0002	0.100
Chromium	7440-47-3	0.005	0.005	0.500	0.0011	0.500
Lead	7439-92-1	0.005	0.005	0.003	0.0023	0.003
Mercury	7439-97-6	0.0002	0.0001	0.0002	0.00009	0.0002
Selenium	7782-49-2	0.001	0.005	0.005	0.0027	0.005
Silver	7440-22-4	0.005	0.005	0.500	0.0007	0.500

[2] Data will be evaluated against sample specific MDLs and RLs. Non-detects, or values detected at a level below the sample specific MDL, will be reported as the sample specific MDL and U flagged. Values detected above the sample specific MDL and below the sample specific RL will be reported and J flagged.

[1] MDLs or PQLs from corresponding EPA SW-846 Methods when cited. The limits listed represent those that are typically achievable by these methods.

[3] Achievable MDLs are from a seven replicate MDL study (aqueous matrix) in accordance with 40 CFR Part 136, Appendix B.

[4] The RLs will be adjusted for sample specific factors such as volumes and dilutions that vary from the standard procedure. Sample –specific reporting limits are highly matrix dependent.

* Regulatory levels from USEPA Region II Technical Assistance Document for Complying With the TC Rule and Implementing the Toxicity Characteristic leaching Procedure (TCLP) (Table 3-2).

Table B-6d

Hudson River Design Support Sediment Sampling and Analysis Program

Dioxins/Dibenzofurans
(Reference Limit and Evaluation Table)

Medium/Matrix: Sediment
Analytical Parameter: Dioxins/Dibenzofurans
Concentration Level: Low to High
Fixed Laboratory Method/SOP: SOP 1613B (see QAPP Appendix 28)

Analyte	CAS Number	Project Action Limit Goal* (pg/g – dry-weight)	Analytical Method[1]		Achievable Laboratory Limits [2] (pg/g – dry-weight)	
			MDLs (pg/g)	Method Practical QLs (dry wt –pg/g)	MDLs[3] (pg/g)	RLs[4] (pg/g)
Total-TCDD	41903-57-5	Not available	0.75	1	Not applicable	1
2378-TCDD	1746-01-6	Not available	0.75	1	0.134	1
Total-TCDF	55722-27-5	Not available	0.75	1	Not applicable	1
2378-TCDF	51207-31-9	Not available	0.75	1	0.165	1
Total PeCDD	36088-22-9	Not available	0.75	5	Not applicable	5
12378-PeCDD	40321-76-4	Not available	0.75	5	0.155	5
Total PeCDF	30402-15-4	Not available	0.75	5	Not applicable	5
12378-PeCDF	57117-41-6	Not available	0.75	5	0.331	5
23478-PeCDF	57117-31-4	Not available	0.75	5	0.316	5
Total HxCDD	34465-46-8	Not available	0.75	5	Not applicable	5
123478-HxCDD	39227-28-6	Not available	0.75	5	0.246	5
123678-HxCDD	57653-85-7	Not available	0.75	5	0.128	5
123789-HxCDD	19408-74-3	Not available	0.75	5	0.497	5
Total HxCDF	55684-94-1	Not available	0.75	5	Not applicable	5
123478-HxCDF	70648-26-9	Not available	0.75	5	0.297	5
123678-HxCDF	57117-44-9	Not available	0.75	5	0.243	5
123789-HxCDF	72918-21-9	Not available	0.75	5	0.271	5
234678-HxCDF	60851-34-5	Not available	0.75	5	0.242	5
Total HpCDD	37871-00-4	Not available	0.75	5	Not applicable	5
1234678-HpCDD	35822-46-9	Not available	0.75	5	0.302	5
Total HpCDF	38998-75-3	Not available	0.75	5	Not applicable	5
1234678-HpCDF	67562-39-4	Not available	0.75	5	0.254	5
1234789-HpCDF	55673-89-7	Not available	0.75	5	0.202	5
OCDD	3268-87-9	Not available	5	10	1.05	10
OCDF	39001-02-0	Not available	5	10	0.546	10

[2] Data will be evaluated against sample specific MDLs and RLs. Non-detects, or values detected at a level below the sample specific MDL, will be reported as the sample specific MDL and U flagged. Values detected above the sample specific MDL and below the sample specific RL will be reported and J flagged.

[1] MDLs and PQLs are not cited in USEPA Method 1613B. The limits listed represent those that are typically achievable by this method.
[3] Achievable MDLs are from a seven replicate MDL study (solid matrix such as sodium sulfate) in accordance with 40 CFR Part 136, Appendix B.
[4] The RLs will be adjusted for specific factors such as % solids, weights/volumes and dilutions that vary from the standard procedure. Sample –specific reporting limits are highly matrix dependent.

* A concentration based Project Action Limit Goal has not been identified to GE for this project.

Table B-6e

Hudson River Design Support Sediment Sampling and Analysis Program

Total RCRA Metals
(Reference Limit and Evaluation Table)

Medium/Matrix: Sediment
Analytical Parameter: Total RCRA Metals
Concentration Level: Low to High
Fixed Laboratory Method/SOP: SOP 6010B/7471A (see QAPP Appendix 29)

Analyte	CAS Number	Project Action Limit Goal* (mg/kg – dry-weight)	Analytical Method[1]		Achievable Laboratory Limits [2] (mg/kg – dry-weight)	
			MDLs (mg/kg)	Method Practical QLs (dry wt –mg/kg)	MDLs[3] (mg/kg)	RLs[4] (mg/kg)
Arsenic	7440-38-2	Not available	0.375	1.0	0.2446	1.0
Barium	7440-39-3	Not available	0.375	20	0.1106	20
Cadmium	7440-43-9	Not available	0.045	0.5	0.02446	0.5
Chromium	7440-47-3	Not available	0.375	0.5	0.1074	0.5
Lead	7439-92-1	Not available	0.375	0.3	0.23069	0.3
Mercury	7439-97-6	Not available	0.015	0.033	0.00904	0.033
Selenium	7782-49-2	Not available	0.375	0.5	0.2745	0.5
Silver	7440-22-4	Not available	0.10	0.5	0.0653	0.5

[2] Data will be evaluated against sample specific MDLs and RLs. Non-detects, or values detected at a level below the sample specific MDL, will be reported as the sample specific MDL and U flagged. Values detected above the sample specific MDL and below the sample specific RL will be reported and J flagged.

[1] MDLs and PQLs are not cited in EPA SW-846 Methods 6010B and 7471A. The limits listed represent those that are typically achievable by these methods.
[3] Achievable MDLs are from a seven replicate MDL study (solid matrix such as sodium sulfate) in accordance with 40 CFR Part 136, Appendix B.
[4] The RLs will be adjusted for specific factors such as % solids, weights/volumes and dilutions that vary from the standard procedure. Sample –specific reporting limits are highly matrix dependent.

* A concentration based Project Action Limit Goal has not been identified to GE for this project.

Table B-6f

Hudson River Design Support Sediment Sampling and Analysis Program

TOC
(Reference Limit and Evaluation Table)

Medium/Matrix: Sediment
Analytical Parameter: TOC
Concentration Level: Low to High
Fixed Laboratory Method/SOP: SOP NE205_01.SOP (see QAPP Appendix 15)

Analyte	CAS Number	Project Action Limit Goal* (mg/kg – dry-weight)	Analytical Method[1]		Achievable Laboratory Limits [2] (mg/kg – dry-weight)	
			MDL (mg/kg)	Method Practical QL (dry wt – mg/kg)	MDL[3] (mg/kg)	RL[4] (mg/kg)
Total Organic Carbon	Not Applicable	Not applicable	50	170	40	170

[2] Data will be evaluated against sample specific MDL and RL. Non-detects, or values detected at a level below the sample specific MDL, will be reported as the sample specific MDL and U flagged. Values detected above the sample specific MDL and below the sample specific RL will be reported and J flagged.

[1] MDLs and PQLs are not cited in Lloyd Kahn. The limits listed represent those that are typically achievable by this method.
[3] Achievable MDL is from a seven replicate MDL study (solid matrix such as sodium sulfate) in accordance with 40 CFR Part 136, Appendix B.
[4] The RL will be adjusted for specific factors such as % solids, weights/volumes and dilutions that vary from the standard procedure. Sample –specific reporting limits are highly matrix dependent.

* A concentration based Project Action Limit Goal has not been identified to GE for this project.

Table B-6g

Hudson River Design Support Sediment Sampling and Analysis Program

^{137} Cesium
(Reference Limit and Evaluation Table)

Medium/Matrix: Sediment
Analytical Parameter: ^{137} Cesium
Concentration Level: Low to High
Fixed Laboratory Method/SOP: SOP TBE-2008 (see QAPP Appendix 20)

Analyte	CAS Number	Project Action Limit Goal* (pg/g – dry-weight)	Analytical Method[1]		Achievable Laboratory Limits [2] (pCi/g – dry-weight)	
			MDA (pCi/kg)	Method Practical QL (dry wt – pCi/kg)	MDA (pCi/kg)	RL[3] (pCi/kg)
^{137} Cesium	10045-97-3	Not applicable	30	500	20	500

[2] Data will be evaluated against sample specific MDL and RL. Non-detects, or values detected at a level below the sample specific MDL, will be reported as the sample specific MDL and U flagged. Values detected above the sample specific MDL and below the sample specific RL will be reported and J flagged.

[1] MDAs and PQLs are not cited in Gamma Spectroscopy. The limits listed represent those that are typically achievable by this method.

[3] The RL will be adjusted for specific factors such as % solids, weights/volumes and dilutions that vary from the standard procedure. Sample –specific reporting limits are highly matrix dependent and based on count time.

* A concentration based Project Action Limit Goal has not been identified to GE for this project.

Table B-6h

Hudson River Design Support Sediment Sampling and Analysis Program

Bulk Density
(Reference Limit and Evaluation Table)

Medium/Matrix: Sediment
Analytical Parameter: Bulk Density
Concentration Level: Low to High
Fixed Laboratory Method/SOP: SOP NE188_01.DOC (see QAPP Appendix 13)

Analyte	CAS Number	Project Action Limit Goal* (g/cm^3 -dry-weight)	Analytical Method[1]		Achievable Laboratory Limits (dry-weight)	
			MDL (g/cm^3)	Method Practical QL (dry wt – g/cm^3)	MDL (mg/kg)	RL (g/cm^3)
Bulk Density	Not applicable	Not applicable	Not applicable[#]	Not applicable[#]	Not applicable[#]	Not applicable[#]

[1] MDLs and PQLs are not cited in ASTM D4531-86.

* A concentration based Project Action Limit Goal has not been identified to GE for this project.

[#] MDLs and PQLs are not utilized in this method given the fact that all samples will have a bulk density.

Table B-6i

Hudson River Design Support Sediment Sampling and Analysis Program

Moisture Content
(Reference Limit and Evaluation Table)

Medium/Matrix: Sediment
Analytical Parameter: Moisture Content
Concentration Level: Low to High
Fixed Laboratory Method/SOP: USEPA 160.3 (as discussed in the Extraction SOPs; see QAPP Appendices 6 and 7)

Analyte	CAS Number	Project Action Limit Goal* (% -dry-weight)	Analytical Method[1]		Achievable Laboratory Limits [2] (dry-weight)	
			MDL (%)	Method Practical QL (wet wt –%)	MDL (%)	RL[3] (%)
Moisture Content	Not applicable	Not applicable	Not applicable	0.5	Not applicable	0.5
[2] Data will be evaluated against sample specific RL.						

[1] MDLs and PQLs are not cited in USEPA 160.3. The limit listed represents those that are typically achievable by this method.
[3] The RL will be adjusted for specific factors such as weights/volumes and dilutions that vary from the standard procedure. Sample–specific reporting limits are highly matrix dependent.

* A concentration based Project Action Limit Goal has not been identified to GE for this project.

Table B-6j

Hudson River Design Support Sediment Sampling and Analysis Program

Ignitability
(Reference Limit and Evaluation Table)

Medium/Matrix: Sediment
Analytical Parameter: Ignitability
Concentration Level: Low to High
Fixed Laboratory Method/SOP: SOP SW-846 Chapter 7 (see QAPP Appendix 27)

Analyte	CAS Number	Project Action Limit Goal* (°C)	Analytical Method[1]		Achievable Laboratory Limits (dry-weight)	
			MDL (°C)	Method Practical QL (°C)	MDL (°C)	RL[3] (°C)
Ignitability	Not applicable	Not applicable	Not applicable[#]	Not applicable[#]	Not applicable[#]	Not applicable[#]

[1] MDLs and PQLs are not cited in SW-846 Chapter 7.

* A concentration based Project Action Limit Goal has not been identified to GE for this project.

[#] MDLs and PQLs are not utilized in this method given the fact that samples will either ignite or not ignite.

Table B-7a

Hudson River Design Support Sediment Sampling and Analysis Program

Measurement Performance Criteria Table

Medium/ Matrix	Sediment
Analytical Parameter	Total PCBs as Aroclors
Concentration Level	Low to High

QC results are evaluated against the measurement performance criteria (MPC) and data that do not meet the listed MPCs will be submitted to the Project Manager and QA Program Manager for review and assessment of the potential impact of the results. Affected samples may be recollected and reanalyzed. Data that are accepted outside these criteria will be flagged with the appropriate data qualifier during data verification or data validation(see QAPP Section D2) and the qualification of the analysis results thoroughly documented in the verification or validation narrative.

Sampling Procedure	**Analytical Method/SOP**	**Data Quality Indicators (DQIs)[1]**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
See QAPP Section B2	SOP GEHR8082 (QAPP Appendix 5)	Accuracy	< sample-specific RL, or associated samples >5× blank values	Laboratory or Equipment Blank	A
			60-140% R	Laboratory Control Sample (Aroclor-1242)	A
			60-140% R	Surrogates (TCMX and DCB)	A
			95% LWL & UWL	Performance Evaluation (PE) Samples	A
			99% LCL & UCL	Performance Evaluation (PE) Samples	A
		Precision	The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Field Duplicates	S&A
		Sensitivity	See Table B-6a	Reporting Limits	A
		Representativeness	Use of standardized collection methods and analytical methods.	Field Audits and Laboratory Audits. See QAPP Section A7.3.3	S&A
		Completeness	95%	See QAPP Section A7.3.5	S&A
		Comparability	Based on Accuracy and Media Comparison	PE analysis, use of standardized SOPs by field and analytical contractors.	S&A

RL = Reporting Limit; R = Recovery; RPD = Relative Percent Difference; LWL = Lower Warning Limit; UWL = Upper Warning Limit; LCL = Lower Control Limit; UCL = Upper Control Limit

[1] Data Quality Indicators (a.k.a. PASRCC parameters, *i.e.,* precision, accuracy/bias, sensitivity, data completeness, comparability).

Table B-7b

Hudson River Design Support Sediment Sampling and Analysis Program

Measurement Performance Criteria Table

Medium/ Matrix	Sediment
Analytical Parameter	Total PCBs as Homologs
Concentration Level	Low to High

QC results are evaluated against the measurement performance criteria (MPC) and data that do not meet the listed MPCs will be submitted to the Project Manager and QA Program Manager for review and assessment of the potential impact of the results. Affected samples may be recollected and reanalyzed. Data that are accepted outside these criteria will be flagged with the appropriate data qualifier during data verification or data validation(see QAPP Section D2) and the qualification of the analysis results thoroughly documented in the verification or validation narrative.

Sampling Procedure	**Analytical Method/SOP**	**Data Quality Indicators (DQIs)[1]**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
See QAPP Section B2	SOP GEHR680 (QAPP Appendix 8)	Accuracy	< sample-specific RL, or associated samples >5× blank values	Laboratory or Equipment Blank	A
			60-140% R	Laboratory Control Sample (Aroclor-1242)	A
			60-140% R	Surrogates (TCMX and DCB)	A
			95% LWL & UWL	Performance Evaluation (PE) Samples	A
			99% LCL & UCL	Performance Evaluation (PE) Samples	A
		Precision	The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Field Duplicates	S&A
		Sensitivity	See Table B-6a	Reporting Limits	A
		Representativeness	Use of standardized collection methods and analytical methods.	Field Audits and Laboratory Audits. See QAPP Section A7.3.3	S&A
		Completeness	95%	See QAPP Section A7.3.5	S&A
		Comparability	Based on Accuracy and Media Comparison	PE analysis, use of standardized SOPs by field and analytical contractors.	S&A

RL = Reporting Limit; R = Recovery; RPD = Relative Percent Difference; LWL = Lower Warning Limit; UWL = Upper Warning Limit; LCL = Lower Control Limit; UCL = Upper Control Limit

[1] Data Quality Indicators (a.k.a. PASRCC parameters, *i.e.,* precision, accuracy/bias, sensitivity, data completeness, comparability).

Table B-7c

Hudson River Design Support Sediment Sampling and Analysis Program

Measurement Performance Criteria Table

Medium/ Matrix	Leachate
Analytical Parameter	TCLP Volatile Compounds
Concentration Level	Low to High

QC results are evaluated against the measurement performance criteria (MPC) and data that do not meet the listed MPCs will be submitted to the Project Manager and QA Program Manager for review and assessment of the potential impact of the results. Affected samples may be recollected and reanalyzed. Data that are accepted outside these criteria will be flagged with the appropriate data qualifier during data verification or data validation(see QAPP Section D2) and the qualification of the analysis results thoroughly documented in the verification or validation narrative.

Sampling Procedure	**Analytical Method/SOP**	**Data Quality Indicators (DQIs)[1]**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
See QAPP Section B2	SOP 8260B (QAPP Appendix 22)	Accuracy	< sample-specific RL, or associated samples >5× blank values	Laboratory, Trip, or Equipment Blank	A
			70-130% R	Matrix Spike (All TCLP Volatile Compounds)	A
			70-130% R	Laboratory Control Sample (All TCLP Volatile Compounds)	A
			80-114% R 77-120%R 78-111%R 78-110%R	Surrogates: 4-Bromofluorobenzene 1,2-Dichloroethane-d_4 Toluene-d_8 Dibromofluoromethane	A
		Precision	The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Field Duplicates	S&A
		Sensitivity	See Table B-6c	Reporting Limits	A

Sampling Procedure	Analytical Method/SOP	Data Quality Indicators (DQIs)[1]	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
See QAPP Section B2	SOP 8260B (QAPP Appendix 22)	Representativeness	Use of standardized collection methods and analytical methods.	Field Audits and Laboratory Audits. See QAPP Section A7.3.3	S&A
		Completeness	95%	See QAPP Section A7.3.5	S&A
		Comparability	Based on Accuracy and Media Comparison	Use of standardized SOPs by field and analytical contractors.	S&A

RL = Reporting Limit; R = Recovery; RPD = Relative Percent Difference

[1] Data Quality Indicators (a.k.a. PASRCC parameters, *i.e.,* precision, accuracy/bias, sensitivity, data completeness, comparability).

Table B-7d

Hudson River Design Support Sediment Sampling and Analysis Program

Measurement Performance Criteria Table

Medium/ Matrix	Leachate
Analytical Parameter	TCLP Semivolatile Compounds
Concentration Level	Low to High

QC results are evaluated against the measurement performance criteria (MPC) and data that do not meet the listed MPCs will be submitted to the Project Manager and QA Program Manager for review and assessment of the potential impact of the results. Affected samples may be recollected and reanalyzed. Data that are accepted outside these criteria will be flagged with the appropriate data qualifier during data verification or data validation(see QAPP Section D2) and the qualification of the analysis results thoroughly documented in the verification or validation narrative.

Sampling Procedure	**Analytical Method/SOP**	**Data Quality Indicators (DQIs)[1]**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
See QAPP Section B2	SOP 8270C (QAPP Appendix 23)	Accuracy	< sample-specific RL, or associated samples >5× blank values	Laboratory or Equipment Blank	A
			50-135% R	Matrix Spike (All TCLP Semivolatile Compounds)	A
			50-135% R	Laboratory Control Sample (All TCLP Semivolatile Compounds)	A
			30-110% R 13-110%R 21-122%R 32-112%R 10-113%R 78-11-%R	Surrogates: 2-Fluorobiphenyl 2-Fluorophenol 2,4,6-Tribromophenol Nitrobenzene-d_5 Phenol-d_5 Terphenyl-d_{14}	A
		Precision	The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Field Duplicates	S&A

Sampling Procedure	Analytical Method/SOP	Data Quality Indicators (DQIs)[1]	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
See QAPP Section B2	SOP 8270C (QAPP Appendix 23)	Sensitivity	See Table B-6c	Reporting Limits	A
		Representativeness	Use of standardized collection methods and analytical methods.	Field Audits and Laboratory Audits. See QAPP Section A7.3.3	S&A
		Completeness	95%	See QAPP Section A7.3.5	S&A
		Comparability	Based on Accuracy and Media Comparison	Use of standardized SOPs by field and analytical contractors.	S&A

RL = Reporting Limit; R = Recovery; RPD = Relative Percent Difference

[1] Data Quality Indicators (a.k.a. PASRCC parameters, *i.e.,* precision, accuracy/bias, sensitivity, data completeness, comparability).

Table B-7e

Hudson River Design Support Sediment Sampling and Analysis Program

Measurement Performance Criteria Table

Medium/ Matrix	Leachate
Analytical Parameter	TCLP Pesticide Compounds
Concentration Level	Low to High

QC results are evaluated against the measurement performance criteria (MPC) and data that do not meet the listed MPCs will be submitted to the Project Manager and QA Program Manager for review and assessment of the potential impact of the results. Affected samples may be recollected and reanalyzed. Data that are accepted outside these criteria will be flagged with the appropriate data qualifier during data verification or data validation(see QAPP Section D2) and the qualification of the analysis results thoroughly documented in the verification or validation narrative.

Sampling Procedure	**Analytical Method/SOP**	**Data Quality Indicators (DQIs)[1]**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
See QAPP Section B2	SOP 8081A (QAPP Appendix 24)	Accuracy	< sample-specific RL, or associated samples >5× blank values	Laboratory or Equipment Blank	A
			50-135% R	Matrix Spike (*gamma*-BHC, endrin, heptachlor, and methoxychlor)	A
			50-135% R	Laboratory Control Sample (*gamma*-BHC, endrin, heptachlor, and methoxychlor)	A
			10-147% R 39-130%R	Surrogates: Decachlorobiphenyl Tetrachloro-*m*-xylene	A
		Precision	The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Field Duplicates	S&A
		Sensitivity	See Table B-6c	Reporting Limits	A

Sampling Procedure	Analytical Method/SOP	Data Quality Indicators (DQIs)[1]	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
See QAPP Section B2	SOP 8081A (QAPP Appendix 24)	Representativeness	Use of standardized collection methods and analytical methods.	Field Audits and Laboratory Audits. See QAPP Section A7.3.3	S&A
		Completeness	95%	See QAPP Section A7.3.5	S&A
		Comparability	Based on Accuracy and Media Comparison	Use of standardized SOPs by field and analytical contractors.	S&A

RL = Reporting Limit; R = Recovery; RPD = Relative Percent Difference

[1] Data Quality Indicators (a.k.a. PASRCC parameters, *i.e.,* precision, accuracy/bias, sensitivity, data completeness, comparability).

Table B-7f

Hudson River Design Support Sediment Sampling and Analysis Program

Measurement Performance Criteria Table

Medium/ Matrix	Leachate
Analytical Parameter	TCLP Herbicide Compounds
Concentration Level	Low to High

QC results are evaluated against the measurement performance criteria (MPC) and data that do not meet the listed MPCs will be submitted to the Project Manager and QA Program Manager for review and assessment of the potential impact of the results. Affected samples may be recollected and reanalyzed. Data that are accepted outside these criteria will be flagged with the appropriate data qualifier during data verification or data validation(see QAPP Section D2) and the qualification of the analysis results thoroughly documented in the verification or validation narrative.

Sampling Procedure	**Analytical Method/SOP**	**Data Quality Indicators (DQIs)[1]**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
See QAPP Section B2	SOP 8151A (QAPP Appendix 25)	Accuracy	< sample-specific RL, or associated samples >5× blank values	Laboratory or Equipment Blank	A
			50-135% R	Matrix Spike (All TCLP Herbicide Compounds)	A
			50-135% R	Laboratory Control Sample (All TCLP Herbicide Compounds)	A
			42-125% R	Surrogate (2,4-Dichlorophenylacetic acid)	A
		Precision	The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Field Duplicates	S&A
		Sensitivity	See Table B-6c	Reporting Limits	A
		Representativeness	Use of standardized collection methods and analytical methods.	Field Audits and Laboratory Audits. See QAPP Section A7.3.3	S&A
		Completeness	95%	See QAPP Section A7.3.5	S&A
		Comparability	Based on Accuracy and Media Comparison	Use of standardized SOPs by field and analytical contractors.	S&A

RL = Reporting Limit; R = Recovery; RPD = Relative Percent Difference

[1] Data Quality Indicators (a.k.a. PASRCC parameters, *i.e.,* precision, accuracy/bias, sensitivity, data completeness, comparability).

Table B-7g

Hudson River Design Support Sediment Sampling and Analysis Program

Measurement Performance Criteria Table

Medium/ Matrix	Leachate
Analytical Parameter	TCLP Metals
Concentration Level	Low to High

QC results are evaluated against the measurement performance criteria (MPC) and data that do not meet the listed MPCs will be submitted to the Project Manager and QA Program Manager for review and assessment of the potential impact of the results. Affected samples may be recollected and reanalyzed. Data that are accepted outside these criteria will be flagged with the appropriate data qualifier during data verification or data validation(see QAPP Section D2) and the qualification of the analysis results thoroughly documented in the verification or validation narrative.

Sampling Procedure	Analytical Method/SOP	Data Quality Indicators (DQIs)[1]	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
See QAPP Section B2	SOPs 7040A and 6010B (QAPP Appendices 26 and 29)	Accuracy	< sample-specific RL, or associated samples >5× blank values	Laboratory or Equipment Blank	A
			75-125% R	Matrix Spike (All TCLP Metals)	A
			80-120% R	Laboratory Control Sample (All TCLP Metals)	A
		Precision	The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Field Duplicates	S&A
		Sensitivity	See Table B-6c	Reporting Limits	A
		Representativeness	Use of standardized collection methods and analytical methods.	Field Audits and Laboratory Audits. See QAPP Section A7.3.3	S&A
		Completeness	95%	See QAPP Section A7.3.5	S&A
		Comparability	Based on Accuracy and Media Comparison	Use of standardized SOPs by field and analytical contractors.	S&A

RL = Reporting Limit; R = Recovery; RPD = Relative Percent Difference

[1] Data Quality Indicators (a.k.a. PASRCC parameters, *i.e.,* precision, accuracy/bias, sensitivity, data completeness, comparability).

Table B-7h

Hudson River Design Support Sediment Sampling and Analysis Program

Measurement Performance Criteria Table

Medium/ Matrix	Sediment
Analytical Parameter	Dioxins/ Dibenzofurans
Concentration Level	Low to High

QC results are evaluated against the measurement performance criteria (MPC) and data that do not meet the listed MPCs will be submitted to the Project Manager and QA Program Manager for review and assessment of the potential impact of the results. Affected samples may be recollected and reanalyzed. Data that are accepted outside these criteria will be flagged with the appropriate data qualifier during data verification or data validation(see QAPP Section D2) and the qualification of the analysis results thoroughly documented in the verification or validation narrative.

Sampling Procedure	Analytical Method/SOP	Data Quality Indicators (DQIs)[1]	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
See QAPP Section B2	SOP 1613B (QAPP Appendix 28)	Accuracy	< sample-specific RL, or associated samples >5× blank values	Laboratory or Equipment Blank	A
			Method-Specified Limits (See SOP in Appendix 28)	Matrix Spike/Matrix Spike Duplicate (Method-Specified Compounds [See SOP in Appendix 28])	A
			Method-Specified Limits (See SOP in Appendix 28)	Laboratory Control Sample (Referred to as On-Going Precision Recovery [OPR] Sample in Method 1613B) (Method-Specified Compounds [See SOP in Appendix 28])	A
		Precision	The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Field Duplicates	S&A
		Sensitivity	See Table B-6d	Reporting Limits	A
		Representativeness	Use of standardized collection methods and analytical methods.	Field Audits and Laboratory Audits. See QAPP Section A7.3.3	S&A
		Completeness	95%	See QAPP Section A7.3.5	S&A
		Comparability	Based on Accuracy and Media Comparison	Use of standardized SOPs by field and analytical contractors.	S&A

RL = Reporting Limit; RPD = Relative Percent Difference

[1] Data Quality Indicators (a.k.a. PASRCC parameters, *i.e.,* precision, accuracy/bias, sensitivity, data completeness, comparability).

Table B-7i

Hudson River Design Support Sediment Sampling and Analysis Program

Measurement Performance Criteria Table

Medium/ Matrix	Sediment
Analytical Parameter	Total RCRA Metals
Concentration Level	Low to High

QC results are evaluated against the measurement performance criteria (MPC) and data that do not meet the listed MPCs will be submitted to the Project Manager and QA Program Manager for review and assessment of the potential impact of the results. Affected samples may be recollected and reanalyzed. Data that are accepted outside these criteria will be flagged with the appropriate data qualifier during data verification or data validation(see QAPP Section D2) and the qualification of the analysis results thoroughly documented in the verification or validation narrative.

Sampling Procedure	Analytical Method/SOP	Data Quality Indicators (DQIs)[1]	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
See QAPP Section B2	SOP 6010B/7471A (QAPP Appendix 29)	Accuracy	< sample-specific RL, or associated samples >5× blank values	Laboratory or Equipment Blank	A
			75-125% R	Matrix Spike (All RCRA Metals)	A
			70-130% R	Laboratory Control Sample (All RCRA Metals)	A
		Precision	The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Field Duplicates	S&A
			The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Laboratory Duplicates	A
		Sensitivity	See Table B-6e	Reporting Limits	A
		Representativeness	Use of standardized collection methods and analytical methods.	Field Audits and Laboratory Audits. See QAPP Section A7.3.3	S&A
		Completeness	95%	See QAPP Section A7.3.5	S&A
		Comparability	Based on Accuracy and Media Comparison	Use of standardized SOPs by field and analytical contractors.	S&A

RL = Reporting Limit; R = Recovery; RPD = Relative Percent Difference

[1] Data Quality Indicators (a.k.a. PASRCC parameters, *i.e.,* precision, accuracy/bias, sensitivity, data completeness, comparability).

Table B-7j

Hudson River Design Support Sediment Sampling and Analysis Program

Measurement Performance Criteria Table

Medium/ Matrix	Sediment
Analytical Parameter	TOC
Concentration Level	Low to High

QC results are evaluated against the measurement performance criteria (MPC) and data that do not meet the listed MPCs will be submitted to the Project Manager and QA Program Manager for review and assessment of the potential impact of the results. Affected samples may be recollected and reanalyzed. Data that are accepted outside these criteria will be flagged with the appropriate data qualifier during data verification or data validation(see QAPP Section D2) and the qualification of the analysis results thoroughly documented in the verification or validation narrative.

Sampling Procedure	Analytical Method/SOP	Data Quality Indicators (DQIs)[1]	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
See QAPP Section B2	SOP NE205_01.SOP (QAPP Appendix 15)	Accuracy	< sample-specific RL, or associated samples >5× blank values	Laboratory or Equipment Blank	A
			75-125% R	Matrix Spike	A
			75-125% R	Laboratory Control Sample	A
		Precision	The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Field Duplicates	S&A
			The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Laboratory Duplicates	A
		Sensitivity	See Table B-6f	Reporting Limits	A
		Representativeness	Use of standardized collection methods and analytical methods.	Field Audits and Laboratory Audits. See QAPP Section A7.3.3	S&A
		Completeness	95%	See QAPP Section A7.3.5	S&A
		Comparability	Based on Accuracy and Media Comparison	Use of standardized SOPs by field and analytical contractors.	S&A

RL = Reporting Limit; R = Recovery; RPD = Relative Percent Difference

[1] Data Quality Indicators (a.k.a. PASRCC parameters, *i.e.,* precision, accuracy/bias, sensitivity, data completeness, comparability).

Table B-7k

Hudson River Design Support Sediment Sampling and Analysis Program

Measurement Performance Criteria Table

Medium/ Matrix	Sediment
Analytical Parameter	^{137} Cesium
Concentration Level	Low to High

QC results are evaluated against the measurement performance criteria (MPC) and data that do not meet the listed MPCs will be submitted to the Project Manager and QA Program Manager for review and assessment of the potential impact of the results. Affected samples may be recollected and reanalyzed. Data that are accepted outside these criteria will be flagged with the appropriate data qualifier during data verification or data validation(see QAPP Section D2) and the qualification of the analysis results thoroughly documented in the verification or validation narrative.

Sampling Procedure	**Analytical Method/SOP**	**Data Quality Indicators (DQIs)[1]**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
See QAPP Section B2	SOP TBE-2008 (QAPP Appendix 20)	Accuracy	< sample-specific RL, or associated samples >5× blank values	Laboratory or Equipment Blank	A
			70-130% R	Laboratory Control Sample	A
		Precision	The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Field Duplicates	S&A
		Sensitivity	See Table B-6g	Reporting Limits	A
		Representativeness	Use of standardized collection methods and analytical methods.	Field Audits and Laboratory Audits. See QAPP Section A7.3.3	S&A
		Completeness	95%	See QAPP Section A7.3.5	S&A
		Comparability	Based on Accuracy and Media Comparison	Use of standardized SOPs by field and analytical contractors.	S&A

RL = Reporting Limit; R = Recovery; RPD = Relative Percent Difference

[1] Data Quality Indicators (a.k.a. PASRCC parameters, *i.e.,* precision, accuracy/bias, sensitivity, data completeness, comparability).

Table B-7l

Hudson River Design Support Sediment Sampling and Analysis Program

Measurement Performance Criteria Table

Medium/ Matrix	Sediment
Analytical Parameter	Bulk Density
Concentration Level	Low to High

QC results are evaluated against the measurement performance criteria (MPC) and data that do not meet the listed MPCs will be submitted to the Project Manager and QA Program Manager for review and assessment of the potential impact of the results. Affected samples may be recollected and reanalyzed. Data that are accepted outside these criteria will be flagged with the appropriate data qualifier during data verification or data validation(see QAPP Section D2) and the qualification of the analysis results thoroughly documented in the verification or validation narrative.

Sampling Procedure	Analytical Method/SOP	Data Quality Indicators (DQIs)[1]	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
See QAPP Section B2	SOP NE188_01.DOC (QAPP Appendix 13)	Precision	The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Field Duplicates	S&A
			The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Laboratory Duplicates	A
		Sensitivity	See Table B-6h	Reporting Limits	A
		Representativeness	Use of standardized collection methods and analytical methods.	Field Audits and Laboratory Audits. See QAPP Section A7.3.3	S&A
		Completeness	95%	See QAPP Section A7.3.5	S&A
		Comparability	Based on Accuracy and Media Comparison	Use of standardized SOPs by field and analytical contractors.	S&A

RL = Reporting Limit; RPD = Relative Percent Difference

[1] Data Quality Indicators (a.k.a. PASRCC parameters, *i.e.,* precision, accuracy/bias, sensitivity, data completeness, comparability).

Table B-7m

Hudson River Design Support Sediment Sampling and Analysis Program

Measurement Performance Criteria Table

Medium/ Matrix	Sediment
Analytical Parameter	Moisture Content
Concentration Level	Low to High

QC results are evaluated against the measurement performance criteria (MPC) and data that do not meet the listed MPCs will be submitted to the Project Manager and QA Program Manager for review and assessment of the potential impact of the results. Affected samples may be recollected and reanalyzed. Data that are accepted outside these criteria will be flagged with the appropriate data qualifier during data verification or data validation(see QAPP Section D2) and the qualification of the analysis results thoroughly documented in the verification or validation narrative.

Sampling Procedure	Analytical Method/SOP	Data Quality Indicators (DQIs)[1]	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
See QAPP Section B2	EPA 160.3 (as discussed in the Extraction SOPs; see QAPP Appendices 6 and 7)	Precision	The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Field Duplicates	S&A
			The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Laboratory Duplicates	A
		Sensitivity	See Table B-6i	Reporting Limits	A
		Representativeness	Use of standardized collection methods and analytical methods.	Field Audits and Laboratory Audits. See QAPP Section A7.3.3	S&A
		Completeness	95%	See QAPP Section A7.3.5	S&A
		Comparability	Based on Accuracy and Media Comparison	Use of standardized SOPs by field and analytical contractors.	S&A

RL = Reporting Limit; RPD = Relative Percent Difference

[1] Data Quality Indicators (a.k.a. PASRCC parameters, *i.e.,* precision, accuracy/bias, sensitivity, data completeness, comparability).

Table B-7n

Hudson River Design Support Sediment Sampling and Analysis Program

Measurement Performance Criteria Table

Medium/ Matrix	Sediment
Analytical Parameter	Ignitability
Concentration Level	Low to High

QC results are evaluated against the measurement performance criteria (MPC) and data that do not meet the listed MPCs will be submitted to the Project Manager and QA Program Manager for review and assessment of the potential impact of the results. Affected samples may be recollected and reanalyzed. Data that are accepted outside these criteria will be flagged with the appropriate data qualifier during data verification or data validation(see QAPP Section D2) and the qualification of the analysis results thoroughly documented in the verification or validation narrative.

Sampling Procedure	**Analytical Method/SOP**	**Data Quality Indicators (DQIs)[1]**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
See QAPP Section B2	SOP SW-846 Chapter 7 (QAPP Appendix 27)	Precision	The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Field Duplicates	S&A
			The RPD between the results of sediment/solid field duplicates should be less than or equal to 40% for results greater than 5 × the RL. The difference between results in sediment/solid field duplicates should be less than 2 × the RL when at least one result is less than or equal to 5 × the Reporting Limit.	Laboratory Duplicates	A
		Sensitivity	See Table B-6j	Reporting Limits	A
		Representativeness	Use of standardized collection methods and analytical methods.	Field Audits and Laboratory Audits. See QAPP Section A7.3.3	S&A
		Completeness	95%	See QAPP Section A7.3.5	S&A
		Comparability	Based on Accuracy and Media Comparison	Use of standardized SOPs by field and analytical contractors.	S&A

RL = Reporting Limit; RPD = Relative Percent Difference

[1] Data Quality Indicators (a.k.a. PASRCC parameters, *i.e.,* precision, accuracy/bias, sensitivity, data completeness, comparability).

Table B-8 Data Collected During Sediment Core Collection

Data Field	Valid Values	Data Entry Type
Core ID[1]		Drop-down selection list
Date Collected	MM/DD/YYYY	Automatic (based on current computer date)
Time Collected	HH:MM	Automatic (based on current computer time)
Northing (ft)	northing within 10 ft of target coordinates	Manual
Easting (ft)	easting within 10 ft of target coordinates	Manual
Water Depth (ft)	0 - 50 ft	Manual
Probing Depth (in)	0 - 200 in	Manual
Probing Sediment Type	"FINE", "COARSE", or "ROCK"	Drop-down selection list
Additional Probing Information		Manual
Core/Grab was Recovered	"YES" or "NO"	Toggle Button
Sample Type	"CORE" or "GRAB"	Drop-down selection list
Core Tube Material	"LEXAN" or "ALUMINUM"	Drop-down selection list
Core Penetration Depth (in)	0 - 200 in	Manual
Core Recovery Depth (in)	less than or equal to penetration depth	Manual
Core/Grab Weight (kg)	0 - 200 kg	Manual
Field Lab Core Recovery Depth (in)	less than or equal to penetration depth	Manual
Sampler Initials		Manual

Notes:

[1] *Core ID's and target coordinates are uploaded prior to sample collection to be selected by sampling crews.*

Table B-9 Data Collected During Sample Processing in the Field Lab.

Data Field	Valid Values	Data Entry Type
QA/QC[1]	"ENV", "DUP", "PE1", "PE2", "PE3", "PE4", "PE5", "FDBL", "RSBL", "MS/MSD"	Drop-down selection list
Parent Field Sample ID[2]		Drop-down selection list
Core ID[3]		Drop-down selection list
Upper Depth (in)		Drop-down selection list or Manual
Lower Depth (in)		Drop-down selection list or Manual
Field Sample ID		Automatic[4]
Analyte Selection		Selected automatically based on SSAP criteria, or manual selection
Number of Sample Containers		Automatic (calculated based on selected analytes)
Split	"YES" or "NO"	Toggle Button
Archive	"YES" or "NO"	Toggle Button
Sediment Texture Description[5]	"GR", "CS", "FS", "SI", "CL", "OR"	Drop-down selection list
General Sediment Description		Manual
Cultural Observations		Manual
Date Processed	MM/DD/YYYY	Automatic (based on current computer date)
Time Processed	HH:MM	Automatic (based on current computer time)
Sample Custodian Initials		Manual

Notes:

[1] *This field is "ENV" by default for all environmental samples; value is changed only when a QA/QC sample is introduced.*

[2] *This field is only used to link duplicate and MS/MSD samples to a pre-existing parent sample.*

[3] *Core ID's are selected from the list of cores collected during the previous day.*

[4] *Field sample ID's are created automatically using Core ID, depth, and QA/QC information.*

[5] *Sediment textures are entered in the format "Primary/Some/Little/Trace" using each of the listed valid values.*

TABLE B-10
Valid Values for GE Hudson River PCB Superfund Site
Analytical Leachates

	CASNO	ANALYTE_NAME	LAB_ANL_METHOD_NAME	PREP_METHOD	TCLP_Reporting_Unit
Volatiles	71-43-2	Benzene	8260B-TCLP	SW846-1311 SW846-5030A	ug/L
	78-93-3	Methyl ethyl ketone	8260B-TCLP	SW846-1311 SW846-5030A	ug/L
	56-23-5	Carbon tetrachloride	8260B-TCLP	SW846-1311 SW846-5030A	ug/L
	108-90-7	Chlorobenzene	8260B-TCLP	SW846-1311 SW846-5030A	ug/L
	67-66-3	Chloroform	8260B-TCLP	SW846-1311 SW846-5030A	ug/L
	107-06-2	1,2-Dichloroethane	8260B-TCLP	SW846-1311 SW846-5030A	ug/L
	75-35-4	1,1-Dichloroethene	8260B-TCLP	SW846-1311 SW846-5030A	ug/L
	127-18-4	Tetrachloroethene	8260B-TCLP	SW846-1311 SW846-5030A	ug/L
	79-01-6	Trichloroethene	8260B-TCLP	SW846-1311 SW846-5030A	ug/L
	75-01-4	Vinyl chloride	8260B-TCLP	SW846-1311 SW846-5030A	ug/L
Semivolatiles	106-46-7	1,4-Dichlorobenzene	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L
	121-14-2	2,4-Dinitrotoluene	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L
	118-74-1	Hexachlorobenzene	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L
	87-68-3	Hexachlorobutadiene	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L
	67-72-1	Hexachloroethane	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L
	95-48-7	2-Methylphenol	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L
	108-39-4/106-44-5	3 or 4-Methylphenol	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L
	98-95-3	Nitrobenzene	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L
	87-86-5	Pentachlorophenol	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L
	110-86-1	Pyridine	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L
	95-95-4	2,4,5-Trichlorophenol	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L
	88-06-2	2,4,6-Trichlorophenol	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L

TABLE B-10
Valid Values for GE Hudson River PCB Superfund Site
Analytical Leachates

	CASNO	ANALYTE_NAME	LAB_ANL_METHOD_NAME	PREP_METHOD	TCLP_Reporting_Unit
Pesticides	58-89-9	*gamma*-BHC/Lindane	8081A-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L
	72-20-8	Endrin	8081A-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L
	76-44-8	Heptachlor	8081A-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L
	72-43-5	Methoxychlor	8081A-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L
	8001-35-2	Toxaphene	8081A-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L
	12789-03-6	Technical Chlordane	8081A-TCLP	SW846-1311 SW846-3510C or 3520C	ug/L
Herbicides	94-75-7	2,4-D	8151A-TCLP	SW846-1311 SW846-8151A	ug/L
	93-72-1	2,4,5-TP (Silvex)	8151A-TCLP	SW846-1311 SW846-8151A	ug/L
Metals	7440-38-2	Arsenic	6010B-TCLP	SW846-1311 SW846-3005A	mg/L
	7440-39-3	Barium	6010B-TCLP	SW846-1311 SW846-3005A	mg/L
	7440-43-9	Cadmium	6010B-TCLP	SW846-1311 SW846-3005A	mg/L
	7440-47-3	Chromium	6010B-TCLP	SW846-1311 SW846-3005A	mg/L
	7439-92-1	Lead	6010B-TCLP	SW846-1311 SW846-3005A	mg/L
	7439-97-6	Mercury	7470A-TCLP	SW846-1311 SW846-7470A	mg/L
	7782-49-2	Selenium	6010B-TCLP	SW846-1311 SW846-3005A	mg/L
	7440-22-4	Silver	6010B-TCLP	SW846-1311 SW846-3005A	mg/L

TABLE B-10
Valid Values for GE Hudson River PCB Superfund Site
Analytical Leachates

Surrogates

	CASNO	ANALYTE_NAME	METHOD	PREP_METHOD	Reporting_Unit
Volatiles	460-00-4	4-Bromofluorobenzene	8260B-TCLP	SW846-1311 SW846-5030A	%
	17060-07-0	1,2-Dichloroethane-d4	8260B-TCLP	SW846-1311 SW846-5030A	%
	2037-26-5	Toluene-d8	8260B-TCLP	SW846-1311 SW846-5030A	%
	1868-53-7	Dibromofluoromethane	8260B-TCLP	SW846-1311 SW846-5030A	%
Semivolatiles	321-60-8	2-Fluorobiphenyl	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	%
	367-12-4	2-Fluorophenol	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	%
	118-79-6	2,4,6-Tribromophenol	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	%
	4165-60-0	Nitrobenzene-d5	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	%
	13127-88-3	Phenol-d5	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	%
	98904-43-9	Terphenyl-d14	8270C-TCLP	SW846-1311 SW846-3510C or 3520C	%
Pesticides	877-09-8	Tetrachloro-meta-xylene	8081A-TCLP	SW846-1311 SW846-3510C or 3520C	%
	S2051-24-3	Decachlorobiphenyl	8081A-TCLP	SW846-1311 SW846-3510C or 3520C	%
Herbicides	19719-28-9	2,4-Dichlorophenylacetic acid	8151A-TCLP	SW846-1311 SW846-8151A	%

TABLE B-10
Valid Values for GE Hudson River PCB Superfund Site
Analytical Solids

	CASNO	ANALYTE_NAME	LAB_ANL_METHOD_NAME	PREP_METHOD	Solid_Reporting_Unit
Aroclor	12674-11-2	Aroclor-1016	GEHR8082	GEHR3545/GEHR3540C	mg/Kg
	11104-28-2	Aroclor-1221	GEHR8082	GEHR3545/GEHR3540C	mg/Kg
	11141-16-5	Aroclor-1232	GEHR8082	GEHR3545/GEHR3540C	mg/Kg
	53469-21-9	Aroclor-1242	GEHR8082	GEHR3545/GEHR3540C	mg/Kg
	12672-29-6	Aroclor-1248	GEHR8082	GEHR3545/GEHR3540C	mg/Kg
	11097-69-1	Aroclor-1254	GEHR8082	GEHR3545/GEHR3540C	mg/Kg
	11096-82-5	Aroclor-1260	GEHR8082	GEHR3545/GEHR3540C	mg/Kg
	1336-36-3	Total PCBs	GEHR8082	GEHR3545/GEHR3540C	mg/Kg
PCB Homolog	27323-18-8	Monochlorobiphenyls	GEHR680	GEHR3545/GEHR3540C	mg/Kg
	25512-42-9	Dichlorobiphenyls	GEHR680	GEHR3545/GEHR3540C	mg/Kg
	25323-68-6	Trichlorobiphenyls	GEHR680	GEHR3545/GEHR3540C	mg/Kg
	26914-33-0	Tetrachlorobiphenyls	GEHR680	GEHR3545/GEHR3540C	mg/Kg
	25429-29-2	Pentachlorobiphenyls	GEHR680	GEHR3545/GEHR3540C	mg/Kg
	26601-64-9	Hexachlorobiphenyls	GEHR680	GEHR3545/GEHR3540C	mg/Kg
	28655-71-2	Heptachlorobiphenyls	GEHR680	GEHR3545/GEHR3540C	mg/Kg
	31472-83-0	Octachlorobiphenyls	GEHR680	GEHR3545/GEHR3540C	mg/Kg
	53742-07-7	Nonachlorobiphenyls	GEHR680	GEHR3545/GEHR3540C	mg/Kg
	1336-36-3	Total PCBs	GEHR680	GEHR3545/GEHR3540C	mg/Kg
Dioxin/Furan	41903-57-5	Total-TCDD	EPA 1613	EPA 1613	pg/g
	1746-01-6	2378-TCDD	EPA 1613	EPA 1613	pg/g
	55722-27-5	Total-TCDF	EPA 1613	EPA 1613	pg/g
	51207-31-9	2378-TCDF	EPA 1613	EPA 1613	pg/g

TABLE B-10
Valid Values for GE Hudson River PCB Superfund Site
Analytical Solids

	36088-22-9	Total PeCDD	EPA 1613	EPA 1613	pg/g
	40321-76-4	12378-PeCDD	EPA 1613	EPA 1613	pg/g
	30402-15-4	Total PeCDF	EPA 1613	EPA 1613	pg/g
	57117-41-6	12378-PeCDF	EPA 1613	EPA 1613	pg/g
	57117-31-4	23478-PeCDF	EPA 1613	EPA 1613	pg/g
	34465-46-8	Total HxCDD	EPA 1613	EPA 1613	pg/g
	39227-28-6	123478-HxCDD	EPA 1613	EPA 1613	pg/g
	57653-85-7	123678-HxCDD	EPA 1613	EPA 1613	pg/g
	19408-74-3	123789-HxCDD	EPA 1613	EPA 1613	pg/g
	55684-94-1	Total HxCDF	EPA 1613	EPA 1613	pg/g
	70648-26-9	123478-HxCDF	EPA 1613	EPA 1613	pg/g
	57117-44-9	123678-HxCDF	EPA 1613	EPA 1613	pg/g
	72918-21-9	123789-HxCDF	EPA 1613	EPA 1613	pg/g
	60851-34-5	234678-HxCDF	EPA 1613	EPA 1613	pg/g
	37871-00-4	Total HpCDD	EPA 1613	EPA 1613	pg/g
	35822-46-9	1234678-HpCDD	EPA 1613	EPA 1613	pg/g
	38998-75-3	Total HpCDF	EPA 1613	EPA 1613	pg/g
	67562-39-4	1234678-HpCDF	EPA 1613	EPA 1613	pg/g
	55673-89-7	1234789-HpCDF	EPA 1613	EPA 1613	pg/g
	3268-87-9	OCDD	EPA 1613	EPA 1613	pg/g
	39001-02-0	OCDF	EPA 1613	EPA 1613	pg/g
Metals	7440-38-2	Arsenic	6010B-RCRA	SW846-3050B	mg/Kg
	7440-39-3	Barium	6010B-RCRA	SW846-3050B	mg/Kg

TABLE B-10
Valid Values for GE Hudson River PCB Superfund Site
Analytical Solids

	7440-43-9	Cadmium	6010B-RCRA	SW846-3050B	mg/Kg
	7440-47-3	Chromium	6010B-RCRA	SW846-3050B	mg/Kg
	7439-92-1	Lead	6010B-RCRA	SW846-3050B	mg/Kg
	7439-97-6	Mercury	7471A-RCRA	SW846-7471A	mg/Kg
	7782-49-2	Selenium	6010B-RCRA	SW846-3050B	mg/Kg
	7440-22-4	Silver	6010B-RCRA	SW846-3050B	mg/Kg
RAD	10045-97-3	^{137} Cesium	gamma spectroscopy	gamma spectroscopy	pCi/g
Wet Chemistry	WC001	Bulk Density	USACE EM-1110-2-1906	USACE EM-1110-2-1906	g/cm^3
	WC002	Moisture Content	EPA 160.3	EPA 160.3	%
	WC003	Ignitability	CFR261.21	CFR261.21	NA
	WC006	Total Organic Carbon	Lloyd Kahn	Lloyd Kahn	mg/Kg
Field	GEO001	Grain Size Distribution	ASTM D422		% and % retained
	GEO002	Liquid Limit	ASTM D4318-00		%
	GEO003	Plastic Limit	ASTM D4318-00		%
	GEO004	Specific Gravity	ASTM D854-001		g/cm^3
	GEO005	USCS	ASTM D2487		**TEXT**

Surrogates

CASNO	ANALYTE_NAME	METHOD	PREP_METHOD	Reporting_Unit
877-09-8	Tetrachloro-meta-xylene	GEHR8082	GEHR3545/GEHR3540C	%
S2051-24-3	Decachlorobiphenyl	GEHR8082	GEHR3545/GEHR3540C	%
877-09-8	Tetrachloro-meta-xylene	GEHR680	GEHR3545/GEHR3540C	%
S2051-24-3	Decachlorobiphenyl	GEHR680	GEHR3545/GEHR3540C	%

TABLE B-10
Valid Values for GE Hudson River PCB Superfund Site
Other Analytical

result_type_code	lab_matrix_code	lab_qualifiers	sample_type_code	test_type	total_or_dissolved	detect_flag	test_batch_type	basis
TRG	S	U	ENV	initial	T	Y	Prep	Wet
SUR	W	B	FDBL	reanalysis	D	N	Analysis	Dry
		J	DUP	reextract	N		Leach	NA
		X	LR					
		JD	LCS					
		EMPC	MS					
		D	MB					
		E	PE					

sample_source	column_number	analysis_location	reportable_result	organic_yn	data_package_level
Lab	1C	FI	Yes	Y	A
	2C	FL	No	N	B
	NA	LB			

TABLE B-10
Valid Values for GE Hudson River PCB Superfund Site
Field Values

sample_type_code	sampling_company_code	sample_matrix_code	texture_desc	sample_source	test_requested	matrix_spike_yn
ENV	QEA	SED	GR	Field	refer to analytical	Y
DUP	BBL	S	CS		method codes	N
FDBL	ATL	W	FS			
RSBL			SI			
PE1			CL			
PE2			OR			
PE3						
PE4						
PE5						

matrix_spike_dup_yn	probe_sed_type	core_tube	sampling_technique
Y	FINE	LEXAN	CORE
N	COARSE	ALUMINUM	GRAB
	ROCK		

TABLE C-1
Summary of Analyses for Initial PE Acceptance Criteria Development
GE Hudson River Design Support Sediment Sampling and Analysis Program

		Number of Analyses for Initial PE Acceptance Criteria Development								
		Jar 1		Jar 2		Jar 3		Total # Analyses		Total # to be Peformed by Independent Lab*
PE Sample	Approx. Conc. (mg/Kg)	GEHR8082	GEHR680	GEHR8082	GEHR680	GEHR8082	GEHR680	GEHR8082	GEHR680	GEHR680
RFP_191.3B	1-3	1	1	1	1	3	3	5	5	5
RFP_191.3A	13	1	1	1	1	3	3	5	5	5
RFP_189.5	169	1	1	1	1	3	3	5	5	5
RFP_190.5	749	1	1	1	1	3	3	5	5	5
Wibby Aroclor Mix PE	30-40	1	1	1	1	3	3	5	5	5
						Grand Total # of Analyses:		25	25	25

* - The independent laboratory will analyze the same extracts by GEHR680 as NEA analyzed.

TABLE C-2
Summary of Analyses for Inter-Laboratory Comparison Study
GE Hudson River Design Support Sediment Sampling and Analysis Program

	Number of Total PCBs as Aroclor Analyses (GEHR8082) by Each Laboratory												
	RFP_191.3B (approx. 1-3 mg/Kg)			RFP_191.3A (approx. 13 mg/Kg)			RFP_189.5 (approx. 169 mg/Kg)			RFP_190.5 (approx. 749 mg/Kg)			Wibby Aroclor Mix PE (approx. 30-40 mg/Kg)
Laboratory Candidate	Jar 1	Jar 2	Jar 3	Jar 1	Jar 2	Jar 3	Jar 1	Jar 2	Jar 3	Jar 1	Jar 2	Jar 3	Jar 1
1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1	1	1	1	1
Total # of Analyses:	30			30			30			30			10

TABLE D-1
GENERAL ELECTRIC COMPANY
HUDSON RIVER DESIGN SUPPORT SEDIMENT SAMPLING AND ANALYSIS PROGRAM

FORMAT OF AN ENVIRONMENTAL STANDARDS QUALITY ASSURANCE REVIEW

TITLE PAGE
TABLE OF CONTENTS
INTRODUCTION AND SAMPLE LISTING

SECTION 1

1. Introduction

The introduction section will briefly state the number of samples analyzed, the laboratory that analyzed them, the parameters that were analyzed for, and the methods used for analysis.

2. Laboratory Compliance

This section will specify any correctable and/or noncorrectable deficiencies and will make informative comments about issues that were identified relative to the organic, inorganic, and general chemistry requirements specified in the analytical SOPs. Appropriate EPA citations or project citations will be provided for each item listed. This section will also specify discrepancies between the reported data and the raw data.

3. Data Qualifiers

This section will present qualifiers that should be considered for the data to best be utilized. A detailed assessment of the degree to which data have been compromised by any deviation from protocol (i.e., lack of analytical control and QC failure) will be included. For every statement made in this section, there will be a subsequent finding that justifies the qualifying statement. These qualifiers/findings will be presented as bulleted items, in order of importance, relative to their impact on the data set. The data qualifiers will be presented in two subsections; organic data and inorganic and general chemistry data. The qualifiers will be presented in the order of greatest impact to least impact within each subsection.

SECTION 2

This section will include the qualified sample result summaries and a glossary defining the qualifier codes. These qualified spreadsheets will be presented in the following order: volatiles, semivolatiles, pesticides, PCBs, herbicides, metals, and general chemistry parameters.

SECTION 3

The organic quality assurance review is fully supported by a documentation appendix. For every qualifier made in the report, there is a photocopied page of laboratory data that is used in support of the reviewer's comments. All QC summary forms as well as the reviewer's worksheets are presented in the support documentation.

SECTION 4

The inorganic and general chemistry quality assurance review is also fully supported by a documentation appendix in the same format as the organic data. All QC summary forms as well as the reviewer's worksheets are presented in the support documentation.

SECTION 5

This section of the quality assurance review will contain the laboratory case narratives and the field and laboratory Chain-of-Custody Records.

SECTION 6

This section of the quality assurance review will contain any applicable project correspondence.