EcoChem, Inc.

DATA VALIDATION REPORT

Lower Duwamish Waterway
Baseline Sediment Sampling Report 2

Prepared for:

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EcoChem Project: C22033-4

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Approved for Release:

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PROJECT NARRATIVE

Basis for the Data Validation

This report presents the results of Full and Summary Validation (EPA Stage 4 and Stage 2B) performed on sediment and quality control sample data for the Lower Duwamish Waterway Baseline Sediment Sampling project. A complete list of samples is provided in the **Sample Index**.

Samples were analyzed by Analytical Resources, Inc. (ARI), Tukwila, Washington, Alpha Analytical, Mansfield, Massachusetts, and SGS Axys, Sidney BC, Canada. The analytical methods and EcoChem project chemists are listed below.

Analysis	Method	Primary Review	Secondary Review
Semivolatile Organic Compounds	SW 8270D	E. Clayton	C. Frans & A. Bodkin
Polynuclear Aromatic Hydrocarbon (PAH) Compounds	SW 8270D-SIM		
PCB Aroclors	SW 8082A		
Toxaphene	SW 8081B		
Dioxins & Furans	EPA 1613B		
Total Metals & Mercury	SW 6020/7471B		
Total Organic Carbon	SW 9060		
Grain Size	Plumb 1981		
Total Solids	SM 2540-G		
Black Carbon	SW9060M/Gustafsson		

The data were reviewed using guidance and quality control criteria documented in the analytical methods; *Lower Duwamish Waterway Group Baseline Surface Sediment Collection and Chemical Analyses – Quality Assurance Project Plan and Appendices C&D* (Windward, May 2018); *National Functional Guidelines for Organic Data Review* (USEPA 2008 & 2014); *National Functional Guidelines for Inorganic Data Review* (USEPA 2010); and *National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) & Chlorinated Dibenzofurans (CDFs) Data Review,* (USEPA September 2011), USEPA *R10 Data Validation and Review Guidelines for Polychlorinated Dibenzo-p-Dioxin and Polychlorinated Dibenzofuran Data (PCDD/PCDF) Using Method 1613B and SW846 Method 8290A (USEPA May 2014)*.

EcoChem's goal in assigning data assessment qualifiers is to assist in proper data interpretation. If values are estimated (J or UJ), data may be used for site evaluation and risk assessment purposes but reasons for data qualification should be taken into consideration when interpreting sample concentrations. If values are assigned an R, the data are to be rejected and should not be used for any site evaluation purposes. If values have no data qualifier assigned, then the data meet the data quality objectives as stated in the documents and methods referenced previously.

Data qualifier definitions, reason codes, and validation criteria are included as Appendix A. A Qualified Data Summary Table is included in Appendix B. Data Validation Worksheets will be kept on file at EcoChem, Inc. A qualified laboratory electronic data deliverable (EDD) is also submitted with this report.

Sample Index
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID			Dioxins	PCB Congeners	PCB Aroclors	PAH	SVOC	Toxaphene	Metals	Conventional Tests			
		ARI	Axys	Alpha								TOC	Grain Size	Solids	Black Carbon
18E0226	LDW-SSOT-2510	18E0226-01					✓	✓	✓		✓	✓	✓	✓	
	LDW-SSOT-2114	18E0226-02					✓	✓	✓		✓	✓	✓	✓	
18F0174	LDW18-BNK5-1	18F0174-01					✓	✓	✓		✓	✓	✓	✓	
	LDW18-BNK5-1-FD	18F0174-02					✓	✓	✓		✓	✓	✓	✓	
	LDW18-BNK3-1	18F0241-01					✓	✓	✓		✓	✓	✓	✓	
	LDW18-BNK3-2	18F0241-02					✓	✓	✓		✓	✓	✓	✓	
	LDW18-BNK3-3	18F0241-03					✓	✓	✓		✓	✓	✓	✓	
	LDW18-BNK4-1	18F0241-04					✓	✓	✓		✓	✓	✓	✓	
	LDW18-BNK4-2	18F0241-05					✓	✓	✓		✓	✓	✓	✓	
	LDW18-BNK4-3	18F0241-06					✓	✓	✓		✓	✓	✓	✓	
	LDW18-BNK1-1	18F0242-01					✓	✓	✓		✓	✓	✓	✓	
	LDW18-BNK2-1	18F0242-02					✓	✓	✓		✓	✓	✓	✓	
18F0280	LDW18-BNK6-1	18F0256-01					✓	✓	✓	✓	✓	✓	✓	✓	
	LDW18-BNK6-2	18F0256-02					✓	✓	✓	✓	✓	✓	✓	✓	
	LDW18-IT45-B1-Comp1	18F0280-01					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B1-Comp1-FD	18F0280-04					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B1-Comp2	18F0280-02					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B1-Comp2-FD	18F0280-05					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B1-Comp3	18F0280-03					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B1-Comp3-FD	18F0280-06					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B2-Comp1	18F0280-07					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B2-Comp2	18F0280-08					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B2-Comp3	18F0280-09					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B4-Comp1	18F0280-10					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B4-Comp2	18F0280-11					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B4-Comp3	18F0280-12					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B5-Comp1	18F0280-13					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B5-Comp2	18F0280-14					✓	✓		✓	✓	✓	✓	✓	

Sample Index
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID			Dioxins	PCB Congeners	PCB Aroclors	PAH	SVOC	Toxaphene	Metals	Conventional Tests			
		ARI	Axys	Alpha								TOC	Grain Size	Solids	Black Carbon
18F0280	LDW18-IT45-B5-Comp3	18F0280-15					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-CL-Comp1	18G0025-01					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-CL-Comp4	18G0025-02						✓							
	LDW18-IT45-CL-Comp5	18G0025-03						✓							
	LDW18-IT45-CL-Comp2	18G0025-04					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-CL-Comp3	18G0025-05					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B1-Comp1	18G0147-01					✓	✓		✓	✓	✓	✓	✓	
18F0314	LDW18-IT45-B3-Comp1	18F0314-01					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B3-Comp2	18F0314-02					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B3-Comp3	18F0314-03					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B6-Comp1	18F0314-04					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B6-Comp1-FD	18F0314-07					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B6-Comp2	18F0314-05					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B6-Comp2-FD	18F0314-08					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B6-Comp3	18F0314-06					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B6-Comp3-FD	18F0314-09					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B7-Comp1	18F0314-10					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B7-Comp2	18F0314-11					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B7-Comp3	18F0314-12					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B8-Comp1	18F0314-13					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B8-Comp2	18F0314-14					✓	✓		✓	✓	✓	✓	✓	
	LDW18-IT45-B8-Comp3	18F0314-15					✓	✓		✓	✓	✓	✓	✓	
18H0068	LDW18-IT45-CL-Comp4	18H0068-01					✓					✓			
	LDW18-IT45-CL-Comp5	18H0068-02					✓					✓			
L1828580	LDW18-SSCL-A01-BC			L1828580-01											✓
	LDW18-SSCL-A02-BC			L1828580-02											✓
	LDW18-SSCL-A03-BC			L1828580-03											✓
	LDW18-SSCL-A04-BC			L1828580-04											✓

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SDG	Sample ID	Laboratory ID			Dioxins	PCB Congeners	PCB Aroclors	PAH	SVOC	Toxaphene	Metals	Conventional Tests			
		ARI	Axys	Alpha								TOC	Grain Size	Solids	Black Carbon
L1828580	LDW18-SSCL-A05-BC			L1828580-05											✓
	LDW18-SSCL-A06-BC			L1828580-06											✓
	LDW18-SSCL-A07-BC			L1828580-07											✓
	LDW18-SSCL-A08-BC			L1828580-08											✓
	LDW18-SSCL-A09-BC			L1828580-09											✓
	LDW18-SSCL-A10-BC			L1828580-10											✓
	LDW18-SSCL-A11-BC			L1828580-11											✓
	LDW18-SSCL-A11-FD-BC			L1828580-17											✓
	LDW18-SSCL-A12-BC			L1828580-12											✓
	LDW18-SSCL-A13-BC			L1828580-13											✓
	LDW18-SSCL-A17-BC			L1828580-14											✓
	LDW18-SSCL-A18-BC			L1828580-15											✓
	LDW18-SSCL-A19-BC			L1828580-16											✓
	LDW18-SS-COMP01-BC			L1828580-18											✓
	LDW18-SS-COMP02-BC			L1828580-19											✓
	LDW18-SS-COMP03-BC			L1828580-20											✓
	LDW18-SS-COMP04-BC			L1828580-21											✓
	LDW18-SS-COMP05-BC			L1828580-22											✓
	LDW18-SS-COMP06-BC			L1828580-23											✓
	LDW18-SS-COMP07-BC			L1828580-24											✓
L1828594	LDW18-SS-COMP08-BC			L1828594-01											✓
	LDW18-SS-COMP09-BC			L1828594-02											✓
	LDW18-SS-COMP10-BC			L1828594-03											✓
	LDW18-SS-COMP11-BC			L1828594-04											✓
	LDW18-SS-COMP12-BC			L1828594-05											✓
	LDW18-SS-COMP13-BC			L1828594-06											✓
	LDW18-SS-COMP14-BC			L1828594-07											✓
	LDW18-SS-COMP15-BC			L1828594-08											✓

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Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID			Dioxins	PCB Congeners	PCB Aroclors	PAH	SVOC	Toxaphene	Metals	Conventional Tests			
		ARI	Axys	Alpha								TOC	Grain Size	Solids	Black Carbon
L1828594	LDW18-SS-COMP16-BC			L1828594-09											✓
	LDW18-SS-COMP17-BC			L1828594-10											✓
	LDW18-SS-COMP18-BC			L1828594-11											✓
	LDW18-SS-COMP19-BC			L1828594-12											✓
	LDW18-SS-COMP20-BC			L1828594-13											✓
	LDW18-SS-COMP21-BC			L1828594-14											✓
	LDW18-SS-COMP22-BC			L1828594-15											✓
	LDW18-SS-COMP23-BC			L1828594-16											✓
	LDW18-SS-COMP24-BC			L1828594-17											✓
	LDW18-SS-169-BC			L1828594-18											✓
	LDW18-SS-170-BC			L1828594-19											✓
	LDW18-SS-171-BC			L1828594-20											✓
	LDW18-SS-172-BC			L1828594-21											✓
	LDW18-SS-173-BC			L1828594-22											✓
	LDW18-SS-174-BC			L1828594-23											✓
	LDW18-SS-175-BC			L1828594-24											✓
	LDW18-SS-176-BC			L1828594-25											✓
	LDW18-SS-177-BC			L1828594-26											✓
	LDW18-SS-178-BC			L1828594-27											✓
	LDW18-SS-178-FD-BC			L1828594-28											✓
	LDW18-SS-179-BC			L1828594-29											✓
	LDW18-SS-180-BC			L1828594-30											✓
	LDW18-SS-181-BC			L1828594-31											✓
	LDW18-SS-182-BC			L1828594-32											✓
	LDW18-SS-183-BC			L1828594-33											✓
	LDW18-SS-184-BC			L1828594-34											✓
	LDW18-SS-185-BC			L1828594-35											✓
	LDW18-SS-186-BC			L1828594-36											✓

Sample Index
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID			Dioxins	PCB Congeners	PCB Aroclors	PAH	SVOC	Toxaphene	Metals	Conventional Tests			
		ARI	Axys	Alpha								TOC	Grain Size	Solids	Black Carbon
L1828594	LDW18-SS-187-BC			L1828594-37											✓
	LDW18-SS-188-BC			L1828594-38											✓
WG63753	LDW18-SS-169-PCBCongeners		L29052-1 K			✓									
	LDW18-SS-172-PCBCongeners		L29052-4			✓									
	LDW18-SS-174-PCBCongeners		L29052-6			✓									
	LDW18-SS-175-PCBCongeners		L29052-7			✓									
	LDW18-SS-177-PCBCongeners		L29052-9			✓									
	LDW18-SS-179-PCBCongeners		L29052-11			✓									
	LDW18-SS-180-PCBCongeners		L29052-12			✓									
	LDW18-SS-184-PCBCongeners		L29052-16 (A)			✓									
	LDW18-SS-185-PCBCongeners		L29052-17			✓									
	LDW18-SS-187-PCBCongeners		L29052-19			✓									
WG63778	PCB Day Zero #1		L28862-2 i			✓									
	PCB Day Zero #2		L28862-3 i			✓									
	PCB Day Zero #3		L28862-4 i			✓									
	LDW18-PWPS-SS169		L29196-1 i2			✓									
	LDW18-PWPS-SS174		L29196-3 i			✓									
	LDW18-PWPS-SS179		L29196-6			✓									
	LDW18-PWPS-SS184		L29196-8			✓									
	LDW18-PWPS-SS187		L29196-10			✓									
	LDW18-PWPS-SS172		L29196-13			✓									
	LDW18-PWPS-SS175		L29196-15			✓									
	LDW18-PWPS-SS177		L29196-17			✓									
	LDW18-PWPS-SS180		L29196-18			✓									
	LDW18-PWPS-SS185		L29196-21 i			✓									
	LDW18-PWPS-EXP BLK		L29196-22 i			✓									
WG64577	LDW18-IT45-B1-Comp1		L29625-1 i2 (A)		✓										
	LDW18-IT45-B1-Comp2		L29625-2 i2		✓										

Sample Index
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID			Dioxins	PCB Congeners	PCB Aroclors	PAH	SVOC	Toxaphene	Metals	Conventional Tests			
		ARI	Axys	Alpha								TOC	Grain Size	Solids	Black Carbon
WG64577	LDW18-IT45-B1-Comp3		L29625-3 i2		✓										
	LDW18-IT45-B1-Comp1-FD		L29625-4 i2		✓										
	LDW18-IT45-B1-Comp2-FD		L29625-5 i3		✓										
	LDW18-IT45-B1-Comp3-FD		L29625-6 i2		✓										
	LDW18-IT45-B2-Comp1		L29625-7 i2		✓										
	LDW18-IT45-B2-Comp2		L29625-8 i		✓										
	LDW18-IT45-B2-Comp3		L29625-9 i		✓										
	LDW18-IT45-B4-Comp1		L29625-10 i		✓										
	LDW18-IT45-B4-Comp2		L29625-11 W		✓										
	LDW18-IT45-B4-Comp3		L29625-12 i2		✓										
	LDW18-IT45-B5-Comp1		L29625-13 i		✓										
	LDW18-IT45-B5-Comp2		L29625-14		✓										
	LDW18-IT45-B5-Comp3		L29625-15		✓										
	LDW18-IT45-B3-Comp1		L29625-16		✓										
	LDW18-IT45-B3-Comp2		L29625-17		✓										
WG64578	LDW18-IT45-B3-Comp3		L29625-18 i (A)		✓										
	LDW18-IT45-B6-Comp1		L29625-19		✓										
	LDW18-IT45-B6-Comp2		L29625-20		✓										
	LDW18-IT45-B6-Comp3		L29625-21		✓										
	LDW18-IT45-B6-Comp1-FD		L29625-22 L2		✓										
	LDW18-IT45-B6-Comp2-FD		L29625-23 L2		✓										
	LDW18-IT45-B6-Comp3-FD		L29625-24 L2		✓										
	LDW18-IT45-B7-Comp1		L29625-25 i		✓										
	LDW18-IT45-B7-Comp2		L29625-26		✓										
	LDW18-IT45-B7-Comp3		L29625-27		✓										
	LDW18-IT45-B8-Comp1		L29625-28		✓										
	LDW18-IT45-B8-Comp2		L29625-29		✓										
	LDW18-IT45-B8-Comp3		L29625-30		✓										

Sample Index
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID			Dioxins	PCB Congeners	PCB Aroclors	PAH	SVOC	Toxaphene	Metals	Conventional Tests			
		ARI	Axys	Alpha								TOC	Grain Size	Solids	Black Carbon
WG64578	LDW18-BNK2-1		L29625-31 i		✓										
	LDW18-IT45-CL-Comp1		L29646-1		✓										
	LDW18-IT45-CL-Comp2		L29646-2 W		✓										
	LDW18-IT45-CL-Comp3		L29646-3		✓										

DATA VALIDATION REPORT
Lower Duwamish Waterway: Sediment
Semi-Volatile Organic and Polynuclear Aromatic Hydrocarbon Compounds by EPA SW8270D

This report documents the review of analytical data from the analysis of sediment samples and the associated laboratory quality control (QC) samples. Samples were analyzed by Analytical Resources, Inc. (ARI), Tukwila, Washington. Refer to the Sample Index for a complete list of samples.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
18E0226	2 Sediment	EPA Stage 4
18F0174,	10 Sediment	EPA Stage 2B
18F0280	2 Sediment	EPA Stage 2B

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

SDG 18F0280: The original chains-of-custody (COC) were missing from the laboratory report. The laboratory was contacted and submitted the missing documentation.

EDD TO HARDCOPY VERIFICATION

All sample IDs and results reported in the electronic data deliverable (EDD) were verified (100% verification) by comparing the EDD to the hardcopy laboratory data package. Ten percent (10%) of the laboratory QC results were also verified.

TECHNICAL DATA VALIDATION

The quality control (QC) requirements that were reviewed are listed in the following table:

1	Sample Receipt, Preservation, and Holding Times	1	Field Duplicates
✓	GC/MS Instrument Performance	✓	Target Analyte List
✓	Initial Calibration (ICAL)	✓	Internal Standards
2	Continuing Calibration (CCAL)	1	Certified Reference Material
✓	Laboratory Blanks	1	Reporting Limits
1	Field Blanks	✓	Reported Results
1	Surrogate Compounds	✓	Compound Identification
✓	Laboratory Control Samples (LCS/LCSD)	1	Calculation Verification
✓	Matrix Spike/Matrix Spike Duplicates (MS/MSD)		

✓ Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.
[1] Quality control results are discussed below, but no data were qualified.
[2] Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Sample Receipt, Preservation, Holding Times

As stated in validation guidance documents, sample shipping coolers should arrive at the laboratory within the advisory temperature range of ≤6°C. With the exceptions noted below, the laboratory received the sample coolers within the advisory temperature range.

SDG 18F0174: The samples were received at temperatures greater than the upper control limit between 8.6°C to 13.9°C. The samples arrived at the laboratory within several hours of collection; no data were qualified.

SDG 18F0280: The samples were received at temperatures greater than the upper control limit between 9.3° to 17.2°C. The samples arrived at the laboratory within several hours of collection; no data were qualified.

Continuing Calibration

A continuing calibration verification (CCAL) standard was analyzed at the required frequency. Relative response factors (RRF) were greater than or equal to 0.05 for all compounds except for poorly responding compounds with RRF values greater than or equal to 0.01. The percent difference (%D) values were less than or equal to 25% for all compounds except for poorly responding compounds were less than or equal to 40.0%. When the CCAL %D values indicate a potential low bias, associated results are estimated (J/UJ-5BL). Only the associated positive results are estimated (J-5BH) if the %D value indicates a potential high bias.

The following CCAL outliers required qualification:

SDG	CCAL Date	Compound	Potential Bias	Action
18F0174	7/01/18	Phenol	Low	J/UJ-5BL
18F0280	7/01/18	Phenol	Low	UJ-5BL
	7/05/18	4-Methylphenol	Low	J-5BL
		Fluorene	Low	J-5BL

Surrogate Compounds

The surrogate compounds dibenzo(a,h)anthracene-d14, fluoranthrene-d10, and 2-methylnaphthalene-d10, were added to all field and batch QC samples. When two or more surrogate %R values are below the control limits and indicate a potential low bias, associated results for the are estimated (J/UJ-13L). When two or more surrogate %R values are greater than the control limit and indicate a potential high bias, only the positive results for a sample are estimated (J-13H). If there is one surrogate outlier that is less than 10% recovery, the reporting limits for that fraction are rejected (R-13L) and the detections are estimated (J-13L). With the exceptions noted below, all surrogate spike recoveries were within the laboratory control limits.

SDG 18F0174: For Samples LDW18-BNK4-3 and LDW18-BNK2-1, the %R values for 2,4,6-tribromophenol were greater than the upper control limit. The other acid surrogates were in control; no qualifiers were added based on these single outliers.

SDG 18F0280: For Sample LDW18-BNK6-1, the %R value for 2,4,6-tribromophenol was greater than the upper control limit. The other acid surrogates were in control; no qualifiers were assigned based on this single outlier.

For the associated SRM sample, the %R value for 2,4,6-tribromophenol was greater than the upper control limit. The other acid surrogates were in control and this is a QC sample; no qualifiers were assigned based on this single outlier.

Field Blanks

No field blanks were submitted.

Field Duplicates

For sediment samples, the QAPP RPD control limit is 35% for results greater than 5x the reporting limit (RL). For results less than 5x the RL, the absolute difference between the sample and replicate must be less than 2x the RL.

SDGs 18E0226 & 18F0280: No field duplicates were submitted with these SDGs.

SDG 18F0174: Samples LDW18-BNK5-1 and LDW18-BNK5-1-FD were submitted as field duplicates. All acceptance criteria were met.

Certified Reference Material

Certified reference material (CRM), CRM142 (Silty Loam), was analyzed with these analytical data sets. All acceptance criteria were met.

Calculation Verification

SDG 18E0226: Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable as demonstrated by the surrogate, LCS, MS/MSD recovery values and precision was acceptable as demonstrated by the RPD values for the MS/MSD and field duplicate analyses.

Results were estimated due to continuing calibration verification accuracy outliers.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Lower Duwamish Waterway: Sediment
Semivolatile Organic and Polynuclear Aromatic Hydrocarbon Compounds by EPA SW8270D-SIM

This report documents the review of analytical data from the analysis of sediment samples and the associated laboratory quality control (QC) samples. Samples were analyzed by Analytical Resources, Inc. (ARI), Tukwila, Washington. Refer to the Sample Index for a complete list of samples.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
18E0226	2 Sediment	EPA Stage 4
18F0174	10 Sediment	EPA Stage 2B
18F0314	15 Sediment	EPA Stage 2B
18F0280	22 Sediment	EPA Stage 2B

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

SDG 18E0226: The quantitation report for a calibration sample was missing from the laboratory report. The laboratory was contacted and submitted the missing documentation.

SDG 18F0280: The original chains-of-custody (COC) were missing from the laboratory report. The laboratory was contacted and submitted the missing documentation.

EDD TO HARDCOPY VERIFICATION

All sample IDs and results reported in the electronic data deliverable (EDD) were verified (100% verification) by comparing the EDD to the hardcopy laboratory data package. Ten percent (10%) of the laboratory QC results were also verified.

TECHNICAL DATA VALIDATION

The quality control (QC) requirements that were reviewed are listed in the following table:

1	Sample Receipt, Preservation, and Holding Times	1	Field Duplicates
✓	GC/MS Instrument Performance	✓	Target Analyte List
✓	Initial Calibration (ICAL)	✓	Internal Standards
2	Continuing Calibration (CCAL)	✓	Certified Reference Material
✓	Laboratory Blanks	1	Reporting Limits
1	Field Blanks	2	Reported Results
✓	Surrogate Compounds	✓	Compound Identification
✓	Laboratory Control Samples (LCS/LCSD)	1	Calculation Verification
2	Matrix Spike/Matrix Spike Duplicates (MS/MSD)		

✓ Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.
[1] Quality control results are discussed below, but no data were qualified.
[2] Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Sample Receipt, Preservation, Holding Times

As stated in validation guidance documents, sample shipping coolers should arrive at the laboratory within the advisory temperature range of ≤6°C. With the exceptions noted below, the laboratory received the sample coolers within the advisory temperature range.

SDG 18F0174: The samples were received at temperatures greater than the upper control limit between 8.6°C to 13.9°C. The samples arrived at the laboratory the within several hours of collection; no data were qualified.

SDG 18F0280: The samples were received at temperatures greater than the upper control limit between 9.3°C and 17.2°C. Some temperatures were not noted upon receipt. The samples arrived at the laboratory the within several hours of collection; no data were qualified.

SDG 18F0314: The samples were received at temperatures greater than the upper control limit between 10.6°C to 12.4°C. The samples arrived at the laboratory the within several hours of collection; no data were qualified.

Continuing Calibration

A continuing calibration verification (CCAL) standard was analyzed at the required frequency. Relative response factors (RRF) were greater than or equal to 0.05 for all compounds except for poorly responding compounds with RRF values greater than or equal to 0.01. The percent difference (%D) values were less than or equal to 25% for all compounds except for poorly responding compounds were less than or equal to 40.0%. When the CCAL %D values indicate a potential low bias, associated results are estimated (J/UJ-5BL). Only the associated positive results are estimated (J-5BH) if the %D value indicates a potential high bias.

The following CCAL outliers required qualification:

SDG	CCAL Date	Compound	Potential Bias	Action
18E0226	5/26/18	Benzoic acid	Low	J-5BL
		Pentachlorophenol	Low	J/UJ-5BL
18F0280	7/05/18	Benzoic acid	Low	J-5BL
		Pentachlorophenol	Low	J-5BL

Field Blanks

No field blanks were submitted.

Matrix Spike/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate (MS/MSD) samples were analyzed at the appropriate frequency. No action is taken unless both the MS and MSD percent recovery (%R) values are outside the control limits for MS/MSD %R outliers. Precision is evaluated using the RPD values calculated between the MS and MSD results. Any RPD values outside the control limits indicate uncertainty in the measured results for the sample. Qualifiers were only issued to the parent sample.

When the MS/MSD %R values indicate a potential low bias, associated results are estimated (J/UJ-8L). Only the associated positive results are estimated (J-8H) if the %R values indicate a potential high bias. Associated positive results are estimated (J-9) if the RPD values indicate uncertainty.

SDG 18F0280: For the matrix spikes performed using Sample LDW18-IT45-B1-Comp1, the %R and RPD values for were much greater than the control limit with unusually high RPD values (between 150% and 186%). The laboratory re-extracted the parent sample (in triplicate) and the associated MS and MSD. The %R and RPD values for the re-extracted MS and MSD were within the control limits. The laboratory attributed the initial extraction results to sample homogeneity. Results from the original extracted were qualified as do-not-report (DNR-11) for the parent sample.

The following outliers resulted in qualification of sample results:

SDG	Parent Sample	Analyte	MS %R	MSD %R %R	RPD	Qualifier
18F0280	LDW18-IT45-CL-Comp1	Benzo(a)anthracene	-48.9	15.8	41.8	J-8L,9
		Benzo(a)pyrene	-85.5	4.53	58.3	J-8L,9
		Benzo(b)fluoranthene	-25.3	ok	40.3	J-9
		Benzo(k)fluoranthene	-5.94	32.1	36.8	J-8L9
		Chrysene	-74.7	-5.6	40.2	J-8L,9
		Indeno(1,2,3-cd)pyrene	-26.6	22.5	40.1	J-8L,9
18F0314	LDW18-IT45-B3-Comp1	benzo(a)anthracene	248	249	--	J-8H
		benzo(a)pyrene	431	416	--	
		benzo(b)fluoranthene	322	315	--	
		benzo(k)fluoranthene	217	206	--	

SDG	PARENT SAMPLE	ANALYTE	MS %R	MSD %R %R	RPD	QUALIFIER
18F0314	LDW18-IT45-B3-Comp1	chrysene	320	321	--	J-8H
		indeno(1,2,3-cd)pyrene	350	316	--	

Field Duplicates

For sediment samples, the QAPP RPD control limit is 35% for results greater than 5x the reporting limit (RL). For results less than 5x the RL, the absolute difference between the sample and replicate must be less than 2x the RL.

SDG 18F0174: Samples LDW18-BNK5-1 and LDW18-BNK5-1-FD were submitted as field duplicates. All acceptance criteria were met.

SDG 18F0314: Three field duplicate sets were submitted:

- LDW18-IT45-B6-Comp1 & LDW18-IT45-B6-Comp1-FD
- LDW18-IT45-B6-Comp2 & LDW18-IT45-B6-Comp2-FD
- LDW18-IT45-B6-Comp3 & LDW18-IT45-B6-Comp3-FD

With the following exceptions, all acceptance criteria were met.

SDG	PARENT SAMPLE	DUPLICATE SAMPLE	ANALYTE	OUTLIER TYPE
18F0314	LDW18-IT45-B6-Comp1	LDW18-IT45-B6-Comp1-FD	Indeno(1,2,3-cd)pyrene	147% RPD
			Benzo(b)fluoranthene	158% RPD
			Benzo(k)fluoranthene	158% RPD
			Chrysene	161% RPD
			Benzo(a)pyrene	155% RPD
			Dibenzo(a,h)anthracene	Difference
			Benzo(a)anthracene	164% RPD
	LDW18-IT45-B6-Comp2	LDW18-IT45-B6-Comp2-FD	Indeno(1,2,3-cd)pyrene	76% RPD
			Benzo(b)fluoranthene	69% RPD
			Benzo(k)fluoranthene	73% RPD
			Chrysene	74% RPD
			Benzo(a)pyrene	79% RPD
			Dibenzo(a,h)anthracene	70% RPD
			Benzo(a)anthracene	79% RPD
	LDW18-IT45-B6-Comp3	LDW18-IT45-B6-Comp3-FD	Indeno(1,2,3-cd)pyrene	76% RPD
			Benzo(b)fluoranthene	64% RPD
			Benzo(k)fluoranthene	64% RPD
			Chrysene	68% RPD
			Benzo(a)pyrene	63% RPD
			Dibenzo(a,h)anthracene	Difference
			Benzo(a)anthracene	68% RPD

SDG 18F0280: Three field duplicate sets were submitted:

- LDW18-IT45-B1-Comp1 & LDW18-IT45-B1-Comp1-FD
- LDW18-IT45-B1-Comp2 & LDW18-IT45-B1-Comp2-FD
- LDW18-IT45-B1-Comp3 & LDW18-IT45-B1-Comp3-FD

With the following exceptions, all acceptance criteria were met. For the first field duplicate set, the laboratory re-extracted the parent sample (see the Matrix Spike/Matrix Spike Duplicate section for details), but not the associated field duplicate. The high RPD values could indicate a sample homogeneity issue.

SDG	PARENT SAMPLE	DUPLICATE SAMPLE	ANALYTE	OUTLIER TYPE
18F0280	LDW18-IT45-B1-Comp1 (re-extract)	LDW18-IT45-B1-Comp1-FD	Indeno(1,2,3-cd)pyrene	125% RPD
			Benzo(b)fluoranthene	123% RPD
			Benzo(k)fluoranthene	124% RPD
			Chrysene	129% RPD
			Benzo(a)pyrene	116% RPD
			Dibenzo(a,h)anthracene	117% RPD
			Benzo(a)anthracene	128% RPD

Reporting Limits

SDG 18F0280: Reporting limits were elevated due to required dilutions.

Reported Results

SDG 18F0314: For Sample LDW18-IT45-B6-Comp1-FD, several analytes were reported with an "E" flag indicating a result that exceeded the upper calibration range. The "E" flagged results were flagged as do-not-report (DNR-20) in the original analysis and all other results in the dilution analyses were flagged (DNR-11).

SDG 18F0280: For Samples LDW18-IT45-B1-Comp1, LDW18-IT45-B1-Comp1-FD, LDW18-IT45-B5-Comp3, and LDW18-IT45-CL-Comp2, several analytes were reported with an "E" flag indicating a result that exceeded the upper calibration range. Sample LDW18-IT45-B1-Comp1 was re-extracted. All E-flagged values were qualified do-not-report (DNR-11). For the remaining samples, the "E" flagged results were flagged as do-not-report (DNR-20) in the original analysis and all other results in the dilution analyses were flagged (DNR-11).

Calculation Verification

SDG 18E0226: Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. With the exceptions noted previously, accuracy was acceptable as demonstrated by the surrogate, LCS, and MS/MSD recovery values. With the exceptions noted above, precision was acceptable as demonstrated by the RPD values for the MS/MSD and field duplicate analyses.

Results were estimated due to MS/MSD accuracy and precision outliers and continuing calibration percent drift outliers. Data were qualified as do-not report to indicate which result from multiple reported results should not be used.

Data that have been flagged as do-not-report should not be used for any purpose.

All other data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Lower Duwamish Waterway: Sediment
Toxaphene by EPA 8081B

This report documents the review of analytical data from the analyses of sediment samples and the associated laboratory quality control (QC) samples. Samples were analyzed by Analytical Resources, Inc. (ARI), Tukwila, Washington. Refer to the Sample Index for a list of samples reviewed.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
18F0280	18 Sediment	EPA Stage 2B
18F0314	15 Sediment	EPA Stage 4

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

SDG 18F0280: Some of the original chains-of-custody (COC) were missing from the laboratory report. The laboratory was contacted and submitted the missing documentation.

EDD TO HARDCOPY VERIFICATION

All sample IDs and results reported in the electronic data deliverable (EDD) were verified (100% verification) by comparing the EDD to the hardcopy laboratory data package. Ten percent (10%) of the laboratory QC results were also verified. The following discrepancy was found.

TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

1	Sample Receipt, Preservation, and Holding Times	✓	Matrix Spikes/Matrix Spike Duplicates (MS/MSD)
✓	Initial Calibration	**1**	Field Duplicates
✓	Continuing Calibration	✓	Internal Standards
✓	Laboratory Blanks	✓	Target Analyte List
1	Field Blanks	✓	Reporting Limits
1	Surrogate Compounds	✓	Reported Results
✓	Laboratory Control Samples (LCS)	**2**	Compound Identification
1	Reference Material	✓	Calculation Verification

✓ Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.
[1] Quality control results are discussed below, but no data were qualified.
[2] Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Sample Receipt, Preservation, Holding Times

As stated in validation guidance documents, sample shipping coolers should arrive at the laboratory within the advisory temperature range of ≤6°C. With the exceptions noted below, the laboratory received the sample coolers within the advisory temperature range.

SDG 18F0280: The samples were received at temperatures greater than the upper control limit between 9.3°C and 17.21°C. The samples arrived at the laboratory within several hours of collection; no data were qualified.

SDG 18F0314: The samples were received at temperatures greater than the upper control limit between 10.6°C to 12.4°C. The samples arrived at the laboratory within several hours of collection; no data were qualified.

Surrogate Compounds

The surrogate compounds tetrachloro-m-xylene and decachlorobiphenyl were added to all samples. With the following exception, all surrogate recovery values were within the laboratory control limits.

SDG 18F0314: The percent recovery (%R) values for decachlorobiphenyl were greater than the upper control limit for the following samples. There were no positive results for toxaphene in these samples. No qualifiers were applied.

- LDW18-IT45-B3-Comp1
- LDW18-IT45-B6-Comp2
- LDW18-IT45-B6-Comp2-FD
- LDW18-IT45-B6-Comp3-FD

Field Blanks

No field blanks were submitted with this data set.

Reference Material

No reference material was analyzed with this data set.

Field Duplicates

For sediment water samples, the RPD control limit is 35% for results greater than 5x the reporting limit (RL). For results less than 5x the RL, the absolute difference between the sample and replicate must be less than 1x the RL.

SDG 18F0280: Three field duplicate sets were submitted. Field precision was acceptable.

- LDW18-IT45-B1-Comp1 & LDW18-IT45-B1-Comp1-FD
- LDW18-IT45-B1-Comp2 & LDW18-IT45-B1-Comp2-FD
- LDW18-IT45-B1-Comp3 & LDW18-IT45-B1-Comp3-FD

SDG 18F0314: Three field duplicate sets were submitted. Field precision was acceptable.

- LDW18-IT45-B6-Comp1 & LDW18-IT45-B6-Comp1-FD
- LDW18-IT45-B6-Comp2 & LDW18-IT45-B6-Comp2-FD
- LDW18-IT45-B6-Comp3 & LDW18-IT45-B6-Comp3-FD

Calculation Verification

SDG 18F0314: Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory performed the specified analytical method. Accuracy was acceptable, as demonstrated by the surrogate, LCS, and MS/MSD percent recoveries. Precision was also acceptable as demonstrated by the field duplicate and MS/MSD RPD values.

No results were qualified for any reason.

All data, as reported, are acceptable for use.

DATA VALIDATION REPORT
Lower Duwamish Waterway: Sediment
PCB Aroclors by EPA 8082A

This report documents the review of analytical data from the analysis of sediment samples and the associated laboratory quality control (QC) samples. Samples were analyzed by Analytical Resources, Inc. (ARI), Tukwila, Washington. Refer to the Sample Index for a complete list of samples.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
18E0226	2 Sediment	EPA Stage 4
18F0174	10 Sediment	EPA Stage 2B
18F0280	20 Sediment	EPA Stage 2B
18F0314	15 Sediment	EPA Stage 2B
18H0068	2 Sediment	EPA Stage 2B

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

SDG 18F0280: The original chains-of-custody (COC) for some samples were missing from the laboratory report. The laboratory was contacted and submitted the missing documentation.

EDD TO HARDCOPY VERIFICATION

All sample IDs and results reported in the electronic data deliverable (EDD) were verified (100% verification) by comparing the EDD to the hardcopy laboratory data package. Ten percent (10%) of the laboratory QC results were also verified.

TECHNICAL DATA VALIDATION

This report documents the review of analytical QC requirements as listed in the following table.

1	Sample Receipt, Preservation, and Holding Times	1	Certified Reference Material
✓	Initial Calibration (ICAL)	1	Field Duplicates
✓	Continuing Calibration (CCAL)	✓	Target Analyte List
✓	Laboratory Blanks	1	Reporting Limits
1	Field Blanks	2	Compound Identification
2	Surrogate Compounds	2	Reported Results
✓	Matrix Spikes/Matrix Spike Duplicates (MS/MSD)	1	Calculation Verification (Full validation only)
✓	Laboratory Control Samples (LCS)		

✓ Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.
[1] Quality control results are discussed below, but no data were qualified.
[2] Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Sample Receipt, Preservation, Holding Times

As stated in validation guidance documents, sample shipping coolers should arrive at the laboratory within the advisory temperature range of ≤6°C. With the exceptions noted below, the laboratory received the sample coolers within the advisory temperature range.

SDG 18F0174: The samples were received at temperatures greater than the upper control limit between 8.6°C to 13.9°C. The samples arrived at the laboratory within several hours of collection; no data were qualified.

SDG 18F0280: The samples were received at temperatures greater than the upper control limit between 9.3°C and 17.2°C. The samples arrived at the laboratory within several hours of collection; no data were qualified.

SDG 18F0314: The samples were received at temperatures greater than the upper control limit between 10.6°C to 12.4°C. The samples arrived at the laboratory within several hours of collection; no data were qualified.

SDG 18H0068: The samples were received at a temperature greater than the upper control limit at 9.3°C. The samples were received at the laboratory the same day as collection; no data were qualified.

Field Blanks

No field blanks were submitted.

Surrogate Compounds

The surrogate compounds tetrachloro-m-xylene and decachlorobiphenyl were added to all samples. With the following exception, all surrogate recovery values were within the laboratory control limits.

SDG 18F0314: The percent recovery (%R) values for decachlorobiphenyl were greater than the upper control limit in the diluted analyses (5x) of Samples LDW18-IT45-B6-Comp2 and LDW18-IT45-B6-Comp2-FD. The detected results in these samples were estimated (J-13H).

SDG 18F0280: The %R value for decachlorobiphenyl was greater than the upper control limit in the diluted analysis (5x) of Sample LDW18-IT45-CL-Comp2. The positive results in these samples were estimated (J-13H).

Certified Reference Material

Certified reference material, Puget Sound Reference Material, was analyzed with these analytical data sets. All recoveries were within acceptance criteria.

Field Duplicates

For sediment samples, the QAPP RPD control limit is 35% for results greater than 5x the reporting limit (RL). For results less than 5x the RL, the absolute difference between the sample and replicate must be less than 2x the RL.

SDG 18F0174: Samples LDW18-BNK5-1 and LDW18-BNK5-1-FD were submitted as field duplicates. All acceptance criteria were met.

SDG 18F0280: Three field duplicate sets were submitted:

- LDW18-IT45-B1-Comp1 & LDW18-IT45-B1-Comp1-FD
- LDW18-IT45-B1-Comp2 & LDW18-IT45-B1-Comp2-FD
- LDW18-IT45-B1-Comp3 & LDW18-IT45-B1-Comp3-FD

For LDW18-IT45-B1-Comp2 & LDW18-IT45-B1-Comp2-FD, the RPD value for Aroclor 1248 was greater than the control limit at 41%. For LDW18-IT45-B1-Comp3 & LDW18-IT45-B1-Comp3-FD, the RPD value for Aroclor 1260 was greater than the control limit at 38%.

SDG 18F0314: Three field duplicate sets were submitted:

- LDW18-IT45-B6-Comp1 & LDW18-IT45-B6-Comp1-FD
- LDW18-IT45-B6-Comp2 & LDW18-IT45-B6-Comp2-FD
- LDW18-IT45-B6-Comp3 & LDW18-IT45-B6-Comp3-FD

For LDW18-IT45-B6-Comp1 & LDW18-IT45-B6-Comp1-FD, the RPD value for Aroclor 1248 was greater than the control limit ay 38%.

Reporting Limits

All SDGs: Reporting limits were elevated due to required dilutions and/or percent moisture adjustment and some were greater than the QAPP specified limits.

Reported Results

SDG 18E0226: The laboratory reported results from both the primary and confirmation columns. One result for each analyte was flagged as do-not-report (DNR-11) to indicate which result to use from multiple reported results.

SDG 18F0314: For Samples LDW18-IT45-B6-Comp2, LDW18-IT45-B6-Comp3, LDW18-IT45-B6-Comp2-FD, and LDW18-IT45-B6-Comp3-FD, one or more positive results that exceeded the calibration range of the instrument and were "E" flagged by the laboratory. The samples were re-analyzed at a dilution. The "E" flagged results were flagged as do-not-report (DNR-20) in the original analysis and all other results in the diluted sample were flagged (DNR-11).

SDG 18F0280: For Samples LDW18-BNK6-1, LDW18-IT45-B1-Comp1, LDW18-IT45-B1-Comp1-FD, LDW18-IT45-B4-Comp2, and LDW18-IT45-CL-Comp2, one or more positive results exceeded the

calibration range of the instrument and were "E" flagged by the laboratory. The samples were re-analyzed at a dilution. The "E" flagged results were flagged as do-not-report (DNR-20) in the original analyses and all other results in the diluted samples were flagged (DNR-11).

Compound Identification

As required by the method, the laboratory analyzed samples with positive detections on a confirmation column. The results from the two analytical columns were compared for agreement. An elevated RPD value may indicate the presence of an interference resulting in a high bias. When the RPD value was greater than or equal to 40% but less than 60% the reported value was estimated (J-3). If the RPD value was greater than 60%, the result was qualified as a tentative identification (NJ-3). Confirmation outliers resulting in data qualification are discussed below.

SDG	Sample ID	Compound	RPD	Qualifier
18F0241	LDW18-BNK4-3	Aroclor 1254	83	NJ-3
18F0174	LDW18-BNK2-1	Aroclor 1254	57	J-3
		Aroclor 1248	51	J-3
18F0314	LDW18-IT45-B3-Comp1	Aroclor 1248	50	J-3
	LDW18-IT45-B3-Comp3	Aroclor 1248	80	NJ-3
		Aroclor 1260	47	J-3
	LDW18-IT45-B6-Comp2 RE	Aroclor 1248	49	J-3
	LDW18-IT45-B6-Comp1-FD	Aroclor 1248	43	J-3
	LDW18-IT45-B6-Comp2-FD	Aroclor 1248	52	J-3
	LDW18-IT45-B8-Comp1	Aroclor 1248	42	J-3
18F0280	LDW18-BNK6-2	Aroclor 1254	63	NJ-3
	LDW18-IT45-B1-Comp2	Aroclor 1248	54	J-3
	LDW18-IT45-B1-Comp3-FD	Aroclor 1254	46	J-3
	LDW18-IT45-B2-Comp1	Aroclor 1248	45	J-3
	LDW18-IT45-B4-Comp1	Aroclor 1254	45	J-3
	LDW18-IT45-B4-Comp2	Aroclor 1254	66	NJ-3
	LDW18-IT45-B5-Comp1	Aroclor 1248	70	NJ-3
		Aroclor 1254	44	J-3
	LDW18-IT45-B5-Comp2	Aroclor 1248	45	J-3
		Aroclor 1254	40	J-3
	LDW18-IT45-B5-Comp3	Aroclor 1248	65	NJ-3
	LDW18-IT45-CL-Comp2	Aroclor 1254	72	NJ-3
	LDW18-IT45-CL-Comp3	Aroclor 1248	56	J-3

Calculation Verification

SDG 18E0226: Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. With the exceptions noted above, accuracy was acceptable as demonstrated by the surrogate, LCS, and MS/MSD recoveries. With the exceptions noted above, precision was also acceptable as demonstrated by the MS/MSD and field duplicate RPD values.

Data were estimated due to surrogate recovery outliers and dual column confirmation RPD outliers. Data were qualified as do-not report to indicate which result from multiple reported results should not be used.

Data that have been flagged as do-not-report should not be used for any purpose.

All other data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Lower Duwamish Waterway: Sediment
Dioxin/Furan Compounds by EPA 1613B

This report documents the review of analytical data from the analysis of sediment samples and the associated laboratory quality control (QC) samples. Samples were analyzed by SGS Axys, Sidney, BC, Canada. Refer to the Sample Index for a complete list of samples.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
WG64576	17 Sediment	EPA Stage 4
WG64577	17 Sediment	EPA Stage 2B

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

EDD TO HARDCOPY VERIFICATION

All sample IDs and results reported in the electronic data deliverable (EDD) were verified (100% verification) by comparing the EDD to the hardcopy laboratory data package. Ten percent (10%) of the laboratory QC results were also verified.

TECHNICAL DATA VALIDATION

The quality control (QC) requirements that were reviewed are listed in the following table.

✓	Sample Receipt, Preservation, and Holding Times	✓	Ongoing Precision and Recovery (OPR)
✓	System Performance and Resolution Checks	2	Certified Reference Material
✓	Initial Calibration (ICAL)	1	Field Duplicates
✓	Calibration Verification (CVER)	✓	Target Analyte List
2	Laboratory Blanks	✓	Reporting Limits
1	Field Blanks	2	Compound Identification
✓	Labeled Compound Recovery	✓	Compound Quantitation
1	Matrix Spike/Matrix Spike Duplicates (MS/MSD)	1	Calculation Verification (Full Validation Only)
2	Laboratory Duplicates		

✓Method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.
1 Quality control results are discussed below, but no data were qualified.
2 Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Laboratory Blanks

To assess the impact of any blank contaminant on the reported sample results, an action level is established at five times (5x) the concentration reported in the blank. If a contaminant is reported

in an associated field sample and the concentration is less than the action level, the result is qualified as not detected (U-7). No action is taken if the sample result is greater than the action level, or for non-detected results. The laboratory assigned EMPC-flags to values when a peak was detected but did not meet identification criteria. These values cannot be considered as positive identifications, but are "estimated maximum possible concentrations". When these occurred in the method blank the results were considered as false positives. No action levels were established for these analytes.

Method blanks were analyzed at the appropriate frequency. Contaminant levels, associated samples, and action levels are documented in the data validation worksheets.

SDG WG64576: 2,3,4,7,8-PeCDF, 2,3,7,8-TCDF, OCDD, and 1,2,3,4,6,7,8-HpCDD were detected. After evaluating against the action level, four (4) results were qualified as not detected (U-7).

Field Blanks

No field blanks were submitted.

Matrix Spike/Matrix Spike Duplicate

Matrix spike/matrix spike duplicate (MS/MSD) analyses were not performed. Accuracy was assessed using labeled compound recoveries and laboratory control samples. This QC sample goes through the entire extraction process prior to analysis. Precision is evaluated using the field duplicate analyses.

Laboratory Duplicate Analysis

One sample from each laboratory batch was extracted and analyzed in duplicate. Relative percent difference (RPD) values were calculated for detected analytes where results are greater than five times the reporting limit (RL). With the exceptions noted below, all RPD values were less than the 20% control limit.

The following RPD values were greater than the control limit; results for these compounds were estimated (J-9) in the parent and duplicate samples:

SDG	Parent Sample ID	Analyte	Outlier Type (% RPD/Difference)
WG64576	LDW18-IT45-B1-Comp1	1,2,3,4,6,7,8-HpCDF	21%
		1,2,3,4,6,7,8-HpCDF	30%
		1,2,3,6,7,8-HxCDF	50%
		2,3,4,6,7,8-HxCDF	34%
		2,3,4,7,8-PeCDF	50%
		OCDF	60%
WG64577	LDW18-IT45-B3-Comp3	1,2,3,4,6,7,8-HpCDF	60%
		OCDF	37%
		Total HxCDF	46%
		Total PeCDD	24%
		Total TCDD	23%

SDG	Parent Sample ID	Analyte	Outlier Type (% RPD/Difference)
WG64577	LDW18-IT45-B3-Comp3	Total HpCDF	71%

Certified Reference Material

The laboratory extracted and analyzed the Puget Sound reference material for dioxin/furan compounds. The criteria for CRM recovery is that the reported result is within ±20% of the 95% confidence interval of the true value for analytes with reference concentrations greater than five times the detection limit.

SDG WG64576: The recovery for 1,2,3,4,6,7,8-HpCDD was greater than the upper control limit. All associated sample results were estimated (J-12H). The recoveries for 1,2,3,7,8,9-HxCDF and 2,3,7,8-TCDF were less than the lower control limits; associated sample results were estimated (J/UJ-12L).

SDG WG64577: The recoveries for OCDF and 2,3,7,8-TCDF were greater than the upper control limit; associated sample results were estimated (J-12H). The recoveries for 1,2,3,7,8,9-HxCDF and 2,3,4,6,7,8-HxCDF were less than the lower control limit; associated sample results were estimated (J/UJ-12l). For the confirmation analyses, the 2,3,7,8-TCDF and 1,2,3,7,8,9-HxCDD recoveries were less than the lower control limit; associated sample results were estimated (J/UJ-12L).

Field Duplicates

For sediment samples, the QAPP RPD control limit is 20% for results greater than 5x the reporting limit (RL). For results less than 5x the RL, the absolute difference between the sample and replicate must be less than 1x the RL. No data were qualified based on field replicate precision outliers. Users of the data should consider the impact of field precision outliers on the reported results.

SDG WG64576: Three field duplicate sample sets were submitted: Samples LDW18-IT45-B1-Comp1 & LDW18-IT45-B1-Comp1-FD, LDW18-IT45-B1-Comp2 & LDW18-IT45-B1-Comp2-FD, and LDW18-IT45-B1-Comp3 & LDW18-IT45-B1-Comp3-FD. The RPD values exceeded the acceptance criteria for the following compounds:

Parent / Field Duplicate Set	Compound	RPD/Difference Evaluation
LDW18-IT45-B1-Comp1 / LDW18-IT45-B1-Comp1-FD	1,2,3,7,8,9-HxCDD	Difference
	2,3,7,8-TCDF	21%
	1,2,3,7,8-PeCDD	45%
	1,2,3,4,7,8-HxCDD	79%
	1,2,3,6,7,8-HxCDD	54%
	1,2,3,7,8,9-HxCDD	110%
	OCDD	34%
	2,3,4,7,8-PeCDF	110%
	1,2,3,4,7,8-HxCDF	65%
	1,2,3,6,7,8-HxCDF	116%

Parent / Field Duplicate Set	Compound	RPD/Difference Evaluation
LDW18-IT45-B1-Comp1 / LDW18-IT45-B1-Comp1-FD	2,3,4,6,7,8-HxCDF	163%
	1,2,3,4,6,7,8-HpCDF	102%
	1,2,3,4,7,8,9-HpCDF	76%
	Total TCDD	24%
	Total PeCDD	79%
	Total HxCDD	79%
	Total TCDF	59%
	Total PeCDF	108%
	Total HxCDF	100%
	Total HpCDF	58%
LDW18-IT45-B1-Comp2 / LDW18-IT45-B1-Comp2-FD	1,2,3,7,8,9-HxCDD	32%
	1,2,3,4,7,8-HxCDD	26%
	1,2,3,6,7,8-HxCDD	28%
	1,2,3,4,6,7,8-HpCDD	45%
	OCDD	65%
	1,2,3,7,8,9-HxCDF	139%
	1,2,3,4,6,7,8-HpCDF	23%
	OCDF	24%
	Total HxCDD	35%
	Total HpCDD	58%
	Total TCDF	48%
	Total PeCDF	37%
LDW18-IT45-B1-Comp3 / LDW18-IT45-B1-Comp3-FD	1,2,3,7,8-PeCDD	Difference
	1,2,3,4,7,8-HxCDD	25%
	2,3,4,6,7,8-HxCDF	26%
	Total TCDD	154%
	Total PeCDD	99%

SDG WG64577: Three field duplicate sample sets were submitted: LDW18-IT45-B6-Comp1 & LDW18-IT45-B6-Comp1-FD, LDW18-IT45-B6-Comp2 & LDW18-IT45-B6-Comp2-FD, and LDW18-IT45-B6-Comp3 & LDW18-IT45-B6-Comp3-FD. The RPD values exceeded the acceptance criteria for the following compounds:

Parent / Field Duplicate Set	Compound	RPD/Difference Evaluation
LDW18-IT45-B6-Comp1 / LDW18-IT45-B6-Comp1-FD	1,2,3,7,8-PeCDD	59%
	1,2,3,4,7,8-HxCDD	82%
	1,2,3,6,7,8-HxCDD	51%
	1,2,3,7,8,9-HxCDD	85%
	1,2,3,4,6,7,8-HpCDD	31%
	OCDD	44%

Parent / Field Duplicate Set	Compound	RPD/Difference Evaluation
LDW18-IT45-B6-Comp1 / LDW18-IT45-B6-Comp1-FD	1,2,3,4,7,8-HxCDF	59%
	1,2,3,6,7,8-HxCDF	90%
	1,2,3,7,8,9-HxCDF	Difference
	2,3,4,6,7,8-HxCDF	83%
	1,2,3,4,7,8,9-HpCDF	88%
	OCDF	39%
	Total TCDD	129%
	Total HxCDD	43%
	Total HpCDD	23%
	Total TCDF	88%
	Total HxCDF	56%
	Total HpCDF	38%
LDW18-IT45-B6-Comp2 / LDW18-IT45-B6-Comp2-FD	2,3,7,8-TCDD	Difference
	1,2,3,7,8-PeCDD	81%
	1,2,3,4,7,8-HxCDD	23%
	1,2,3,7,8,9-HxCDD	76%
	2,3,7,8-TCDF	79%
	1,2,3,7,8-PeCDF	93%
	2,3,4,7,8-PeCDF	95%
	1,2,3,6,7,8-HxCDF	57%
	1,2,3,7,8,9-HxCDF	Difference
	2,3,4,6,7,8-HxCDF	80%
	OCDF	34%
	Total TCDD	156%
	Total PeCDD	95%
	Total HxCDD	50%
	Total TCDF	144%
	Total PeCDF	76%
	Total HpCDF	32%
LDW18-IT45-B6-Comp3 / LDW18-IT45-B6-Comp3-FD	2,3,7,8-TCDD	153%
	1,2,3,7,8-PeCDD	130%
	1,2,3,4,7,8-HxCDD	87%
	1,2,3,6,7,8-HxCDD	55%
	1,2,3,7,8,9-HxCDD	79%
	2,3,7,8-TCDF	166%
	1,2,3,7,8-PeCDF	172%
	2,3,4,7,8-PeCDF	167%
	1,2,3,4,7,8-HxCDF	86%
	1,2,3,6,7,8-HxCDF	128%
	1,2,3,7,8,9-HxCDF	Difference
	2,3,4,6,7,8-HxCDF	149%
	1,2,3,4,6,7,8-HpCDF	21%

Parent / Field Duplicate Set	Compound	RPD/Difference Evaluation
LDW18-IT45-B6-Comp3 / LDW18-IT45-B6-Comp3-FD	1,2,3,4,7,8,9-HpCDF	27%
	Total TCDD	124%
	Total PeCDD	162%
	Total HxCDD	94%
	Total TCDF	160%
	Total PeCDF	159%
	Total HxCDF	76%
	Total HpCDF	33%

Compound Identification

The method requires the confirmation of 2,3,7,8-TCDF detects using an alternate GC column. The DB5 column that is typically used cannot fully separate 2,3,7,8-TCDF from closely eluting non-target TCDF isomers. The laboratory performed a second column confirmation on a DB225 column. All 2,3,7,8-TCDF results reported from the DB5 column were qualified as do-not-report (DNR-11) in favor of the DB225 results.

The laboratory reported results for 1,2,3,7,8,9-HxCDD both analysis columns and indicated the primary column as not reportable in the EDD. Therefore, all 1,2,3,7,8,9-HxCDD results reported from the DB5 column were qualified as do-not-report (DNR-11) in favor of the DB225 results.

For several samples, the laboratory reported EMPC or "estimated maximum possible concentrations" values for one or more of the target analytes. These values were K-flagged by the laboratory. An EMPC value is reported when a peak was detected but did not meet identification criteria, as required by the method; therefore, the result cannot be considered as a positive identification for the analyte. To indicate that the reported result for an individual analyte is in effect an elevated detection limit, the EMPC values were qualified as not detected (U-25) for native compound results below the reporting limit and were estimated (J-25) for homolog values and native compound results greater than the reporting limit.

Calculation Verification

SDG WG64576: Calculation verifications were performed for this sample delivery group (SDG). No calculation or transcription errors were found.

OVERALL ASSESSMENT

As determined by this evaluation, the laboratory performed the specified analytical method. Accuracy was acceptable, as demonstrated by the labeled compound and OPR recoveries. With the exceptions noted above, precision was also acceptable as indicated by the laboratory and field duplicate sample RPD values.

Data were qualified as not detected due to method blank contamination. Results were estimated based on reference material recovery outliers and laboratory duplicate precision outliers. Data were qualified as estimated to indicate that EMPC values represent elevated detection limits. Data were qualified as do-not report to indicate which result from multiple reported results should not be used.

Data flagged as do-not-report should not be used for any reason.

All other data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Lower Duwamish Waterway: Sediment
PCB Congeners by EPA 1668C

This report documents the review of analytical data from the analysis of sediment samples and the associated laboratory quality control (QC) samples. Samples were analyzed by SGS Axys, Sidney, BC, Canada. Refer to the Sample Index for a complete list of samples.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
WG63753	10 Sediment	EPA Stage 4

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

EDD TO HARDCOPY VERIFICATION

All sample IDs and results reported in the electronic data deliverable (EDD) were verified (100% verification) by comparing the EDD to the hardcopy laboratory data package. Ten percent (10%) of the laboratory QC results were also verified.

TECHNICAL DATA VALIDATION

This report documents the review of analytical QC requirements as listed in the following table.

1	Sample Receipt, Preservation, and Holding Times	2	Laboratory Duplicates
✓	Initial Calibration (ICAL)	1	Field Duplicates
✓	Calibration Verification (CVER)	✓	Target Analyte List
2	Laboratory Blanks	✓	Reporting Limits
✓	Labeled Compound Recovery	2	Compound Identification
1	Matrix Spike/Matrix Spike Duplicates (MS/MSD)	✓	Compound Quantitation
✓	Ongoing Precision and Recovery (OPR)	✓	Calculation Verification (Full Validation Only)
✓	Certified Reference Material		

1 Quality control results are discussed below, but no data were qualified.
2 Quality control outliers that impact the reported data were noted.
Data qualifiers were issued as discussed below.

Sample Receipt, Preservation, and Holding Times

The validation guidance documents state that sample shipping coolers should arrive at the laboratory within the advisory temperature range of 2° to 6°C.

SDG WG63753: The laboratory received the sample cooler with a temperature less than the lower limit, at -0.2°C. This outlier did not impact data quality; no qualifiers were assigned.

Sample LDW18-SS-180-PCBCongeners had a collection date of 2/28/18 on the chain-of-custody (COC), but was logged in with 2/02/18. Sample LDW18-SS-177-PCBCongeners had a collection date of 3/02/18 on the chain-of-custody (COC) but was logged in as 3/01/18. The laboratory was contacted and confirmed the dates on the COC are correct and the dates were updated in the EDD during validation.

Laboratory Blanks

To assess the impact of any blank contaminant on the reported sample results, an action level is established at five times (5x) the concentration reported in the blank. If a contaminant is reported in an associated field sample and the concentration is less than the action level, the result is qualified as not detected (U-7). No action is taken if the sample result is greater than the action level, or for non-detected results. The laboratory assigned EMPC-flags to values when a peak was detected but did not meet identification criteria. These values cannot be considered as positive identifications, but are "estimated maximum possible concentrations". When these occurred in the method blank the results were considered as false positives. No action levels were established for these analytes.

SDG WG63753: Sixty-five (65) compounds were detected (excluding homologs and TEQs) in the laboratory method blank. All but one result for the associated samples were greater than the action levels; the single analyte concentration less than the action level (PCB-11) was qualified as not detected (U-7) at the reported concentration.

Matrix Spikes/Matrix Spike Duplicates

Matrix spike/matrix spike duplicates (MS/MSD) were not analyzed. Accuracy was assessed using labeled compound recoveries and ongoing precision and recovery (OPR) sample.

Certified Reference Material

NIST Standard reference material 1943 (Polychlorinated Biphenyl Congeners in 2,2,4-Trimethylpentane) was analyzed with this analytical data set. All analytes were recovered with the QAP control limits of 30%-150% recovery.

Laboratory Duplicate Analysis

One sample from each laboratory batch was extracted and analyzed in duplicate. Relative percent difference (RPD) values were calculated for detected analytes where results are greater than five times the method detection limit (MDL). With the exception noted below, all RPD values were less than the 20% control limit.

SDG WG63753: The RPD values for twenty-seven (27) analytes were greater than the control limit. Results for these compounds were estimated (J/-9) in the parent and duplicate of Sample LDW18-SS-184.

Field Duplicates

No field duplicates were submitted.

Compound Identification

For several samples, the laboratory reported EMPC or "estimated maximum possible concentration" values for one or more of the target analytes. An EMPC value is reported when a peak was detected but did not meet identification criteria, as required by the method; therefore, the result cannot be considered as a positive identification for the analyte. To indicate that the reported result for an individual analyte is in effect an elevated detection limit, the EMPC values were qualified as not detected (U-25) for native compound results below the reporting limit and were estimated (J-25) for homolog values and native compound results greater than the reporting limit.

SDG WG63753: The laboratory case narrative indicated that several results were flagged "G" to indicate lock-mass disturbances at the retention times associated with PCB-2, PCB-32, PCB-42, PCB-49/69, PCB-55, PCB-89, and PCB-156/157. After examining the chromatograms, those congeners with disturbances greater than approximately 50% of the baseline were estimated (J-24).

Calculation Verification (Full validation only)

SDG WG63753: Full validation (Level IV) was performed on this SDG. No transcription or calculation errors were found.

OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory performed the specified analytical method. With the exceptions noted above, accuracy was acceptable as demonstrated by the labeled compound and laboratory control sample recoveries and precision was acceptable as demonstrated by the laboratory duplicate values.

Data were flagged as not detected at the reported concentration due to laboratory blank contamination. Data were also flagged as not detected to indicate that EMPC values represent elevated detection limits. Results were estimated due to lock mass interferences and laboratory duplicate precision outliers.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Lower Duwamish Waterway: Passive Sampler
PCB Congeners by EPA 1668C

This report documents the review of analytical data from the analysis of surface water samples and the associated laboratory quality control (QC) samples. Samples were analyzed by SGS Axys, Sidney, BC, Canada. Refer to the Sample Index for a complete list of samples.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
WG63778	11 Passive Sampler 3 Day Zero Samples 1 Exposure Blank Sample	EPA Stage 4

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

EDD TO HARDCOPY VERIFICATION

All sample IDs and results reported in the electronic data deliverable (EDD) were verified (100% verification) by comparing the EDD to the hardcopy laboratory data package. Ten percent (10%) of the laboratory QC results were also verified.

TECHNICAL DATA VALIDATION

This report documents the review of analytical QC requirements as listed in the following table.

✓	Sample Receipt, Preservation, and Holding Times	1	Certified Reference Material
✓	Initial Calibration (ICAL)	1	Field Duplicates
✓	Calibration Verification (CVER)	1	Target Analyte List
2	Laboratory Blanks	✓	Reporting Limits
2	Exposure Blank	2	Compound Identification
✓	Labeled Compound Recovery	✓	Compound Quantitation
1	Matrix Spike/Matrix Spike Duplicates (MS/MSD)	✓	Calculation Verification (Full Validation Only)
✓	Ongoing Precision and Recovery (OPR)		

1 Quality control results are discussed below, but no data were qualified.
2 Quality control outliers that impact the reported data were noted.
Data qualifiers were issued as discussed below.

Laboratory Blanks

To assess the impact of any blank contaminant on the reported sample results, an action level is established at five times (5x) the concentration reported in the blank. If a contaminant is reported in an associated field sample and the concentration is less than the action level, the result is qualified as not detected (U-7). No action is taken if the sample result is greater than the action level, or for non-detected results. The laboratory assigned EMPC-flags to values when a peak was detected but did not meet identification criteria. These values cannot be considered as positive identifications, but are "estimated maximum possible concentrations". When these occurred in the method blank the results were considered as false positives. No action levels were established for these analytes.

Thirty (30) compounds were detected (excluding homologs and TEQs) in the laboratory method blank. Associated sample results less than the action levels were qualified as not detected (U-7) at the reported concentration.

Exposure Blank

Action levels were established at five times (5x) the concentration reported in the field blank. Following evaluation of the laboratory method blank, if a contaminant is reported in an associated field sample and the concentration is less than the action level, the result is qualified as not detected (U-6). No action is taken if the sample result is greater than the action level, or for non-detected results.

Sample LDW18-PWPS-EXP BLK was submitted as trip blank. The labeled compounds listed below were used as part of the passive sampler collection and are not evaluated as contamination in the trip blank:

13C12-2,2',3,3',5,5',6-HpCB

13C12-2,2',3,5',6-PeCB

13C12-2,2',4,4',5,5'-HxCB

13C12-2,3,3',5,5'-PeCB

13C12-2,4,4'-TriCB

13C12-2,4'-DiCB.

There were detections for many target compounds and after method blank evaluation 19 analytes remained in the trip blank. After evaluation of associated sample results, analyte concentrations less than the action level and were qualified as not detected (U-6) at the reported concentrations.

Matrix Spikes/Matrix Spike Duplicates

Matrix spike/matrix spike duplicates (MS/MSD) were not analyzed. Accuracy was assessed using labeled compound recoveries and ongoing precision and recovery (OPR) sample.

Certified Reference Material

No certified reference material was analyzed with this analytical data set.

Field Duplicates

For passive sampler samples, the QAPP RPD control limit is 20% for results greater than 5x the reporting limit (RL). For results less than 5x the RL, the absolute difference between the sample and replicate must be less than the RL. No data were qualified based on field duplicate precision outliers. Users of the data should consider the impact of field precision outliers on the reported results.

Samples LDW18-PWPS-SS174 and LDW18-PWPS-174 (DUP) were identified as field duplicates. The following compounds exceeded acceptance criteria:

Compound	Evaluation
PCB-43-TetraCB	58% RPD
PCB-96-TetraCB	29% RPD
PCB-128-HexaCB	21% RPD
PCB-145-HexaCB	34% RPD
PCB-150-HexaCB	21% RPD
PCB-171-HeptaCB	21% RPD
PCB-174-HeptaCB	21% RPD
PCB-182-HeptaCB	23% RPD
PCB-183-HeptaCB	22% RPD
PCB-184-HeptaCB	27% RPD
PCB-187-HeptaCB	32% RPD
PCB-203-OctaCB	28% RPD

Target Analyte List

The labeled analytes listed below are analyzed as target analytes in the field samples and trip blank and are listed as performance reference compounds (PRC). The analytes are used to measure the non-equilibrium conditions between the polyethylene sampler and the porewater. Data qualifiers are not applied to results for these compounds.

13C12-2,2',3,3',5,5',6-HpCB

13C12-2,2',3,5',6-PeCB

13C12-2,2',4,4',5,5'-HxCB

13C12-2,3,3',5,5'-PeCB

13C12-2,4,4'-TriCB

13C12-2,4'-DiCB

Compound Identification

For several samples, the laboratory reported EMPC or "estimated maximum possible concentration" values for one or more of the target analytes. An EMPC value is reported when a peak was detected but did not meet identification criteria, as required by the method; therefore, the result cannot be considered as a positive identification for the analyte. To indicate that the reported result for an individual analyte is in effect an elevated detection limit, the EMPC values were qualified as not detected (U-25) for native compound results below the reporting limit and were estimated (J-25) for homolog values and native compound results greater than the reporting limit.

The laboratory case narrative indicated that several results were flagged "G" to indicate lock-mass disturbances at the retention times associated with PCB-187 and PCB-197/200. Because there were only minor disturbances observed in the chromatograms, the data were not significantly affected, and no qualifiers were added.

Calculation Verification (Full validation only)

Full validation (Level IV) was performed on this SDG. No transcription or calculation errors were found.

OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory performed the specified analytical method. Accuracy was acceptable as demonstrated by the labeled compound and laboratory control sample recoveries. With the exceptions noted previously, precision was acceptable as demonstrated by the field duplicate RPD values.

Data were flagged as not detected at the reported concentration due to laboratory and exposure blank contamination. Data were also flagged as not detected to indicate that EMPC values represent elevated detection limits.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Lower Duwamish Waterway: Sediment
Total Metals by SW6020A
Total Mercury by SW7471B

This report documents the review of analytical data from the analyses of sediment samples and the associated laboratory and field quality control (QC) samples. Samples were analyzed by Analytical Resources, Inc. (ARI), Tukwila, Washington. Refer to the Sample Index for a complete list of samples.

SDG	Number of Samples and Matrix	Analyte	Validation Level
18E0226	2 Sediment	Metals/Mercury	EPA Stage 3
18F0174	10 Sediment	Metals/Mercury	EPA Stage 2B
18F0280	20 Sediment	Metals/Mercury	EPA Stage 2B
18F0314	15 Sediment	Arsenic Only	EPA Stage 2B

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

SDG 18F0280: The original chains-of-custody (COC) for some samples were missing from the laboratory report. The laboratory was contacted and submitted the missing documentation.

EDD TO HARDCOPY VERIFICATION

All sample IDs and results reported in the electronic data deliverable (EDD) were verified (100% verification) by comparing the EDD to the hardcopy laboratory data package. Ten percent (10%) of the laboratory QC results were also verified.

TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

1	Sample Receipt, Preservation, and Holding Times	✓	Matrix Spikes (MS) and Matrix Spike Duplicates (MSD)
✓	ICP-MS Tune	2	Laboratory Duplicates
✓	Initial Calibration	✓	ICP-MS Internal standards
✓	Calibration Verification	1	Interference Check Samples
✓	CRDL Standards	1	Field Duplicates
1	Laboratory Blanks	1	Reporting Limits
1	Field Blanks	✓	Reported Results
✓	Laboratory Control Samples (LCS)	1	Calculation Verification

✓ Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.
1 Quality control outliers are discussed below, but no data were qualified.
2 Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Sample Receipt, Preservation, and Holding Times

As stated in validation guidance documents, sample shipping coolers should arrive at the laboratory within the advisory temperature range of ≤6°C. With the exceptions noted below, the laboratory received the sample coolers within the advisory temperature range.

SDG 18F0174: The samples were received at temperatures greater than the upper control limit between 8.6°C to 13.9°C. The samples arrived at the laboratory the within several hours of collection; no data were qualified.

SDG 18F0280: The samples were received at a temperature greater than the upper control limit between at 9.3°C and 17.2°C. The samples arrived at the laboratory within several hours of collection; no data were qualified.

SDG 18F0314: The samples were received at temperatures greater than the upper control limit between 10.6°C to 12.4°C. The samples arrived at the laboratory within several hours of collection; no data were qualified.

Laboratory Blanks

To assess the impact of any blank contaminant on the reported sample results, an action level is established at five times (5x) the concentration reported in the blank. If a contaminant is reported in an associated field sample and the concentration is less than the action level, the result is qualified as not detected (U-7). No action is taken if the sample result is greater than the action level, or for non-detected results. For laboratory blanks that are less than the negative MDL, positive results less than the action level of five times the absolute value of the blank concentration are estimated (J-7) and non-detects are estimated (UJ-7) to indicate a potential low bias.

Laboratory blanks were analyzed at the appropriate frequency. Contaminant levels, associated samples, and action levels are documented in the data validation worksheets.

SDG 18E0226: The ICPMS method blank associated with digestion batch BGE0444 had detected values for cadmium, lead, and zinc. Associated sample concentrations were greater than the action levels, no data were qualified.

Field Blanks

Field blanks were not submitted.

Laboratory Duplicates

One sample from each laboratory batch was extracted and analyzed in duplicate. Relative percent difference (RPD) values were calculated for detected analytes where results are greater than five times the method detection limit (MDL). With the exception noted below, all RPD values were less than the 20% control limit.

SDG 18F0174: The RPD value for lead was greater than the control limit at 21.7%. Results for this element were estimated (J-9) for all samples in the batch.

SDG 18F0280: The RPD values for arsenic were greater than the control limit at 43.7% (batch BGF0724) and 37.4% (batch BGG0161. Results for this element were estimated (J-9) for all samples in each batch.

Interference Check Samples

Interference check standard samples (ICSA/ICSAB) were analyzed as required by the method. The ICSAB %R values were within the criteria of 80% – 120% for all spiked elements.

To assess the potential impact of interferences on the reported sample results, the results for the ICSA were evaluated. For cases where the concentration of an unspiked analytes in the ICSA was greater than ± the RL, an action level is established at 2x the absolute value of the ICSA result. If the ICSA values indicate a potential low bias, the positive results less than the action level and/or detection limits were estimated (J/UJ-17). If the ICSA values indicate a potential high bias, only the positive results less than the action level were estimated (J-17).

SDGs 18E0226: Chromium and/or cadmium were detected in the ICSA analyzed on 5/24/18. Because spectral interferences are uncommon for ICPMS and the concentrations observed are usually due to low levels of contaminants in the purchased solutions used by the laboratory; no qualifiers were applied.

Field Duplicates

For sediment samples, the QAPP RPD control limit is 20% for results greater than 5x the reporting limit (RL). For results less than 5x the RL, the absolute difference between the sample and replicate must be less than 2x the RL. No data were qualified based on field duplicate precision outliers. Users of the data should consider the impact of field precision outliers on the reported results.

SDG 18F0174: Samples LDW18-BNK5-1 and LDW18-BNK5-1-FD were submitted as field duplicates. All acceptance criteria were met.

SDG 18F0280: Three sample sets were submitted as field duplicates: LDW18-IT45-B1-Comp1 & LDW18-IT45-B1-Comp1-FD, LDW18-IT45-B1-Comp2 & LDW18-IT45-B1-Comp2-FD, and LDW18-IT45-B1-Comp3 & LDW18-IT45-B1-Comp3-FD. For all sample sets, the RPD values for arsenic were greater than the control limit.

Parent Sample	Duplicate Sample	Analyte	Outlier Type
LDW18-IT45-B1-Comp1	LDW18-IT45-B1-Comp1-FD	Arsenic	92% RPD
LDW18-IT45-B1-Comp2	LDW18-IT45-B1-Comp2-FD	Arsenic	35% RPD
LDW18-IT45-B1-Comp3	LDW18-IT45-B1-Comp3-FD	Arsenic	90% RPD

SDG 18F0314: Three sample sets were submitted as field duplicates:

Parent Sample	Duplicate Sample	Analyte	Outlier Type
LDW18-IT45-B6-Comp1	LDW18-IT45-B6-Comp1-FD	Arsenic	27% RPD
LDW18-IT45-B6-Comp2	LDW18-IT45-B6-Comp2-FD	Arsenic	26% RPD
LDW18-IT45-B6-Comp3	LDW18-IT45-B6-Comp3-FD	Arsenic	70% RPD

Reporting Limits

All SDGs: Several samples were diluted due to interferences or other factors and the reporting limits were elevated.

Calculation Verification

SDG 18E0226: Several results were verified by recalculation from the raw data. No calculation or transcription errors were noted.

OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical methods. Accuracy was acceptable, as demonstrated by the LCS and MS %R values. With the exceptions noted above, precision was acceptable as demonstrated by the laboratory and field duplicate RPD values.

Results were estimated based on laboratory precision outliers.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Lower Duwamish Waterway: Sediment

This report documents the review of analytical data from the analysis of sediment samples and the associated laboratory quality control (QC) samples. Analytical Resources, Inc., Tukwila, Washington, and Alpha Analytical, Mansfield, Massachusetts analyzed the samples. Refer to the Sample Index for a list of samples reviewed.

SDG	Number of Samples	Validation Level
18E0226	2 Sediment	EPA Stage 3
18F0174	10 Sediment	EPA Stage 2B
18F0314	15 Sediment	EPA Stage 2B
18F0280	20 Sediment	EPA Stage 2B
18H0068	2 Sediment	EPA Stage 2B
L1828580	24 Sediment	EPA Stage 3
L1828594	38 Sediment	EPA Stage 2B

The analytical tests that were performed are summarized below:

Laboratory	Parameter	Method
Analytical Resources	Total Solids	SM 2540-G
	Grainsize	Plumb, 1981
	Total Organic Carbon(TOC)	EPA 9060
Alpha Analytical	Black Carbon	EPA 9060M/Gustafsson

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

SDG 18E0226: A total organic carbon (TOC) QC summary form had incorrect information. The laboratory was contacted and resubmitted the documentation with the corrected information.

SDG 18F0280: Some of the original chains-of-custody (COC) were missing from the laboratory report. Additionally, the data sheet for the matrix spike associated with Sample LDW18-IT45-CL-Comp1 was missing, but the data sheet for the matrix spike duplicate was present. The laboratory was contacted and provided an update report with the missing COCs and matrix spike data sheet.

SDG 18F0174: A TOC QC summary form had incorrect information. The laboratory was contacted and resubmitted the documentation with the corrected information.

EDD TO HARDCOPY VERIFICATION

All sample IDs and results (100% verification) reported in the electronic data deliverable (EDD) were verified by comparing the EDD to the hardcopy laboratory data package. Ten percent (10%) of the laboratory QC results were also verified.

SDG 18E0226: The relative percent difference value reported in the data package and EDD did not represent the correct value based on the percent recoveries reported for the spiked samples. The laboratory was contacted and confirmed that the value reported was incorrect. The laboratory provided corrected matrix spike summary forms for the data package and during validation the RPD value in the EDD was updated.

SDG 18F0174: An additional TOC matrix spike result was included in the EDD. This result was flagged as do-not-report (DNR-11).

TECHNICAL DATA VALIDATION

The QC requirements for review are listed below.

1	Sample Receipt, Preservation, and Holding Times	1	Field Duplicates
1	Laboratory Blanks	2	Laboratory Replicates
1	Field Blanks	✓	Reporting Limits
1	Reference Materials	✓	Reported Results
✓	Laboratory Control Samples (LCS)	✓	Calculation Verification
2	Matrix Spike/Matrix Spike Duplicate (MS/MSD)		

✓ Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.
[1] Quality control results are discussed below, but no data were qualified.
[2] Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Sample Receipt, Preservation, Holding Times

As stated in validation guidance documents, sample shipping coolers should arrive at the laboratory within the advisory temperature range of ≤6°C. The laboratory received the sample coolers within the advisory temperature range.

SDG 18F0174: The samples were received at temperatures greater than the upper control limit between 8.6°C to 13.9°C. The samples arrived at the laboratory within several hours of collection; no data were qualified.

Samples LDW18-BNK4-2, LDW18-BNK4-3, LDW18-BNK5-1and LDW18-BNK5-1-FD were analyzed for total organic carbon past the 28-day hold time at 29 to 30 days. Although the project quality assurance plan indicates a 28-day holding time with cooling to ≤4°C ±2°C, the samples were stored frozen at the laboratory and results were judged as not impacted by the holding time outliers. No action was taken.

SDG 18F0280: Some samples were received at a temperature greater than the upper control limit between 9.3°C and 17.2°C. The samples arrived at the laboratory within several hours of collection; no data were qualified.

Samples LDW18-IT45-CL-Comp1, LDW18-IT45-CL-Comp2, and LDW18-IT45-CL-Comp3 were analyzed for total organic carbon past the 28-day hold time at 32 to 35 days. Although the project quality assurance plan indicates a 28-day holding time with cooling to ≤4˚C ±2˚C, the samples were stored frozen at the laboratory and results were judged as not impacted by the holding time outliers. No action was taken.

SDG 18F0314: The samples were received at temperatures greater than the upper control limit between 10.6°C to 12.4°C. The samples arrived at the laboratory within several hours of collection; no data were qualified.

SDG 18H0068: The samples were received at a temperature greater than the upper control limit at 9.3°C. The samples were received at the laboratory the same day as collection; no data were qualified.

Laboratory Blanks

To assess the impact of any blank contaminant on the reported sample results, an action level is established at five times (5x) the concentration reported in the blank. If a contaminant is reported in an associated field sample and the concentration is less than the action level, the result is qualified as not detected (U-7). No action is taken if the sample result is greater than the action level, or for non-detected results. For laboratory blanks that are less than the negative MDL, positive results less than the action level of five times the absolute value of the blank concentration are estimated (J-7) and non-detects are estimated (UJ-7) to indicate a potential low bias.

Laboratory blanks were analyzed at the appropriate frequency. Contaminant levels, associated samples, and action levels are documented in the data validation worksheets.

SDG 18H0068: Although the method blank for total organic carbon analysis had a detected value, the associated sample concentrations were greater than the action level and no data were qualified.

Field Blanks

Field blanks were not submitted.

Reference Material

For TOC analysis, a standard reference material, NIST 1941B, was analyzed in lieu of a laboratory control sample with each batch. All acceptance criteria were met.

Matrix Spike/Matrix Spike Duplicate

Matrix spike/matrix spike duplicate samples (MS/MSD) were analyzed at the proper frequency of one

per 20 samples or one per batch for soil samples.

For accuracy, where analyte concentrations were less than 4x the spike amount, the percent recovery (%R) values were evaluated. If the percent recovery values indicate a potential low bias, associated results are estimated (J/UJ-8L). If the %R values indicate a potential high bias, only the associated positive results are estimated (J-8H). No qualifiers were added for a single outlier in the MS or MSD only.

Precision is indicated by the relative percent difference (RPD) between the MS and MSD values. RPD values outside the control limit of 20% indicate uncertainty in the measured results for the sample and positive results are estimated (J-9).

Results were qualified based on %R or RPD value outliers. Qualifiers were issued to all samples associated with a QC batch.

SDG	Parent Sample ID	Analyte	MS %R	MSD %R	RPD	Potential Bias	Action
18F0314	LDW18-IT45-B3-Comp1	TOC	167	41.2	54.7	--	J-8,9
18F0174	LDW18-BNK5-1	TOC	--	126	39	--	J-9
18F0280	LDW18-IT45-CL-Comp1	TOC	127	--	--	--	NA
L1828580	LDW18-SSCL-A01	%Soot	--	218	47	--	J-9

SDG L1828580: The RPD values for the matrix spikes performed on Sample LDW18-SSCL-A11 were reported as 43% and 49% for the two replicates. The percent recoveries for the matrix spikes were between 93% and 103%. The laboratory calculates the RPD based on the concentration values of the spiked samples rather than the percent recoveries. Because of different aliquot sizes analyzed for the matrix spike and its duplicate, the RPD value calculated using the concentrations was greater than the control limit. The RPD values using the percent recoveries are 5.2% and 8.1% for the two replicates. These values are less than the QAP control limit of ±20% RPD for inorganic tests and qualifiers were not required.

SDG L1828594: The RPD values for the matrix spikes performed on Sample LDW18-SS-COMP08 were reported as 31% and 22% for the two replicates. The percent recoveries for the matrix spikes were between 101% and 109%. The laboratory calculates the RPD based on the concentration values of the spiked samples rather than the percent recoveries. Because of different aliquot sizes analyzed for the matrix spike and its duplicate, the RPD value calculated using the concentrations was greater than the control limit. The RPD values using the percent recoveries are 7.6% and 5.7% for the two replicates. These values are less than the QAP control limit of ±20% RPD for inorganic tests and qualifiers were not required.

Field Duplicates

For sediment samples, the RPD control limit is 20% for results greater than 5x the reporting limit (RL) for TOC and solids and particle size percentages greater than 5% for grain size. For results less than 5x the RL, the absolute difference between the sample and replicate must be less than 2x the RL. No

data were qualified based on field duplicate precision outliers. Users of the data should consider the impact of field precision outliers on the reported results.

SDG 18F0174: Samples LDW18-BNK5-1 and LDW18-BNK5-1-FD were submitted as field duplicates. All acceptance criteria were met.

SDG 18F0280: Three sample sets were submitted as field duplicates: LDW18-IT45-B1-Comp1 & LDW18-IT45-B1-Comp1-FD, LDW18-IT45-B1-Comp2 & LDW18-IT45-B1-Comp2-FD, and LDW18-IT45-B1-Comp3 & LDW18-IT45-B1-Comp3-FD.

Parent Sample ID	Field Duplicate ID	Analyte	RPD Outliers
LDW18-IT45-B1-Comp2	LDW18-IT45-B1-Comp2-FD	TOC	65
LDW18-IT45-B1-Comp3	LDW18-IT45-B1-Comp3-FD	TOC	22

SDG 18F0314: Three sample sets were submitted as field duplicates: LDW18-IT45-B6-Comp1 & LDW18-IT45-B6-Comp1-FD, LDW18-IT45-B6-Comp2 & LDW18-IT45-B6-Comp2-FD, and LDW18-IT45-B6-Comp3 & LDW18-IT45-B6-Comp3-FD.

Parent Sample ID	Field Duplicate ID	Analyte	RPD Outliers
LDW18-IT45-B6-Comp3	LDW18-IT45-B6-Comp3-FD	TOC	41
		Grainsize: Fractional % phi 4-5 (31.2-62.5 microns)	34

SDG L1828580: Samples LDW18-SS-178 & LDW18-SS-178-FD were submitted as field duplicates. The RPD for black carbon was greater than the control limit at 63%.

Laboratory Replicates

Black Carbon:

All samples were run in duplicate. the RPD control limit is 20% for results greater than 5x the reporting limit (RL). For results less than 5x the RL, the absolute difference between the sample and replicate must be less than 2x the RL. Qualifiers are applied to the parent and duplicate samples.

The following samples were estimated (J-9):

SDG	Sample ID	Analyte	RPD Outliers
L1828580	LDW18-SSCL-A04	Black Carbon	45.5%
	LDW18-SSCL-A05	Black Carbon	32.5%
	LDW18-SSCL-A09	Black Carbon	21.3%
	LDW18-SSCL-A10	Black Carbon	28.0%

SDG	Sample ID	Analyte	RPD Outliers
L1828580	LDW18-SSCL-A18	Black Carbon	33.0%
	LDW18-SSCL-A19	Black Carbon	21.3%
	LDW18-SS-COMP01	Black Carbon	40.5%
	LDW18-SS-COMP02	Black Carbon	29.8%
	LDW18-SS-COMP03	Black Carbon	80.8%
	LDW18-SS-COMP07	Black Carbon	Diff >2xRL
L1828594	LDW18-SS-COMP12	Black Carbon	139%
	LDW18-SS-169	Black Carbon	86%
	LDW18-SS-172	Black Carbon	21.1%
	LDW18-SS-174	Black Carbon	21.0%

SDG L1828594: In addition to analyzing all samples in duplicate, the laboratory analyzed duplicate samples. The RPD values for the laboratory duplicate samples indicated in the following table were greater than the control limits and qualifiers were applied to all samples in the analysis batch.

SDG	Sample ID	Analyte	RPD Outliers
L1828594	LDW18-SS-COMP08	Black Carbon	28%
	LDW18-SS-COMP09	Black Carbon	44%
	LDW18-SS-174	Black Carbon	Diff >2xRL

Grainsize:

One sample from each laboratory batch was prepared and analyzed in triplicate. Relative standard deviation (RSD) values were calculated for detected analytes where particle size percentages were greater than 5%. With the exception noted below, all RSD values were less than the 20% control limit. Qualifiers are only applied to the parent sample due to the individual nature of each sample's composition.

SDG	Parent Sample ID	Analyte	RSD	Action
18F0314	LDW18-IT45-B7-Comp1	Fractional % phi 4-5 (31.2-62.5 microns)	22	J-9

Calculation Verification

SDG 18E0226: Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

SDG L1828580: The instrument raw data for black carbon are reported in concentration units only; no measured intensity values are provided. The calibration is preset by the instrument manufacturer and recalculations of the calibration could not be done. Calculation verifications were performed using the concentration values from the instrument and verifying percent recovery and RPD values. No calculation or transcription errors were observed.

OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical methods. With the exceptions noted above, accuracy was acceptable as demonstrated by the laboratory control and reference material samples and MS/MSD recoveries and precision was acceptable as indicated by the MS/MSD and field and laboratory duplicate RPD values as well as the laboratory triplicate RSD values.

Results were estimated based on MS/MSD recovery and precision outliers as well as laboratory replicate precision outliers.

Data flagged as do-not-report (DNR) due to multiple results reported for a given sample and should not be used for any reason.

All other data, as qualified, are acceptable for use.

ECOCHEM
Data Quality

APPENDIX A

DATA QUALIFIER DEFINITIONS
REASON CODES
AND CRITERIA TABLES

DATA VALIDATION QUALIFIER CODES
Based on National Functional Guidelines

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents the approximate concentration.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

The following is an EcoChem qualifier that may also be assigned during the data review process:

DNR	Do not report; a more appropriate result is reported from another analysis or dilution.

DATA QUALIFIER REASON CODES

Group	Code	Reason for Qualification
Sample Handling	1	Improper Sample Handling or Sample Preservation (i.e., headspace, cooler temperature, pH, summa canister pressure); Exceeded Holding Times
Instrument Performance	24	Instrument Performance (i.e., tune, resolution, retention time window, endrin breakdown, lock-mass)
	5A	Initial Calibration (RF, %RSD, r^2)
	5B	Calibration Verification (CCV, CCAL; RF, %D, %R) Use bias flags (H,L)[1] where appropriate
	5C	Initial Calibration Verification (ICV %D, %R) Use bias flags (H,L)[1] where appropriate
Blank Contamination	6	Field Blank Contamination (Equipment Rinsate, Trip Blank, etc.)
	7	Lab Blank Contamination (i.e., method blank, instrument blank, etc.) Use low bias flag (L)[1] for negative instrument blanks
Precision and Accuracy	8	Matrix Spike (MS and/or MSD) Recoveries Use bias flags (H,L)[1] where appropriate
	9	Precision (all replicates: LCS/LCSD, MS/MSD, Lab Replicate, Field Replicate)
	10	Laboratory Control Sample Recoveries (a.k.a. Blank Spikes) Use bias flags (H,L)[1] where appropriate
	12	Reference Material Use bias flags (H,L)[1] where appropriate
	13	Surrogate Spike Recoveries (a.k.a. labeled compounds, recovery standards) Use bias flags (H,L)[1] where appropriate
Interferences	16	ICP/ICP-MS Serial Dilution Percent Difference
	17	ICP/ICP-MS Interference Check Standard Recovery Use bias flags (H,L)[1] where appropriate
	19	Internal Standard Performance (i.e., area, retention time, recovery)
	22	Elevated Detection Limit due to Interference (i.e., chemical and/or matrix)
	23	Bias from Matrix Interference (i.e. diphenyl ether, PCB/pesticides)
Identification and Quantitation	2	Chromatographic pattern in sample does not match pattern of calibration standard
	3	2nd column confirmation (RPD or %D)
	4	Tentatively Identified Compound (TIC) (associated with NJ only)
	20	Calibration Range or Linear Range Exceeded
	25	Compound Identification (i.e., ion ratio, retention time, relative abundance, etc.)
Miscellaneous	11	A more appropriate result is reported (multiple reported analyses i.e., dilutions, re-extractions, etc. Associated with "R" and "DNR" only)
	14	Other (See DV report for details)
	26	Method QC information not provided

[1] H = high bias indicated
L = low bias indicated

Semivolatile Organic Compounds by Gas Chromatography-Mass Spectroscopy (GC-MS)
(Based on NFG 1999 & 2008 and SW-846 Method 8270D)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	4°C±2°C sediment/tissues may require storage at -20°C	NFG (1) Method (3)	**If required by project:** J (pos)/UJ (ND) if greater than 6° C	1	Use **PJ** for temp outliers; see **TM20** Current SW846 criterion is ≤ 6° C (3)
Holding Time	**Extraction Aqueous:** 7 days from collection **Extraction Solid:** 14 days from collection **Analysis (all matrices)**: 40 days from extraction Holding time may be extended to 1 year for frozen sediments/tissues	NFG (1) Method (3)	J (pos)/UJ (ND) if HT exceeded J (pos)/R (ND) if gross exceedance (> 2x HT)	1	Gross exceedance = > 2x HT, as per 1999 NFG
Instrument Performance					
Tuning	DFTPP Beginning of each 12 hour period Use method or project acceptance criteria	NFG (1) Method (3)	R (pos/ND) all analytes in all samples associated with the tune	24	
Initial Calibration **Sensitivity**	RRF ≥ 0.05 except: RRF ≥ 0.01 poor responders *	NFG (1) Method (3)	Use **PJ** to qualify J (pos)/UJ (ND)	5A	**TM-06** EcoChem Policy for the Evaluation and Qualification of GCMS Instrument Performance **PJ** - no action if response is stable (ICAL RSD and CCAL %D acceptable)
Initial Calibration **Stability**	Minimum 5 standards %RSD ≤ 20.0% except: %RSD ≤ 40.0% poor responders * **or** co-efficient of determination (r^2) > 0.99	NFG (1) Method (3)	J (pos) if %RSD > limit **or** r^2 value <0.99	5A	
Initial Calibration Verification Check	Prepared from second source; analyze after each ICAL Percent recovery limits = 70-130%	Method (3)	J (pos) %R > UCL J (pos)/UJ (ND) %R < LCL	5A (H,L)[4]	QAPP may have overriding accuracy limits.

Semivolatile Organic Compounds by Gas Chromatography-Mass Spectroscopy (GC-MS)
(Based on NFG 1999 & 2008 and SW-846 Method 8270D)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Instrument Performance (continued)					
Continuing Calibration **Sensitivity**	RRF ≥ 0.05 except: RRF ≥ 0.01 poor responders *	NFG (1) Method (3)	Use **PJ** to qualify J (pos)/UJ (ND)	5B	see ICAL RRF guidance
Continuing Calibration **Stability**	Prior to sample analysis and every 12 hours %D ≤ 25% except: %D ≤ 40.0% poor responders *	NFG (1) Method (3)	J (pos) - %D > control limit (high bias) J (pos)/UJ (ND) - %D < -control limit (low bias)	5B (H,L)[4]	
Blank Contamination					
Method Blank (MB)	MB: One per matrix per batch of (of ≤ 20 samples) No detected compounds > MDL	NFG (2) Method (3)	U(pos) if result is < 5X or 10X action level	7	10X action level applies to phthalates only. 5X for all other target analytes **Hierarchy of blank review:** **#1 - Review MB, qualify as needed** **#2 - Review FB , qualify as needed** **Note: Actions as per 1999 NFG**
	No TICs present		R (pos) TICs using 10X rule	7	
Field Blank (FB)	No detected compounds > MDL	NFG (2) Method (3)	U (pos) if result is < 5X or 10X action level	6	
Precision and Accuracy					
LCS/LCSD (recovery)	One per matrix per batch (of ≤ 20 samples) LCSD not required by NFG or method Use method acceptance criteria/laboratory limits	Method (3)	J (pos) if %R > UCL J (pos)/UJ (ND) if %R < LCL J (pos)/R (ND)%R < 10%	10 (H,L)[4]	No action if only one spike %R is outside criteria when LCSD is analyzed, unless one recovery is <10%. QAPP may have overriding accuracy limits. Qualify all associated samples.
LCS/LCSD (RPD)	If LCSD analyzed RPD < lab limits	Method (3)	J (pos)	9	Qualify all associated samples. QAPP may have overriding precision limits.

Semivolatile Organic Compounds by Gas Chromatography-Mass Spectroscopy (GC-MS)
(Based on NFG 1999 & 2008 and SW-846 Method 8270D)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy (continued)					
Reference Material (RM, SRM, or CRM)	Result ±20% of the 95% confidence interval of the true value for analytes	EcoChem standard policy	J (pos)/UJ (ND) if < LCL J (pos) if > UCL	12 (H,L)[4]	QAPP may have overriding accuracy limits. Some manufacturers have different RM control limits
MS/MSD (recovery)	One per matrix per batch (of ≤ 20 samples) Use method acceptance criteria/laboratory limits	NFG (1) Method (3)	J (pos) %R > UCL J (pos)/UJ (ND) if both %R < LCL J (pos)/R (ND) if both %R < 10% J (pos)/UJ (ND) if one > UCL & one < LCL, with no bias	8 (H,L)[4]	No action if only one spike %R is outside criteria. No action if parent concentration is >4x the amount spiked. Qualify parent sample only.
MS/MSD (RPD)	One per matrix per batch (of ≤ 20 samples) Use method acceptance criteria/laboratory limits	NFG (1) Method (2)	J (pos) in parent sample if RPD > CL	9	Qualify parent sample only
Surrogates	Minimum of 3 acid & 3 base/neutral (B/N) compounds added to all samples Within method control limits	NFG (1) Method (3)	J (pos) if %R > UCL J (pos)/UJ (ND) if %R < LCL J (pos)/R (ND) if %R < 10%	13 (H,L)[4]	Qualify all compounds in associated fraction. Do not qualify if only 1 acid and/or 1 B/N surrogate is out, unless <10%. If 1 surrogate outlier < 10% then J (pos)/R (ND)
Internal Standards	Added to all samples Acceptable Range: IS area 50% to 200% of CCAL area RT within 30 seconds of CC RT	NFG (1) Method (3)	J (pos) if > 200% J (pos)/UJ (ND) if < 50% J (pos)/R (ND) if < 25% if RT >30 seconds use **PJ**	19	Qualify compounds quantified using particular internal standard
Field Duplicates	**Solids:** RPD < 50% OR difference < 2X RL (for results < 5X RL) **Aqueous:** RPD < 35% OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	J (pos)/UJ (ND) Qualify only parent and field duplicate samples	9	Use project limits if specified

Semivolatile Organic Compounds by Gas Chromatography-Mass Spectroscopy (GC-MS)
(Based on NFG 1999 & 2008 and SW-846 Method 8270D)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Compound Identification and Quantitation and Calculation					
Retention times and relative ion intensities	RRT within 0.06 of standard RRT Ion relative intensity within 20% of standard All ions in std. at > 10% intensity must be present in sample	NFG [(1)] Method [(3)]	U (pos) if identification criteria not met	25	
TICs	Major ions (>10%) in reference must be present in sample; intensities agree within 20%; check identification	NFG [(1)] Method [(3)]	NJ the TIC unless: R (pos) common laboratory contaminants	4	
Calibration Range	Results greater than highest calibration standard	EcoChem standard policy	Qualify J (pos)	20	If result from dilution analysis is not reported.
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	EcoChem standard policy	Use "DNR" to flag results that will not be reported.	11	**TM-04** EcoChem Policy for Rejection/Selection Process for Multiple Results

[1] National Functional Guidelines for Organic Data Review, June, 2008
[2] National Functional Guidelines for Organic Data Review, October, 1999
[3] Method SW846 8270D Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), Revision 4, February 2007.
[4] NFG 2013 suggests using "+ / -" to indicate bias; EcoChem has chosen "H" = high bias indicated; "L" = low bias indicated.

(pos): Positive Result(s)
(ND): Non-detects

* "Poor responder" compounds: acetophenone, atrazine, benzaldehyde, 1,1'-biphenyl, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, caprolactam, carbazole, 4-chloroaniline, diethylphthalate, di-n-butylphthalate, 3-3'-dichlorobenzidine, dimethylphthalate, 2,4-dinitrophenol, 4,6-dinitro-2-methylphenol, di-n-octylphthalate, hexachlorobutadiene, hexachlorocyclopentadiene, 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, 4-nitrophenol, N-nitrosodiphenylamine, 2,2'-oxybis-(1-chloropropane), 1,2,4,5-tetrachlorobenzene use a 0.010 RRF criterion.

Pesticides by GC
(Based on Organic NFG 1999 & 2008 and SW-846 Method 8081B)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	4°C ± 2°C Tissue/sediments (may be frozen -20°C)	NFG (2) Method (3)	J (pos)/UJ (ND) if greater than 6° C	1	Use Professional Judgment (PJ) to qualify for temperature outlier. Current SW846 criterion is ≤ 6° C(3)
Holding Time	*Extraction Aqueous:* 7 days from collection *Extraction Solid:* 14 days from collection *Exraction Tissue/Sediment (frozen):* 1 year *Analysis (all matrices):* 40 days from extraction	NFG (2) Method (3)	J (pos)/UJ (ND) if ext/analyzed > HT J (pos)/R (ND) if gross exceedance (> 2x HT)	1	Gross exceedance > 2x HT, as per NFG 1999
Instrument Performance					
Resolution Check	Beginning of ICAL sequence Within RTW and resolution > 60%	NFG (2)	NJ (pos)/R (ND) results	14	CLP criterion; might not be submitted with SW846 data package
Retention Times	Surrogates: TCMX (± 0.05); DCB (± 0.10) Target analytes: within RTW	NFG (2) Method (3)	NJ (pos)/R (ND) results for analytes with RT shifts	24	Use PJ based on examination of raw data
Breakdown	DDT Breakdown: ≤ 20% Endrin Breakdown: ≤ 20% Combined Breakdown: ≤ 30% Compounds within RTW	NFG (2) Method (3)	If 4,4'-DDT is detected: J (pos) 4,4'-DDT, 4,4'-DDD and 4,4'-DDE If 4,4'-DDT is ND and either 4,4'-DDD or 4,4'-DDE are detected: R (ND) 4,4'-DDT, NJ (pos) DDD and DDE If Endrin is detected: J (pos) Endrin, Endrin Aldehyde and Endrin Ketone If Endrin is ND and either EA or EK are detected: R (ND) Endrin, NJ (pos) EA and EK	5A	Method 8081B breakdown criterion: ≤ 15%. For combined breakdown outliers, apply qualifiers considering the degree of individual breakdown.

Pesticides by GC
(Based on Organic NFG 1999 & 2008 and SW-846 Method 8081B)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Instrument Performance (continued)					
Initial Calibration	Single Component Compounds: RSD ≤ 20% alpha-BHC and delta-BHC: RSD ≤ 25% toxaphene and surrogates: RSD ≤ 30% **or** correlation coefficient (r-value) ≥ 0.995 OR Minimum 6-point with coefficient of determination (r^2-value) ≥ 0.99	NFG (2) Method (4)	J (pos) if %RSD greater than control limit **or** r-value < 0.995 **or** r^2-value < 0.99	5A	Refer to TM-01 for additional information. Use bias flags (H,L) (6) where appropriate
Initial Calibration Verification (ICV)	No NFG criteria Project specific	Project QAPP	J (pos) if > UCL J (pos)/UJ (ND) if < LCL	5B	Use bias flags (H,L) (6) where appropriate
Continuing Calibration	%D ± 20% Analyzed prior to each 12 hour shift	Method (3)	If > 20% (high bias): J (pos) If <20% (low bias: J (pos)/UJ (ND)	5B	Refer to TM-01 for additional information. Use bias flags (H,L)(6) where appropriate
Blank Contamination					
Method Blank (MB)	One per matrix per batch (of ≤ 20 samples) No detected compounds > RL	NFG (1) Method (3)	U (pos) if result is less than appropriate 5X action level.	7	**Hierarchy of blank review:** #1 - Review MB and IB, qualify as needed #2 - Review FB , qualify as needed **Note: Actions as per NFG 1999** Note: IB not required by method
Field Blank (FB)	FB: frequency as per QAPP No detected compounds > RL	NFG (1) Method (3)	U (pos) if result is less than appropriate 5X action level.	6	
Instrument Blanks (IB)	Analyzed at the beginning and end of every 12 hour sequence No analyte > CRQL	NFG (1)	U (pos) if result is less than appropriate 5X action level.	7	

Pesticides by GC
(Based on Organic NFG 1999 & 2008 and SW-846 Method 8081B)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy					
MS/MSD (recovery)	One set per matrix per batch (of ≤ 20 samples) Method or project acceptance limits	NFG (2) Method (3)	Qualify parent only unless other QC indicates systematic problems. J (pos) if both %R > upper control limit (UCL) J (pos)/UJ (ND) if both %R < lower control limit (LCL) J (pos)/R (ND) if both %R < 10%	8	No action if only one spike %R is outside criteria No action if native analyte conc. > 5x the amount spiked Use bias flags (H,L) (6) where appropriate
MS/MSD (RPD)	One set per matrix per batch (of ≤ 20 samples) Method or project acceptance limits	NFG (2) Method (3)	Qualify parent only unless other QC indicates systematic problems. J (pos) if RPD > control limit	9	No action if parent is ND
LCS	One per lab batch (of ≤ 20 samples) Method or project acceptance limits	NFG (2)	J (pos) if %R > UCL J (pos)/UJ (ND) if %R < LCL J (pos)/R (ND) if %R < 10%	10	Qualify all associated samples. Use bias flags (H,L) (6) where appropriate
LCS/LCSD (RPD)	if analyzed use MS/MSD RPD criteria	NFG (2)	J (pos) assoc. compound in all samples	9	LCSD not required by method or NFG
Surrogates	TCMX and DCBP added to every sample %R = 30% - 150% **or** project limits	NFG (2) Method (3)	J (pos) if either %R > UCL J (pos)/UJ (ND) if either %R < LCL J (pos)/R (ND) if either %R < 10%	13	If %R < 10% (dilution is a factor), use PJ Use bias flags (H,L) (6) where appropriate
Internal Standards (if used)	Acceptable Range: IS area = 50% to 200% of CCAL area RT within 30 seconds of CC RT	Method (3)	J (pos) if area > 200% J (pos)/UJ (ND) if area < 50% J (pos)/R (ND) if area < 25% RT > 30 seconds, narrate	19	

Pesticides by GC
(Based on Organic NFG 1999 & 2008 and SW-846 Method 8081B)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy (continued)					
Field Duplicates	**Solids:** RPD < 50% **or** difference < 2X RL (for results < 5X RL) **Aqueous:** RPD < 35% **or** difference < 1X RL (for results < 5X RL)	EcoChem standard practice	J (pos)/UJ (ND) Qualify only parent and field duplicate samples	9	Use project limits if specified
Compound Identification/Quantification					
Quantitation/ Identification	Between two columns: RPD < 40% or %D < 25% Within Retention Time Windows on both columns.	NFG [2] Method [3]	J (pos) if RPD = 40% - 60% (25% - 60% for %D) NJ (pos) if > 60% R (pos) if RTW criterion not met	3	See TM-08 for additional info
Calibration Range	On-column concentration < high calibration standard	NFG [2] Method [3]	J (pos) if conc > high standard and sample was not diluted	20	
Dilutions Re-extractions and/or Reanalyses	Report only one result per analyte	Standard reporting policy	Use "DNR" to flag results that will not be reported.	11	TM-04 for additional info
Sample Clean-up					
GPC/Sulfur/ Florisil	GPC or Florisil cleanup stndards 80% - 120%	NFG [2]	J (pos) if %R > UCL J (pos)/UJ (ND) if %R < LCL J (pos)/R (ND) if %R < 10%	14	Cleanups are optional under SW846 Use bias flags (H,L) [6] where appropriate

[1] National Functional Guidelines for Organic Data Review, October 1999
[2] National Functional Guidelines for Organic Data Review, June, 2008
[3] Organochlorine Pesticides by Gas Chromatography USEPA Method SW846 8081B, Feb 2007, Rev. 2
[4] SW846, Chapter 4, Organic Analytes
[5] Determinative Chromatographic Separations , Method 8000C , March 2003, Rev.3
[6] NFG 2013 suggests using "+ / -" to indicate bias; EcoChem has chosen "H" = high bias indicated; "L" = low bias indicated.

PCB Aroclors by GC
(Based on Organic NFG 2008 and SW-846 Method 8082A)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample					
Cooler/Storage Temperature Preservation	4°C ± 2°C Tissue/sediments (may be frozen -20°C)	NFG [1] Method [2]	**If required by project:** J (pos)/UJ (ND) if greater than 6° C	1	Use Professional Judgment (PJ) to qualify for temperature outlier. Current SW846 criterion is ≤ 6° C [3]
Holding Time	**Extraction Aqueous:** 7 days from collection **Extraction Solid:** 14 days from collection **Exraction Tissue/Sediment (frozen):** 1 year **Analysis (all matrices)**: 40 days from extraction	NFG [1] Method [2]	**If required by project:** J (pos)/UJ (ND) if ext/analyzed > HT J (pos)/R (ND) if gross exceedance (> 2x HT)	1	Use PJ to qualify for holding time outlier. ***Current SW846 does not have an extraction holding time limit.*** [3] Gross exceedance > 2x HT, as per NFG 1999
Instrument Performance					
Retention Times	Surrogates: TCMX (± 0.05); DCB (± 0.10) Aroclors (± 0.07)	NFG [1]	NJ (pos)/R (ND) results for analytes with RT shifts	24	
Initial Calibration	Minimum 5 point with RSD ≤ 20% OR correlation coefficient (r-value) ≥ 0.995 OR Minimum 6-point with co-efficient of determination (r2-value) ≥ 0.99	NFG [1] Method [4]	J (pos) if %RSD greater than 20% OR r-value < 0.995 OR r^2-value < 0.99	5A	Refer to TM-01 for additional information. Use bias flags (H,L)[5] where appropriate
Initial Calibration Verification (ICV)	No NFG criteria. Project specific.	Project	J (pos) if > UCL J (pos)/UJ (ND) if < LCL	5B	Use bias flags (H,L) where appropriate
Continuing Calibration (Prior to each 12 hr. shift)	%D ± 20%	Method [2]	If > 20% (high bias): J (pos) If <20% (low bias: J (pos)/UJ (ND)	5B	Refer to TM-01 for additional information. Use bias flags (H,L) where appropriate
Blank Contamination					
Method Blank (MB)	MB: One per matrix per batch of (of ≤ 20 samples) No detected compounds > RL	NFG [1] Method [2]	U (pos) if result is less than appropriate 5X action level.	7	**Hierarchy of blank review:** **#1 - Review MB and IB, qualify as needed** **#2 - Review FB , qualify as needed** Note: Actions as per NFG 1999 Note: IB not required by method
Field Blank (FB)	FB: frequency as per QAPP No detected compounds > RL	NFG [1] Method [2]	U (pos) if result is less than appropriate 5X action level.	6	
Instrument Blanks (IB)	Analyzed at the beginning and end of every 12 hour sequence No analyte > CRQL	NFG [1]	U (pos) if result is less than appropriate 5X action level.	7	

PCB Aroclors by GC
(Based on Organic NFG 2008 and SW-846 Method 8082A)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy					
MS/MSD (recovery)	One set per matrix per batch (of ≤ 20 samples) AR1016 and AR1260: %R = 29% - 135%, or project limits	NFG (1) Method (2)	Qualify parent only unless other QC indicates systematic problems. J (pos) if both %R > upper control limit (UCL) J (pos)/UJ (ND) if both %R < lower control limit (LCL) J (pos)/R (ND) if both %R < 10%	8	No action if only one spike %R is outside criteria. No action if native analyte conc. > 5x the amount spiked. Use bias flags (H,L) where appropriate. Actions apply to all Aroclors in parent sample.
MS/MSD (RPD)	One set per matrix per batch (of ≤ 20 samples) AR1016: RPD < 15%, AR1260: RPD < 20% or project limits	NFG (1) Method (2)	Qualify parent only unless other QC indicates systematic problems. J (pos) if RPD > control limit	9	No action if parent is ND.
LCS	One per lab batch (of ≤ 20 samples) AR1016 and AR1260: %R = 50% - 150%, or project limits	NFG (1)	J (pos) if %R > UCL J (pos)/UJ (ND) if %R < LCL J (pos)/R (ND) if %R < 10%	10	Use bias flags (H,L) where appropriate. Actions apply to all Aroclors in associated samples.
LCS/LCSD (RPD)	if analyzed use MS/MSD RPD criteria	NFG (1)	J (pos) assoc. compound in all samples	9	LCSD not required by method or NFG
Precision and Accuracy					
Surrogates	TCMX and DCBP added to every sample %R = 30% - 150% or project limits	NFG (1) Method (2)	J (pos) if either %R > UCL J (pos)/UJ (ND) if either %R < LCL J (pos)/R (ND) if either %R < 10%	13	If %R < 10% (sample dilution is a factor), use PJ Use bias flags (H,L) where appropriate
Internal Standards (if used)	Acceptable Range: IS area = 50% to 200% of CCAL area RT within 30 seconds of CC RT	Method (2)	J (pos) if area > 200% J (pos)/UJ (ND) if area < 50% J (pos)/R (ND) if area < 25% RT > 30 seconds, narrate	19	
Field Duplicates	**Solids:** RPD < 50% OR difference < 2X RL (for results < 5X RL) **Aqueous:** RPD < 35% OR difference < 1X RL (for results < 5X RL)	EcoChem	J (pos)/UJ (ND) Qualify only parent and field duplicate samples	9	use project limits if specified

PCB Aroclors by GC
(Based on Organic NFG 2008 and SW-846 Method 8082A)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Compound Identification/Quantification					
Quantitation/ Identification	Between two columns: RPD < 40% or %D < 25% Within Retention Time Windows on both columns.	NFG [1] Method [2]	J (pos) if RPD = 40% - 60% (25% - 60% for %D) NJ (pos) if > 60% R (pos) if RTW criterion not met	3	See TM-08 for additional info.
Calibration Range	on column concentration < high calibration standard	NFG [1] Method [2]	J (pos) if conc > high standard and sample was not diluted	20	
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	Standard reporting policy	Use "DNR" to flag results that will not be reported.	11	TM-04 Rev. 1 for additional info.
Sample Clean-up					
GPC/Sulfur/ Florisil/Acid	No criteria - cleanups are optional	NFG [1] Method [2]	Use Professional Judgment	14	special cleanups may be required for project cleanup standards may be associated with GPC/florisil cleanups

[1] National Functional Guidelines for Organic Data Review, June, 2008
[2] Polychlorinated Biphenyls (PCBs) by Gas Chromatography USEPA Method SW846 8082A, Feb 2007, Rev. 1
[3] SW846, Chapter 4, Organic Analytes
[4] Determinative Chromatographic Separations , Method 8000C , March 2003, Rev.3
[5] "H" = high bias indicated; "L" = low bias indicated

Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	Waters/Solids ≤ 6°C & in the dark Tissues <-10°C & in the dark **Preservation Aqueous:** If Cl_2 is present Thiosulfate must be added and if pH > 9 it must be adjusted to 7 - 9	NFG [1] Method[2]	J(pos)/R(ND) if thiosulfate not added if Cl_2 present; J(pos)/UJ(ND) if pH not adjusted J(pos)/UJ(ND) if temp > 20°C	1	**EcoChem PJ, see TM-05**
Holding Time	**If properly stored, 1 year or:** **Extraction (all matrices):** 30 days from collection **Analysis (all matrices)**: 45 days from extraction	NFG [1] Method[2]	If not properly stored or HT exceedance: J(pos)/UJ(ND)	1	**EcoChem PJ, see TM-05** Gross exceedance = > 1 year 2011 NFG **Note:** Under CWA, SDWA, and RCRA the HT for H2O is 7 days.
Instrument Performance					
Mass Resolution (Tuning)	PFK (Perfluorokerosene) ≥10,000 resolving power at m/z 304.9824. Exact mass of m/z 380.9760 w/in 5 ppm of theoretical value (380.97410 to 380.97790) . Analyzed prior to ICAL and at the start and end of each 12 hr. shift.	NFG [1] Method [2]	R(pos/ND) all analytes in all samples associated with the tune	24	Notify PM
Windows Defining Mix	Peaks for first and last eluters must be within established retention time windows for each selector group (chlorination level)	NFG [1] Method [2]	If peaks are not completely within windows (clipped): If natives are ok, J(pos)/UJ(ND) homologs (Totals) If natives are affected, R all results for that selector group	24	Notify PM
Column Performance Mix	Both mixes must be analyzed before ICAL and CCAL Valley < 25% (valley = (x/y)*100%) where x = ht. of TCDD (or TCDF) & y = baseline to bottom of valley For all isomers eluting near the 2378-TCDD (TCDF) peak (TCDD only for 8290)	NFG [1] Method [2]	J(pos) if valley > 25%	24	**EcoChem PJ, see TM-05, Rev. 2**; Note: TCDF is evaluated only if second column confirmation is performed
Initial Calibration **Sensitivity**	S/N ratio > 10 for all native and labeled compounds in CS1 std.	NFG [1] Method [2]	If <10, elevate Det. Limit or R(ND)	5A	
Initial Calibration **Selectivity**	Ion Abundance ratios within QC limits (Table 8 of method 8290) (Table 9 of method 1613B)	NFG [1] Method [2]	If 2 or more ion ratios are out for one compound in ICAL, J(pos)	5A	**EcoChem PJ, see TM-05, Rev. 2**

Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Instrument Performance (continued)					
Initial Calibration (Minimum 5 stds.) **Stability**	%RSD < 20% for native compounds %RSD <30% for labeled compounds (%RSD < 35% for labeled compounds under 1613b)	NFG [1] Method [2]	J(pos) natives if %RSD > 20%	5A	
	Absolute RT of $^{13}C_{12}$-1234-TCDD >25 min on DB5 & >15 min on DB-225	NFG [1] Method [2]	Narrate, no action		**EcoChem PJ, see TM-05, Rev. 2**
Continuing Calibration (Prior to each 12 hr. shift) **Sensitivity**	S/N ratio for CS3 standard > 10	NFG [1] Method [2]	If <10, elevate Det. Limit or R(ND)	5B	
Continuing Calibration (Prior to each 12 hr. shift) **Selectivity**	Ion Abundance ratios within QC limits (Table 8 of method 8290) (Table 9 of method 1613B)	NFG [1] Method [2]	For congener with ion ratio outlier, J(pos) natives in all samples associated with CCAL. No action for labeled congener ion ratio outliers.	25	**EcoChem PJ, see TM-05**
Continuing Calibration (Prior to each 12 hr. shift) **Stability**	%D+/-20% for native compounds %D +/-30% for labeled compounds **(Must meet limits in Table 6, Method 1613B)** If %D in the closing CCAL are within 25%/35%, the mean RF from the two CCAL may be used to calculate samples **(Section 8.3.2.4 of 8290)**.	NFG [1] Method [2]	**Labeled compounds:** Narrate, no action. **Native compounds:** 1613: J(pos)/UJ(ND)if %D is outside Table 6 limits J(pos)/R(ND) if %D is +/-75% of Table 6 limits 8290: J(pos)/UJ(ND) if %D = 20% - 75% J(pos)/R(ND) if %D > 75%	5B (H,L)[3]	
	Absolute RT of $^{13}C_{12}$-1234-TCDD and $^{13}C_{12}$-123789-HxCDD should be ± 15 seconds of ICAL RRT for all other compounds must meet criteria listed in Table 2 Method 1316.	NFG [1] Method [2]	Narrate, no action	5B	**EcoChem PJ, see TM-05**
Blank Contamination					
Method Blank (MB)	MB: One per matrix per batch of (of ≤ 20 samples) No detected compounds > RL	NFG [1] Method [2]	U(pos) if result is < 5X action level.	7	**Hierarchy of blank review:** **#1 - Review MB, qualify as needed** **#2 - Review FB , qualify as needed**
Field Blank (FB)	FB: frequency as per QAPP No detected compounds > RL		U(pos) if result is < 5X action level.	6	

Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy					
MS/MSD (recovery)	**MS/MSD not typically required for HRMS analyses.** If lab analyzes MS/MSD then one set per matrix per batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos) if both %R > UCL - high bias J(pos)/UJ(ND) if both %R < LCL - low bias J(pos)/R(ND) if both %R < 10% - very low bias J(pos)/UJ(ND) if one > UCL & one < LCL, with no bias **PJ if only one %R outlier**	8 (H,L)[3]	No action if only one spike %R is outside criteria. No action if parent concentration is >4x the amount spiked. Qualify parent sample only unless other QC indicates systematic problems.
MS/MSD (RPD)	**MS/MSD not typically required for HRMS analyses.** If lab analyzes MS/MSD then one set per matrix per batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos) in parent sample if RPD > CL	9	Qualify parent sample only.
LCS (or OPR)	One per lab batch (of ≤ 20 samples) Use most current laboratory control limits **or** Limits from Table 6 of 1613B	NFG [1] Method [2]	J(pos) if %R > UCL - high bias J(pos)/UJ(ND) if %R < LCL - low bias J(pos)/R(ND) if %R < 10% - very low bias	10 (H,L)[3]	No action if only one spike %R is outside criteria, when LCSD is analyzed. Qualify all associated samples.
LCS/LCSD (RPD)	**LCSD not typically required for HRMS analyses.** One set per matrix and batch of 20 samples RPD < 35%	Method [2] Ecochem standard policy	J(pos) assoc. compound in all samples if RPD > CL	9	Qualify all associated samples.
Lab Duplicate (RPD)	**Lab Dup not typically required for HRMS analyses.** One per lab batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos)/UJ(ND) if RPD > CL	9	
Labeled Compounds (Internal Standards)	Added to all samples %R = 40% - 135% in all samples 8290 %R must meet limits in Table 7 Method 1613B	NFG [1] Method [2]	J(pos) if %R > UCL - high bias J(pos)/UJ(ND) if %R < LCL - low bias J(pos)/R(ND) if %R < 10% - very low bias	13 (H,L)[3]	
Field Duplicates	Solids: RPD <50% OR difference < 2X RL (for results < 5X RL) Aqueous: RPD <35% OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	Narrate and qualify if required by project	9	**Use professional judgment**

Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Compound ID and Calculation					
Quantitation/ Identification	All ions for each isomer must maximize within ± 2 seconds. S/N ratio >2.5 Ion ratios must meet criteria listed in Table 8 Method 8290, or Table 9 of 1613B; RRTs w/in limits in Table 2 of 1613B	NFG [1] Method [2]	Narrate in report; qualify if necessary NJ(pos) for retention time outliers. U(pos) for ion ratio outliers.	25	**EcoChem PJ, see TM-05**
EMPC (estimated maximum possible concentration)	If quantitation identification criteria are not met, laboratory should report an EMPC value.	NFG [1] Method [2]	If laboratory correctly reported an EMPC value, qualify the native compound U(pos) to indicate that the value is a detection limit and qualify total homolog groups J (pos)	25	**Use professional judgment See TM-18**
Interferences	Interferences from chlorodiphenyl ether compounds	NFG [1] Method [2]	J(pos)/UJ(ND) if present	23	**See TM-16**
	Lock masses must not deviate ± 20% from values in Table 8 of 1613B	Method [2]	J(pos)/UJ(ND) if present	24	**See TM-17**
Second Column Confirmation	All 2,3,7,8-TCDF hits must be confirmed on a DB-225 (or equiv) column. All QC criteria must also be met for the confirmation analysis.	NFG [1] Method [2]	Report the DB-225 value. If not performed use PJ.	3	DNR-11 DB5 result if both results from both columns are reported. **EcoChem PJ, see TM-05**
Calculation Check	Check 10% of field & QC sample results	EcoChem standard policy	Contact laboratory for resolution and/or corrective action	na	Full data validation only.
Electronic Data Deliverable (EDD)					
Verification of EDD to hardcopy data	EcoChem verify @ 10% unless problems noted; then increase level up to 100% for next several packages.		Depending on scope of problem, correct at EcoChem (minor issues) to resubmittal by laboratory (major issues).	na	EcoChem Project Manager and/or Database Administrator will work with lab to provide long-term corrective action.
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	Standard reporting policy	Use "DNR" to flag results that will not be reported.	11	

(pos) - positive (detected) results; (ND) - not detected results

[1] National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) & Chlorinated Dibenzofurans (CDFs) Data Review, September 2011

[2] Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High-Resolution Gas Chromatography/High-Resolution Mass Spectrometry (HRGC/HRMS), USEPA SW-846, Method 8290

[2] EPA Method 1613, Rev.B, Tetra-through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGS/HRMS, October 1994

[3] NFG 2013 suggests using "+ / -" to indicate bias; EcoChem has chosen "H" = high bias indicated; "L" = low bias indicated.

PCB Congener Analysis by HRMS
(Based on EPA DV Guidance[1] and Method EPA 1668C)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	Waters/Solids ≤ 6°C & in the dark Tissues <-10°C & in the dark **Preservation Aqueous:** If Cl_2 is present Thiosulfate must be added and if needed adjust pH to 2 - 3 (drinking water requirement)	EPA (1) Method (2)	J(pos)/R(ND) if thiosulfate not added if Cl_2 present and J(pos)/UJ(ND) if pH not adjusted; J(pos)/UJ(ND) if temp > 20°C	1	Note: EPA DV guidance documents use < 4°C, method uses ≤ 6°C. Info in EcoChem TM-05 also generally applies.
Holding Time	If properly stored, 1 year prior to extraction. If extracts properly stored (< -10°C & in dark), 1 year from extraction to analysis.	EPA (1) Method (2)	If not properly stored or HT exceeded: J(pos)/UJ(ND)	1	May **be dictated by QAPP** Info in EcoChem TM-05 also generally applies
Instrument Performance					
Mass Resolution (Tuning)	≥10,000 resolving power at m/z 330.9792 <5 ppm deviation from each m/z listed in **Table 7** of method. Analyzed prior to ICAL and at the beginning and end of each 12 hr. shift	EPA (1) Method (2)	R all analytes in all samples associated with a failed tune	24	PFK (Perfluorokerosene) tuning compound
Column Resolution	Mix of all 209 PCBs run prior to each ICAL/12 hours RT of PCB209 must be > 55 min PCB156 & 157 must coelute w/in 2 sec PCB34 & 23 and PCB187 & 182 must be resolved where ((x/y)*100%) < 40% x = ht of valley and y = ht of shortest peak RRT of all congeners must fall within the range in **Table 2** of the method	EPA (1) Method (2)	If criteria are not met, review sample chromatograms to determine if sample results are negatively impacted. If so, discuss with client for possible reanalyses, or J(pos) all data.	24	Criteria are for SPB-octyl column. If different column used, see Section 6.9.1.2 of method. Appendix A provides info for DB-1 column
Initial Calibration **Sensitivity**	S/N ratio > 10 for all native and labeled congeners in CS1 std.	EPA (1) Method (2)	If <10, elevate Det. Limit or R(ND)	5A	
Initial Calibration **Selectivity**	Ion Abundance ratios within QC limits (**Table 8** of Method 1668C)	EPA (1) Method (2)	If ion ratios are out for a given congener in 2 or more standards in ICAL, J(pos) results for that congener in all samples	5A	Professional judgement. The info in EcoChem TM-05 also generally applies
Initial Calibration (Minimum 5 stds.) **Stability**	%RSD < 20% for congeners listed in **Table 3** of method RRT of all congeners must meet **Table 2** of method	EPA (1) Method (2)	J(pos) natives if %RSD > 20% RRT outliers: narrate, no action	5A	RRT outliers: professional judgement. The info in EcoChem TM-05 also generally applies
Continuing Calibration (Prior to each 12 hr. shift) **Sensitivity**	S/N ratio for CS3 standard > 10	EPA (1) Method (2)	If <10, elevate Det. Limit to lowest calibration or R(ND)	5B	
Continuing Calibration (Prior to each 12 hr. shift) **Selectivity**	Ion Abundance ratios within QC limits (**Table 8** of Method 1668C)	EPA (1) Method (2)	No action if %D acceptable, review sample ion ratios, U(pos) if ion ratio outside limits	5B	Professional judgement. The info in EcoChem TM-05 also generally applies.

PCB Congener Analysis by HRMS
(Based on EPA DV Guidance[1] and Method EPA 1668C)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Continuing Calibration (Prior to each 12 hr. shift) **Stability**	Recoveries must meet VER% limits in **Table 6,** Method 1668C	EPA [(1)] Method [(2)]	**Labeled congeners:** Narrate, no action. **Native congeners:** J(pos)/UJ(ND) for low bias J(pos) for high bias	5B (H,L)[3]	
	Absolute RT of all Labeled congeners and Window Defining Congeners must be +/- 15 sec of RT in ICAL RRT of all congeners must be within range in **Table 2** of method	EPA [(1)] Method [(2)]	Narrate, no action	5B	Professional judgement. The info in EcoChem TM-05 also generally applies
Blank Contamination					
Method Blank (MB)	MB: One per matrix per batch of (of ≤ 20 samples) No detected congeners	EPA [(1)] Method [(2)]	U(pos) if sample result is < 5X blank concentration	7	**Heirarchy of blank review:** **#1 - Review MB, quaify as needed** **#2 - Review FB , qualify as needed** EMPC values in blanks as considered to be non-detects
Field Blank (FB)	FB: frequency as per QAPP No detected congeners		U(pos) if sample result is < 5X blank concentration	6	
Precision and Accuracy					
MS/MSD (recovery)	**MS/MSD not typically required for HRMS analyses.** If lab analyzes MS/MSD then one set per matrix per batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos) if both %R > UCL - high bias J(pos)/UJ(ND) if both %R < LCL - low bias J(pos)/R(ND) if both %R < 10% - very low bias J(pos)/UJ(ND) if one > UCL & one < LCL, with no bias **PJ if only one %R outlier**	8 (H,L)[3]	No action if only one spike %R is outside criteria. No action if parent concentration is >4x the amount spiked. Qualify parent sample only unless other QC indicates systematic problems.
MS/MSD (RPD)	**MS/MSD not typically required for HRMS analyses.** If lab analyzes MS/MSD then one set per matrix per batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos) in parent sample if RPD > CL	9	Qualify parent sample only.
LCS (or OPR)	One per lab batch (of ≤ 20 samples) %R must meet limits in **Table 6** Method 1668C	EPA [(1)] Method [(2)]	J(pos) if %R > UCL - high bias J(pos)/UJ(ND) if %R < LCL - low bias J(pos)/R(ND) if %R < 10% - very low bias	10 (H,L)[3]	No action if only one spike %R is outside criteria, when LCSD is analyzed. Qualify all associated samples.
LCS/LCSD (RPD)	**LCS/LCSD not typically required for HRMS analyses.** If lab analyzes LCS/LCSD then one set per matrix and batch of 20 samples RPD < 35%	EcoChem standard policy	J(pos) assoc. congener in all samples if RPD > CL	9	Qualify all associated samples.
Lab Duplicate (RPD) (if required)	**Lab Dup not typically required for HRMS analyses.** One per lab batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos)/UJ(ND) if RPD > CL	9	Optional element. Qualify parent sample only.

PCB Congener Analysis by HRMS
(Based on EPA DV Guidance[1] and Method EPA 1668C)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Labeled congeners (Internal Standards)	Added to all samples %R must meet limits in **Table 6** Method 1668C	EPA [(1)] Method [(2)]	J(pos) if %R > UCL - high bias J(pos)/UJ(ND) if %R < LCL - low bias J(pos)/R(ND) if %R <5% - very low bias J(pos)/UJ(ND) if %R between 5-10% for two or more labeled compounds in a substitution group (ie, mono, -di-, trichlorinated)- very low bias	13 (H,L)[3]	See next tab for labled congener associations as per **Table 2** Method 1668
Field Duplicates	Solids: RPD <50% OR difference < 2X RL (for results < 5X RL) Aqueous: RPD <35% OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	Narrate and qualify if required by project **(EcoChem PJ)**	9	**RPD values may be dictated by QAPP** 35% and 50% are EcoChem defaults
Compound ID and Calculation					
Quantitation/ Identification	All ions for each isomer must maximize within +/- 2 seconds. S/N ratio >2.5 Ion ratios must meet criteria listed in **Table 8** of 1668C; RRTs w/in limits in **Table 2** of 1668C	EPA [(1)] Method [(2)]	Narrate in report; qualify if necessary NJ(pos) for retention time outliers. U(pos) for ion ratio outliers.	25	The info in EcoChem TM-05 also generally applies
EMPC (estimated maximum possible concentration)	If quantitation identification criteria are not met, laboratory should report an EMPC value.	EPA [(1)] Method [(2)]	If laboratory correctly reported an EMPC value, qualify the native congener U to indicate that the value is an elevated detection limit and qualify total homolog groups J(+)	25	**Use professional judgment.** **See TM-18**
Interferences	Lock masses must not deviate +/- 20% from values in **Table 7** of 1668C	Method [(2)]	J(pos)/UJ(ND) if present	24	**Use professional judgment.** **See TM-17**
Calibration Range	Results greater than highest calibration standard	EcoChem standard policy	Qualify J (pos)	20	If result from dilution analysis is not reported.
Calculation Check	Check 10% of field & QC sample results	EcoChem standard policy	Contact laboratory for resolution and/or corrective action	na	Full data validation only.
Electronic Data Deliverable (EDD)					
Verification of EDD to hardcopy data	EcoChem verify @ 10% unless problems noted; then increase level up to 100% for next several packages.		Depending on scope of problem, correct at EcoChem (minor issues) to resubmittal by laboratory (major issues).	na	EcoChem Project Manager and/or Database Administrator will work with lab to provide long-term corrective action.
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	Standard reporting policy	Use "DNR" to flag results that will not be reported.	11	

[1] USEPA Region 2 Data Validation, Standard Operating Procedure for EPA Method 1668A, Revision 1, September 2008
USEPA Region 3 Interim Guidelines for the Validation of Data Generated Using Method 1668 PCB Congener Data, Revision 0, April 2004
USEPA Region 10 SOP For the Validation of Method 1668 Toxic, Dioxin-like, PCB Data, Revision 1, December 1995
[2] EPA Method 1668, Rev.C, Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS, April 2010
[3] "H" = high bias indicated; "L" = low bias indicated

(pos): Positive Result(s)
(ND): Non-detects

PCB by 1668C

Labeled Compound

1L	3L	4L	15L	19L	37L	54L	77L	81L	104L	105L	114L	118L	123L	126L	155L	156L/ 157L	167L	169L	188L	189L	202L	205L	206L	208L	209L
1	2	**4**	5	16	16	40	40	40	82	82	82	82	82	**126**	128	128	128	128	170	170	194	194	**206**	207	**209**
2	**3**	5	6	17	17	41	41	41	83	83	83	83	83		129	129	129	129	171	171	195	195	207	**208**	
		6	7	18	18	42	42	42	84	84	84	84	84		130	130	130	130	172	172	196	196			
		7	8	**19**	20	43	43	43	85	85	85	85	85		131	131	131	131	173	173	197	197			
		8	9	20	21	44	44	44	86	86	86	86	86		132	132	132	132	174	174	198	198			
		9	10	21	22	45	45	45	87	87	87	87	87		133	133	133	133	175	175	199	199			
		10	11	22	23	46	46	46	88	88	88	88	88		134	134	134	134	176	176	200	200			
		11	12	23	24	47	47	47	89	89	89	89	89		135	135	135	135	177	177	201	201			
		12	13	24	25	48	48	48	90	90	90	90	90		136	136	136	136	178	178	**202**	203			
		13	14	25	26	49	49	49	91	91	91	91	91		137	137	137	137	179	179	203	204			
		14	**15**	26	27	50	50	50	92	92	92	92	92		138	138	138	138	180	180	204	**205**			
				27	28	51	51	51	93	93	93	93	93		139	139	139	139	181	181					
				28	29	52	52	52	94	94	94	94	94		140	140	140	140	182	182					
				29	30	53	53	53	95	95	95	95	95		141	141	141	141	183	183					
				30	31	**54**	55	55	96	96	96	96	96		142	142	142	142	184	184					
				31	32	55	56	56	97	97	97	97	97		143	143	143	143	185	185					
				32	33	56	57	57	98	98	98	98	98		144	144	144	144	186	186					
				33	34	57	58	58	99	99	99	99	99		145	145	145	145	187	187					
				34	35	58	59	59	100	100	100	100	100		146	146	146	146	**188**	**189**					
				35	36	59	60	60	101	101	101	101	101		147	147	147	147	190	190					
				36	**37**	60	61	61	102	102	102	102	102		148	148	148	148	191	191					
				38	38	61	62	62	103	103	103	103	103		149	149	149	149	192	192					
				39	39	62	63	63	**104**	**105**	106	106	106		150	150	150	150	193	193					
						63	64	64	106	106	107	107	107		151	151	151	151							
						64	65	65	107	107	108	108	108		152	152	152	152							
						65	66	66	108	108	109	109	109		153	153	153	153							
						66	67	67	109	109	110	110	110		154	154	154	154							
						67	68	68	110	110	111	111	111		**155**	**156**	158	158							
						68	69	69	111	111	112	112	112		158	**157**	159	159							
						69	70	70	112	112	113	113	113		159	158	160	160							
						70	71	71	113	113	**114**	115	115		160	159	161	161							
						71	72	72	115	115	115	116	116		161	160	162	162							
						72	73	73	116	116	116	117	117		162	161	163	163							
						73	74	74	117	117	117	**118**	119		163	162	164	164							
						74	75	75	119	119	119	119	120		164	163	165	165							
						75	76	76	120	120	120	120	121		165	164	166	166							
						76	**77**	78	121	121	121	121	122		166	165	**167**	168							
						78	78	79	122	122	122	122	**123**		168	166	168	**169**							
						79	79	80	124	124	124	124	124			168									
						80	80	**81**	125	125	125	125	125												
									127	127	127	127	127												

Metals by ICP-MS
(Based on Inorganic NFG 2010 and SW-846 6020A)

QC Element	EcoChem Acceptance Criteria	Source of Criteria	EcoChem Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler / Storage Temperature Preservation	**Solid:** Cooler temperature 4°C±2°C **Aqueous:** Nitric Acid to pH < 2 **Dissolved Metals:** 0.45 µm filter, preserve to pH < 2 after filtration	NFG (1) Method (2)	Cooler Temps: **If required by project** J (pos)/UJ (ND) if greater than 6° C Aqueous: J (pos)/UJ (ND) if pH > 2	1	Use **PJ** to qualify for temperature outlier. Current SW846 criterion is ≤ 6° C (4) No quals for pH if samples preserved by lab immediately upon receipt and within 1 day of collection.
Holding Time	All matrices: 180 days from date sampled Frozen soils, sediments, tissues (-20°C) - HT extended to 1 year	NFG (1) Method (2) EcoChem standard policy	J (pos)/UJ (ND) if holding time exceeded	1	
Instrument Performance					
Tune	Analyzed prior to ICAL tunignsolution analyzed 5 times with Std. Dev. ≤ 5% Mass calibration < 0.1 amu difference from target mass Resolution < 0.9 amu @ 10% peak height	NFG (1) Method (2)	J(pos)/UJ(ND) if tune criteria not met	5A	Use **PJ** to evaluate tune. Alternate Resolution critteria may apply based on instrument specs (i.e <0.75 amu at 5% peak height)
Initial Calibration (ICAL)	Based on instrument requirements, blank + 1 standard minimum requirement for calibration If more than 1 standard used, r ≥ 0.995	NFG (1) Method (2)	J (pos)/UJ (ND) if r < 0.995	5A	
Initial Calibration Verification (ICV)	Independent source analyzed immediately after calibration %R within ± 10% of true value	NFG (1) Method (2)	R (pos/ND) if %R < 75% J (pos)/UJ (ND) if %R 75% - 89% J (pos) if %R >111%	5A (H,L)[3]	Qualify all samples in run
Reporting Limit (RL) Standard Low Level ICV/CCV	concentration at RL %R = 70%-130%	Method (2)	J (pos) < 2x RL / R (ND) if %R <50% J (pos) < 2x RL / UJ (ND) if %R 50 - 69% J (pos) < 2x RL if %R > 130%	5A (H,L)[3]	Qualify all samples in run

Metals by ICP-MS
(Based on Inorganic NFG 2010 and SW-846 6020A)

QC Element	EcoChem Acceptance Criteria	Source of Criteria	EcoChem Action for Non-Conformance	Reason Code	Discussion and Comments
Instrument Performance cont'd					
Continuing Calibration Verification (CCV)	Immediately following ICV/ICB, then every two hours or ten samples, and at end of run. %R within ± 10% of true value	NFG (1) Method (2)	R (pos/ND) if %R < 75% J (pos)/UJ (ND) if %R 75% - 89% J (pos) if %R >111%	5B (H,L)[3]	Qualify samples bracketed by CCV outliers
Interference Check Samples (ICSA / ICSAB)	ICSAB %R 80% - 120% for all spiked elements | ICSA | < MDL for all unspiked elements	NFG (1) Method (2)	For samples with Al, Ca, Fe, Mg > ICS levels: **ICSAB**: J(pos)/R (ND) if %R < 50% J (pos)/UJ (ND) if %R = 50% - 79% J (pos) if %R > 120% **ICSA:** J (pos)< 2x ICSA/UJ (ND) for ICSA <Neg MDL J (pos) < 2x ICSA for ICSA > MDL	17 (H,L)[3]	Use **PJ** and molecular interferences to evaluate ICSA to determine if bias is present. Refer to **TM-14** for additional information.
Blank Contamination					
Method Blank (MB)	One per matrix per batch of (of ≤ 20 samples) Blank conc < MDL	NFG (1) Method (2)	U (pos) if result is < 5X method blank concentration	7	Refer to **TM-02** for additional information. Blank Evaluation based on NFG 1994
Instrument Blanks (ICB/CCB)	After each ICV & CCV | blank concentration | < MDL	NFG (1) Method (2)	Action level is 5x absolute value of blank conc. For positive blanks: U (pos) results < action level For negative blanks: J (pos)/UJ (ND) results < action level	Pos Blks: 7 Neg Blks: 7L[3]	Use blanks bracketing samples for Qualification Refer to **TM-02** for additional information. **Hierarchy of blank review:** **#1 - Review MB, quaify as needed** **#2 - Review IB , qualify as needed** **#3 - Review FB , qualify as needed**
Field Blank (FB)	Blank conc < MDL	EcoChem standard policy	U (pos) if result is < 5x action level, as per analyte.	6	Qualify in associated field samples only. Refer to **TM-02** for additional information.

Metals by ICP-MS
(Based on Inorganic NFG 2010 and SW-846 6020A)

QC Element	EcoChem Acceptance Criteria	Source of Criteria	EcoChem Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy					
Internal Standards (IS)	Added to all samples. All analytes must be associated with an internal standard 60-125% of cal blank IS	NFG [1] Method [2]	J(pos)/UJ(ND) all analytes associated with IS outlier	19	6020A criteria - IS >70% of ICAL std
LCS (recovery)	One per matrix per batch (of ≤ 20 samples); LCSD not required %R between 80-120%	Method [2]	J (pos)/R (ND) if %R <50% J (pos)/UJ (ND) if %R 50% - 79% J (pos) if %R > 120%	10 (H,L)[3]	Qualify all samples in batch QAPP may have overriding accuracy limits. NFG Limits 70% -130%
LCS/LCSD (RPD)	LCSD not required, if analyzed: RPD ≤ 20%	Method [2]	J (pos)/UJ (ND) if RPD > 20%	9	Qualify all samples in batch QAPP may have overriding precision limits.
MS/MSD (recovery)	One per matrix per batch (of ≤ 20 samples); MSD not required %R between 75-125%	NFG [1] Method [2]	J (pos) if %R > 125% J (pos)/UJ (ND) if %R <75% J (pos)/R (ND) if %R < 30%, unless post digestion spike analyzed, J (pos)/UJ (ND) if post digestion spike %R OK	8 (H,L)[3]	No action if only one spike %R is outside criteria. NA if parent concentration >4x the amount spiked. Qualify all samples in batch. QAPP may have overriding accuracy limits.
Post Digestion Spikes	If MS is outside 75-125%, post-spike should be analyzed %R 80%-120% (method); 75%-125% (NFG)	NFG [1] Method [2]	Only used to support MS qualification decisions	NA	No qualifiers assigned based solely on this element.
MS/MSD (RPD)	MSD not required, if analyzed: RPD ≤ 20%	NFG [1] Method [2]	J (pos)/UJ (ND) if RPD > 20%	9	QAPP may have overriding precision limits.
Laboratory Duplicate	One per matrix per batch (of ≤ 20 samples) RPD ≤ 20% for results ≥ 5x RL Solids: difference < 2X RL for results < 5X RL Aqueous: difference < 1X RL for results < 5X RL	NFG [1] Method [2]	J (pos)/UJ (ND) if RPD > 20% or if difference > control limit	9	Qualify all samples in batch. QAPP may have overriding precision limits.

Metals by ICP-MS
(Based on Inorganic NFG 2010 and SW-846 6020A)

QC Element	EcoChem Acceptance Criteria	Source of Criteria	EcoChem Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy cont'd					
Reference Material (RM, SRM, or CRM)	Result ±20% of the 95% confidence interval of the true value for analytes	EcoChem standard policy	J (pos)/UJ (ND) if < LCL J (pos) if > UCL	12 (H,L)[3]	QAPP may have overriding accuracy limits. Some manufacturers may have different RM control limits
Serial Dilution	Analyze one sample per matrix at a 5x dilution %D <10% for original sample conc. > 50x MDL	NFG [(1)]	J(pos)/UJ(ND) if %D > 10% and native sample concentration > 50x MDL	16	Note serial dilutions for soil are reported in ug/L, but the MDL is in mg/kg. The units need to be adjusted. Qualify all samples in batch.
Field Duplicate	Solids: RPD <50% OR difference < 2X RL (for results < 5X RL) Aqueous: RPD <35% OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	Narrate and qualify if required by project **(EcoChem PJ)** Qualify only field duplicate samples J(pos)/UJ(ND)	9	QAPP may have overriding precision limits.
Compound Quantitation					
Total and Dissolved Comparison	Total > Dissolved	EcoChem standard policy	J (pos)/UJ (ND) if Dissolved > Total and results fall outside of standard duplicate precision criteria	14	
Calibration Range	Results < instrument linear range	NFG [(1)] Method [(2)]	if result exceeds linear range and sample was not diluted J (pos)	20	
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	EcoChem standard policy	Use "DNR" to flag results that will not be reported.	11	**TM-04** EcoChem Policy for Rejection/Selection Process for Multiple Results

[1] National Functional Guidelines for Inorganic Superfund Data Review, January 2010.
[2] Method SW846 6020A Inductively Coupled Plasma-Mass Spectrometry (ICP-MS), Revision 1, February 2007.
[3] "H" = high bias indicated; "L" = low bias indicated
[4] SW846, Chapter 3, Inorganic Analytes

(pos): Positive Result
(ND): Not detected

Mercury by CVAA
(Based on Inorganic NFG 2010 and SW846 7470A & 7471B)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler / Storage Temperature Preservation	**Solid:** Cooler temperature 4°C±2°C **Aqueous:** Nitric Acid to pH < 2 **Dissolved Metals:** 0.45 µm filter, preserve to pH < 2 after filtration	NFG (1) Method (2)	Cooler Temps: **If required by project** J (pos)/UJ (ND) if greater than 6° C Aqueous: J (pos)/UJ (ND) if pH > 2	1	Use **PJ** to qualify for temperature outlier. Current SW846 criterion is ≤ 6° C (4) No quals for pH if samples preserved by lab immediately upon receipt and within 1 day of collection.
Holding Time	28 days from date sampled Frozen solids and tissues HT extended to 6 months	NFG (1) Method (2) EcoChem standard policy	J (pos)/UJ (ND) if HT exceeded	1	
Instrument Performance					
Initial Calibration (ICAL)	Daily Calibration Blank + 5 standards, one ≤ RL Correlation coefficient (r) ≥ 0.995	NFG (1) Method (2)	J (pos)/UJ (ND) if r < 0.995	5A (H,L)[3]	
Initial Calibration Verification (ICV)	Independent source analyzed immediately after ICAL %R within ± 15% of true value	NFG (1) Method (2)	R(pos/ND) if %R <70% J(pos)/UJ(ND) if %R = 70-84% J(pos) if %R = > 116%	5A (H,L)[3]	Qualify all samples in run
Reporting Limit (RL) Standard	Conc = RL %R = 70-130%	Method (2)	J (pos) < 2x RL / R (ND) if %R <50% J (pos) < 2x RL / UJ (ND) if %R 50 - 69% J (pos) < 2x RL if %R > 130%	5A (H,L)[3]	Qualify all samples in run
Continuing Calibration Verification (CCV)	At beginning of run, every ten samples, and again after last sample. %R within ± 15% of true value	NFG (1) Method (2)	R(pos/ND) if %R <70% J(pos)/UJ(ND) if %R = 70-84% J(pos) if %R = > 116%	5B (H,L)[3]	Qualify samples bracketed by CCV outliers
Blank Contamination					
Method Blank (MB)	One per matrix per batch of (of ≤ 20 samples) Blank conc < MDL	NFG (1) Method (2)	U (pos) if result is < 5X method blank concentration	7	Refer to **TM-02** for additional information. Blank Evaluation based on NFG 1994

Mercury by CVAA
(Based on Inorganic NFG 2010 and SW846 7470A & 7471B)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Instrument Blanks (ICB/CCB)	After each ICV & CCV | blank concentration | < MDL	NFG (1) Method (2)	Action level is 5x absolute value of blank conc. For positive blanks: U (pos) results < action level For negative blanks: J (pos)/UJ (ND) results < action level	Pos Blanks: 7 Neg Blanks: 7L[3]	Use blanks bracketing samples for Qualification Refer to **TM-02** for additional information. **Hierarchy of blank review:** **#1 - Review MB, quaify as needed** **#2 - Review IB , qualify as needed** **#3 - Review FB , qualify as needed**
Field Blank (FB)	Blank conc < MDL	EcoChem standard policy	U (pos) if result is < 5x action level, as per analyte.	6	Qualify in associated field samples only. Refer to **TM-02** for additional information.
Precision and Accuracy					
Laboratroy Control Sample (recovery)	One per matrix per batch (of ≤ 20 samples); LCSD not required %R between 80-120%	Method (2)	J (pos)/R (ND) if %R <50% J (pos)/UJ (ND) if %R 50% - 79% J (pos) if %R > 120%	10 (H,L)[3]	Qualify all samples in batch QAPP may have overriding accuracy limits. NFG does not address LCS
LCS/LCSD (RPD)	LCSD not required, if analyzed: RPD ≤ 20%	Method (2)	J (pos)/UJ (ND) if RPD > 20%	9	Qualify all samples in batch QAPP may have overriding precision limits.
Matris Spike/Matrix Spike Duplicate MS/MSD (recovery)	One per matrix per batch (of ≤ 20 samples); MSD not required %R between 75-125%	NFG (1) Method (2)	J (pos) if %R > 125% J (pos)/UJ (ND) if %R <75% J (pos)/R (ND) if %R < 30%	8 (H,L)[3]	No action if only one spike %R is outside criteria. NA if parent concentration >4x the amount spiked. Qualify all samples in batch. QAPP may have overriding accuracy limits.
MS/MSD (RPD)	MSD not required, if analyzed: RPD ≤ 20%	NFG (1) Method (2)	J (pos)/UJ (ND) if RPD > 20%	9	QAPP may have overriding precision limits.
Laboratory Duplicate	One per matrix per batch (of ≤ 20 samples) RPD ≤ 20% for results ≥ 5x RL Solids: difference < 2X RL for results < 5X RL Aqueous: difference < 1X RL for results < 5X RL	NFG (1) Method (2)	J (pos)/UJ (ND) if RPD > 20% or if difference > control limit	9	Qualify all samples in batch. QAPP may have overriding precision limits.

Mercury by CVAA
(Based on Inorganic NFG 2010 and SW846 7470A & 7471B)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Reference Material (RM, SRM, or CRM)	Result ±20% of the 95% confidence interval of the true value for analytes	EcoChem standard policy	J (pos)/UJ (ND) if < LCL J (pos) if > UCL	12 (H,L)[3]	QAPP may have overriding accuracy limits. Some manufacturers may have different RM control limits
Field Duplicate	Solids: RPD <50% (for results ≥ 5x RL) OR difference < 2X RL (for results < 5X RL) Aqueous: RPD <35% (for results ≥ 5x RL) OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	Qualify only parent and field duplicate samples J (pos)/UJ (ND)	9	QAPP may have overriding precision limits. Client/QAPP may not require qualification based on field precision.
Compound Quantitation					
Total and Dissolved Comparison	Total > Dissolved	EcoChem standard policy	J (pos)/UJ (ND) if Dissolved > Total and results fall outside of standard duplicate precision criteria	14	
Calibration Range	Results < instrument linear range	NFG (1) Method (2)	if result exceeds linear range and sample was not diluted J (pos)	20	
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	EcoChem standard policy	Use "DNR" to flag results that will not be reported.	11	**TM-04** EcoChem Policy for Rejection/Selection Process for Multiple Results

[1] National Functional Guidelines for Inorganic Superfund Data Review, January 2010.

[2] Method SW846 7470A Mercury in Liquid Waste (Manual Cold-Vapor Technique), Revision 1, September 1994.
Method SW846 7471B Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique), Revision 2, February 2007.

[3] "H" = high bias indicated; "L" = low bias indicated

[4] SW846, Chapter 3, Inorganic Analytes

(pos): Positive Result
(ND): Not Detected

Conventional Methods with Instrument Calibrations (i.e., Ion Chromatography, Total Organic Carbon)
(Based on Inorganic NFG 2010 and EPA methods)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	Cooler temperature: 4°C±2°C Preservation: Analyte/Method Specific	NFG [(1)] Method [(2)]	J (pos)/UJ (ND) if preservation requirements not met	1	Use **PJ** to qualify for cooler temp outliers.
Holding Time	Analyte/Method Specific	NFG [(1)] Method [(2)]	J (pos)/UJ (ND) if holding time exceeded	1	
Instrument Performance					
Initial Calibration (ICAL)	blank + multiple standards as per method requirements r ≥ 0.995	NFG [(1)] Method [(2)]	J (pos)/UJ (ND) for r < 0.995	5A	
Initial Calibration Verification (ICV)	Independent source analyzed immediately after calibration %R method specific	NFG [(1)] Method [(2)]	J (pos)/UJ (ND) if %R < lower control limit (LCL) J (pos) if %R > upper control limit (UCL)	5A (H,L)[3]	Qualify all samples in run
Continuing Calibration Verification (CCV)	Immediately following ICV, every 10 samples, and end of run %R method specific	NFG [(1)] Method [(2)]	J(pos)/UJ(ND) if %R < LCL J(pos) if %R > UCL	5B (H,L)[3]	Qualify samples bracketed by CCV outliers
Blank Contamination					
Method Blank (MB)	One per matrix per batch of (of ≤ 20 samples) Blank conc < MDL	NFG [(1)] Method [(2)]	U (pos) if result is < 5X method blank concentration	7	Refer to **TM-02** for additional information. Blank Evaluation based on NFG 1994

Conventional Methods with Instrument Calibrations (i.e., Ion Chromatography, Total Organic Carbon)
(Based on Inorganic NFG 2010 and EPA methods)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Instrument Blanks (ICB/CCB)	After each ICV & CCV | blank concentration | < MDL	NFG [(1)] Method [(2)]	Action level is 5x absolute value of blank conc. For positive blanks: U (pos) results < action level For negative blanks: J (pos)/UJ (ND) results < action level	Pos Blanks: 7 Neg Blanks: 7L[3]	Use blanks bracketing samples for Qualification Refer to **TM-02** for additional information. **Hierarchy of blank review:** **#1 - Review MB, quaify as needed** **#2 - Review IB , qualify as needed** **#3 - Review FB , qualify as needed**
Field Blank (FB)	Blank conc < MDL	EcoChem standard policy	U (pos) if result is < 5x action level, as per analyte.	6	Qualify in associated field samples only. Refer to **TM-02** for additional information.
Precision and Accuracy					
Laboratory Control Sample (LCS)	One per matrix per batch (of ≤ 20 samples) %R within Method control limits (or Laboratory control limtis if none specified in method)	NFG [(1)] Method [(2)]	J (pos)/UJ (ND) if %R < LCL J (pos) if %R > UCL	10 (H,L)[3]	Qualify all samples in batch QAPP may have overriding accuracy limits.
Reference Materials (RM, CRM, SRM)	Result ±20% of the 95% confidence interval of the true value for analytes	EcoChem standard policy	J (pos)/UJ (ND) if < LCL J (pos) if > UCL	12 (H,L)[3]	QAPP may have overriding accuracy limits. Some manufacturers may have different RM control limits

Conventional Methods with Instrument Calibrations (i.e., Ion Chromatography, Total Organic Carbon)
(Based on Inorganic NFG 2010 and EPA methods)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Matrix Spike/ Matrix Spike Duplicate (MS/MSD)	Where applicable to method; MSD may not be required One per matrix per batch (of ≤ 20 samples) For samples <4x spike level, %R within method control limits (or Laboratory control limtis if none specified in method)	NFG [1] Method [2]	J (pos)/UJ (ND) if %R < LCL J (pos) if %R > UCL	8 (H,L)3	Qualify all samples in batch No action if native analyte concentration ≥ 4x spike added. Qualify all samples in batch. QAPP may have overriding accuracy limits.
Laboratory Duplicate (or MS/MSD)	One per matrix per batch (of ≤ 20 samples) RPD ≤ 20% for results ≥ 5x RL Solids: difference < 2X RL for results < 5X RL Aqueous: difference < 1X RL for results < 5X RL	NFG [1] Method [2]	J (pos)/UJ (ND) if RPD > 20% or if difference > control limit	9	Qualify all samples in batch. QAPP may have overriding precision limits.
Field Duplicate	Solids: RPD <50% (for results ≥ 5x RL) OR difference < 2X RL (for results < 5X RL) Aqueous: RPD <35% (for results ≥ 5x RL) OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	Qualify only parent and field duplicate samples J (pos)/UJ (ND)	9	QAPP may have overriding precision limits. Client/QAPP may not require qualification based on field precision.
Compound Quantitation					
Linear Range	Sample concentrations less than highest calibration standard	NFG [1] Method [2]	If result exceeds linear range & sample was not diluted J (pos)	20	
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	EcoChem standard policy	Use "DNR" to flag results that will not be reported.	11	**TM-04** EcoChem Policy for Rejection/Selection Process for Multiple Results

[1] National Functional Guidelines for Inorganic Superfund Data Review, January 2010.
[2] SW846 or EPA Standard Methods
[3] "H" = high bias indicated; "L" = low bias indicated

(pos): Positive Result
(ND): Not Detected

Conventional Methods by Gravimetric Analysis
(i.e., Total Solids, Total Dissolved Solids, Total Suspended Solids, Grain Size)
(Based on Inorganic NFG 2010 and EPA methods)

QC Element	EcoChem Acceptance Criteria	Source of Criteria	EcoChem Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	Cooler temperature: 4°C±2°C Preservation: Analyte/Method Specific	Method [1] NFG[2]	J (pos)/UJ (ND) if preservation requirements not met	1	Use **PJ** to qualify for cooler temp outliers.
Holding Time	Analyte/Method Specific	Method NFG[2]	J (pos)/UJ (ND) if holding time exceeded	1	
Blank Contamination					
Method Blank (MB)	If required by method,one per matrix per batch of (of ≤ 20 samples) Blank conc < MDL	NFG [1] Method [2]	U (pos) if result is < 5X method blank concentration	7	Refer to **TM-02** for additional information. Blank Evaluation based on NFG 1994
Precision and Accuracy					
LCS (If appropriate to method)	One per matrix per batch (of ≤ 20 samples) %R between 80-120%	Method [2]	J (pos)/R (ND) if %R <50% J (pos)/UJ (ND) if %R 50% - 79% J (pos) if %R > 120%	10 (H,L)[3]	Qualify all samples in batch QAPP may have overriding accuracy limits.
Reference Material (RM, SRM, or CRM)	Result ±20% of the 95% confidence interval of the true value for analytes	EcoChem standard policy	J (pos)/UJ (ND) if < LCL J (pos) if > UCL	12 (H,L)[3]	QAPP may have overriding accuracy limits. Some manufacturers may have different RM control limits

Conventional Methods by Gravimetric Analysis
(i.e., Total Solids, Total Dissolved Solids, Total Suspended Solids, Grain Size)
(Based on Inorganic NFG 2010 and EPA methods)

QC Element	EcoChem Acceptance Criteria	Source of Criteria	EcoChem Action for Non-Conformance	Reason Code	Discussion and Comments
Laboratory Duplicate	One per matrix per batch (of ≤ 20 samples) RPD ≤ 20% for results ≥ 5x RL Solids: difference < 2X RL for results < 5X RL Aqueous: difference < 1X RL for results < 5X RL	NFG [1] Method [2]	J (pos)/UJ (ND) if RPD > 20% For Grain Size, no action if results for fraction are less than 5%	9	Qualify all samples in batch, except Grain Size - qualify parent only. QAPP may have overriding precision limits.
Field Duplicate	Solids: RPD <50% (for results ≥ 5x RL) OR difference < 2X RL (for results < 5X RL) Aqueous: RPD <35% (for results ≥ 5x RL) OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	Qualify only parent and field duplicate samples J (pos)/UJ (ND)	9	QAPP may have overriding precision limits. Client/QAPP may not require qualification based on field precision.
Compound Quantitation					
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte per sample	EcoChem standard policy	Use "DNR" to flag results that will not be reported.	11	

[1] National Functional Guidelines for Inorganic Superfund Data Review, January 2010.
[2] SW846 or EPA Standard Methods
[3] "H" = high bias indicated; "L" = low bias indicated

(pos): Positive Result
(ND): Not Detected

ECOCHEM
Data Quality

APPENDIX B

QUALIFIED DATA SUMMARY TABLE

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-121-PentaCB	1.44	pg/g	K	J	25
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-126-PentaCB	6.49	pg/g	K	J	25
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-4-DiCB	61.9	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-111-PentaCB	2.19	pg/g	K	J	25
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-123-PentaCB	36.6	pg/g	K	J	25
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-81-TetraCB	3.68	pg/g	K	J	25
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-68-TetraCB	12.3	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-2-MonoCB	3.92	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-1-MonoCB	18.2	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	Total_NonaCb	398	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	Total_OctaCB	2880	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-208-NonaCB	112	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	Total_MonoCB	35.5	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-195-OctaCB	360	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-207-NonaCB	48.4	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-206-NonaCB	382	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-205-OctaCB	46.4	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-204-OctaCB	0.225	pg/g	K J	U	25
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-203-OctaCB	607	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-202-OctaCB	174	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-201-OctaCB	142	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-196-OctaCB	458	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-194-OctaCB	915	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-190-HeptaCB	235	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-197-OctaCB	132	pg/g	C	J	9
WG63753	LDW18-SS-180-PCBCongeners	L29052-12	EPA 1668C	PCB-204-OctaCB	3.34	pg/g	K	J	25
WG63753	LDW18-SS-180-PCBCongeners	L29052-12	EPA 1668C	PCB-126-PentaCB	102	pg/g	K	J	25
WG63753	LDW18-SS-180-PCBCongeners	L29052-12	EPA 1668C	PCB-123-PentaCB	632	pg/g	K	J	25
WG63753	LDW18-SS-180-PCBCongeners	L29052-12	EPA 1668C	PCB-121-PentaCB	3.47	pg/g	K	J	25

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG63753	LDW18-SS-180-PCBCongeners	L29052-12	EPA 1668C	PCB-155-HexaCB	2.11	pg/g	K	J	25
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-10-DiCB	3.34	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-27-TriCB	45.7	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-12-DiCB	63.6	pg/g	C	J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-42-TetraCB	187	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-40-TetraCB	325	pg/g	C	J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-48-TetraCB	92.3	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	Total_NonaCb	542	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-6-DiCB	104	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-4-DiCB	78.1	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-3-MonoCB	22.3	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-2-MonoCB	5.46	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-1-MonoCB	40.2	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	PCB-59-TetraCB	71.2	pg/g	C	J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	Total_OctaCB	3780	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners	L29052-16 (A)	EPA 1668C	Total_MonoCB	68	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-3-MonoCB	13.4	pg/g		J	9
WG63753	LDW18-SS-185-PCBCongeners	L29052-17	EPA 1668C	PCB-29-TriCB	2.79	pg/g	K	J	25
WG63753	LDW18-SS-185-PCBCongeners	L29052-17	EPA 1668C	PCB-33-TriCB	55.3	pg/g	G	J	24
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-208-NonaCB	88.1	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-207-NonaCB	30.6	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-206-NonaCB	279	pg/g		J	9
WG63753	LDW18-SS-185-PCBCongeners	L29052-17	EPA 1668C	PCB-111-PentaCB	3.26	pg/g	K	J	25
WG63753	LDW18-SS-185-PCBCongeners	L29052-17	EPA 1668C	PCB-104-PentaCB	0.899	pg/g	K	J	25
WG63753	LDW18-SS-185-PCBCongeners	L29052-17	EPA 1668C	PCB-123-PentaCB	197	pg/g	K	J	25
WG63753	LDW18-SS-185-PCBCongeners	L29052-17	EPA 1668C	PCB-126-PentaCB	28.1	pg/g	K	J	25
WG63753	LDW18-SS-185-PCBCongeners	L29052-17	EPA 1668C	PCB-55-TetraCB	14.5	pg/g	G	J	24
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-203-OctaCB	448	pg/g		J	9
WG63753	LDW18-SS-185-PCBCongeners	L29052-17	EPA 1668C	PCB-89-PentaCB	37.8	pg/g	G	J	24
WG63753	LDW18-SS-185-PCBCongeners	L29052-17	EPA 1668C	PCB-81-TetraCB	9.95	pg/g	K	J	25

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-80-TetraCB	0.303	pg/g	K J	U	25
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-59-TetraCB	87.7	pg/g	C	J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-68-TetraCB	15.3	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-205-OctaCB	36.5	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-81-TetraCB	4.2	pg/g	K	J	25
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-27-TriCB	37.2	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-12-DiCB	38.1	pg/g	C	J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-10-DiCB	2.63	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-6-DiCB	80.3	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-48-TetraCB	116	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-42-TetraCB	229	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-40-TetraCB	403	pg/g	C	J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-39-TriCB	1.69	pg/g	K	J	25
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-202-OctaCB	130	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-201-OctaCB	106	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-197-OctaCB	106	pg/g	C	J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-196-OctaCB	337	pg/g		J	9

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-195-OctaCB	236	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-194-OctaCB	528	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-190-HeptaCB	308	pg/g		J	9
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-184-HeptaCB	0.821	pg/g	K	J	25
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-126-PentaCB	6.09	pg/g	K	J	25
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-123-PentaCB	30	pg/g	K	J	25
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-111-PentaCB	2.59	pg/g	K	J	25
WG63753	LDW18-SS-184-PCBCongeners (Duplicate)	WG63753-103 (DUP L29052-16)	EPA 1668C	PCB-204-OctaCB	0.367	pg/g	K J	U	25
WG63753	LDW18-SS-187-PCBCongeners	L29052-19	EPA 1668C	PCB-126-PentaCB	5.17	pg/g	K	J	25
WG63753	LDW18-SS-187-PCBCongeners	L29052-19	EPA 1668C	PCB-123-PentaCB	36.7	pg/g	K	J	25
WG63753	LDW18-SS-187-PCBCongeners	L29052-19	EPA 1668C	PCB-145-HexaCB	0.831	pg/g	K	J	25
WG63753	LDW18-SS-187-PCBCongeners	L29052-19	EPA 1668C	PCB-81-TetraCB	2.33	pg/g	K	J	25
WG63753	LDW18-SS-187-PCBCongeners	L29052-19	EPA 1668C	PCB-104-PentaCB	0.354	pg/g	K J	U	25
WG63753	LDW18-SS-187-PCBCongeners	L29052-19	EPA 1668C	PCB-184-HeptaCB	0.426	pg/g	K	J	25
WG63753	LDW18-SS-185-PCBCongeners	L29052-17	EPA 1668C	PCB-184-HeptaCB	2.09	pg/g	K	J	25
WG63753	LDW18-SS-187-PCBCongeners	L29052-19	EPA 1668C	PCB-29-TriCB	0.844	pg/g	K	J	25
WG63753	LDW18-SS-187-PCBCongeners	L29052-19	EPA 1668C	PCB-11-DiCB	10.6	pg/g	B	U	7
WG63753	LDW18-SS-172-PCBCongeners	L29052-4	EPA 1668C	PCB-89-PentaCB	54.4	pg/g	G	J	24
WG63753	LDW18-SS-172-PCBCongeners	L29052-4	EPA 1668C	PCB-123-PentaCB	393	pg/g	K	J	25
WG63753	LDW18-SS-172-PCBCongeners	L29052-4	EPA 1668C	PCB-126-PentaCB	44.5	pg/g	K	J	25
WG63753	LDW18-SS-172-PCBCongeners	L29052-4	EPA 1668C	PCB-55-TetraCB	64.6	pg/g	G	J	24
WG63753	LDW18-SS-172-PCBCongeners	L29052-4	EPA 1668C	PCB-42-TetraCB	2140	pg/g	G	J	24
WG63753	LDW18-SS-169-PCBCongeners	L29052-1 K	EPA 1668C	PCB-123-PentaCB	100	pg/g	K	J	25
WG63753	LDW18-SS-172-PCBCongeners	L29052-4	EPA 1668C	PCB-81-TetraCB	32.8	pg/g	K	J	25
WG63753	LDW18-SS-172-PCBCongeners	L29052-4	EPA 1668C	PCB-204-OctaCB	0.766	pg/g	K J	U	25
WG63753	LDW18-SS-172-PCBCongeners	L29052-4	EPA 1668C	PCB-156-HexaCB	3460	pg/g	C G	J	24
WG63753	LDW18-SS-172-PCBCongeners	L29052-4	EPA 1668C	PCB-155-HexaCB	1.24	pg/g	K	J	25

Qualified Data Summary Table
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SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG63753	LDW18-SS-172-PCBCongeners	L29052-4	EPA 1668C	PCB-184-HeptaCB	3.15	pg/g	K	J	25
WG63753	LDW18-SS-172-PCBCongeners	L29052-4	EPA 1668C	PCB-33-TriCB	367	pg/g	G	J	24
WG63753	LDW18-SS-169-PCBCongeners	L29052-1 K	EPA 1668C	PCB-2-MonoCB	14.3	pg/g	G	J	24
WG63753	LDW18-SS-169-PCBCongeners	L29052-1 K	EPA 1668C	PCB-126-PentaCB	17.9	pg/g	K	J	25
WG63753	LDW18-SS-172-PCBCongeners	L29052-4	EPA 1668C	PCB-2-MonoCB	28	pg/g	G	J	24
WG63753	LDW18-SS-169-PCBCongeners	L29052-1 K	EPA 1668C	PCB-89-PentaCB	54.7	pg/g	G	J	24
WG63753	LDW18-SS-169-PCBCongeners	L29052-1 K	EPA 1668C	PCB-14-DiCB	0.56	pg/g	K	J	25
WG63753	LDW18-SS-169-PCBCongeners	L29052-1 K	EPA 1668C	PCB-81-TetraCB	13	pg/g	K	J	25
WG63753	LDW18-SS-169-PCBCongeners	L29052-1 K	EPA 1668C	PCB-29-TriCB	12.7	pg/g	K	J	25
WG63753	LDW18-SS-169-PCBCongeners	L29052-1 K	EPA 1668C	PCB-204-OctaCB	0.882	pg/g	K	J	25
WG63753	LDW18-SS-174-PCBCongeners	L29052-6	EPA 1668C	PCB-204-OctaCB	0.182	pg/g	K J	U	25
WG63753	LDW18-SS-174-PCBCongeners	L29052-6	EPA 1668C	PCB-81-TetraCB	2.23	pg/g	K	J	25
WG63753	LDW18-SS-174-PCBCongeners	L29052-6	EPA 1668C	PCB-2-MonoCB	2.09	pg/g	G	J	24
WG63753	LDW18-SS-174-PCBCongeners	L29052-6	EPA 1668C	PCB-33-TriCB	31.4	pg/g	G	J	24
WG63753	LDW18-SS-174-PCBCongeners	L29052-6	EPA 1668C	PCB-39-TriCB	0.637	pg/g	K	J	25
WG63753	LDW18-SS-174-PCBCongeners	L29052-6	EPA 1668C	PCB-14-DiCB	0.45	pg/g	K	J	25
WG63753	LDW18-SS-174-PCBCongeners	L29052-6	EPA 1668C	PCB-162-HexaCB	5.44	pg/g	K	J	25
WG63753	LDW18-SS-174-PCBCongeners	L29052-6	EPA 1668C	PCB-148-HexaCB	3.5	pg/g	K	J	25
WG63753	LDW18-SS-174-PCBCongeners	L29052-6	EPA 1668C	PCB-145-HexaCB	0.739	pg/g	K	J	25
WG63753	LDW18-SS-174-PCBCongeners	L29052-6	EPA 1668C	PCB-188-HeptaCB	1.11	pg/g	K	J	25
WG63753	LDW18-SS-174-PCBCongeners	L29052-6	EPA 1668C	PCB-184-HeptaCB	0.439	pg/g	K	J	25
WG63753	LDW18-SS-174-PCBCongeners	L29052-6	EPA 1668C	PCB-94-PentaCB	6.4	pg/g	K	J	25
WG63753	LDW18-SS-174-PCBCongeners	L29052-6	EPA 1668C	PCB-126-PentaCB	4.22	pg/g	K	J	25
WG63753	LDW18-SS-174-PCBCongeners	L29052-6	EPA 1668C	PCB-123-PentaCB	22.4	pg/g	K	J	25
WG63753	LDW18-SS-177-PCBCongeners	L29052-9	EPA 1668C	PCB-81-TetraCB	17	pg/g	K	J	25
WG63753	LDW18-SS-177-PCBCongeners	L29052-9	EPA 1668C	PCB-55-TetraCB	65.2	pg/g	G	J	24
WG63753	LDW18-SS-177-PCBCongeners	L29052-9	EPA 1668C	PCB-29-TriCB	20.2	pg/g	K	J	25
WG63753	LDW18-SS-177-PCBCongeners	L29052-9	EPA 1668C	PCB-39-TriCB	6.34	pg/g	K	J	25
WG63753	LDW18-SS-177-PCBCongeners	L29052-9	EPA 1668C	PCB-33-TriCB	537	pg/g	G	J	24
WG63753	LDW18-SS-177-PCBCongeners	L29052-9	EPA 1668C	PCB-104-PentaCB	1.9	pg/g	K	J	25
WG63753	LDW18-SS-177-PCBCongeners	L29052-9	EPA 1668C	PCB-204-OctaCB	0.799	pg/g	K	J	25
WG63753	LDW18-SS-177-PCBCongeners	L29052-9	EPA 1668C	PCB-126-PentaCB	25.2	pg/g	K J	U	25
WG63753	LDW18-SS-177-PCBCongeners	L29052-9	EPA 1668C	PCB-123-PentaCB	283	pg/g	K	J	25
WG63753	LDW18-SS-177-PCBCongeners	L29052-9	EPA 1668C	PCB-111-PentaCB	5.47	pg/g	K	J	25
WG63753	LDW18-SS-175-PCBCongeners	L29052-7	EPA 1668C	PCB-126-PentaCB	17.1	pg/g	K J	U	25

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG63753	LDW18-SS-175-PCBCongeners	L29052-7	EPA 1668C	PCB-123-PentaCB	179	pg/g	K	J	25
WG63753	LDW18-SS-175-PCBCongeners	L29052-7	EPA 1668C	PCB-121-PentaCB	2.75	pg/g	K	J	25
WG63753	LDW18-SS-175-PCBCongeners	L29052-7	EPA 1668C	PCB-55-TetraCB	128	pg/g	G	J	24
WG63753	LDW18-SS-175-PCBCongeners	L29052-7	EPA 1668C	PCB-81-TetraCB	38.8	pg/g	K	J	25
WG63753	LDW18-SS-175-PCBCongeners	L29052-7	EPA 1668C	PCB-204-OctaCB	0.452	pg/g	K	J	25
WG63753	LDW18-SS-175-PCBCongeners	L29052-7	EPA 1668C	PCB-155-HexaCB	0.811	pg/g	K	J	25
WG63753	LDW18-SS-175-PCBCongeners	L29052-7	EPA 1668C	PCB-184-HeptaCB	2.25	pg/g	K	J	25
WG63753	LDW18-SS-179-PCBCongeners	L29052-11	EPA 1668C	PCB-181-HeptaCB	10.6	pg/g	K	J	25
WG63753	LDW18-SS-180-PCBCongeners	L29052-12	EPA 1668C	PCB-81-TetraCB	95.2	pg/g	K	J	25
WG63753	LDW18-SS-180-PCBCongeners	L29052-12	EPA 1668C	PCB-79-TetraCB	617	pg/g	K	J	25
WG63753	LDW18-SS-180-PCBCongeners	L29052-12	EPA 1668C	PCB-14-DiCB	1.38	pg/g	K	J	25
WG63753	LDW18-SS-179-PCBCongeners	L29052-11	EPA 1668C	PCB-162-HexaCB	11.4	pg/g	K	J	25
WG63753	LDW18-SS-179-PCBCongeners	L29052-11	EPA 1668C	PCB-126-PentaCB	8.29	pg/g	K	J	25
WG63753	LDW18-SS-179-PCBCongeners	L29052-11	EPA 1668C	PCB-123-PentaCB	52.9	pg/g	K	J	25
WG63753	LDW18-SS-179-PCBCongeners	L29052-11	EPA 1668C	PCB-121-PentaCB	1.24	pg/g	K	J	25
WG63753	LDW18-SS-179-PCBCongeners	L29052-11	EPA 1668C	PCB-155-HexaCB	1.03	pg/g	K	J	25
WG63753	LDW18-SS-179-PCBCongeners	L29052-11	EPA 1668C	PCB-145-HexaCB	1.27	pg/g	K	J	25
WG63753	LDW18-SS-179-PCBCongeners	L29052-11	EPA 1668C	PCB-81-TetraCB	7.83	pg/g	K	J	25
WG63753	LDW18-SS-179-PCBCongeners	L29052-11	EPA 1668C	PCB-58-TetraCB	8	pg/g	K	J	25
WG63778	LDW18-PWPS-SS174	L29196-3 i	EPA 1668C	2',3,4,4',5-PeCB	1330	pg/g	K	J	25
WG63778	LDW18-PWPS-SS174	L29196-3 i	EPA 1668C	3,3',4,4',5-PeCB	211	pg/g	K	J	25
WG63778	LDW18-PWPS-SS174	L29196-3 i	EPA 1668C	3,5-DiCB	11.6	pg/g	K J	U	25
WG63778	LDW18-PWPS-SS174	L29196-3 i	EPA 1668C	4-MoCB	38.2	pg/g		U	6
WG63778	LDW18-PWPS-SS174	L29196-3 i	EPA 1668C	3,3'-DiCB	399	pg/g	B	U	7
WG63778	LDW18-PWPS-SS174	L29196-3 i	EPA 1668C	3-MoCB	26.4	pg/g	J	U	6
WG63778	LDW18-PWPS-SS174	L29196-3 i	EPA 1668C	2-MoCB	41.7	pg/g	B	U	7
WG63778	LDW18-PWPS-SS174	L29196-3 i	EPA 1668C	2,2',3,4,4',5,6,6'-OcCB	9.38	pg/g	K J	U	25
WG63778	LDW18-PWPS-SS174	L29196-3 i	EPA 1668C	2,3,5-TriCB	8.59	pg/g	J	U	6
WG63778	LDW18-PWPS-SS172	L29196-13	EPA 1668C	2,2',3,4,4',5,6,6'-OcCB	27.3	pg/g	K J	U	25
WG63778	LDW18-PWPS-SS172	L29196-13	EPA 1668C	2,3,5-TriCB	36.5	pg/g	J	U	6
WG63778	LDW18-PWPS-SS172	L29196-13	EPA 1668C	3,4,4',5-TeCB	346	pg/g	K	J	25
WG63778	LDW18-PWPS-SS172	L29196-13	EPA 1668C	3-MoCB	52.5	pg/g		U	6
WG63778	LDW18-PWPS-SS172	L29196-13	EPA 1668C	4-MoCB	145	pg/g		U	6
WG63778	LDW18-PWPS-SS175	L29196-15	EPA 1668C	3,4,4',5-TeCB	755	pg/g	K	J	25
WG63778	LDW18-PWPS-SS175	L29196-15	EPA 1668C	2,2',4,6,6'-PeCB	68.1	pg/g	K	J	25

Qualified Data Summary Table
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SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG63778	LDW18-PWPS-SS175	L29196-15	EPA 1668C	3-MoCB	53.5	pg/g		U	6
WG63778	LDW18-PWPS-SS175	L29196-15	EPA 1668C	4-MoCB	106	pg/g		U	6
WG63778	LDW18-PWPS-SS175	L29196-15	EPA 1668C	3,3'-DiCB	315	pg/g	B	U	7
WG63778	LDW18-PWPS-SS177	L29196-17	EPA 1668C	2',3,4,4',5-PeCB	2690	pg/g	K	J	25
WG63778	LDW18-PWPS-SS177	L29196-17	EPA 1668C	3,3',4,4',5-PeCB	521	pg/g	K	J	25
WG63778	LDW18-PWPS-SS175	L29196-15	EPA 1668C	2',3,4,4',5-PeCB	7850	pg/g	K	J	25
WG63778	LDW18-PWPS-SS174	L29196-3 i	EPA 1668C	2,2',4,6,6'-PeCB	15.8	pg/g	K J	U	25
WG63778	LDW18-PWPS-SS174	L29196-3 i	EPA 1668C	3,4,4',5-TeCB	108	pg/g	K	J	25
WG63778	LDW18-PWPS-SS175	L29196-15	EPA 1668C	2,2',3,4,4',5,6,6'-OcCB	42.3	pg/g	K	J	25
WG63778	LDW18-PWPS-SS175	L29196-15	EPA 1668C	3,3',4,4',5-PeCB	967	pg/g	K	J	25
WG63778	LDW18-PWPS-SS179	L29196-6	EPA 1668C	2,3,5-TriCB	21.9	pg/g	J	U	6
WG63778	LDW18-PWPS-SS179	L29196-6	EPA 1668C	4-MoCB	83.4	pg/g		U	6
WG63778	LDW18-PWPS-SS179	L29196-6	EPA 1668C	3-MoCB	30.4	pg/g	J	U	6
WG63778	LDW18-PWPS-SS179	L29196-6	EPA 1668C	3,4,4',5-TeCB	181	pg/g	K	J	25
WG63778	LDW18-PWPS-SS179	L29196-6	EPA 1668C	3,3'-DiCB	375	pg/g	B	U	7
WG63778	LDW18-PWPS-SS179	L29196-6	EPA 1668C	3,3',4,4',5-PeCB	164	pg/g	K	J	25
WG63778	LDW18-PWPS-SS179	L29196-6	EPA 1668C	2',3,4,4',5-PeCB	1420	pg/g	K	J	25
WG63778	LDW18-PWPS-SS177	L29196-17	EPA 1668C	3,4,4',5-TeCB	182	pg/g	K	J	25
WG63778	LDW18-PWPS-SS177	L29196-17	EPA 1668C	3-MoCB	28.2	pg/g	J	U	6
WG63778	LDW18-PWPS-SS177	L29196-17	EPA 1668C	4-MoCB	61.1	pg/g		U	6
WG63778	LDW18-PWPS-SS177	L29196-17	EPA 1668C	3,3'-DiCB	372	pg/g	B	U	7
WG63778	LDW18-PWPS-SS177	L29196-17	EPA 1668C	2,2',3,4,4',5,6,6'-OcCB	15.4	pg/g	K J	U	25
WG63778	LDW18-PWPS-SS177	L29196-17	EPA 1668C	2,3,5-TriCB	31.9	pg/g	J	U	6
WG63778	LDW18-PWPS-SS184	L29196-8	EPA 1668C	2',3,4,4',5-PeCB	1710	pg/g	K	J	25
WG63778	LDW18-PWPS-SS184	L29196-8	EPA 1668C	3,3',4,4',5-PeCB	275	pg/g	K	J	25
WG63778	LDW18-PWPS-SS184	L29196-8	EPA 1668C	2,2',3,4,4',5,6,6'-OcCB	8.68	pg/g	K J	U	25
WG63778	LDW18-PWPS-SS184	L29196-8	EPA 1668C	2,3,5-TriCB	12.8	pg/g	J	U	6
WG63778	LDW18-PWPS-SS180	L29196-18	EPA 1668C	3,3',4,4',5-PeCB	1030	pg/g	K	J	25
WG63778	LDW18-PWPS-SS180	L29196-18	EPA 1668C	2',3,4,4',5-PeCB	9330	pg/g	K	J	25
WG63778	LDW18-PWPS-SS180	L29196-18	EPA 1668C	3,4,5-TriCB	984	pg/g	K	J	25
WG63778	LDW18-PWPS-SS180	L29196-18	EPA 1668C	3,4,4',5-TeCB	1110	pg/g	K	J	25
WG63778	LDW18-PWPS-SS180	L29196-18	EPA 1668C	3-MoCB	87.5	pg/g		U	6
WG63778	LDW18-PWPS-SS180	L29196-18	EPA 1668C	2,2',3,4,4',5,6,6'-OcCB	23.1	pg/g	K J	U	25
WG63778	LDW18-PWPS-SS185	L29196-21 i	EPA 1668C	3-MoCB	22	pg/g	J	U	6
WG63778	LDW18-PWPS-SS185	L29196-21 i	EPA 1668C	3,3'-DiCB	315	pg/g	B	U	7

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG63778	LDW18-PWPS-SS185	L29196-21 i	EPA 1668C	2,3,5-TriCB	14.1	pg/g	J	U	6
WG63778	LDW18-PWPS-SS185	L29196-21 i	EPA 1668C	4-MoCB	46.5	pg/g		U	6
WG63778	LDW18-PWPS-SS185	L29196-21 i	EPA 1668C	3,3',5-TriCB	18.4	pg/g	K J	U	25
WG63778	LDW18-PWPS-SS187	L29196-10	EPA 1668C	2',3,4,4',5-PeCB	1870	pg/g	K	J	25
WG63778	LDW18-PWPS-SS187	L29196-10	EPA 1668C	3,3',4,4',5-PeCB	1090	pg/g	K	J	25
WG63778	LDW18-PWPS-SS185	L29196-21 i	EPA 1668C	3,4,4',5-TeCB	260	pg/g	K	J	25
WG63778	LDW18-PWPS-SS184	L29196-8	EPA 1668C	3,4,4',5-TeCB	106	pg/g	K	J	25
WG63778	LDW18-PWPS-SS184	L29196-8	EPA 1668C	3-MoCB	20.3	pg/g	J	U	6
WG63778	LDW18-PWPS-SS184	L29196-8	EPA 1668C	4-MoCB	35.7	pg/g	J	U	6
WG63778	LDW18-PWPS-SS184	L29196-8	EPA 1668C	3,3'-DiCB	262	pg/g	B	U	7
WG63778	LDW18-PWPS-SS185	L29196-21 i	EPA 1668C	3,3',4,4',5-PeCB	757	pg/g	K	J	25
WG63778	LDW18-PWPS-SS185	L29196-21 i	EPA 1668C	2',3,4,4',5-PeCB	6830	pg/g	K	J	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,3,3',4,4'-PeCB	18.6	pg/g	K J	U	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	3,3'-DiCB	118	pg/g	B	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',5-TriCB	118	pg/g	C B	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,3,3',4',6-PeCB	111	pg/g	C K	J	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,3,3',4',5-PeCB	5.74	pg/g	K J	U	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2-MoCB	12.7	pg/g	B J	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,4'-DiCB	84.4	pg/g	B	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	4,4'-DiCB	30.1	pg/g	B J	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3-TriCB	44.4	pg/g	B	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,3,4'-TriCB	48	pg/g	B	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,3,4-TriCB	79	pg/g	C B	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,3,3'-TriCB	199	pg/g	C B	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',6-TriCB	12.8	pg/g	K J	U	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',4-TriCB	70.3	pg/g	K	J	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,3',4,4'-HxCB	14.5	pg/g	C K J	U	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,4,4'-PeCB	23.5	pg/g	C K J	U	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,3',6-PeCB	39.8	pg/g	K B J	U	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,3',4-PeCB	9.69	pg/g	K J	U	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,4',5,5',6-HpCB	34.7	pg/g	B J	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,3',4,5,5',6-OcCB	8.71	pg/g	C K J	U	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2'-DiCB	34.1	pg/g	K B J	U	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',4,4',5,5'-HxCB	113	pg/g	C K	J	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,3,3',4,4',5-HxCB	6.53	pg/g	C K J	U	25

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,4',6-TriCB	44.1	pg/g	B	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',4,5-TeCB	47	pg/g	B	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,6-TeCB	52.6	pg/g	C B	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,3',5-TriCB	33	pg/g	C B J	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,4,4',5,5',6-OcCB	9.7	pg/g	K J	U	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,3',4,4',5,5',6,6'-DeCB	12.9	pg/g	B J	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,4',5-TriCB	161	pg/g	B	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	3,4,4'-TriCB	22.2	pg/g	B J	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,5-TeCB	9.45	pg/g	K J	U	25
WG63778	LDW18-PWPS-SS187	L29196-10	EPA 1668C	2,2',3,4,4',5,6,6'-OcCB	11	pg/g	K J	U	25
WG63778	LDW18-PWPS-SS187	L29196-10	EPA 1668C	2,2',4,6,6'-PeCB	43.5	pg/g	K	J	25
WG63778	LDW18-PWPS-SS187	L29196-10	EPA 1668C	3,3'-DiCB	251	pg/g	B	U	7
WG63778	LDW18-PWPS-SS187	L29196-10	EPA 1668C	3,4,4',5-TeCB	72.6	pg/g	K	J	25
WG63778	LDW18-PWPS-SS187	L29196-10	EPA 1668C	2-MoCB	55.9	pg/g	B	U	7
WG63778	LDW18-PWPS-SS187	L29196-10	EPA 1668C	3-MoCB	15.1	pg/g	K J	U	25
WG63778	LDW18-PWPS-SS187	L29196-10	EPA 1668C	4-MoCB	22.4	pg/g	J	U	6
WG63778	LDW18-PWPS-SS187	L29196-10	EPA 1668C	2,4-DiCB	89.9	pg/g	K	J	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',6-TriCB	6.6	pg/g	K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,3,3',4'-TeCB	12.4	pg/g	K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,3,4',6-TeCB	21.2	pg/g	K B J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',5,5'-TeCB	105	pg/g	B	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,3,4-TriCB	32.9	pg/g	C B J	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,3,4,5-TeCB	69.2	pg/g	C B	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	4-MoCB	9.49	pg/g	K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	4,4'-DiCB	18.3	pg/g	K B J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3-TriCB	23.7	pg/g	K B J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',5-TriCB	58.8	pg/g	C B	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	3,3'-DiCB	108	pg/g	B	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,3,4'-TriCB	21.2	pg/g	B J	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2-MoCB	12.7	pg/g	B J	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,5,5'-PeCB	18.5	pg/g	K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,3',6-PeCB	14.4	pg/g	B J	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,4,4'-PeCB	9.8	pg/g	C K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,4,5-PeCB	34.5	pg/g	C K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,4,6-PeCB	12.7	pg/g	C K J	U	25

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2'-DiCB	31.9	pg/g	B J	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,4',5-PeCB	76.6	pg/g	C B	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,3'-DiCB	14.9	pg/g	K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,4'-DiCB	67.8	pg/g	B	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,3',4,4',5,5',6,6'-DeCB	7.95	pg/g	B J	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,3',5,6'-HxCB	28.3	pg/g	C B J	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,3',6,6'-HxCB	9.77	pg/g	K B J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,4',5,6-HxCB	41.5	pg/g	C B	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,4',5,5',6-HpCB	18.5	pg/g	K B J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,3',4,5,6'-HpCB	6.26	pg/g	K B J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,4,5',6-HxCB	5.27	pg/g	K J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,4',5,5'-HxCB	11	pg/g	K B J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,3',4,5-HxCB	34.3	pg/g	C K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,6-TeCB	12.3	pg/g	C B J	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,3',4,4',6-HpCB	7.38	pg/g	C K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,3',4,5,5'-HpCB	5.56	pg/g	K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,4',5,6-HxCB	46.9	pg/g	C K B	J	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,3',4,5,6'-HpCB	12.2	pg/g	B J	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,3,3',4,4',5-HxCB	5.54	pg/g	C K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,3',4,4'-HxCB	7.8	pg/g	C K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,3',4,6'-HxCB	16.5	pg/g	K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,3',4,4',5-HpCB	10.8	pg/g	K B J	U	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,3',5,6'-HxCB	72.3	pg/g	C B	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,3',5,6,6'-HpCB	14.8	pg/g	K J	U	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,4,4',5,5'-HpCB	38.5	pg/g	C K B J	U	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,3',6,6'-HxCB	28.3	pg/g	K B J	U	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,4,4',5-HxCB	6.7	pg/g	K J	U	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,4',5,5'-HxCB	22.6	pg/g	B J	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,4',5,6-HxCB	113	pg/g	C B	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,3,3',4',5',6-HxCB	5.6	pg/g	K J	U	25
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,3',4,4',5-HpCB	14.8	pg/g	B J	U	7
WG63778	PCB Day Zero #1	L28862-2 i	EPA 1668C	2,2',3,3',4,5,6'-HpCB	10.7	pg/g	K B J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	3,4,4'-TriCB	9.17	pg/g	B J	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,3',4,6,6'-HpCB	5.89	pg/g	K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,3',4-TriCB	5.14	pg/g	K J	U	25

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,4,4',5,5',6-OcCB	6.21	pg/g	K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,4',5,5',6-HpCB	33.3	pg/g	B J	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,4'-TeCB	14.1	pg/g	K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',4,5-TeCB	15.4	pg/g	B J	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,3,3'-TriCB	72.2	pg/g	C B	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,4',6-TriCB	17	pg/g	B J	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,4',5-TriCB	58.7	pg/g	B	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,3',5-TriCB	13	pg/g	C B J	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',4,5'-TeCB	52.8	pg/g	C K	J	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,4',5,5'-HxCB	12.9	pg/g	B J	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,3',5,6'-HxCB	31.3	pg/g	C B J	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,3',6,6'-HxCB	6.84	pg/g	K B J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,4,4',5',6-HpCB	15.9	pg/g	C K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,4,4',5,5'-HpCB	45.8	pg/g	C B	U	7
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,3',5,6,6'-HpCB	7.84	pg/g	K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,3',4',5,6-HpCB	13.7	pg/g	K J	U	25
WG63778	PCB Day Zero #2	L28862-3 i	EPA 1668C	2,2',3,3',4,4',5,5',6,6'-DeCB	12.8	pg/g	K B J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	4,4'-DiCB	17.5	pg/g	B J	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3-TriCB	20.9	pg/g	B J	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',4-TriCB	28.9	pg/g	K J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',5-TriCB	57.3	pg/g	C B	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',6-TriCB	10	pg/g	K J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,3,4'-TriCB	14.7	pg/g	B J	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	4-MoCB	8.12	pg/g	K J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2-MoCB	13.2	pg/g	B J	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,6-TeCB	10.9	pg/g	C K B J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,4,6-PeCB	6.78	pg/g	C K J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,5,5'-PeCB	15.6	pg/g	K J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2'-DiCB	33	pg/g	B J	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,4'-DiCB	63	pg/g	B	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	3,3'-DiCB	95.6	pg/g	B	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,4',5-PeCB	83.6	pg/g	C K B	J	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	3,4,4'-TriCB	7.11	pg/g	B J	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,3',4,5,5',6-OcCB	5.49	pg/g	C K J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,3,3'-TriCB	56.4	pg/g	C B	U	7

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,4,4',5,5',6-OcCB	9.72	pg/g	K J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,3',5,6,6'-HpCB	5.92	pg/g	K J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,4,4',5,5'-HpCB	17.3	pg/g	C K B J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,3,4-TriCB	28.1	pg/g	C B J	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,3'-TeCB	18.8	pg/g	C K J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',4,5-TeCB	9.37	pg/g	B J	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,4',6-TriCB	19.2	pg/g	K B J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,3',5-TriCB	11	pg/g	C B J	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,3',4-TriCB	5.36	pg/g	K J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,3,4,5-TeCB	52.8	pg/g	C B	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,3,4,4'-TeCB	6.26	pg/g	K J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,3,3',6-TeCB	5.44	pg/g	C K J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',3,3',6-PeCB	10.2	pg/g	K B J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,3,3',4,4'-PeCB	9.02	pg/g	K J	U	25
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,3,4',6-TeCB	15.4	pg/g	B J	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,2',5,5'-TeCB	79.6	pg/g	B	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,4',5-TriCB	50.6	pg/g	B	U	7
WG63778	PCB Day Zero #3	L28862-4 i	EPA 1668C	2,3,3',4'-TeCB	6.94	pg/g	K J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,3',4,4'-HxCB	7.16	pg/g	C K J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,3',4,4',5-HpCB	8.26	pg/g	K B J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,3',4,5,6'-HpCB	10.8	pg/g	K B J	U	25
WG63778	LDW18-PWPS-174 (DUP)	L29196-4	EPA 1668C	2,2',4,6,6'-PeCB	17.6	pg/g	K J	U	25
WG63778	LDW18-PWPS-174 (DUP)	L29196-4	EPA 1668C	3,4,4',5-TeCB	93.5	pg/g	K	J	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,4',5,5',6-HpCB	18.8	pg/g	K B J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,4,4',5,5',6-OcCB	8.56	pg/g	K J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,4,4',5',6-HpCB	8.36	pg/g	C K J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,4,4',5,5'-HpCB	21.8	pg/g	C K B J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,3',5,6,6'-HpCB	6.3	pg/g	K J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,3,3'-TriCB	61.8	pg/g	C B	U	7
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,4',6-TriCB	19	pg/g	B J	U	7
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,4',5-TriCB	55.2	pg/g	B	U	7
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,3',6-TriCB	5.55	pg/g	K J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,3',5-TriCB	12.7	pg/g	C B J	U	7
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,3,4'-TriCB	20.9	pg/g	B J	U	7
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',5,5'-TeCB	63.1	pg/g	B	U	7

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,3',5,6'-HxCB	18.1	pg/g	C K B J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,4',5,5'-HxCB	9.93	pg/g	B J	U	7
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,4',5,6-HxCB	31.7	pg/g	C K B J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,3',4,4',5-PeCB	31.3	pg/g	K J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,4,5,5'-HxCB	8.67	pg/g	K J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,3',4,4',5,5',6,6'-DeCB	12.8	pg/g	K B J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,3',4',5,6-HpCB	7.87	pg/g	K J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',4,5-TeCB	13	pg/g	B J	U	7
WG63778	LDW18-PWPS-174 (DUP)	L29196-4	EPA 1668C	3,3',4,4',5-PeCB	213	pg/g	K	J	25
WG63778	LDW18-PWPS-174 (DUP)	L29196-4	EPA 1668C	2,2',3,4,6,6'-HxCB	29.4	pg/g	K J	U	25
WG63778	LDW18-PWPS-174 (DUP)	L29196-4	EPA 1668C	2',3,4,4',5-PeCB	1430	pg/g	K	J	25
WG63778	LDW18-PWPS-174 (DUP)	L29196-4	EPA 1668C	2-MoCB	37.5	pg/g	B	U	7
WG63778	LDW18-PWPS-174 (DUP)	L29196-4	EPA 1668C	4-MoCB	35.7	pg/g	J	U	6
WG63778	LDW18-PWPS-174 (DUP)	L29196-4	EPA 1668C	3,3'-DiCB	395	pg/g	B	U	7
WG63778	LDW18-PWPS-174 (DUP)	L29196-4	EPA 1668C	3-MoCB	23.7	pg/g	J	U	6
WG63778	LDW18-PWPS-174 (DUP)	L29196-4	EPA 1668C	2,2',3,4,4',5,6,6'-OcCB	7.61	pg/g	K J	U	25
WG63778	LDW18-PWPS-174 (DUP)	L29196-4	EPA 1668C	2,3,5-TriCB	7.75	pg/g	J	U	6
WG63778	LDW18-PWPS-SS169	L29196-1 i2	EPA 1668C	3-MoCB	40.9	pg/g		U	6
WG63778	LDW18-PWPS-SS169	L29196-1 i2	EPA 1668C	2,3,5-TriCB	33.9	pg/g		U	6
WG63778	LDW18-PWPS-SS169	L29196-1 i2	EPA 1668C	2,2',4,4',6,6'-HxCB	55.7	pg/g	K	J	25
WG63778	LDW18-PWPS-SS172	L29196-13	EPA 1668C	2',3,4,4',5-PeCB	5230	pg/g	K	J	25
WG63778	LDW18-PWPS-SS172	L29196-13	EPA 1668C	3,3',4,4',5-PeCB	1280	pg/g	K	J	25
WG63778	LDW18-PWPS-SS169	L29196-1 i2	EPA 1668C	2',3,4,4',5-PeCB	1860	pg/g	K	J	25
WG63778	LDW18-PWPS-SS169	L29196-1 i2	EPA 1668C	3,3',4,4',5-PeCB	192	pg/g	K	J	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,3,3',4,4'-PeCB	12.8	pg/g	K J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,3,3',4',6-PeCB	42.6	pg/g	C K J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,3',6-PeCB	10.2	pg/g	K B J	U	25
WG63778	LDW18-PWPS-SS169	L29196-1 i2	EPA 1668C	4-MoCB	84.8	pg/g		U	6
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,3',4-PeCB	5.86	pg/g	K J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,3,4,4'-TeCB	9.55	pg/g	K J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,3,4',6-TeCB	20.5	pg/g	B J	U	7
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,4,6-PeCB	7.47	pg/g	C K J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,3,4,5-TeCB	51.4	pg/g	C B	U	7
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',6,6'-TeCB	15.1	pg/g	K J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	3,4,4'-TriCB	12.2	pg/g	K B J	U	25

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,4',5-PeCB	49	pg/g	C B	U	7
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',4,6-TeCB	9.22	pg/g	C K J	U	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3,6-TeCB	13.2	pg/g	C B J	U	7
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,4'-DiCB	80.4	pg/g	B	U	7
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2'-DiCB	66.6	pg/g	B	U	7
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	4,4'-DiCB	40.5	pg/g	B J	U	7
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',3-TriCB	31.7	pg/g	B J	U	7
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',5-TriCB	64.9	pg/g	C B	U	7
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	3,3'-DiCB	264	pg/g	B	U	7
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,3,4-TriCB	36.9	pg/g	C B J	U	7
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2-MoCB	41.5	pg/g	B J	U	7
WG63778	LDW18-PWPS-SS169	L29196-1 i2	EPA 1668C	3,4,4',5-TeCB	189	pg/g	K	J	25
WG63778	LDW18-PWPS-EXP BLK	L29196-22 i	EPA 1668C	2,2',4,5'-TeCB	31.3	pg/g	C K J	U	25
WG63778	LDW18-PWPS-SS169	L29196-1 i2	EPA 1668C	2,3,3',5,5'-PeCB	59.9	pg/g	K	J	25
18E0226	LDW-SSOT-2114	18E0226-02	EPA 8082A	Aroclor-1248	24	ug/kg		DNR	11
18E0226	LDW-SSOT-2114	18E0226-02	EPA 8082A	Aroclor-1260	31.4	ug/kg		DNR	11
18E0226	LDW-SSOT-2114	18E0226-02	EPA 8082A	Aroclor-1254	42.5	ug/kg		DNR	11
18E0226	LDW-SSOT-2510	18E0226-01	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
18E0226	LDW-SSOT-2510	18E0226-01	EPA 8082A	Aroclor-1260		ug/kg	U	DNR	11
18E0226	LDW-SSOT-2510	18E0226-01	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
18E0226	LDW-SSOT-2510	18E0226-01	EPA 8082A	Aroclor-1248		ug/kg	U	DNR	11
18E0226	LDW-SSOT-2510	18E0226-01	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
18E0226	LDW-SSOT-2510	18E0226-01	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
18E0226	LDW-SSOT-2510	18E0226-01	EPA 8082A	Aroclor-1254		ug/kg	U	DNR	11
18E0226	LDW-SSOT-2510	18E0226-01	EPA 8270D-SIM	Benzoic acid	59.3	ug/kg		J	5BL
18E0226	LDW-SSOT-2510	18E0226-01	EPA 8270D-SIM	Pentachlorophenol		ug/kg	U	UJ	5BL
18E0226	LDW-SSOT-2114	18E0226-02	EPA 8270D-SIM	Benzoic acid	181	ug/kg		J	5BL
18E0226	LDW-SSOT-2114	18E0226-02	EPA 8270D-SIM	Pentachlorophenol	4.9	ug/kg	J	J	5BL
18F0174	LDW18-BNK1-1	18F0242-01	EPA 6020	Lead	209	mg/kg	D	J	9
18F0174	LDW18-BNK1-1	18F0242-01	EPA 8270D	Phenol		ug/kg	U	UJ	5BL
18F0174	LDW18-BNK1-1	18F0242-01	EPA 9060	Total Organic carbon (TOC)	1.16	%		J	9
18F0174	LDW18-BNK2-1	18F0242-02	EPA 6020	Lead	13	mg/kg	D	J	9
18F0174	LDW18-BNK2-1	18F0242-02	EPA 8082A	Aroclor-1254	8.6	ug/kg		J	3
18F0174	LDW18-BNK2-1	18F0242-02	EPA 8082A	Aroclor-1248	6.3	ug/kg		J	3
18F0174	LDW18-BNK2-1	18F0242-02	EPA 8270D	Phenol	189	ug/kg	Q	J	5BL

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
18F0174	LDW18-BNK2-1	18F0242-02	EPA 9060	Total Organic carbon (TOC)	0.78	%		J	9
18F0174	LDW18-BNK3-1	18F0241-01	EPA 6020	Lead	46.5	mg/kg	D	J	9
18F0174	LDW18-BNK3-1	18F0241-01	EPA 8270D	Phenol		ug/kg	U	UJ	5BL
18F0174	LDW18-BNK3-1	18F0241-01RE1	EPA 9060	Total Organic carbon (TOC)	0.21	%		J	9
18F0174	LDW18-BNK3-2	18F0241-02	EPA 6020	Lead	2.18	mg/kg	D	J	9
18F0174	LDW18-BNK3-2	18F0241-02	EPA 8270D	Phenol		ug/kg	U	UJ	5BL
18F0174	LDW18-BNK3-2	18F0241-02RE1	EPA 9060	Total Organic carbon (TOC)	0.43	%		J	9
18F0174	LDW18-BNK3-3	18F0241-03	EPA 6020	Lead	4.03	mg/kg	D	J	9
18F0174	LDW18-BNK3-3	18F0241-03	EPA 8270D	Phenol		ug/kg	U	UJ	5BL
18F0174	LDW18-BNK3-3	18F0241-03	EPA 9060	Total Organic carbon (TOC)	0.27	%		J	9
18F0174	LDW18-BNK4-1	18F0241-04	EPA 6020	Lead	132	mg/kg	D	J	9
18F0174	LDW18-BNK4-1	18F0241-04	EPA 8270D	Phenol		ug/kg	U	UJ	5BL
18F0174	LDW18-BNK4-1	18F0241-04	EPA 9060	Total Organic carbon (TOC)	0.18	%		J	9
18F0174	LDW18-BNK4-2	18F0241-05	EPA 6020	Lead	156	mg/kg	D	J	9
18F0174	LDW18-BNK4-2	18F0241-05	EPA 8270D	Phenol	23.6	ug/kg	Q	J	5BL
18F0174	LDW18-BNK4-2	18F0241-05	EPA 9060	Total Organic carbon (TOC)	1.1	%		J	9
18F0174	LDW18-BNK4-3	18F0241-06	EPA 6020	Lead	253	mg/kg	D	J	9
18F0174	LDW18-BNK4-3	18F0241-06	EPA 8082A	Aroclor-1254	34	ug/kg	P1	NJ	3
18F0174	LDW18-BNK4-3	18F0241-06	EPA 8270D	Phenol		ug/kg	U	UJ	5BL
18F0174	LDW18-BNK4-3	18F0241-06	EPA 9060	Total Organic carbon (TOC)	0.8	%		J	9
18F0174	LDW18-BNK5-1	18F0174-01	EPA 6020	Lead	2.87	mg/kg	D	J	9
18F0174	LDW18-BNK5-1	18F0174-01	EPA 8270D	Phenol		ug/kg	Q U	UJ	5BL
18F0174	LDW18-BNK5-1	18F0174-01RE1	EPA 9060	Total Organic carbon (TOC)	0.19	%		J	9
18F0174	LDW18-BNK5-1DUP1	BGF0506-DUP1	EPA 6020	Lead	2.31	mg/kg	* D	J	9
18F0174	LDW18-BNK5-1-FD	18F0174-02	EPA 6020	Lead	3.38	mg/kg	D	J	9
18F0174	LDW18-BNK5-1-FD	18F0174-02	EPA 8270D	Phenol		ug/kg	U	UJ	5BL
18F0174	LDW18-BNK5-1-FD	18F0174-02RE2	EPA 9060	Total Organic carbon (TOC)	0.23	%		J	9
18F0174	LDW18-BNK5-1MS1	BGF0481-MS1	EPA 9060	Total Organic carbon (TOC)	3.05	%		DNR	11
18F0280	LDW18-BNK6-1	18F0256-01	EPA 8082A	Aroclor-1260	2960	ug/kg	P1 E	DNR	20
18F0280	LDW18-BNK6-1	18F0256-01RE1	EPA 8082A	Aroclor-1254		ug/kg	D U	DNR	11
18F0280	LDW18-BNK6-1	18F0256-01RE1	EPA 8082A	Aroclor-1221		ug/kg	D U	DNR	11
18F0280	LDW18-BNK6-1	18F0256-01RE1	EPA 8082A	Aroclor-1232		ug/kg	D U	DNR	11
18F0280	LDW18-BNK6-1	18F0256-01RE1	EPA 8082A	Aroclor-1248		ug/kg	D U	DNR	11
18F0280	LDW18-BNK6-1	18F0256-01RE1	EPA 8082A	Aroclor-1016		ug/kg	D U	DNR	11
18F0280	LDW18-BNK6-1	18F0256-01RE1	EPA 8082A	Aroclor-1242		ug/kg	D U	DNR	11

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
18F0280	LDW18-BNK6-1	18F0256-01	EPA 8270D	Phenol		ug/kg	U	UJ	5BL
18F0280	LDW18-BNK6-2	18F0256-02	EPA 8082A	Aroclor-1254	24.6	ug/kg	P1	NJ	3
18F0280	LDW18-BNK6-2	18F0256-02	EPA 8270D	4-Methylphenol	23.9	ug/kg		J	5BL
18F0280	LDW18-BNK6-2	18F0256-02	EPA 8270D	Fluorene	15.1	ug/kg	J	J	5BL
18F0280	LDW18-BNK6-2	18F0256-02	EPA 8270D-SIM	Benzoic acid	159	ug/kg		J	5BL
18F0280	LDW18-BNK6-2	18F0256-02	EPA 8270D-SIM	Pentachlorophenol	2.1	ug/kg	J	J	5BL
18F0280	LDW18-IT45-B1-Comp1	18F0280-01	EPA 6020	Arsenic	6.01	mg/kg	D	J	9
18F0280	LDW18-IT45-B1-Comp1	18F0280-01	EPA 8082A	Aroclor-1260	293	ug/kg	E	DNR	20
18F0280	LDW18-IT45-B1-Comp1	18F0280-01RE1	EPA 8082A	Aroclor-1254		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01RE1	EPA 8082A	Aroclor-1221		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01RE1	EPA 8082A	Aroclor-1232		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01RE1	EPA 8082A	Aroclor-1248		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01RE1	EPA 8082A	Aroclor-1016		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01RE1	EPA 8082A	Aroclor-1242		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01	EPA 8270D-SIM	Indeno(1,2,3-cd)pyrene	318	ug/kg		DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01	EPA 8270D-SIM	Benzo(b)fluoranthene	425	ug/kg		DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01	EPA 8270D-SIM	Benzo(k)fluoranthene	254	ug/kg		DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01	EPA 8270D-SIM	Chrysene	661	ug/kg	E	DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01	EPA 8270D-SIM	Benzo(a)pyrene	547	ug/kg	E	DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01	EPA 8270D-SIM	Dibenzo(a,h)anthracene	102	ug/kg		DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01	EPA 8270D-SIM	Benzo(a)anthracene	633	ug/kg	E	DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01RE1	EPA 8270D-SIM	Indeno(1,2,3-cd)pyrene	363	ug/kg	D	DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01RE1	EPA 8270D-SIM	Benzo(b)fluoranthene	479	ug/kg	D	DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01RE1	EPA 8270D-SIM	Benzo(k)fluoranthene	287	ug/kg	D	DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01RE1	EPA 8270D-SIM	Chrysene	729	ug/kg	D	DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01RE1	EPA 8270D-SIM	Benzo(a)pyrene	601	ug/kg	D	DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01RE1	EPA 8270D-SIM	Dibenzo(a,h)anthracene	123	ug/kg	D	DNR	11
18F0280	LDW18-IT45-B1-Comp1	18F0280-01RE1	EPA 8270D-SIM	Benzo(a)anthracene	706	ug/kg	D	DNR	11
18F0280	LDW18-IT45-B1-Comp1DUP1	BGF0724-DUP1	EPA 6020	Arsenic	3.86	mg/kg	* D	J	9
18F0280	LDW18-IT45-B1-Comp1-FD	18F0280-04	EPA 6020	Arsenic	16.3	mg/kg	D	J	9
18F0280	LDW18-IT45-B1-Comp1-FD	18F0280-04	EPA 8082A	Aroclor-1260	366	ug/kg	E	DNR	20
18F0280	LDW18-IT45-B1-Comp1-FD	18F0280-04RE1	EPA 8082A	Aroclor-1254		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-B1-Comp1-FD	18F0280-04RE1	EPA 8082A	Aroclor-1221		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-B1-Comp1-FD	18F0280-04RE1	EPA 8082A	Aroclor-1232		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-B1-Comp1-FD	18F0280-04RE1	EPA 8082A	Aroclor-1248		ug/kg	D U	DNR	11

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
18F0280	LDW18-IT45-B1-Comp1-FD	18F0280-04RE1	EPA 8082A	Aroclor-1016		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-B1-Comp1-FD	18F0280-04RE1	EPA 8082A	Aroclor-1242		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-B1-Comp1-FD	18F0280-04	EPA 8270D-SIM	Indeno(1,2,3-cd)pyrene	565	ug/kg	E	DNR	20
18F0280	LDW18-IT45-B1-Comp1-FD	18F0280-04	EPA 8270D-SIM	Benzo(b)fluoranthene	753	ug/kg	E	DNR	20
18F0280	LDW18-IT45-B1-Comp1-FD	18F0280-04	EPA 8270D-SIM	Benzo(k)fluoranthene	513	ug/kg	E	DNR	20
18F0280	LDW18-IT45-B1-Comp1-FD	18F0280-04	EPA 8270D-SIM	Chrysene	1390	ug/kg	E	DNR	20
18F0280	LDW18-IT45-B1-Comp1-FD	18F0280-04	EPA 8270D-SIM	Benzo(a)pyrene	1030	ug/kg	E	DNR	20
18F0280	LDW18-IT45-B1-Comp1-FD	18F0280-04	EPA 8270D-SIM	Benzo(a)anthracene	1320	ug/kg	E	DNR	20
18F0280	LDW18-IT45-B1-Comp1-FD	18F0280-04RE1	EPA 8270D-SIM	Dibenzo(a,h)anthracene	211	ug/kg	D	DNR	11
18F0280	LDW18-IT45-B1-Comp2	18F0280-02	EPA 6020	Arsenic	16	mg/kg	D	J	9
18F0280	LDW18-IT45-B1-Comp2	18F0280-02	EPA 8082A	Aroclor-1248	22.5	ug/kg	P1	J	3
18F0280	LDW18-IT45-B1-Comp2-FD	18F0280-05	EPA 6020	Arsenic	22.7	mg/kg	D	J	9
18F0280	LDW18-IT45-B1-Comp3	18F0280-03	EPA 6020	Arsenic	23.2	mg/kg	D	J	9
18F0280	LDW18-IT45-B1-Comp3-FD	18F0280-06	EPA 6020	Arsenic	8.79	mg/kg	D	J	9
18F0280	LDW18-IT45-B1-Comp3-FD	18F0280-06	EPA 8082A	Aroclor-1254	12.9	ug/kg	P1	J	3
18F0280	LDW18-IT45-B2-Comp1	18F0280-07	EPA 6020	Arsenic	55.3	mg/kg	D	J	9
18F0280	LDW18-IT45-B2-Comp1	18F0280-07	EPA 8082A	Aroclor-1248	23.3	ug/kg	P1	J	3
18F0280	LDW18-IT45-B2-Comp2	18F0280-08	EPA 6020	Arsenic	32.8	mg/kg	D	J	9
18F0280	LDW18-IT45-B2-Comp3	18F0280-09	EPA 6020	Arsenic	46.1	mg/kg	D	J	9
18F0280	LDW18-IT45-B4-Comp1	18F0280-10	EPA 6020	Arsenic	8.51	mg/kg	D	J	9
18F0280	LDW18-IT45-B4-Comp1	18F0280-10	EPA 8082A	Aroclor-1254	149	ug/kg	P1	J	3
18F0280	LDW18-IT45-B4-Comp2	18F0280-11	EPA 6020	Arsenic	6.14	mg/kg	D	J	9
18F0280	LDW18-IT45-B4-Comp2	18F0280-11	EPA 8082A	Aroclor-1254	230	ug/kg	E	DNR	20
18F0280	LDW18-IT45-B4-Comp2	18F0280-11RE1	EPA 8082A	Aroclor-1260	135	ug/kg	D	DNR	11
18F0280	LDW18-IT45-B4-Comp2	18F0280-11RE1	EPA 8082A	Aroclor-1254	224	ug/kg	P1 D	NJ	3
18F0280	LDW18-IT45-B4-Comp2	18F0280-11RE1	EPA 8082A	Aroclor-1221		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-B4-Comp2	18F0280-11RE1	EPA 8082A	Aroclor-1232		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-B4-Comp2	18F0280-11RE1	EPA 8082A	Aroclor-1248	193	ug/kg	D	DNR	11
18F0280	LDW18-IT45-B4-Comp2	18F0280-11RE1	EPA 8082A	Aroclor-1016		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-B4-Comp2	18F0280-11RE1	EPA 8082A	Aroclor-1242		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-B4-Comp3	18F0280-12	EPA 6020	Arsenic	4.08	mg/kg	D	J	9
18F0280	LDW18-IT45-B5-Comp1	18F0280-13	EPA 6020	Arsenic	5.52	mg/kg	D	J	9
18F0280	LDW18-IT45-B5-Comp1	18F0280-13	EPA 8082A	Aroclor-1254	40.7	ug/kg	P1	J	3
18F0280	LDW18-IT45-B5-Comp1	18F0280-13	EPA 8082A	Aroclor-1248	19.9	ug/kg	P1	NJ	3
18F0280	LDW18-IT45-B5-Comp2	18F0280-14	EPA 6020	Arsenic	12.4	mg/kg	D	J	9

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
18F0280	LDW18-IT45-B5-Comp2	18F0280-14	EPA 8082A	Aroclor-1254	77.9	ug/kg	P1	J	3
18F0280	LDW18-IT45-B5-Comp2	18F0280-14	EPA 8082A	Aroclor-1248	42.8	ug/kg	P1	J	3
18F0280	LDW18-IT45-B5-Comp3	18F0280-15	EPA 6020	Arsenic	8.31	mg/kg	D	J	9
18F0280	LDW18-IT45-B5-Comp3	18F0280-15	EPA 8082A	Aroclor-1248	19.2	ug/kg	P1	NJ	3
18F0280	LDW18-IT45-B5-Comp3	18F0280-15	EPA 8270D-SIM	Chrysene	2500	ug/kg	D E	DNR	20
18F0280	LDW18-IT45-B5-Comp3	18F0280-15	EPA 8270D-SIM	Benzo(a)pyrene	2340	ug/kg	D E	DNR	20
18F0280	LDW18-IT45-B5-Comp3	18F0280-15	EPA 8270D-SIM	Benzo(a)anthracene	2490	ug/kg	D E	DNR	20
18F0280	LDW18-IT45-B5-Comp3	18F0280-15RE1	EPA 8270D-SIM	Indeno(1,2,3-cd)pyrene	1240	ug/kg	D	DNR	11
18F0280	LDW18-IT45-B5-Comp3	18F0280-15RE1	EPA 8270D-SIM	Benzo(b)fluoranthene	1310	ug/kg	D	DNR	11
18F0280	LDW18-IT45-B5-Comp3	18F0280-15RE1	EPA 8270D-SIM	Benzo(k)fluoranthene	800	ug/kg	D	DNR	11
18F0280	LDW18-IT45-B5-Comp3	18F0280-15RE1	EPA 8270D-SIM	Dibenzo(a,h)anthracene	426	ug/kg	D	DNR	11
18F0280	LDW18-IT45-CL-Comp1	18G0025-01	EPA 6020	Arsenic	9.62	mg/kg	D	J	9
18F0280	LDW18-IT45-CL-Comp1	18G0025-01	EPA 8270D-SIM	Indeno(1,2,3-cd)pyrene	179	ug/kg	D	J	8L,9
18F0280	LDW18-IT45-CL-Comp1	18G0025-01	EPA 8270D-SIM	Benzo(b)fluoranthene	209	ug/kg	D	J	9
18F0280	LDW18-IT45-CL-Comp1	18G0025-01	EPA 8270D-SIM	Benzo(k)fluoranthene	130	ug/kg	D	J	8L,9
18F0280	LDW18-IT45-CL-Comp1	18G0025-01	EPA 8270D-SIM	Chrysene	306	ug/kg	D	J	8L,9
18F0280	LDW18-IT45-CL-Comp1	18G0025-01	EPA 8270D-SIM	Benzo(a)pyrene	281	ug/kg	D	J	8L,9
18F0280	LDW18-IT45-CL-Comp1	18G0025-01	EPA 8270D-SIM	Benzo(a)anthracene	247	ug/kg	D	J	8L,9
18F0280	LDW18-IT45-CL-Comp1DUP1	BGG0161-DUP1	EPA 6020	Arsenic	14	mg/kg	* D	J	9
18F0280	LDW18-IT45-CL-Comp2	18G0025-04	EPA 6020	Arsenic	11.8	mg/kg	D	J	9
18F0280	LDW18-IT45-CL-Comp2	18G0025-04	EPA 8082A	Aroclor-1260	320	ug/kg	E	DNR	20
18F0280	LDW18-IT45-CL-Comp2	18G0025-04	EPA 8082A	Aroclor-1254	404	ug/kg	P1 E	DNR	20
18F0280	LDW18-IT45-CL-Comp2	18G0025-04	EPA 8082A	Aroclor-1248	261	ug/kg	E	DNR	20
18F0280	LDW18-IT45-CL-Comp2	18G0025-04RE1	EPA 8082A	Aroclor-1260	412	ug/kg	D	J	13H
18F0280	LDW18-IT45-CL-Comp2	18G0025-04RE1	EPA 8082A	Aroclor-1254	582	ug/kg	P1 D	NJ	3,13H
18F0280	LDW18-IT45-CL-Comp2	18G0025-04RE1	EPA 8082A	Aroclor-1221		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-CL-Comp2	18G0025-04RE1	EPA 8082A	Aroclor-1232		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-CL-Comp2	18G0025-04RE1	EPA 8082A	Aroclor-1248	357	ug/kg	D	J	13H
18F0280	LDW18-IT45-CL-Comp2	18G0025-04RE1	EPA 8082A	Aroclor-1016		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-CL-Comp2	18G0025-04RE1	EPA 8082A	Aroclor-1242		ug/kg	D U	DNR	11
18F0280	LDW18-IT45-CL-Comp2	18G0025-04	EPA 8270D-SIM	Chrysene	558	ug/kg	E	DNR	20
18F0280	LDW18-IT45-CL-Comp2	18G0025-04	EPA 8270D-SIM	Benzo(a)pyrene	477	ug/kg	E	DNR	20
18F0280	LDW18-IT45-CL-Comp2	18G0025-04	EPA 8270D-SIM	Benzo(a)anthracene	497	ug/kg	E	DNR	20
18F0280	LDW18-IT45-CL-Comp2	18G0025-04RE1	EPA 8270D-SIM	Indeno(1,2,3-cd)pyrene	271	ug/kg	D	DNR	11
18F0280	LDW18-IT45-CL-Comp2	18G0025-04RE1	EPA 8270D-SIM	Benzo(b)fluoranthene	395	ug/kg	D	DNR	11

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
18F0280	LDW18-IT45-CL-Comp2	18G0025-04RE1	EPA 8270D-SIM	Benzo(k)fluoranthene	235	ug/kg	D	DNR	11
18F0280	LDW18-IT45-CL-Comp2	18G0025-04RE1	EPA 8270D-SIM	Dibenzo(a,h)anthracene	110	ug/kg	D	DNR	11
18F0280	LDW18-IT45-CL-Comp3	18G0025-05	EPA 6020	Arsenic	8.35	mg/kg	D	J	9
18F0280	LDW18-IT45-CL-Comp3	18G0025-05	EPA 8082A	Aroclor-1248	60.2	ug/kg	P1	J	3
18F0314	LDW18-IT45-B3-Comp1	18F0314-01	EPA 8082A	Aroclor-1248	19.7	ug/kg	P1	J	3
18F0314	LDW18-IT45-B3-Comp1	18F0314-01	EPA 8270D-SIM	Indeno(1,2,3-cd)pyrene	103	ug/kg		J	8H
18F0314	LDW18-IT45-B3-Comp1	18F0314-01	EPA 8270D-SIM	Benzo(b)fluoranthene	159	ug/kg		J	8H
18F0314	LDW18-IT45-B3-Comp1	18F0314-01	EPA 8270D-SIM	Benzo(k)fluoranthene	74.6	ug/kg		J	8H
18F0314	LDW18-IT45-B3-Comp1	18F0314-01	EPA 8270D-SIM	Chrysene	156	ug/kg		J	8H
18F0314	LDW18-IT45-B3-Comp1	18F0314-01	EPA 8270D-SIM	Benzo(a)pyrene	139	ug/kg		J	8H
18F0314	LDW18-IT45-B3-Comp1	18F0314-01	EPA 8270D-SIM	Benzo(a)anthracene	89.4	ug/kg		J	8H
18F0314	LDW18-IT45-B3-Comp1	18F0314-01RE1	EPA 9060	Total Organic carbon (TOC)	2.53	%		J	8,9
18F0314	LDW18-IT45-B3-Comp2	18F0314-02	EPA 9060	Total Organic carbon (TOC)	0.35	%		J	8,9
18F0314	LDW18-IT45-B3-Comp3	18F0314-03	EPA 8082A	Aroclor-1260	9.8	ug/kg	P1	J	3
18F0314	LDW18-IT45-B3-Comp3	18F0314-03	EPA 8082A	Aroclor-1248	4.6	ug/kg		NJ	3
18F0314	LDW18-IT45-B3-Comp3	18F0314-03	EPA 9060	Total Organic carbon (TOC)	1.01	%		J	8,9
18F0314	LDW18-IT45-B6-Comp1	18F0314-04	EPA 9060	Total Organic carbon (TOC)	1.15	%		J	8,9
18F0314	LDW18-IT45-B6-Comp1-FD	18F0314-07	EPA 8082A	Aroclor-1248	60.5	ug/kg	P1	J	3
18F0314	LDW18-IT45-B6-Comp1-FD	18F0314-07RE1	EPA 8270D-SIM	Indeno(1,2,3-cd)pyrene	2750	ug/kg	D	DNR	11
18F0314	LDW18-IT45-B6-Comp1-FD	18F0314-07RE1	EPA 8270D-SIM	Benzo(b)fluoranthene	6560	ug/kg	D	DNR	11
18F0314	LDW18-IT45-B6-Comp1-FD	18F0314-07RE1	EPA 8270D-SIM	Benzo(k)fluoranthene	3800	ug/kg	D	DNR	11
18F0314	LDW18-IT45-B6-Comp1-FD	18F0314-07RE1	EPA 8270D-SIM	Benzo(a)pyrene	6980	ug/kg	D	DNR	11
18F0314	LDW18-IT45-B6-Comp1-FD	18F0314-07RE1	EPA 8270D-SIM	Dibenzo(a,h)anthracene	1170	ug/kg	D	DNR	11
18F0314	LDW18-IT45-B6-Comp1-FD	18F0314-07	EPA 8270D-SIM	Chrysene	9540	ug/kg	D E	DNR	20
18F0314	LDW18-IT45-B6-Comp1-FD	18F0314-07	EPA 8270D-SIM	Benzo(a)anthracene	9690	ug/kg	D E	DNR	20
18F0314	LDW18-IT45-B6-Comp1-FD	18F0314-07	EPA 9060	Total Organic carbon (TOC)	1.01	%		J	8,9
18F0314	LDW18-IT45-B6-Comp2	18F0314-05	EPA 8082A	Aroclor-1260	214	ug/kg	E	DNR	20
18F0314	LDW18-IT45-B6-Comp2	18F0314-05	EPA 8082A	Aroclor-1248	211	ug/kg	P1 E	DNR	20
18F0314	LDW18-IT45-B6-Comp2	18F0314-05	EPA 8082A	Aroclor-1254	415	ug/kg	E	DNR	20
18F0314	LDW18-IT45-B6-Comp2	18F0314-05RE1	EPA 8082A	Aroclor-1254	479	ug/kg	D	J	13H
18F0314	LDW18-IT45-B6-Comp2	18F0314-05RE1	EPA 8082A	Aroclor-1221		ug/kg	D U	DNR	11
18F0314	LDW18-IT45-B6-Comp2	18F0314-05RE1	EPA 8082A	Aroclor-1232		ug/kg	D U	DNR	11
18F0314	LDW18-IT45-B6-Comp2	18F0314-05RE1	EPA 8082A	Aroclor-1248	243	ug/kg	P1 D	J	3,13H
18F0314	LDW18-IT45-B6-Comp2	18F0314-05RE1	EPA 8082A	Aroclor-1016		ug/kg	D U	DNR	11
18F0314	LDW18-IT45-B6-Comp2	18F0314-05RE1	EPA 8082A	Aroclor-1242		ug/kg	D U	DNR	11

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
18F0314	LDW18-IT45-B6-Comp2	18F0314-05RE1	EPA 8082A	Aroclor-1260	268	ug/kg	D	J	13H
18F0314	LDW18-IT45-B6-Comp2	18F0314-05	EPA 9060	Total Organic carbon (TOC)	1.78	%		J	8,9
18F0314	LDW18-IT45-B6-Comp2-FD	18F0314-08	EPA 8082A	Aroclor-1260	215	ug/kg	E	DNR	20
18F0314	LDW18-IT45-B6-Comp2-FD	18F0314-08	EPA 8082A	Aroclor-1254	415	ug/kg	E	DNR	20
18F0314	LDW18-IT45-B6-Comp2-FD	18F0314-08	EPA 8082A	Aroclor-1248	183	ug/kg	P1	J	3
18F0314	LDW18-IT45-B6-Comp2-FD	18F0314-08RE1	EPA 8082A	Aroclor-1254	451	ug/kg	D	J	13H
18F0314	LDW18-IT45-B6-Comp2-FD	18F0314-08RE1	EPA 8082A	Aroclor-1221		ug/kg	D U	DNR	11
18F0314	LDW18-IT45-B6-Comp2-FD	18F0314-08RE1	EPA 8082A	Aroclor-1232		ug/kg	D U	DNR	11
18F0314	LDW18-IT45-B6-Comp2-FD	18F0314-08RE1	EPA 8082A	Aroclor-1248	224	ug/kg	D	DNR	11
18F0314	LDW18-IT45-B6-Comp2-FD	18F0314-08RE1	EPA 8082A	Aroclor-1016		ug/kg	D U	DNR	11
18F0314	LDW18-IT45-B6-Comp2-FD	18F0314-08RE1	EPA 8082A	Aroclor-1242		ug/kg	D U	DNR	11
18F0314	LDW18-IT45-B6-Comp2-FD	18F0314-08RE1	EPA 8082A	Aroclor-1260	267	ug/kg	D	J	13H
18F0314	LDW18-IT45-B6-Comp2-FD	18F0314-08	EPA 9060	Total Organic carbon (TOC)	1.74	%		J	8,9
18F0314	LDW18-IT45-B6-Comp3	18F0314-06	EPA 8082A	Aroclor-1254	320	ug/kg	E	DNR	20
18F0314	LDW18-IT45-B6-Comp3	18F0314-06RE1	EPA 8082A	Aroclor-1221		ug/kg	D U	DNR	11
18F0314	LDW18-IT45-B6-Comp3	18F0314-06RE1	EPA 8082A	Aroclor-1232		ug/kg	D U	DNR	11
18F0314	LDW18-IT45-B6-Comp3	18F0314-06RE1	EPA 8082A	Aroclor-1248	138	ug/kg	P1 D	DNR	11
18F0314	LDW18-IT45-B6-Comp3	18F0314-06RE1	EPA 8082A	Aroclor-1016		ug/kg	D U	DNR	11
18F0314	LDW18-IT45-B6-Comp3	18F0314-06RE1	EPA 8082A	Aroclor-1242		ug/kg	D U	DNR	11
18F0314	LDW18-IT45-B6-Comp3	18F0314-06RE1	EPA 8082A	Aroclor-1260	147	ug/kg	D	DNR	11
18F0314	LDW18-IT45-B6-Comp3	18F0314-06	EPA 9060	Total Organic carbon (TOC)	6	%		J	8,9
18F0314	LDW18-IT45-B6-Comp3-FD	18F0314-09	EPA 8082A	Aroclor-1254	266	ug/kg	E	DNR	20
18F0314	LDW18-IT45-B6-Comp3-FD	18F0314-09RE1	EPA 8082A	Aroclor-1221		ug/kg	D U	DNR	11
18F0314	LDW18-IT45-B6-Comp3-FD	18F0314-09RE1	EPA 8082A	Aroclor-1232		ug/kg	D U	DNR	11
18F0314	LDW18-IT45-B6-Comp3-FD	18F0314-09RE1	EPA 8082A	Aroclor-1248	118	ug/kg	D	DNR	11
18F0314	LDW18-IT45-B6-Comp3-FD	18F0314-09RE1	EPA 8082A	Aroclor-1016		ug/kg	D U	DNR	11
18F0314	LDW18-IT45-B6-Comp3-FD	18F0314-09RE1	EPA 8082A	Aroclor-1242		ug/kg	D U	DNR	11
18F0314	LDW18-IT45-B6-Comp3-FD	18F0314-09RE1	EPA 8082A	Aroclor-1260	141	ug/kg	D	DNR	11
18F0314	LDW18-IT45-B6-Comp3-FD	18F0314-09	EPA 9060	Total Organic carbon (TOC)	3.94	%		J	8,9
18F0314	LDW18-IT45-B7-Comp1	18F0314-10	EPA 9060	Total Organic carbon (TOC)	0.61	%		J	8,9
18F0314	LDW18-IT45-B7-Comp1	18F0314-10	PLUMB, 1981 GS	Fractional % phi 4-5 (31.2-62.5 microns)	6.5	%		J	9
18F0314	LDW18-IT45-B7-Comp1DUP1	B080818-DUP1	PLUMB, 1981 GS	Fractional % phi 4-5 (31.2-62.5 microns)	9.6	%		J	9

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
18F0314	LDW18-IT45-B7-Comp1DUP2	B080818-DUP2	PLUMB, 1981 GS	Fractional % phi 4-5 (31.2-62.5 microns)	6.9	%		J	9
18F0314	LDW18-IT45-B7-Comp2	18F0314-11	EPA 9060	Total Organic carbon (TOC)	0.93	%		J	8,9
18F0314	LDW18-IT45-B7-Comp3	18F0314-12	EPA 9060	Total Organic carbon (TOC)	1.41	%		J	8,9
18F0314	LDW18-IT45-B8-Comp1	18F0314-13	EPA 8082A	Aroclor-1248	21.5	ug/kg	P1	J	3
18F0314	LDW18-IT45-B8-Comp1	18F0314-13	EPA 9060	Total Organic carbon (TOC)	1.27	%		J	8,9
18F0314	LDW18-IT45-B8-Comp2	18F0314-14RE1	EPA 9060	Total Organic carbon (TOC)	1.25	%		J	8,9
18F0314	LDW18-IT45-B8-Comp3	18F0314-15	EPA 9060	Total Organic carbon (TOC)	0.76	%		J	8,9
WG64576	LDW18-IT45-B1-Comp1	L29625-1 (A)	EPA 1613B	2,3,7,8-TCDF	0.407	ng/kg		UJ	7,12L
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	2,3,7,8-TCDD	0.095	ng/kg	K J	U	25
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	1,2,3,7,8-PeCDD	0.352	ng/kg	K J	U	25
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	1,2,3,7,8,9-HxCDD	0.713	ng/kg	J	DNR	11
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	1,2,3,4,6,7,8-HpCDD	33.2	ng/kg		J	12H
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	2,3,7,8-TCDF	1.21	ng/kg		DNR	11
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	1,2,3,7,8-PeCDF	0.383	ng/kg	K J	U	25
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	2,3,4,7,8-PeCDF	0.564	ng/kg	B J	J	9
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	1,2,3,6,7,8-HxCDF	0.797	ng/kg	J	J	9
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	1,2,3,7,8,9-HxCDF	0.06	ng/kg	K J	UJ	9,12L,25
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	2,3,4,6,7,8-HxCDF	0.607	ng/kg	J	J	9
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	1,2,3,4,6,7,8-HpCDF	9.85	ng/kg		J	9
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	1,2,3,4,7,8,9-HpCDF	1.12	ng/kg		J	9
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	OCDF	19.5	ng/kg		J	9
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	Total TCDD	2.6	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	Total PeCDD	3.9	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	Total HxCDD	9.59	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	Total PeCDF	7.45	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	Total HxCDF	14.9	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp1	L29625-1 i2 (A)	EPA 1613B	Total HpCDF	27.9	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 (DUP L29625-1)	EPA 1613B	2,3,7,8-TCDF	0.334	ng/kg		UJ	12L
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	2,3,7,8-TCDD	0.083	ng/kg	K J	U	25
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	1,2,3,7,8-PeCDD	0.304	ng/kg	K J	U	25

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	1,2,3,7,8,9-HxCDD	0.654	ng/kg	J	DNR	11
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	1,2,3,4,6,7,8-HpCDD	31	ng/kg		J	12H
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	2,3,7,8-TCDF	0.866	ng/kg		DNR	11
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	1,2,3,7,8-PeCDF	0.234	ng/kg	K J	U	25
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	2,3,4,7,8-PeCDF	0.34	ng/kg	B J	J	9
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	1,2,3,6,7,8-HxCDF	0.479	ng/kg	J	J	9
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	1,2,3,7,8,9-HxCDF		ng/kg	U	UJ	12L
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	2,3,4,6,7,8-HxCDF	0.431	ng/kg	J	J	9
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	1,2,3,4,6,7,8-HpCDF	12.2	ng/kg		J	9
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	1,2,3,4,7,8,9-HpCDF	1.51	ng/kg		J	9
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	OCDF	36.3	ng/kg		J	9
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	Total TCDD	1.82	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	Total PeCDD	2.86	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	Total HxCDD	7.81	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	Total TCDF	5.74	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp1 (Duplicate)	WG64576-103 i3 (DUP L29625-1)	EPA 1613B	Total PeCDF	5.51	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp1-FD	L29625-4	EPA 1613B	2,3,7,8-TCDF	0.502	ng/kg		J	12L
WG64576	LDW18-IT45-B1-Comp1-FD	L29625-4 i2	EPA 1613B	2,3,7,8-TCDD	0.099	ng/kg	K J	U	25
WG64576	LDW18-IT45-B1-Comp1-FD	L29625-4 i2	EPA 1613B	1,2,3,7,8-PeCDD	0.558	ng/kg	K J	U	25

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG64576	LDW18-IT45-B1-Comp1-FD	L29625-4 i2	EPA 1613B	1,2,3,7,8,9-HxCDD	2.44	ng/kg		DNR	11
WG64576	LDW18-IT45-B1-Comp1-FD	L29625-4 i2	EPA 1613B	1,2,3,4,6,7,8-HpCDD	33.9	ng/kg		J	12H
WG64576	LDW18-IT45-B1-Comp1-FD	L29625-4 i2	EPA 1613B	2,3,7,8-TCDF	2.59	ng/kg		DNR	11
WG64576	LDW18-IT45-B1-Comp1-FD	L29625-4 i2	EPA 1613B	1,2,3,7,8,9-HxCDF	0.124	ng/kg	J	J	12L
WG64576	LDW18-IT45-B1-Comp1-FD	L29625-4 i2	EPA 1613B	Total TCDD	3.3	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp1-FD	L29625-4 i2	EPA 1613B	Total PeCDD	8.94	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp1-FD	L29625-4 i2	EPA 1613B	Total TCDF	14.7	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp1-FD	L29625-4 i2	EPA 1613B	Total HxCDF	44.7	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp2	L29625-2	EPA 1613B	2,3,7,8-TCDF	0.496	ng/kg		J	12L
WG64576	LDW18-IT45-B1-Comp2	L29625-2 i2	EPA 1613B	1,2,3,7,8,9-HxCDD	1.32	ng/kg		DNR	11
WG64576	LDW18-IT45-B1-Comp2	L29625-2 i2	EPA 1613B	1,2,3,4,6,7,8-HpCDD	44.2	ng/kg		J	12H
WG64576	LDW18-IT45-B1-Comp2	L29625-2 i2	EPA 1613B	2,3,7,8-TCDF	1.19	ng/kg		DNR	11
WG64576	LDW18-IT45-B1-Comp2	L29625-2 i2	EPA 1613B	2,3,4,7,8-PeCDF	0.605	ng/kg	K J	U	25
WG64576	LDW18-IT45-B1-Comp2	L29625-2 i2	EPA 1613B	1,2,3,7,8,9-HxCDF	0.266	ng/kg	J	J	12L
WG64576	LDW18-IT45-B1-Comp2	L29625-2 i2	EPA 1613B	Total TCDD	1.65	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp2	L29625-2 i2	EPA 1613B	Total PeCDD	3.74	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp2	L29625-2 i2	EPA 1613B	Total TCDF	6.09	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp2	L29625-2 i2	EPA 1613B	Total PeCDF	6.58	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp2-FD	L29625-5	EPA 1613B	2,3,7,8-TCDF	0.487	ng/kg		J	12L
WG64576	LDW18-IT45-B1-Comp2-FD	L29625-5 i3	EPA 1613B	2,3,7,8-TCDD	0.1	ng/kg	K J	U	25
WG64576	LDW18-IT45-B1-Comp2-FD	L29625-5 i3	EPA 1613B	1,2,3,7,8,9-HxCDD	1.6	ng/kg		DNR	11
WG64576	LDW18-IT45-B1-Comp2-FD	L29625-5 i3	EPA 1613B	1,2,3,4,6,7,8-HpCDD	70.1	ng/kg		J	12H
WG64576	LDW18-IT45-B1-Comp2-FD	L29625-5 i3	EPA 1613B	2,3,7,8-TCDF	1.32	ng/kg		DNR	11
WG64576	LDW18-IT45-B1-Comp2-FD	L29625-5 i3	EPA 1613B	1,2,3,7,8,9-HxCDF		ng/kg	U	UJ	12L
WG64576	LDW18-IT45-B1-Comp2-FD	L29625-5 i3	EPA 1613B	Total TCDD	1.76	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp2-FD	L29625-5 i3	EPA 1613B	Total PeCDD	4.22	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp2-FD	L29625-5 i3	EPA 1613B	Total TCDF	9.91	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp2-FD	L29625-5 i3	EPA 1613B	Total PeCDF	9.52	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp2-FD	L29625-5 i3	EPA 1613B	Total HxCDF	21.3	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp3	L29625-3	EPA 1613B	2,3,7,8-TCDF	0.413	ng/kg		UJ	7,12L
WG64576	LDW18-IT45-B1-Comp3	L29625-3 i2	EPA 1613B	2,3,7,8-TCDD	0.145	ng/kg	K J	U	25
WG64576	LDW18-IT45-B1-Comp3	L29625-3 i2	EPA 1613B	1,2,3,7,8,9-HxCDD	0.945	ng/kg	J	DNR	11
WG64576	LDW18-IT45-B1-Comp3	L29625-3 i2	EPA 1613B	1,2,3,4,6,7,8-HpCDD	26.9	ng/kg		J	12H
WG64576	LDW18-IT45-B1-Comp3	L29625-3 i2	EPA 1613B	2,3,7,8-TCDF	1.06	ng/kg		DNR	11
WG64576	LDW18-IT45-B1-Comp3	L29625-3 i2	EPA 1613B	1,2,3,7,8-PeCDF	0.233	ng/kg	K J	U	25

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG64576	LDW18-IT45-B1-Comp3	L29625-3 i2	EPA 1613B	1,2,3,7,8,9-HxCDF		ng/kg	U	UJ	12L
WG64576	LDW18-IT45-B1-Comp3	L29625-3 i2	EPA 1613B	Total TCDD	11	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp3	L29625-3 i2	EPA 1613B	Total PeCDD	8.47	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp3	L29625-3 i2	EPA 1613B	Total HxCDD	10	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp3	L29625-3 i2	EPA 1613B	Total TCDF	6.62	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp3	L29625-3 i2	EPA 1613B	Total PeCDF	4.63	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp3	L29625-3 i2	EPA 1613B	Total HxCDF	10.9	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp3	L29625-3 i2	EPA 1613B	Total HpCDF	29.5	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp3-FD	L29625-6	EPA 1613B	2,3,7,8-TCDF	0.35	ng/kg		UJ	7,12L
WG64576	LDW18-IT45-B1-Comp3-FD	L29625-6 i2	EPA 1613B	2,3,7,8-TCDD	0.084	ng/kg	K J	U	25
WG64576	LDW18-IT45-B1-Comp3-FD	L29625-6 i2	EPA 1613B	1,2,3,7,8,9-HxCDD	0.882	ng/kg	K J	DNR	11
WG64576	LDW18-IT45-B1-Comp3-FD	L29625-6 i2	EPA 1613B	1,2,3,4,6,7,8-HpCDD	27.8	ng/kg		J	12H
WG64576	LDW18-IT45-B1-Comp3-FD	L29625-6 i2	EPA 1613B	2,3,7,8-TCDF	0.894	ng/kg		DNR	11
WG64576	LDW18-IT45-B1-Comp3-FD	L29625-6 i2	EPA 1613B	1,2,3,7,8,9-HxCDF		ng/kg	U	UJ	12L
WG64576	LDW18-IT45-B1-Comp3-FD	L29625-6 i2	EPA 1613B	Total TCDD	1.44	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp3-FD	L29625-6 i2	EPA 1613B	Total PeCDD	2.87	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp3-FD	L29625-6 i2	EPA 1613B	Total HxCDD	9.91	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp3-FD	L29625-6 i2	EPA 1613B	Total TCDF	5.43	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp3-FD	L29625-6 i2	EPA 1613B	Total PeCDF	4.47	ng/kg	K	J	25
WG64576	LDW18-IT45-B1-Comp3-FD	L29625-6 i2	EPA 1613B	Total HxCDF	11.4	ng/kg	K	J	25
WG64576	LDW18-IT45-B2-Comp1	L29625-7	EPA 1613B	2,3,7,8-TCDF	4.19	ng/kg		J	12L
WG64576	LDW18-IT45-B2-Comp1	L29625-7 i2	EPA 1613B	1,2,3,7,8,9-HxCDD	12.2	ng/kg		DNR	11
WG64576	LDW18-IT45-B2-Comp1	L29625-7 i2	EPA 1613B	1,2,3,4,6,7,8-HpCDD	486	ng/kg		J	12H
WG64576	LDW18-IT45-B2-Comp1	L29625-7 i2	EPA 1613B	2,3,7,8-TCDF	15	ng/kg		DNR	11
WG64576	LDW18-IT45-B2-Comp1	L29625-7 i2	EPA 1613B	1,2,3,7,8,9-HxCDF	0.709	ng/kg	J	J	12L
WG64576	LDW18-IT45-B2-Comp2	L29625-8	EPA 1613B	2,3,7,8-TCDF	5.68	ng/kg		J	12L
WG64576	LDW18-IT45-B2-Comp2	L29625-8 i	EPA 1613B	1,2,3,7,8,9-HxCDD	4.79	ng/kg		DNR	11
WG64576	LDW18-IT45-B2-Comp2	L29625-8 i	EPA 1613B	1,2,3,4,6,7,8-HpCDD	115	ng/kg		J	12H
WG64576	LDW18-IT45-B2-Comp2	L29625-8 i	EPA 1613B	2,3,7,8-TCDF	40.8	ng/kg		DNR	11
WG64576	LDW18-IT45-B2-Comp2	L29625-8 i	EPA 1613B	1,2,3,7,8,9-HxCDF	0.353	ng/kg	J	J	12L
WG64576	LDW18-IT45-B2-Comp3	L29625-9	EPA 1613B	2,3,7,8-TCDF	1.61	ng/kg		J	12L
WG64576	LDW18-IT45-B2-Comp3	L29625-9 i	EPA 1613B	1,2,3,7,8,9-HxCDD	5.07	ng/kg		DNR	11
WG64576	LDW18-IT45-B2-Comp3	L29625-9 i	EPA 1613B	1,2,3,4,6,7,8-HpCDD	231	ng/kg		J	12H
WG64576	LDW18-IT45-B2-Comp3	L29625-9 i	EPA 1613B	2,3,7,8-TCDF	5.46	ng/kg		DNR	11
WG64576	LDW18-IT45-B2-Comp3	L29625-9 i	EPA 1613B	1,2,3,7,8,9-HxCDF	0.144	ng/kg	J	J	12L

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG64576	LDW18-IT45-B2-Comp3	L29625-9 i	EPA 1613B	Total TCDD	7.69	ng/kg	K	J	25
WG64576	LDW18-IT45-B2-Comp3	L29625-9 i	EPA 1613B	Total PeCDD	17.2	ng/kg	K	J	25
WG64576	LDW18-IT45-B2-Comp3	L29625-9 i	EPA 1613B	Total TCDF	32.9	ng/kg	K	J	25
WG64576	LDW18-IT45-B2-Comp3	L29625-9 i	EPA 1613B	Total PeCDF	20.3	ng/kg	K	J	25
WG64576	LDW18-IT45-B3-Comp1	L29625-16	EPA 1613B	2,3,7,8-TCDF	0.994	ng/kg		J	12L
WG64576	LDW18-IT45-B3-Comp1	L29625-16	EPA 1613B	2,3,7,8-TCDD	0.249	ng/kg	K	J	25
WG64576	LDW18-IT45-B3-Comp1	L29625-16	EPA 1613B	1,2,3,7,8,9-HxCDD	3.44	ng/kg		DNR	11
WG64576	LDW18-IT45-B3-Comp1	L29625-16	EPA 1613B	1,2,3,4,6,7,8-HpCDD	111	ng/kg		J	12H
WG64576	LDW18-IT45-B3-Comp1	L29625-16	EPA 1613B	2,3,7,8-TCDF	3.83	ng/kg		DNR	11
WG64576	LDW18-IT45-B3-Comp1	L29625-16	EPA 1613B	1,2,3,6,7,8-HxCDF	1.21	ng/kg	K	J	25
WG64576	LDW18-IT45-B3-Comp1	L29625-16	EPA 1613B	1,2,3,7,8,9-HxCDF	0.078	ng/kg	K J	UJ	12L,25
WG64576	LDW18-IT45-B3-Comp1	L29625-16	EPA 1613B	Total TCDD	7.01	ng/kg	K	J	25
WG64576	LDW18-IT45-B3-Comp1	L29625-16	EPA 1613B	Total PeCDD	12.4	ng/kg	K	J	25
WG64576	LDW18-IT45-B3-Comp1	L29625-16	EPA 1613B	Total TCDF	21.1	ng/kg	K	J	25
WG64576	LDW18-IT45-B3-Comp1	L29625-16	EPA 1613B	Total PeCDF	14.6	ng/kg	K	J	25
WG64576	LDW18-IT45-B3-Comp1	L29625-16	EPA 1613B	Total HxCDF	38.6	ng/kg	K	J	25
WG64576	LDW18-IT45-B3-Comp2	L29625-17	EPA 1613B	2,3,7,8-TCDF	1.07	ng/kg		J	12L
WG64576	LDW18-IT45-B3-Comp2	L29625-17	EPA 1613B	1,2,3,7,8,9-HxCDD	6.88	ng/kg		DNR	11
WG64576	LDW18-IT45-B3-Comp2	L29625-17	EPA 1613B	1,2,3,4,6,7,8-HpCDD	210	ng/kg		J	12H
WG64576	LDW18-IT45-B3-Comp2	L29625-17	EPA 1613B	2,3,7,8-TCDF	15.6	ng/kg		DNR	11
WG64576	LDW18-IT45-B3-Comp2	L29625-17	EPA 1613B	1,2,3,7,8,9-HxCDF	0.069	ng/kg	J	J	12L
WG64576	LDW18-IT45-B3-Comp2	L29625-17	EPA 1613B	Total TCDD	3.35	ng/kg	K	J	25
WG64576	LDW18-IT45-B3-Comp2	L29625-17	EPA 1613B	Total PeCDD	8.87	ng/kg	K	J	25
WG64576	LDW18-IT45-B3-Comp2	L29625-17	EPA 1613B	Total TCDF	58.5	ng/kg	K	J	25
WG64576	LDW18-IT45-B3-Comp2	L29625-17	EPA 1613B	Total PeCDF	29.7	ng/kg	K	J	25
WG64576	LDW18-IT45-B3-Comp2	L29625-17	EPA 1613B	Total HxCDF	53.6	ng/kg	K	J	25
WG64576	LDW18-IT45-B4-Comp1	L29625-10	EPA 1613B	2,3,7,8-TCDF	0.574	ng/kg		J	12L
WG64576	LDW18-IT45-B4-Comp1	L29625-10 i	EPA 1613B	1,2,3,7,8,9-HxCDD	9.58	ng/kg		DNR	11
WG64576	LDW18-IT45-B4-Comp1	L29625-10 i	EPA 1613B	1,2,3,4,6,7,8-HpCDD	375	ng/kg		J	12H
WG64576	LDW18-IT45-B4-Comp1	L29625-10 i	EPA 1613B	2,3,7,8-TCDF	2.89	ng/kg		DNR	11
WG64576	LDW18-IT45-B4-Comp1	L29625-10 i	EPA 1613B	1,2,3,7,8,9-HxCDF	0.172	ng/kg	J	J	12L
WG64576	LDW18-IT45-B4-Comp1	L29625-10 i	EPA 1613B	Total TCDD	3.43	ng/kg	K	J	25
WG64576	LDW18-IT45-B4-Comp1	L29625-10 i	EPA 1613B	Total PeCDD	11.9	ng/kg	K	J	25
WG64576	LDW18-IT45-B4-Comp1	L29625-10 i	EPA 1613B	Total TCDF	17.3	ng/kg	K	J	25
WG64576	LDW18-IT45-B4-Comp2	L29625-11	EPA 1613B	2,3,7,8-TCDF	2.13	ng/kg		J	12L

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG64576	LDW18-IT45-B4-Comp2	L29625-11 i	EPA 1613B	1,2,3,7,8,9-HxCDD	77.7	ng/kg		DNR	11
WG64576	LDW18-IT45-B4-Comp2	L29625-11 i	EPA 1613B	2,3,7,8-TCDF	9.92	ng/kg		DNR	11
WG64576	LDW18-IT45-B4-Comp2	L29625-11 i	EPA 1613B	1,2,3,7,8,9-HxCDF	0.735	ng/kg	J	J	12L
WG64576	LDW18-IT45-B4-Comp2	L29625-11 i	EPA 1613B	Total TCDD	11.3	ng/kg	K	J	25
WG64576	LDW18-IT45-B4-Comp2	L29625-11 W	EPA 1613B	1,2,3,4,6,7,8-HpCDD	2360	ng/kg	D	J	12H
WG64576	LDW18-IT45-B4-Comp3	L29625-12	EPA 1613B	2,3,7,8-TCDF	0.356	ng/kg		UJ	7,12L
WG64576	LDW18-IT45-B4-Comp3	L29625-12 i2	EPA 1613B	1,2,3,7,8,9-HxCDD	3.59	ng/kg		DNR	11
WG64576	LDW18-IT45-B4-Comp3	L29625-12 i2	EPA 1613B	1,2,3,4,6,7,8-HpCDD	139	ng/kg		J	12H
WG64576	LDW18-IT45-B4-Comp3	L29625-12 i2	EPA 1613B	2,3,7,8-TCDF	1.5	ng/kg		DNR	11
WG64576	LDW18-IT45-B4-Comp3	L29625-12 i2	EPA 1613B	1,2,3,7,8,9-HxCDF	0.078	ng/kg	J	J	12L
WG64576	LDW18-IT45-B4-Comp3	L29625-12 i2	EPA 1613B	Total TCDD	3.3	ng/kg	K	J	25
WG64576	LDW18-IT45-B4-Comp3	L29625-12 i2	EPA 1613B	Total PeCDD	6.37	ng/kg	K	J	25
WG64576	LDW18-IT45-B4-Comp3	L29625-12 i2	EPA 1613B	Total HxCDD	33.3	ng/kg	K	J	25
WG64576	LDW18-IT45-B4-Comp3	L29625-12 i2	EPA 1613B	Total TCDF	7.83	ng/kg	K	J	25
WG64576	LDW18-IT45-B4-Comp3	L29625-12 i2	EPA 1613B	Total PeCDF	8.69	ng/kg	K	J	25
WG64576	LDW18-IT45-B4-Comp3	L29625-12 i2	EPA 1613B	Total HxCDF	26.9	ng/kg	K	J	25
WG64576	LDW18-IT45-B5-Comp1	L29625-13	EPA 1613B	2,3,7,8-TCDF	0.518	ng/kg		J	12L
WG64576	LDW18-IT45-B5-Comp1	L29625-13 i	EPA 1613B	1,2,3,7,8,9-HxCDD	2.93	ng/kg		DNR	11
WG64576	LDW18-IT45-B5-Comp1	L29625-13 i	EPA 1613B	1,2,3,4,6,7,8-HpCDD	131	ng/kg		J	12H
WG64576	LDW18-IT45-B5-Comp1	L29625-13 i	EPA 1613B	2,3,7,8-TCDF	1.5	ng/kg		DNR	11
WG64576	LDW18-IT45-B5-Comp1	L29625-13 i	EPA 1613B	1,2,3,7,8,9-HxCDF	0.054	ng/kg	J	J	12L
WG64576	LDW18-IT45-B5-Comp1	L29625-13 i	EPA 1613B	Total TCDD	2.96	ng/kg	K	J	25
WG64576	LDW18-IT45-B5-Comp1	L29625-13 i	EPA 1613B	Total PeCDD	7.39	ng/kg	K	J	25
WG64576	LDW18-IT45-B5-Comp1	L29625-13 i	EPA 1613B	Total TCDF	9.94	ng/kg	K	J	25
WG64576	LDW18-IT45-B5-Comp2	L29625-14	EPA 1613B	2,3,7,8-TCDF	0.713	ng/kg		J	12L
WG64576	LDW18-IT45-B5-Comp2	L29625-14	EPA 1613B	1,2,3,7,8,9-HxCDD	4.97	ng/kg		DNR	11
WG64576	LDW18-IT45-B5-Comp2	L29625-14	EPA 1613B	1,2,3,4,6,7,8-HpCDD	156	ng/kg		J	12H
WG64576	LDW18-IT45-B5-Comp2	L29625-14	EPA 1613B	2,3,7,8-TCDF	2.3	ng/kg		DNR	11
WG64576	LDW18-IT45-B5-Comp2	L29625-14	EPA 1613B	1,2,3,7,8,9-HxCDF	0.129	ng/kg	J	J	12L
WG64576	LDW18-IT45-B5-Comp2	L29625-14	EPA 1613B	Total TCDD	5.47	ng/kg	K	J	25
WG64576	LDW18-IT45-B5-Comp2	L29625-14	EPA 1613B	Total PeCDD	11.8	ng/kg	K	J	25
WG64576	LDW18-IT45-B5-Comp2	L29625-14	EPA 1613B	Total TCDF	17.2	ng/kg	K	J	25
WG64576	LDW18-IT45-B5-Comp2	L29625-14	EPA 1613B	Total PeCDF	14.8	ng/kg	K	J	25
WG64576	LDW18-IT45-B5-Comp2	L29625-14	EPA 1613B	Total HxCDF	48.2	ng/kg	K	J	25
WG64576	LDW18-IT45-B5-Comp2	L29625-14	EPA 1613B	Total HpCDF	104	ng/kg	K	J	25

Qualified Data Summary Table
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SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG64576	LDW18-IT45-B5-Comp3	L29625-15	EPA 1613B	2,3,7,8-TCDF	0.621	ng/kg		J	12L
WG64576	LDW18-IT45-B5-Comp3	L29625-15	EPA 1613B	2,3,7,8-TCDD	0.207	ng/kg	K	J	25
WG64576	LDW18-IT45-B5-Comp3	L29625-15	EPA 1613B	1,2,3,7,8,9-HxCDD	2.56	ng/kg		DNR	11
WG64576	LDW18-IT45-B5-Comp3	L29625-15	EPA 1613B	1,2,3,4,6,7,8-HpCDD	132	ng/kg		J	12H
WG64576	LDW18-IT45-B5-Comp3	L29625-15	EPA 1613B	2,3,7,8-TCDF	1.89	ng/kg		DNR	11
WG64576	LDW18-IT45-B5-Comp3	L29625-15	EPA 1613B	2,3,4,7,8-PeCDF	1.05	ng/kg	K	J	25
WG64576	LDW18-IT45-B5-Comp3	L29625-15	EPA 1613B	1,2,3,7,8,9-HxCDF	0.161	ng/kg	K J	UJ	12L,25
WG64576	LDW18-IT45-B5-Comp3	L29625-15	EPA 1613B	Total TCDD	4.06	ng/kg	K	J	25
WG64576	LDW18-IT45-B5-Comp3	L29625-15	EPA 1613B	Total PeCDD	8.36	ng/kg	K	J	25
WG64576	LDW18-IT45-B5-Comp3	L29625-15	EPA 1613B	Total TCDF	19.3	ng/kg	K	J	25
WG64576	LDW18-IT45-B5-Comp3	L29625-15	EPA 1613B	Total PeCDF	17.5	ng/kg	K	J	25
WG64576	LDW18-IT45-B5-Comp3	L29625-15	EPA 1613B	Total HxCDF	64.5	ng/kg	K	J	25
WG64577	LDW18-BNK2-1	L29625-31	EPA 1613B	2,3,7,8-TCDF	0.262	ng/kg		J	12L
WG64577	LDW18-BNK2-1	L29625-31 i	EPA 1613B	2,3,7,8-TCDD	0.087	ng/kg	K J	U	25
WG64577	LDW18-BNK2-1	L29625-31 i	EPA 1613B	1,2,3,7,8-PeCDD	0.347	ng/kg	K J	U	25
WG64577	LDW18-BNK2-1	L29625-31 i	EPA 1613B	1,2,3,4,7,8-HxCDD	0.529	ng/kg	K J	U	25
WG64577	LDW18-BNK2-1	L29625-31 i	EPA 1613B	1,2,3,7,8,9-HxCDD	1.4	ng/kg	K	DNR	11
WG64577	LDW18-BNK2-1	L29625-31 i	EPA 1613B	2,3,7,8-TCDF	0.829	ng/kg		DNR	11
WG64577	LDW18-BNK2-1	L29625-31 i	EPA 1613B	2,3,4,7,8-PeCDF	0.309	ng/kg	K J	U	25
WG64577	LDW18-BNK2-1	L29625-31 i	EPA 1613B	1,2,3,6,7,8-HxCDF	0.38	ng/kg	K J	U	25
WG64577	LDW18-BNK2-1	L29625-31 i	EPA 1613B	1,2,3,7,8,9-HxCDF		ng/kg	U	UJ	12L
WG64577	LDW18-BNK2-1	L29625-31 i	EPA 1613B	2,3,4,6,7,8-HxCDF	0.25	ng/kg	J	J	12L
WG64577	LDW18-BNK2-1	L29625-31 i	EPA 1613B	OCDF	16.4	ng/kg		J	12H
WG64577	LDW18-BNK2-1	L29625-31 i	EPA 1613B	Total TCDD	1.44	ng/kg	K	J	25
WG64577	LDW18-BNK2-1	L29625-31 i	EPA 1613B	Total PeCDD	3.17	ng/kg	K	J	25
WG64577	LDW18-BNK2-1	L29625-31 i	EPA 1613B	Total HxCDD	19.5	ng/kg	K	J	25
WG64577	LDW18-BNK2-1	L29625-31 i	EPA 1613B	Total TCDF	5.56	ng/kg	K	J	25
WG64577	LDW18-BNK2-1	L29625-31 i	EPA 1613B	Total PeCDF	4.13	ng/kg	K	J	25
WG64577	LDW18-BNK2-1	L29625-31 i	EPA 1613B	Total HxCDF	11.8	ng/kg	K	J	25
WG64577	LDW18-BNK2-1	L29625-31 i	EPA 1613B	Total HpCDF	28.1	ng/kg	K	J	25
WG64577	LDW18-IT45-B3-Comp3	L29625-18 (A)	EPA 1613B	2,3,7,8-TCDF	0.055	ng/kg	J	J	12L
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	2,3,7,8-TCDD	0.067	ng/kg	K J	U	25
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	1,2,3,7,8-PeCDD	0.115	ng/kg	K J	U	25
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	1,2,3,4,7,8-HxCDD	0.125	ng/kg	K J	U	25
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	1,2,3,6,7,8-HxCDD	0.304	ng/kg	K J	U	25

Qualified Data Summary Table
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SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	1,2,3,7,8,9-HxCDD	0.32	ng/kg	J	DNR	11
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	2,3,7,8-TCDF	0.193	ng/kg	J	DNR	11
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	1,2,3,7,8-PeCDF	0.061	ng/kg	K J	U	25
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	2,3,4,7,8-PeCDF	0.087	ng/kg	K J	U	25
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	1,2,3,4,7,8-HxCDF	0.174	ng/kg	K J	U	25
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	1,2,3,6,7,8-HxCDF	0.075	ng/kg	K J	U	25
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	1,2,3,7,8,9-HxCDF		ng/kg	U	UJ	12L
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	2,3,4,6,7,8-HxCDF	0.079	ng/kg	J	J	12L
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	1,2,3,4,6,7,8-HpCDF	1.48	ng/kg		J	9
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	1,2,3,4,7,8,9-HpCDF	0.127	ng/kg	K J	U	25
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	OCDF	3.62	ng/kg		J	9,12H
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	Total TCDD	0.737	ng/kg	K	J	9,25
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	Total PeCDD	0.739	ng/kg	K	J	9,25
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	Total HxCDD	3.37	ng/kg	K	J	25
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	Total TCDF	1.4	ng/kg	K	J	25
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	Total PeCDF	1.05	ng/kg	K	J	25
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	Total HxCDF	2.32	ng/kg	K	J	9,25
WG64577	LDW18-IT45-B3-Comp3	L29625-18 i (A)	EPA 1613B	Total HpCDF	4.49	ng/kg	K	J	9,25
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	2,3,7,8-TCDF	0.07	ng/kg	K J	UJ	12L,25
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	2,3,7,8-TCDD	0.052	ng/kg	K J	U	25
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	1,2,3,7,8-PeCDD	0.105	ng/kg	K J	U	25
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	1,2,3,4,7,8-HxCDD	0.126	ng/kg	K J	U	25
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	1,2,3,7,8,9-HxCDD	0.305	ng/kg	K J	DNR	11
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	2,3,7,8-TCDF	0.209	ng/kg		DNR	11
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	2,3,4,7,8-PeCDF	0.089	ng/kg	K J	U	25
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	1,2,3,7,8,9-HxCDF		ng/kg	U	UJ	12L

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	2,3,4,6,7,8-HxCDF	0.071	ng/kg	K J	UJ	12L,25
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	1,2,3,4,6,7,8-HpCDF	2.76	ng/kg		J	9
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	1,2,3,4,7,8,9-HpCDF	0.205	ng/kg	K J	U	25
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	OCDF	5.26	ng/kg		J	9,12H
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	Total TCDD	0.583	ng/kg	K	J	9,25
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	Total PeCDD	0.582	ng/kg	K	J	9,25
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	Total HxCDD	3.36	ng/kg	K	J	25
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	Total TCDF	1.52	ng/kg	K	J	25
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	Total PeCDF	0.91	ng/kg	K	J	25
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	Total HxCDF	3.7	ng/kg	K	J	9,25
WG64577	LDW18-IT45-B3-Comp3 (Duplicate)	WG64577-103 (DUP L29625-18)	EPA 1613B	Total HpCDF	9.4	ng/kg	K	J	9,25
WG64577	LDW18-IT45-B6-Comp1	L29625-19	EPA 1613B	2,3,7,8-TCDF	1.14	ng/kg		J	12L
WG64577	LDW18-IT45-B6-Comp1	L29625-19	EPA 1613B	1,2,3,7,8,9-HxCDD	4.54	ng/kg		DNR	11
WG64577	LDW18-IT45-B6-Comp1	L29625-19	EPA 1613B	2,3,7,8-TCDF	4.14	ng/kg		DNR	11
WG64577	LDW18-IT45-B6-Comp1	L29625-19	EPA 1613B	1,2,3,7,8,9-HxCDF	0.158	ng/kg	J	J	12L
WG64577	LDW18-IT45-B6-Comp1	L29625-19	EPA 1613B	2,3,4,6,7,8-HxCDF	1.31	ng/kg	K	J	12L,25
WG64577	LDW18-IT45-B6-Comp1	L29625-19	EPA 1613B	OCDF	151	ng/kg		J	12H
WG64577	LDW18-IT45-B6-Comp1	L29625-19	EPA 1613B	Total TCDD	12.6	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp1	L29625-19	EPA 1613B	Total PeCDD	14.8	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp1	L29625-19	EPA 1613B	Total TCDF	28.3	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp1	L29625-19	EPA 1613B	Total PeCDF	22.5	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp1	L29625-19	EPA 1613B	Total HxCDF	70.8	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp1	L29625-19	EPA 1613B	Total HpCDF	258	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp1-FD	L29625-22 L	EPA 1613B	2,3,7,8-TCDF	1.07	ng/kg		J	12L

Qualified Data Summary Table
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SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG64577	LDW18-IT45-B6-Comp1-FD	L29625-22 L2	EPA 1613B	1,2,3,7,8-PeCDD	2.36	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp1-FD	L29625-22 L2	EPA 1613B	1,2,3,7,8,9-HxCDD	11.2	ng/kg		DNR	11
WG64577	LDW18-IT45-B6-Comp1-FD	L29625-22 L2	EPA 1613B	2,3,7,8-TCDF	2.41	ng/kg		DNR	11
WG64577	LDW18-IT45-B6-Comp1-FD	L29625-22 L2	EPA 1613B	1,2,3,7,8,9-HxCDF	0.301	ng/kg	K J	UJ	12L,25
WG64577	LDW18-IT45-B6-Comp1-FD	L29625-22 L2	EPA 1613B	2,3,4,6,7,8-HxCDF	3.16	ng/kg		J	12L
WG64577	LDW18-IT45-B6-Comp1-FD	L29625-22 L2	EPA 1613B	OCDF	224	ng/kg		J	12H
WG64577	LDW18-IT45-B6-Comp1-FD	L29625-22 L2	EPA 1613B	Total TCDD	2.74	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp1-FD	L29625-22 L2	EPA 1613B	Total PeCDD	17.1	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp1-FD	L29625-22 L2	EPA 1613B	Total TCDF	11	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp1-FD	L29625-22 L2	EPA 1613B	Total PeCDF	19.6	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp1-FD	L29625-22 L2	EPA 1613B	Total HxCDF	126	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp2	L29625-20	EPA 1613B	2,3,7,8-TCDF	4.7	ng/kg		J	12L
WG64577	LDW18-IT45-B6-Comp2	L29625-20	EPA 1613B	2,3,7,8-TCDD	1.13	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp2	L29625-20	EPA 1613B	1,2,3,7,8,9-HxCDD	14.4	ng/kg		DNR	11
WG64577	LDW18-IT45-B6-Comp2	L29625-20	EPA 1613B	2,3,7,8-TCDF	22	ng/kg		DNR	11
WG64577	LDW18-IT45-B6-Comp2	L29625-20	EPA 1613B	1,2,3,7,8,9-HxCDF	0.814	ng/kg	J	J	12L
WG64577	LDW18-IT45-B6-Comp2	L29625-20	EPA 1613B	2,3,4,6,7,8-HxCDF	9.16	ng/kg		J	12L
WG64577	LDW18-IT45-B6-Comp2	L29625-20	EPA 1613B	OCDF	228	ng/kg		J	12H
WG64577	LDW18-IT45-B6-Comp2	L29625-20	EPA 1613B	Total TCDD	33.8	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp2	L29625-20	EPA 1613B	Total PeCDD	74.7	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp2	L29625-20	EPA 1613B	Total TCDF	133	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp2	L29625-20	EPA 1613B	Total PeCDF	125	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp2	L29625-20	EPA 1613B	Total HxCDF	226	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp2-FD	L29625-23 L	EPA 1613B	2,3,7,8-TCDF	2.05	ng/kg		J	12L
WG64577	LDW18-IT45-B6-Comp2-FD	L29625-23 L2	EPA 1613B	1,2,3,7,8,9-HxCDD	8.77	ng/kg		DNR	11
WG64577	LDW18-IT45-B6-Comp2-FD	L29625-23 L2	EPA 1613B	2,3,7,8-TCDF	5.02	ng/kg		DNR	11
WG64577	LDW18-IT45-B6-Comp2-FD	L29625-23 L2	EPA 1613B	1,2,3,7,8,9-HxCDF	0.41	ng/kg	K J	UJ	12L,25
WG64577	LDW18-IT45-B6-Comp2-FD	L29625-23 L2	EPA 1613B	2,3,4,6,7,8-HxCDF	3.91	ng/kg		J	12L
WG64577	LDW18-IT45-B6-Comp2-FD	L29625-23 L2	EPA 1613B	OCDF	321	ng/kg		J	12H
WG64577	LDW18-IT45-B6-Comp2-FD	L29625-23 L2	EPA 1613B	Total TCDD	4.17	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp2-FD	L29625-23 L2	EPA 1613B	Total PeCDD	26.7	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp2-FD	L29625-23 L2	EPA 1613B	Total TCDF	21.8	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp2-FD	L29625-23 L2	EPA 1613B	Total PeCDF	55.9	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp2-FD	L29625-23 L2	EPA 1613B	Total HxCDF	188	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp2-FD	L29625-23 L2	EPA 1613B	Total HpCDF	563	ng/kg	K	J	25

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SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG64577	LDW18-IT45-B6-Comp3	L29625-21	EPA 1613B	2,3,7,8-TCDF	1.57	ng/kg		J	12L
WG64577	LDW18-IT45-B6-Comp3	L29625-21	EPA 1613B	2,3,7,8-TCDD	0.506	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp3	L29625-21	EPA 1613B	1,2,3,7,8,9-HxCDD	6.58	ng/kg		DNR	11
WG64577	LDW18-IT45-B6-Comp3	L29625-21	EPA 1613B	2,3,7,8-TCDF	5.9	ng/kg		DNR	11
WG64577	LDW18-IT45-B6-Comp3	L29625-21	EPA 1613B	1,2,3,7,8,9-HxCDF	0.146	ng/kg	K J	UJ	12L,25
WG64577	LDW18-IT45-B6-Comp3	L29625-21	EPA 1613B	2,3,4,6,7,8-HxCDF	1.33	ng/kg	K	J	12L,25
WG64577	LDW18-IT45-B6-Comp3	L29625-21	EPA 1613B	OCDF	88.7	ng/kg		J	12H
WG64577	LDW18-IT45-B6-Comp3	L29625-21	EPA 1613B	Total TCDD	11.7	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp3	L29625-21	EPA 1613B	Total PeCDD	19.2	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp3	L29625-21	EPA 1613B	Total TCDF	32	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp3	L29625-21	EPA 1613B	Total PeCDF	24	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp3	L29625-21	EPA 1613B	Total HxCDF	55.5	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp3-FD	L29625-24 L	EPA 1613B	2,3,7,8-TCDF	16.8	ng/kg		J	12L
WG64577	LDW18-IT45-B6-Comp3-FD	L29625-24 L2	EPA 1613B	1,2,3,7,8,9-HxCDD	15.1	ng/kg		DNR	11
WG64577	LDW18-IT45-B6-Comp3-FD	L29625-24 L2	EPA 1613B	2,3,7,8-TCDF	70.7	ng/kg		DNR	11
WG64577	LDW18-IT45-B6-Comp3-FD	L29625-24 L2	EPA 1613B	1,2,3,7,8,9-HxCDF	0.751	ng/kg	J	J	12L
WG64577	LDW18-IT45-B6-Comp3-FD	L29625-24 L2	EPA 1613B	2,3,4,6,7,8-HxCDF	9.03	ng/kg		J	12L
WG64577	LDW18-IT45-B6-Comp3-FD	L29625-24 L2	EPA 1613B	OCDF	107	ng/kg		J	12H
WG64577	LDW18-IT45-B6-Comp3-FD	L29625-24 L2	EPA 1613B	Total TCDD	50	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp3-FD	L29625-24 L2	EPA 1613B	Total PeCDD	181	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp3-FD	L29625-24 L2	EPA 1613B	Total TCDF	291	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp3-FD	L29625-24 L2	EPA 1613B	Total PeCDF	208	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp3-FD	L29625-24 L2	EPA 1613B	Total HxCDF	124	ng/kg	K	J	25
WG64577	LDW18-IT45-B6-Comp3-FD	L29625-24 L2	EPA 1613B	Total HpCDF	175	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp1	L29625-25	EPA 1613B	2,3,7,8-TCDF	0.296	ng/kg		J	12L
WG64577	LDW18-IT45-B7-Comp1	L29625-25 i	EPA 1613B	1,2,3,7,8,9-HxCDD	1.69	ng/kg		DNR	11
WG64577	LDW18-IT45-B7-Comp1	L29625-25 i	EPA 1613B	2,3,7,8-TCDF	0.627	ng/kg		DNR	11
WG64577	LDW18-IT45-B7-Comp1	L29625-25 i	EPA 1613B	1,2,3,7,8-PeCDF	0.182	ng/kg	K J	U	25
WG64577	LDW18-IT45-B7-Comp1	L29625-25 i	EPA 1613B	1,2,3,7,8,9-HxCDF		ng/kg	U	UJ	12L
WG64577	LDW18-IT45-B7-Comp1	L29625-25 i	EPA 1613B	2,3,4,6,7,8-HxCDF	0.279	ng/kg	K J	UJ	12L,25
WG64577	LDW18-IT45-B7-Comp1	L29625-25 i	EPA 1613B	OCDF	13.7	ng/kg		J	12H
WG64577	LDW18-IT45-B7-Comp1	L29625-25 i	EPA 1613B	Total TCDD	5.81	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp1	L29625-25 i	EPA 1613B	Total PeCDD	3.74	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp1	L29625-25 i	EPA 1613B	Total TCDF	4.9	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp1	L29625-25 i	EPA 1613B	Total PeCDF	4.69	ng/kg	K	J	25

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SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG64577	LDW18-IT45-B7-Comp1	L29625-25 i	EPA 1613B	Total HxCDF	12	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp1	L29625-25 i	EPA 1613B	Total HpCDF	23.7	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp2	L29625-26	EPA 1613B	2,3,7,8-TCDF	0.32	ng/kg		J	12L
WG64577	LDW18-IT45-B7-Comp2	L29625-26	EPA 1613B	1,2,3,4,7,8-HxCDD	0.669	ng/kg	K J	U	25
WG64577	LDW18-IT45-B7-Comp2	L29625-26	EPA 1613B	1,2,3,6,7,8-HxCDD	1.94	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp2	L29625-26	EPA 1613B	1,2,3,7,8,9-HxCDD	1.91	ng/kg		DNR	11
WG64577	LDW18-IT45-B7-Comp2	L29625-26	EPA 1613B	2,3,7,8-TCDF	0.817	ng/kg		DNR	11
WG64577	LDW18-IT45-B7-Comp2	L29625-26	EPA 1613B	1,2,3,7,8-PeCDF	0.281	ng/kg	K J	U	25
WG64577	LDW18-IT45-B7-Comp2	L29625-26	EPA 1613B	1,2,3,7,8,9-HxCDF		ng/kg	U	UJ	12L
WG64577	LDW18-IT45-B7-Comp2	L29625-26	EPA 1613B	2,3,4,6,7,8-HxCDF	0.371	ng/kg	J	J	12L
WG64577	LDW18-IT45-B7-Comp2	L29625-26	EPA 1613B	OCDF	17.4	ng/kg		J	12H
WG64577	LDW18-IT45-B7-Comp2	L29625-26	EPA 1613B	Total TCDD	3.23	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp2	L29625-26	EPA 1613B	Total PeCDD	4.78	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp2	L29625-26	EPA 1613B	Total HxCDD	18.5	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp2	L29625-26	EPA 1613B	Total TCDF	7.08	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp2	L29625-26	EPA 1613B	Total PeCDF	5.85	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp2	L29625-26	EPA 1613B	Total HxCDF	14.6	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp3	L29625-27	EPA 1613B	2,3,7,8-TCDF	0.385	ng/kg		J	12L
WG64577	LDW18-IT45-B7-Comp3	L29625-27	EPA 1613B	1,2,3,7,8-PeCDD	0.467	ng/kg	K J	U	25
WG64577	LDW18-IT45-B7-Comp3	L29625-27	EPA 1613B	1,2,3,7,8,9-HxCDD	1.9	ng/kg		DNR	11
WG64577	LDW18-IT45-B7-Comp3	L29625-27	EPA 1613B	2,3,7,8-TCDF	1.18	ng/kg		DNR	11
WG64577	LDW18-IT45-B7-Comp3	L29625-27	EPA 1613B	2,3,4,7,8-PeCDF	0.488	ng/kg	K J	U	25
WG64577	LDW18-IT45-B7-Comp3	L29625-27	EPA 1613B	1,2,3,7,8,9-HxCDF		ng/kg	U	UJ	12L
WG64577	LDW18-IT45-B7-Comp3	L29625-27	EPA 1613B	2,3,4,6,7,8-HxCDF	0.637	ng/kg	J	J	12L
WG64577	LDW18-IT45-B7-Comp3	L29625-27	EPA 1613B	1,2,3,4,7,8,9-HpCDF	1.07	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp3	L29625-27	EPA 1613B	OCDF	29	ng/kg	K	J	12H,25
WG64577	LDW18-IT45-B7-Comp3	L29625-27	EPA 1613B	Total TCDD	2.47	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp3	L29625-27	EPA 1613B	Total PeCDD	4.21	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp3	L29625-27	EPA 1613B	Total HxCDD	20	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp3	L29625-27	EPA 1613B	Total TCDF	10.2	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp3	L29625-27	EPA 1613B	Total PeCDF	8.79	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp3	L29625-27	EPA 1613B	Total HxCDF	23.4	ng/kg	K	J	25
WG64577	LDW18-IT45-B7-Comp3	L29625-27	EPA 1613B	Total HpCDF	43.1	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp1	L29625-28	EPA 1613B	2,3,7,8-TCDF	0.588	ng/kg		J	12L
WG64577	LDW18-IT45-B8-Comp1	L29625-28	EPA 1613B	2,3,7,8-TCDD	0.281	ng/kg	K	J	25

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG64577	LDW18-IT45-B8-Comp1	L29625-28	EPA 1613B	1,2,3,7,8,9-HxCDD	2.25	ng/kg		DNR	11
WG64577	LDW18-IT45-B8-Comp1	L29625-28	EPA 1613B	2,3,7,8-TCDF	1.32	ng/kg		DNR	11
WG64577	LDW18-IT45-B8-Comp1	L29625-28	EPA 1613B	1,2,3,7,8,9-HxCDF	0.083	ng/kg	K J	UJ	12L,25
WG64577	LDW18-IT45-B8-Comp1	L29625-28	EPA 1613B	2,3,4,6,7,8-HxCDF	0.533	ng/kg	K J	UJ	12L,25
WG64577	LDW18-IT45-B8-Comp1	L29625-28	EPA 1613B	OCDF	27.7	ng/kg		J	12H
WG64577	LDW18-IT45-B8-Comp1	L29625-28	EPA 1613B	Total TCDD	3.84	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp1	L29625-28	EPA 1613B	Total PeCDD	7	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp1	L29625-28	EPA 1613B	Total HxCDD	22.4	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp1	L29625-28	EPA 1613B	Total TCDF	11.7	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp1	L29625-28	EPA 1613B	Total PeCDF	9.39	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp1	L29625-28	EPA 1613B	Total HxCDF	20.7	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp2	L29625-29	EPA 1613B	2,3,7,8-TCDF	0.961	ng/kg		J	12L
WG64577	LDW18-IT45-B8-Comp2	L29625-29	EPA 1613B	2,3,7,8-TCDD	0.296	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp2	L29625-29	EPA 1613B	1,2,3,7,8,9-HxCDD	3.01	ng/kg		DNR	11
WG64577	LDW18-IT45-B8-Comp2	L29625-29	EPA 1613B	2,3,7,8-TCDF	2.09	ng/kg		DNR	11
WG64577	LDW18-IT45-B8-Comp2	L29625-29	EPA 1613B	1,2,3,7,8,9-HxCDF	0.086	ng/kg	K J	UJ	12L,25
WG64577	LDW18-IT45-B8-Comp2	L29625-29	EPA 1613B	2,3,4,6,7,8-HxCDF	0.777	ng/kg	J	J	12L
WG64577	LDW18-IT45-B8-Comp2	L29625-29	EPA 1613B	1,2,3,4,7,8,9-HpCDF	1.48	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp2	L29625-29	EPA 1613B	OCDF	70.8	ng/kg		J	12H
WG64577	LDW18-IT45-B8-Comp2	L29625-29	EPA 1613B	Total TCDD	4.63	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp2	L29625-29	EPA 1613B	Total PeCDD	9.03	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp2	L29625-29	EPA 1613B	Total TCDF	19.2	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp2	L29625-29	EPA 1613B	Total PeCDF	17.9	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp2	L29625-29	EPA 1613B	Total HxCDF	34.5	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp2	L29625-29	EPA 1613B	Total HpCDF	89	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp3	L29625-30	EPA 1613B	2,3,7,8-TCDF	1.61	ng/kg		J	12L
WG64577	LDW18-IT45-B8-Comp3	L29625-30	EPA 1613B	2,3,7,8-TCDD	0.355	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp3	L29625-30	EPA 1613B	1,2,3,7,8,9-HxCDD	3.85	ng/kg		DNR	11
WG64577	LDW18-IT45-B8-Comp3	L29625-30	EPA 1613B	2,3,7,8-TCDF	6.53	ng/kg		DNR	11
WG64577	LDW18-IT45-B8-Comp3	L29625-30	EPA 1613B	1,2,3,7,8,9-HxCDF		ng/kg	U	UJ	12L
WG64577	LDW18-IT45-B8-Comp3	L29625-30	EPA 1613B	2,3,4,6,7,8-HxCDF	2.2	ng/kg		J	12L
WG64577	LDW18-IT45-B8-Comp3	L29625-30	EPA 1613B	OCDF	26.9	ng/kg		J	12H
WG64577	LDW18-IT45-B8-Comp3	L29625-30	EPA 1613B	Total TCDD	7.69	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp3	L29625-30	EPA 1613B	Total PeCDD	14.1	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp3	L29625-30	EPA 1613B	Total TCDF	42.1	ng/kg	K	J	25

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG64577	LDW18-IT45-B8-Comp3	L29625-30	EPA 1613B	Total PeCDF	32.4	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp3	L29625-30	EPA 1613B	Total HxCDF	42.6	ng/kg	K	J	25
WG64577	LDW18-IT45-B8-Comp3	L29625-30	EPA 1613B	Total HpCDF	48.3	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp1	L29646-1	EPA 1613B	2,3,7,8-TCDF	1.18	ng/kg		J	12L
WG64577	LDW18-IT45-CL-Comp1	L29646-1	EPA 1613B	2,3,7,8-TCDD	0.538	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp1	L29646-1	EPA 1613B	1,2,3,7,8,9-HxCDD	8.35	ng/kg		DNR	11
WG64577	LDW18-IT45-CL-Comp1	L29646-1	EPA 1613B	2,3,7,8-TCDF	5.69	ng/kg		DNR	11
WG64577	LDW18-IT45-CL-Comp1	L29646-1	EPA 1613B	1,2,3,7,8,9-HxCDF	0.292	ng/kg	J	J	12L
WG64577	LDW18-IT45-CL-Comp1	L29646-1	EPA 1613B	2,3,4,6,7,8-HxCDF	2.17	ng/kg		J	12L
WG64577	LDW18-IT45-CL-Comp1	L29646-1	EPA 1613B	OCDF	253	ng/kg		J	12H
WG64577	LDW18-IT45-CL-Comp1	L29646-1	EPA 1613B	Total TCDD	9.18	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp1	L29646-1	EPA 1613B	Total PeCDD	19.8	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp1	L29646-1	EPA 1613B	Total TCDF	31	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp1	L29646-1	EPA 1613B	Total PeCDF	37.6	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp1	L29646-1	EPA 1613B	Total HxCDF	166	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp2	L29646-2	EPA 1613B	2,3,7,8-TCDF	1.74	ng/kg		J	12L
WG64577	LDW18-IT45-CL-Comp2	L29646-2	EPA 1613B	1,2,3,7,8,9-HxCDD	37.6	ng/kg		DNR	11
WG64577	LDW18-IT45-CL-Comp2	L29646-2	EPA 1613B	2,3,7,8-TCDF	12.4	ng/kg		DNR	11
WG64577	LDW18-IT45-CL-Comp2	L29646-2	EPA 1613B	1,2,3,7,8-PeCDF	2.75	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp2	L29646-2	EPA 1613B	1,2,3,7,8,9-HxCDF	0.787	ng/kg	J	J	12L
WG64577	LDW18-IT45-CL-Comp2	L29646-2	EPA 1613B	2,3,4,6,7,8-HxCDF	7.35	ng/kg		J	12L
WG64577	LDW18-IT45-CL-Comp2	L29646-2	EPA 1613B	OCDF	1430	ng/kg		J	12H
WG64577	LDW18-IT45-CL-Comp2	L29646-2	EPA 1613B	Total TCDD	21.2	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp2	L29646-2	EPA 1613B	Total PeCDD	58.5	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp2	L29646-2	EPA 1613B	Total TCDF	66.7	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp2	L29646-2	EPA 1613B	Total PeCDF	115	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp2	L29646-2	EPA 1613B	Total HxCDF	493	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp2	L29646-2	EPA 1613B	Total HpCDF	1430	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp3	L29646-3	EPA 1613B	2,3,7,8-TCDF	1.03	ng/kg		J	12L
WG64577	LDW18-IT45-CL-Comp3	L29646-3	EPA 1613B	1,2,3,7,8,9-HxCDD	8.8	ng/kg		DNR	11
WG64577	LDW18-IT45-CL-Comp3	L29646-3	EPA 1613B	2,3,7,8-TCDF	4.23	ng/kg		DNR	11
WG64577	LDW18-IT45-CL-Comp3	L29646-3	EPA 1613B	1,2,3,7,8,9-HxCDF	0.322	ng/kg	J	J	12L
WG64577	LDW18-IT45-CL-Comp3	L29646-3	EPA 1613B	2,3,4,6,7,8-HxCDF	2.44	ng/kg		J	12L
WG64577	LDW18-IT45-CL-Comp3	L29646-3	EPA 1613B	OCDF	321	ng/kg		J	12H
WG64577	LDW18-IT45-CL-Comp3	L29646-3	EPA 1613B	Total TCDD	12.1	ng/kg	K	J	25

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
WG64577	LDW18-IT45-CL-Comp3	L29646-3	EPA 1613B	Total PeCDD	47.5	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp3	L29646-3	EPA 1613B	Total TCDF	31.6	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp3	L29646-3	EPA 1613B	Total PeCDF	37.3	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp3	L29646-3	EPA 1613B	Total HxCDF	173	ng/kg	K	J	25
WG64577	LDW18-IT45-CL-Comp3	L29646-3	EPA 1613B	Total HpCDF	500	ng/kg	K	J	25
L1828580	LDW18-SSCL-A01-BC	L1828580-01	EPA 9060M/Gustafsson	Black carbon	0.188	%		J	9
L1828580	LDW18-SSCL-A01-Rep2	L1828580-01-Rep2	EPA 9060M/Gustafsson	Black carbon	0.163	%		J	9
L1828580	LDW18-SSCL-A02-BC	L1828580-02	EPA 9060M/Gustafsson	Black carbon	0.173	%		J	9
L1828580	LDW18-SSCL-A02-Rep2	L1828580-02-Rep2	EPA 9060M/Gustafsson	Black carbon	0.162	%		J	9
L1828580	LDW18-SSCL-A03-BC	L1828580-03	EPA 9060M/Gustafsson	Black carbon	0.302	%		J	9
L1828580	LDW18-SSCL-A03-Rep2	L1828580-03-Rep2	EPA 9060M/Gustafsson	Black carbon	0.259	%		J	9
L1828580	LDW18-SSCL-A04-BC	L1828580-04	EPA 9060M/Gustafsson	Black carbon	0.056	%		J	9
L1828580	LDW18-SSCL-A04-Rep2	L1828580-04-Rep2	EPA 9060M/Gustafsson	Black carbon	0.089	%		J	9
L1828580	LDW18-SSCL-A05-BC	L1828580-05	EPA 9060M/Gustafsson	Black carbon	0.139	%		J	9
L1828580	LDW18-SSCL-A05-Rep2	L1828580-05-Rep2	EPA 9060M/Gustafsson	Black carbon	0.193	%		J	9
L1828580	LDW18-SSCL-A07-BC	L1828580-07	EPA 9060M/Gustafsson	Black carbon	0.07	%		J	9
L1828580	LDW18-SSCL-A07-Rep2	L1828580-07-Rep2	EPA 9060M/Gustafsson	Black carbon	0.068	%		J	9
L1828580	LDW18-SSCL-A09-BC	L1828580-09	EPA 9060M/Gustafsson	Black carbon	0.052	%		J	9
L1828580	LDW18-SSCL-A09-Rep2	L1828580-09-Rep2	EPA 9060M/Gustafsson	Black carbon	0.06	%		J	9
L1828580	LDW18-SSCL-A10-BC	L1828580-10	EPA 9060M/Gustafsson	Black carbon	0.026	%		J	9

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
L1828580	LDW18-SSCL-A10-Rep2	L1828580-10-Rep2	EPA 9060M/Gustafsson	Black carbon	0.021	%		J	9
L1828580	LDW18-SSCL-A18-BC	L1828580-15	EPA 9060M/Gustafsson	Black carbon	0.192	%		J	9
L1828580	LDW18-SSCL-A18-Rep2	L1828580-15-Rep2	EPA 9060M/Gustafsson	Black carbon	0.268	%		J	9
L1828580	LDW18-SSCL-A19-BC	L1828580-16	EPA 9060M/Gustafsson	Black carbon	0.177	%		J	9
L1828580	LDW18-SSCL-A19-Rep2	L1828580-16-Rep2	EPA 9060M/Gustafsson	Black carbon	0.143	%		J	9
L1828580	LDW18-SS-COMP01-BC	L1828580-18	EPA 9060M/Gustafsson	Black carbon	0.409	%		J	9
L1828580	LDW18-SS-COMP01-Rep2	L1828580-18-Rep2	EPA 9060M/Gustafsson	Black carbon	0.617	%		J	9
L1828580	LDW18-SS-COMP02-BC	L1828580-19	EPA 9060M/Gustafsson	Black carbon	0.174	%		J	9
L1828580	LDW18-SS-COMP02-Rep2	L1828580-19-Rep2	EPA 9060M/Gustafsson	Black carbon	0.235	%		J	9
L1828580	LDW18-SS-COMP03-BC	L1828580-20	EPA 9060M/Gustafsson	Black carbon	0.059	%		J	9
L1828580	LDW18-SS-COMP03-Rep2	L1828580-20-Rep2	EPA 9060M/Gustafsson	Black carbon	0.139	%		J	9
L1828580	LDW18-SS-COMP04-BC	L1828580-21	EPA 9060M/Gustafsson	Black carbon	0.12	%		J	9
L1828580	LDW18-SS-COMP04-Rep2	L1828580-21-Rep2	EPA 9060M/Gustafsson	Black carbon	0.124	%		J	9
L1828580	LDW18-SS-COMP05-BC	L1828580-22	EPA 9060M/Gustafsson	Black carbon	0.01	%		J	9
L1828580	LDW18-SS-COMP05-Rep2	L1828580-22-Rep2	EPA 9060M/Gustafsson	Black carbon	0.01	%		J	9
L1828580	LDW18-SS-COMP07-BC	L1828580-24	EPA 9060M/Gustafsson	Black carbon	0.025	%		J	9
L1828580	LDW18-SS-COMP07-Rep2	L1828580-24-Rep2	EPA 9060M/Gustafsson	Black carbon	0.074	%		J	9

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
L1828580	WG1144091-3-DUP	WG1144091-3	EPA 9060M/Gustafsson	Black carbon	0.162	%		J	9
L1828580	WG1144091-3-DUP-Rep2	WG1144091-3-Rep2	EPA 9060M/Gustafsson	Black carbon	0.175	%		J	9
L1828594	LDW18-SS-COMP12-Rep2	L1828594-05-Rep2	EPA 9060M/Gustafsson	Black carbon	0.094	%		J	9
L1828594	LDW18-SS-182-BC	L1828594-32	EPA 9060M/Gustafsson	Black carbon	0.711	%		J	9
L1828594	LDW18-SS-182-Rep2	L1828594-32-Rep2	EPA 9060M/Gustafsson	Black carbon	0.673	%		J	9
L1828594	LDW18-SS-183-BC	L1828594-33	EPA 9060M/Gustafsson	Black carbon	1.16	%		J	9
L1828594	LDW18-SS-183-Rep2	L1828594-33-Rep2	EPA 9060M/Gustafsson	Black carbon	0.94	%		J	9
L1828594	LDW18-SS-184-BC	L1828594-34	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-184-Rep2	L1828594-34-Rep2	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-185-BC	L1828594-35	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-185-Rep2	L1828594-35-Rep2	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-186-BC	L1828594-36	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-181-BC	L1828594-31	EPA 9060M/Gustafsson	Black carbon	0.909	%		J	9
L1828594	LDW18-SS-187-BC	L1828594-37	EPA 9060M/Gustafsson	Black carbon	0.038	%		J	9
L1828594	LDW18-SS-180-Rep2	L1828594-30-Rep2	EPA 9060M/Gustafsson	Black carbon	0.08	%		J	9
L1828594	LDW18-SS-188-BC	L1828594-38	EPA 9060M/Gustafsson	Black carbon	0.014	%		J	9
L1828594	LDW18-SS-188-Rep2	L1828594-38-Rep2	EPA 9060M/Gustafsson	Black carbon	0.026	%		J	9

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
L1828594	LDW18-SS-COMP08-BC	L1828594-01	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-COMP08-Rep2	L1828594-01-Rep2	EPA 9060M/Gustafsson	Black carbon	0.029	%		J	9
L1828594	LDW18-SS-COMP09-BC	L1828594-02	EPA 9060M/Gustafsson	Black carbon	0.014	%		J	9
L1828594	LDW18-SS-COMP09-Rep2	L1828594-02-Rep2	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-COMP10-BC	L1828594-03	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-COMP10-Rep2	L1828594-03-Rep2	EPA 9060M/Gustafsson	Black carbon	0.018	%		J	9
L1828594	LDW18-SS-COMP11-BC	L1828594-04	EPA 9060M/Gustafsson	Black carbon	0.034	%		J	9
L1828594	LDW18-SS-COMP11-Rep2	L1828594-04-Rep2	EPA 9060M/Gustafsson	Black carbon	0.053	%		J	9
L1828594	LDW18-SS-169-BC	L1828594-18	EPA 9060M/Gustafsson	Black carbon	0.02	%		J	9
L1828594	LDW18-SS-186-Rep2	L1828594-36-Rep2	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-175-Rep2	L1828594-24-Rep2	EPA 9060M/Gustafsson	Black carbon	0.053	%		J	9
L1828594	LDW18-SS-169-Rep2	L1828594-18-Rep2	EPA 9060M/Gustafsson	Black carbon	0.05	%		J	9
L1828594	LDW18-SS-170-BC	L1828594-19	EPA 9060M/Gustafsson	Black carbon	0.051	%		J	9
L1828594	LDW18-SS-170-Rep2	L1828594-19-Rep2	EPA 9060M/Gustafsson	Black carbon	0.034	%		J	9
L1828594	LDW18-SS-171-BC	L1828594-20	EPA 9060M/Gustafsson	Black carbon	0.074	%		J	9
L1828594	LDW18-SS-171-Rep2	L1828594-20-Rep2	EPA 9060M/Gustafsson	Black carbon	0.081	%		J	9
L1828594	LDW18-SS-172-BC	L1828594-21	EPA 9060M/Gustafsson	Black carbon	0.147	%		J	9

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
L1828594	LDW18-SS-172-Rep2	L1828594-21-Rep2	EPA 9060M/Gustafsson	Black carbon	0.119	%		J	9
L1828594	LDW18-SS-173-BC	L1828594-22	EPA 9060M/Gustafsson	Black carbon	0.055	%		J	9
L1828594	LDW18-SS-173-Rep2	L1828594-22-Rep2	EPA 9060M/Gustafsson	Black carbon	0.056	%		J	9
L1828594	LDW18-SS-174-BC	L1828594-23	EPA 9060M/Gustafsson	Black carbon	0.046	%		J	9
L1828594	LDW18-SS-181-Rep2	L1828594-31-Rep2	EPA 9060M/Gustafsson	Black carbon	0.959	%		J	9
L1828594	LDW18-SS-175-BC	L1828594-24	EPA 9060M/Gustafsson	Black carbon	0.048	%		J	9
L1828594	LDW18-SS-COMP13-BC	L1828594-06	EPA 9060M/Gustafsson	Black carbon	0.101	%		J	9
L1828594	LDW18-SS-176-BC	L1828594-25	EPA 9060M/Gustafsson	Black carbon	0.066	%		J	9
L1828594	LDW18-SS-176-Rep2	L1828594-25-Rep2	EPA 9060M/Gustafsson	Black carbon	0.058	%		J	9
L1828594	LDW18-SS-177-BC	L1828594-26	EPA 9060M/Gustafsson	Black carbon	0.053	%		J	9
L1828594	LDW18-SS-177-Rep2	L1828594-26-Rep2	EPA 9060M/Gustafsson	Black carbon	0.048	%		J	9
L1828594	LDW18-SS-178-BC	L1828594-27	EPA 9060M/Gustafsson	Black carbon	0.085	%		J	9
L1828594	LDW18-SS-178-Rep2	L1828594-27-Rep2	EPA 9060M/Gustafsson	Black carbon	0.082	%		J	9
L1828594	LDW18-SS-178-FD-BC	L1828594-28	EPA 9060M/Gustafsson	Black carbon	0.164	%		J	9
L1828594	LDW18-SS-178-FD-Rep2	L1828594-28-Rep2	EPA 9060M/Gustafsson	Black carbon	0.159	%		J	9
L1828594	LDW18-SS-179-BC	L1828594-29	EPA 9060M/Gustafsson	Black carbon	0.069	%		J	9
L1828594	LDW18-SS-179-Rep2	L1828594-29-Rep2	EPA 9060M/Gustafsson	Black carbon	0.07	%		J	9

Qualified Data Summary Table
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SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
L1828594	LDW18-SS-180-BC	L1828594-30	EPA 9060M/Gustafsson	Black carbon	0.093	%		J	9
L1828594	LDW18-SS-174-Rep2	L1828594-23-Rep2	EPA 9060M/Gustafsson	Black carbon	0.047	%		J	9
L1828594	WG1144221-3-DUP-Rep2	WG1144221-3-Rep2	EPA 9060M/Gustafsson	Black carbon	0.066	%		J	9
L1828594	LDW18-SS-COMP12-BC	L1828594-05	EPA 9060M/Gustafsson	Black carbon	0.017	%		J	9
L1828594	WG1144214-3-DUP	WG1144214-3	EPA 9060M/Gustafsson	Black carbon	0.05	%		J	9
L1828594	WG1144214-3-DUP-Rep2	WG1144214-3-Rep2	EPA 9060M/Gustafsson	Black carbon	0.041	%		J	9
L1828594	WG1144221-2-LCS	WG1144221-2	EPA 9060M/Gustafsson	Black carbon	86.3	%		J	9
L1828594	WG1144214-2-LCS	WG1144214-2	EPA 9060M/Gustafsson	Black carbon	64.2	%		J	9
L1828594	WG1144221-3-DUP	WG1144221-3	EPA 9060M/Gustafsson	Black carbon	0.022	%		J	9
L1828594	WG1144249-2-LCS	WG1144249-2	EPA 9060M/Gustafsson	Black carbon	70.7	%		J	9
L1828594	WG1144249-2-LCS-Rep2	WG1144249-2-Rep2	EPA 9060M/Gustafsson	Black carbon	89.5	%		J	9
L1828594	WG1144249-3-DUP	WG1144249-3	EPA 9060M/Gustafsson	Black carbon	0.221	%		J	9
L1828594	WG1144249-3-DUP-Rep2	WG1144249-3-Rep2	EPA 9060M/Gustafsson	Black carbon	0.033	%		J	9
L1828594	WG1144221-2-LCS-Rep2	WG1144221-2-Rep2	EPA 9060M/Gustafsson	Black carbon	70.1	%		J	9
L1828594	LDW18-SS-COMP19-Rep2	L1828594-12-Rep2	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-COMP13-Rep2	L1828594-06-Rep2	EPA 9060M/Gustafsson	Black carbon	0.027	%		J	9
L1828594	LDW18-SS-COMP14-BC	L1828594-07	EPA 9060M/Gustafsson	Black carbon	0.02	%		J	9

Qualified Data Summary Table
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SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
L1828594	LDW18-SS-COMP14-Rep2	L1828594-07-Rep2	EPA 9060M/Gustafsson	Black carbon	0.011	%		J	9
L1828594	LDW18-SS-COMP15-BC	L1828594-08	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-COMP15-Rep2	L1828594-08-Rep2	EPA 9060M/Gustafsson	Black carbon	0.031	%		J	9
L1828594	LDW18-SS-COMP16-BC	L1828594-09	EPA 9060M/Gustafsson	Black carbon	0.01	%		J	9
L1828594	LDW18-SS-COMP16-Rep2	L1828594-09-Rep2	EPA 9060M/Gustafsson	Black carbon	0.065	%		J	9
L1828594	LDW18-SS-COMP17-BC	L1828594-10	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-COMP17-Rep2	L1828594-10-Rep2	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-COMP18-BC	L1828594-11	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	WG1144214-2-LCS-Rep2	WG1144214-2-Rep2	EPA 9060M/Gustafsson	Black carbon	65.2	%		J	9
L1828594	LDW18-SS-COMP19-BC	L1828594-12	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-COMP20-BC	L1828594-13	EPA 9060M/Gustafsson	Black carbon	0.016	%		J	9
L1828594	LDW18-SS-COMP20-Rep2	L1828594-13-Rep2	EPA 9060M/Gustafsson	Black carbon	0.034	%		J	9
L1828594	LDW18-SS-COMP21-BC	L1828594-14	EPA 9060M/Gustafsson	Black carbon	0.018	%		J	9
L1828594	LDW18-SS-COMP21-Rep2	L1828594-14-Rep2	EPA 9060M/Gustafsson	Black carbon	0.021	%		J	9
L1828594	LDW18-SS-COMP22-BC	L1828594-15	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-COMP22-Rep2	L1828594-15-Rep2	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-COMP23-BC	L1828594-16	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9

Qualified Data Summary Table
Lower Duwamish Waterway - Baseline Sediment Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
L1828594	LDW18-SS-COMP23-Rep2	L1828594-16-Rep2	EPA 9060M/Gustafsson	Black carbon	0.014	%		J	9
L1828594	LDW18-SS-COMP24-BC	L1828594-17	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-COMP24-Rep2	L1828594-17-Rep2	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9
L1828594	LDW18-SS-COMP18-Rep2	L1828594-11-Rep2	EPA 9060M/Gustafsson	Black carbon		%	U	UJ	9