



**DATA VALIDATION
REPORT LDW AOC4 Phase 3
Final**

Prepared for:

Windward Environmental, LLC
200 West Mercer Street, Suite 401
Seattle, Washington 98119

Anchor QEA, LLC
1201 3rd Ave, Suite 2600
Seattle, Washington 98101

Prepared by:

EcoChem, Inc.
500 Union Street, Suite 1010
Seattle, Washington 98101

EcoChem Project: C22035-2

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Approved for Release:

A handwritten signature in black ink that reads "Alison B. Bodkin". The signature is written in a cursive style and is positioned above a horizontal line.

Alison Bodkin
Project Manager
EcoChem, Inc.

PROJECT NARRATIVE

Basis for the Data Validation

This report presents the results of Full (EPA Stage 4) and Summary (EPA Stage 2B) validation performed on sediment and quality control sample data for the LDW AOC4 Phase 3 project. A complete list of samples is provided in the **Sample Index**.

Samples were analyzed by Analytical Resources LLC (ARI), Tukwila, WA. The analytical methods and EcoChem project chemists are listed below.

ANALYSIS	METHOD	PRIMARY REVIEW	SECONDARY REVIEW
Dioxins and Furans	EPA 1613B	ETC/AGB	AGB/CLR
PCB Aroclors	EPA 8082A	IWH	AGB
PAH/cPAH	8270E-SIM	ETC	AGB
SVOC	EPA 8270E	ETC	AGB
Metals	EPA 6020	ETC	CLR
Mercury	EPA 7471B	ETC	CLR
Total Organic Carbon	9060A m	ETC	AGB
Total Solids	ASTM SM2540G-97	ETC	AGB

The data were reviewed using guidance and quality control criteria documented in the analytical methods; *Lower Duwamish Waterway Quality Assurance Project Plan for Remedial Design of Upper Reach: Pre-design Investigation* (Windward Environmental, LLC/Anchor QEA, May 19, 2020); *National Functional Guidelines for High Resolution Superfund Methods Data review* (USEPA 2016); *National Functional Guidelines for Organic Data Review* (USEPA 2017); *National Functional Guidelines for Inorganic Data Review* (USEPA 2017); and *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
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Dioxins 1613B	cPAH	PAH	SVOC (Short List)	PCB	TOC	Mercury	Lead	Arsenic	Total Solids
22L0104	LDW22-SS773	22L0104-01				✓	✓	✓				✓
22L0104	LDW22-SS774	22L0104-02				✓	✓	✓				✓
22L0105	LDW22-SC772	22L0105-01					✓	✓				✓
22L0105	LDW22-SC771	22L0105-02					✓	✓				✓
22L0105	LDW22-SC756	22L0105-03					✓	✓				✓
22L0105	LDW22-SC780	22L0105-04					✓	✓				✓
22L0105	LDW22-IT792	22L0105-05					✓	✓				✓
22L0105	LDW22-SC775A	22L0105-06					✓	✓				✓
22L0105	LDW22-SC775B	22L0105-07					✓	✓				✓
22L0105	LDW22-SC775C	22L0105-08					✓	✓				✓
22L0105	LDW22-SC775D	22L0105-09					✓	✓				✓
22L0105	LDW22-SC775E	22L0105-10					✓	✓				✓
22L0105	LDW22-SC775F	22L0105-11					✓	✓				✓
22L0105	LDW22-SC775G	22L0105-12					✓	✓				✓
22L0105	LDW22-SC775H	22L0105-13					✓	✓				✓
22L0105	LDW22-SC775I	22L0105-14					✓	✓				✓
22L0105	LDW22-SC775J	22L0105-15					✓	✓				✓
22L0105	LDW22-SC775K	22L0105-16					✓	✓				✓
22L0105	LDW22-SC775L	22L0105-17					✓	✓				✓
22L0105	LDW22-SC775M	22L0105-18					✓	✓				✓
22L0105	LDW22-IT796	22L0105-19					✓	✓				✓
22L0105	LDW22-IT798	22L0105-20					✓	✓				✓
22L0105	LDW22-SC782B	22L0105-21					✓	✓				✓
22L0105	LDW22-SC782C	22L0105-22					✓	✓				✓
22L0105	LDW22-SC782D	22L0105-23					✓	✓				✓
22L0105	LDW22-SC782E	22L0105-24					✓	✓				✓
22L0105	LDW22-SC782F	22L0105-25					✓	✓				✓
22L0105	LDW22-SC782G	22L0105-26					✓	✓				✓
22L0105	LDW22-SC782H	22L0105-27					✓	✓				✓
22L0105	LDW22-SC782I	22L0105-28					✓	✓				✓
22L0105	LDW22-SC782J	22L0105-29					✓	✓				✓
22L0105	LDW22-SC782K	22L0105-30					✓	✓				✓

Sample Index
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Dioxins 1613B	cPAH	PAH	SVOC (Short List)	PCB	TOC	Mercury	Lead	Arsenic	Total Solids
22L0105	LDW22-SC782L	22L0105-31					✓	✓				✓
22L0105	LDW22-SC782M	22L0105-32					✓	✓				✓
22L0105	LDW22-SC782N	22L0105-33					✓	✓				✓
22L0136	LDW22-SS823	22L0136-01				✓	✓	✓				✓
22L0136	LDW22-SS822	22L0136-02					✓	✓				✓
22L0136	LDW22-SS821	22L0136-03					✓	✓				✓
22L0136	LDW22-SS820	22L0136-04					✓	✓				✓
22L0136	LDW22-SS819	22L0136-05					✓	✓		✓		✓
22L0136	LDW22-SS818	22L0136-06			✓		✓	✓				✓
22L0136	LDW22-SS811	22L0136-07					✓	✓				✓
22L0136	LDW22-SS786	22L0136-08				✓	✓	✓				✓
22L0136	LDW22-SS766	22L0136-09				✓	✓	✓				✓
22L0136	LDW22-SS771	22L0136-10				✓	✓	✓				✓
22L0136	LDW22-SS771-FD	22L0136-11				✓	✓	✓				✓
22L0136	LDW22-SS772	22L0136-12				✓	✓	✓				✓
22L0136	LDW22-SS825	22L0136-13		✓								✓
22L0136	LDW22-SS824	22L0136-14		✓								✓
22L0137	LDW22-IT817	22L0137-01					✓	✓				✓
22L0137	LDW22-IT816	22L0137-02					✓	✓				✓
22L0137	LDW22-IT815	22L0137-03					✓	✓				✓
22L0137	LDW22-SC813	22L0137-04					✓	✓				✓
22L0137	LDW22-SC784B	22L0137-05					✓	✓				✓
22L0137	LDW22-SC784B-FD	22L0137-06					✓	✓				✓
22L0137	LDW22-SC784C	22L0137-07					✓	✓				✓
22L0137	LDW22-SC784D	22L0137-08					✓	✓				✓
22L0137	LDW22-SC784E	22L0137-09					✓	✓				✓
22L0137	LDW22-SC784F	22L0137-10					✓	✓				✓
22L0137	LDW22-SC784G	22L0137-11					✓	✓				✓
22L0137	LDW22-SC784H	22L0137-12					✓	✓				✓
22L0137	LDW22-SC784I	22L0137-13					✓	✓				✓
22L0137	LDW22-SC784J	22L0137-14					✓	✓				✓
22L0137	LDW22-SC784K	22L0137-15					✓	✓				✓

Sample Index
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Dioxins 1613B	cPAH	PAH	SVOC (Short List)	PCB	TOC	Mercury	Lead	Arsenic	Total Solids
22L0137	LDW22-SC784L	22L0137-16					✓	✓				✓
22L0137	LDW22-SC784M	22L0137-17					✓	✓				✓
22L0137	LDW22-SC785A	22L0137-18					✓	✓				✓
22L0137	LDW22-SC785B	22L0137-19					✓	✓				✓
22L0137	LDW22-SC785C	22L0137-20					✓	✓				✓
22L0137	LDW22-SC785D	22L0137-21					✓	✓				✓
22L0137	LDW22-SC785E	22L0137-22					✓	✓				✓
22L0137	LDW22-SC785F	22L0137-23					✓	✓				✓
22L0137	LDW22-SC785G	22L0137-24					✓	✓				✓
22L0137	LDW22-SC785H	22L0137-25					✓	✓				✓
22L0137	LDW22-SC785I	22L0137-26					✓	✓				✓
22L0137	LDW22-SC785J	22L0137-27					✓	✓				✓
22L0137	LDW22-SC785K	22L0137-28					✓	✓				✓
22L0137	LDW22-SC785L	22L0137-29					✓	✓				✓
22L0137	LDW22-SC785M	22L0137-30					✓	✓				✓
22L0137	LDW22-SC785N	22L0137-31					✓	✓				✓
22L0137	LDW22-SC785A-FD	22L0137-32					✓	✓				✓
22L0137	LDW22-SC776A	22L0137-33					✓	✓				✓
22L0137	LDW22-SC776B	22L0137-34					✓	✓				✓
22L0137	LDW22-SC776C	22L0137-35					✓	✓				✓
22L0137	LDW22-SC776D	22L0137-36					✓	✓				✓
22L0137	LDW22-SC776E	22L0137-37					✓	✓				✓
22L0137	LDW22-SC776E-FD	22L0137-38					✓	✓				✓
22L0137	LDW22-SC776F	22L0137-39					✓	✓				✓
22L0137	LDW22-SC776G	22L0137-40					✓	✓				✓
22L0137	LDW22-SC776H	22L0137-41					✓	✓				✓
22L0137	LDW22-SC776I	22L0137-42					✓	✓				✓
22L0137	LDW22-SC776J	22L0137-43					✓	✓				✓
22L0137	LDW22-SC776K	22L0137-44					✓	✓				✓
22L0137	LDW22-SC776L	22L0137-45					✓	✓				✓
22L0137	LDW22-SC776M	22L0137-46					✓	✓				✓
22L0137	LDW22-SC770A	22L0137-47					✓	✓				✓

Sample Index
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Dioxins 1613B	cPAH	PAH	SVOC (Short List)	PCB	TOC	Mercury	Lead	Arsenic	Total Solids
22L0137	LDW22-SC770B	22L0137-48					✓	✓				✓
22L0137	LDW22-SC770C	22L0137-49					✓	✓				✓
22L0137	LDW22-SC770D	22L0137-50					✓	✓				✓
22L0137	LDW22-SC770E	22L0137-51					✓	✓				✓
22L0137	LDW22-SC770F	22L0137-52					✓	✓				✓
22L0137	LDW22-SC770G	22L0137-53					✓	✓				✓
22L0137	LDW22-SC770H	22L0137-54					✓	✓				✓
22L0137	LDW22-SC770I	22L0137-55					✓	✓				✓
22L0137	LDW22-SC770J	22L0137-56					✓	✓				✓
22L0137	LDW22-SC770K	22L0137-57					✓	✓				✓
22L0137	LDW22-SC770L	22L0137-58					✓	✓				✓
22L0137	LDW22-SC769A	22L0137-59					✓	✓				✓
22L0137	LDW22-SC769B	22L0137-60					✓	✓				✓
22L0137	LDW22-SC769C	22L0137-61					✓	✓				✓
22L0137	LDW22-SC769D	22L0137-62					✓	✓				✓
22L0137	LDW22-SC769E	22L0137-63					✓	✓				✓
22L0137	LDW22-SC769F	22L0137-64					✓	✓				✓
22L0137	LDW22-SC769G	22L0137-65					✓	✓				✓
22L0137	LDW22-SC769H	22L0137-66					✓	✓				✓
22L0137	LDW22-SC769I	22L0137-67					✓	✓				✓
22L0137	LDW22-SC769J	22L0137-68					✓	✓				✓
22L0137	LDW22-SC769K	22L0137-69					✓	✓				✓
22L0155	LDW22-SC768A	22L0155-01			✓		✓	✓	✓			✓
22L0155	LDW22-SC768B	22L0155-02			✓		✓	✓	✓			✓
22L0155	LDW22-SC768C	22L0155-03			✓		✓	✓	✓			✓
22L0155	LDW22-SC768D	22L0155-04			✓		✓	✓	✓			✓
22L0155	LDW22-SC768E	22L0155-05			✓		✓	✓	✓			✓
22L0155	LDW22-SC768F	22L0155-06			✓		✓	✓	✓			✓
22L0155	LDW22-SC768F-FD	22L0155-07			✓		✓	✓	✓			✓
22L0155	LDW22-SC768G	22L0155-08			✓		✓	✓	✓			✓
22L0155	LDW22-SC768H	22L0155-09			✓		✓	✓	✓			✓
22L0155	LDW22-SC768I	22L0155-10			✓		✓	✓	✓			✓

Sample Index
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Dioxins 1613B	cPAH	PAH	SVOC (Short List)	PCB	TOC	Mercury	Lead	Arsenic	Total Solids
22L0155	LDW22-SC768J	22L0155-11			✓		✓	✓	✓			✓
22L0155	LDW22-SC768K	22L0155-12			✓		✓	✓	✓			✓
22L0155	LDW22-SC768L	22L0155-13			✓		✓	✓	✓			✓
22L0155	LDW22-SC764E	22L0155-14					✓	✓				✓
22L0155	LDW22-SC764F	22L0155-15					✓	✓				✓
22L0155	LDW22-SC764G	22L0155-16					✓	✓				✓
22L0155	LDW22-SC764H	22L0155-17					✓	✓				✓
22L0155	LDW22-SC764I	22L0155-18					✓	✓				✓
22L0155	LDW22-SC764J	22L0155-19					✓	✓				✓
22L0155	LDW22-SC764K	22L0155-20					✓	✓				✓
22L0155	LDW22-SC764L	22L0155-21					✓	✓				✓
22L0155	LDW22-SC764M	22L0155-22					✓	✓				✓
22L0155	LDW22-SC764N	22L0155-23					✓	✓				✓
22L0155	LDW22-IT805	22L0155-24	✓				✓	✓				✓
22L0155	LDW22-SC755C	22L0155-25					✓	✓				✓
22L0155	LDW22-SC755D	22L0155-26					✓	✓				✓
22L0155	LDW22-SC755E	22L0155-27					✓	✓				✓
22L0155	LDW22-SC755F	22L0155-28					✓	✓				✓
22L0155	LDW22-SC755G	22L0155-29					✓	✓				✓
22L0155	LDW22-SC755H	22L0155-30					✓	✓				✓
22L0155	LDW22-SC755H-FD	22L0155-31					✓	✓				✓
22L0155	LDW22-SC755I	22L0155-32					✓	✓				✓
22L0155	LDW22-SC755J	22L0155-33					✓	✓				✓
22L0155	LDW22-SC753A	22L0155-34					✓	✓				✓
22L0155	LDW22-SC753B	22L0155-35					✓	✓				✓
22L0155	LDW22-SC753C	22L0155-36					✓	✓				✓
22L0155	LDW22-SC753C-FD	22L0155-37					✓	✓				✓
22L0155	LDW22-SC753D	22L0155-38					✓	✓				✓
22L0155	LDW22-SC753E	22L0155-39					✓	✓				✓
22L0155	LDW22-SC753F	22L0155-40					✓	✓				✓
22L0155	LDW22-SC753G	22L0155-41					✓	✓				✓
22L0155	LDW22-SC753H	22L0155-42					✓	✓				✓

Sample Index
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Dioxins 1613B	cPAH	PAH	SVOC (Short List)	PCB	TOC	Mercury	Lead	Arsenic	Total Solids
22L0155	LDW22-SC753I	22L0155-43					✓	✓				✓
22L0155	LDW22-SC753J	22L0155-44					✓	✓				✓
22L0155	LDW22-SC753K	22L0155-45					✓	✓				✓
22L0155	LDW22-SC751D	22L0155-46					✓	✓				✓
22L0155	LDW22-SC751E	22L0155-47					✓	✓				✓
22L0155	LDW22-SC751F	22L0155-48					✓	✓				✓
22L0155	LDW22-SC751G	22L0155-49					✓	✓				✓
22L0155	LDW22-SC751H	22L0155-50					✓	✓				✓
22L0155	LDW22-SC751I	22L0155-51					✓	✓				✓
22L0155	LDW22-SC751J	22L0155-52					✓	✓				✓
22L0155	LDW22-SC751K	22L0155-53					✓	✓				✓
22L0155	LDW22-SC751E-FD	22L0155-54					✓	✓				✓
22L0155	LDW22-SC801	22L0155-55					✓	✓				✓
22L0155	LDW22-SC803	22L0155-56				✓	✓	✓				✓
22L0155	LDW22-SC760A	22L0155-57					✓	✓				✓
22L0155	LDW22-SC760B	22L0155-58					✓	✓				✓
22L0155	LDW22-SC760C	22L0155-59					✓	✓				✓
22L0155	LDW22-SC760D	22L0155-60					✓	✓				✓
22L0155	LDW22-SC760E	22L0155-61					✓	✓				✓
22L0155	LDW22-SC760F	22L0155-62					✓	✓				✓
22L0155	LDW22-SC760G	22L0155-63					✓	✓				✓
22L0155	LDW22-SC760H	22L0155-64					✓	✓				✓
22L0156	LDW22-SS797	22L0156-01					✓	✓				✓
22L0156	LDW22-IT797	22L0156-02					✓	✓				✓
22L0156	LDW22-SS812	22L0156-03					✓	✓	✓			✓
22L0156	LDW22-SS794	22L0156-04					✓	✓				✓
22L0156	LDW22-IT794	22L0156-05					✓	✓				✓
22L0199	LDW22-SC762A	22L0199-01					✓	✓				✓
22L0199	LDW22-SC762B	22L0199-02					✓	✓				✓
22L0199	LDW22-SC762C	22L0199-03					✓	✓				✓
22L0199	LDW22-SC762D	22L0199-04					✓	✓				✓
22L0199	LDW22-SC762E	22L0199-05					✓	✓				✓

Sample Index
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Dioxins 1613B	cPAH	PAH	SVOC (Short List)	PCB	TOC	Mercury	Lead	Arsenic	Total Solids
22L0199	LDW22-SC762F	22L0199-06					✓	✓				✓
22L0199	LDW22-SC762G	22L0199-07					✓	✓				✓
22L0199	LDW22-SC762H	22L0199-08					✓	✓				✓
22L0199	LDW22-SC762I	22L0199-09					✓	✓				✓
22L0199	LDW22-SC762J	22L0199-10					✓	✓				✓
22L0199	LDW22-IT789F	22L0199-11					✓	✓			✓	✓
22L0199	LDW22-IT789G	22L0199-12					✓	✓			✓	✓
22L0199	LDW22-IT789H	22L0199-13					✓	✓			✓	✓
22L0199	LDW22-IT789I	22L0199-14					✓	✓			✓	✓
22L0199	LDW22-IT789I-FD	22L0199-15					✓	✓			✓	✓
22L0199	LDW22-IT789J	22L0199-16					✓	✓			✓	✓
22L0199	LDW22-IT789K	22L0199-17					✓	✓			✓	✓
22L0199	LDW22-IT789L	22L0199-18					✓	✓			✓	✓
22L0199	LDW22-IT790I	22L0199-19					✓	✓			✓	✓
22L0199	LDW22-IT790J	22L0199-20					✓	✓			✓	✓
22L0199	LDW22-IT790K	22L0199-21					✓	✓			✓	✓
22L0199	LDW22-IT790L	22L0199-22					✓	✓			✓	✓
22L0199	LDW22-IT790M	22L0199-23					✓	✓			✓	✓
22L0199	LDW22-SC802A	22L0199-24					✓	✓				✓
22L0199	LDW22-SC802B	22L0199-25					✓	✓				✓
22L0199	LDW22-SC802C	22L0199-26					✓	✓				✓
22L0199	LDW22-SC802D	22L0199-27					✓	✓				✓
22L0199	LDW22-SC802E	22L0199-28					✓	✓				✓
22L0199	LDW22-SC802F	22L0199-29					✓	✓				✓
22L0199	LDW22-SC802G	22L0199-30					✓	✓				✓
22L0199	LDW22-SC802H	22L0199-31					✓	✓				✓
22L0199	LDW22-SC802I	22L0199-32					✓	✓				✓
22L0199	LDW22-SC802J	22L0199-33					✓	✓				✓
22L0199	LDW22-SC802K	22L0199-34					✓	✓				✓
22L0199	LDW22-SC802C-FD	22L0199-35					✓	✓				✓
22L0199	LDW22-SC787A	22L0199-36					✓	✓			✓	✓
22L0199	LDW22-SC787B	22L0199-37					✓	✓			✓	✓

Sample Index
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Dioxins 1613B	cPAH	PAH	SVOC (Short List)	PCB	TOC	Mercury	Lead	Arsenic	Total Solids
22L0199	LDW22-SC787C	22L0199-38					✓	✓			✓	✓
22L0199	LDW22-SC787D	22L0199-39					✓	✓			✓	✓
22L0199	LDW22-SC787E	22L0199-40					✓	✓			✓	✓
22L0199	LDW22-SC787F	22L0199-41					✓	✓			✓	✓
22L0199	LDW22-SC787G	22L0199-42					✓	✓			✓	✓
22L0199	LDW22-SC787H	22L0199-43					✓	✓			✓	✓
22L0199	LDW22-SC787I	22L0199-44					✓	✓			✓	✓
22L0199	LDW22-SC787J	22L0199-45					✓	✓			✓	✓
22L0199	LDW22-SC787K	22L0199-46					✓	✓			✓	✓
22L0199	LDW22-SC787L	22L0199-47					✓	✓			✓	✓
22L0199	LDW22-SC761A	22L0199-48					✓	✓				✓
22L0199	LDW22-SC761B	22L0199-49					✓	✓				✓
22L0199	LDW22-SC761C	22L0199-50					✓	✓				✓
22L0199	LDW22-SC761D	22L0199-51					✓	✓				✓
22L0199	LDW22-SC761D-FD	22L0199-52					✓	✓				✓
22L0199	LDW22-SC761E	22L0199-53					✓	✓				✓
22L0199	LDW22-SC761F	22L0199-54					✓	✓				✓
22L0199	LDW22-SC761G	22L0199-55					✓	✓				✓
22L0199	LDW22-SC761H	22L0199-56					✓	✓				✓
22L0199	LDW22-SC761I	22L0199-57					✓	✓				✓
22L0199	LDW22-SC761J	22L0199-58					✓	✓				✓
22L0199	LDW22-SC761K	22L0199-59					✓	✓				✓
22L0199	LDW22-SC761L	22L0199-60					✓	✓				✓
22L0199	LDW22-SC758B	22L0199-61					✓	✓				✓
22L0199	LDW22-SC758C	22L0199-62					✓	✓				✓
22L0199	LDW22-SC758D	22L0199-63					✓	✓				✓
22L0199	LDW22-SC758E	22L0199-64					✓	✓				✓
22L0199	LDW22-SC758F	22L0199-65					✓	✓				✓
22L0199	LDW22-SC758G	22L0199-66					✓	✓				✓
22L0199	LDW22-SC758H	22L0199-67					✓	✓				✓
22L0199	LDW22-SC758I	22L0199-68					✓	✓				✓
22L0199	LDW22-SC758J	22L0199-69					✓	✓				✓

Sample Index
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Dioxins 1613B	cPAH	PAH	SVOC (Short List)	PCB	TOC	Mercury	Lead	Arsenic	Total Solids
22L0199	LDW22-SC758K	22L0199-70					✓	✓				✓
22L0246	LDW22-SC778B	22L0246-01					✓	✓				✓
22L0246	LDW22-SC778C	22L0246-02					✓	✓				✓
22L0246	LDW22-SC778C-FD	22L0246-03					✓	✓				✓
22L0246	LDW22-SC778D	22L0246-04					✓	✓				✓
22L0246	LDW22-SC778E	22L0246-05					✓	✓				✓
22L0246	LDW22-SC778F	22L0246-06					✓	✓				✓
22L0246	LDW22-IT810A	22L0246-07	✓				✓	✓				✓
22L0246	LDW22-IT810B	22L0246-08	✓			✓	✓	✓				✓
22L0246	LDW22-IT810C	22L0246-09	✓			✓	✓	✓				✓
22L0246	LDW22-IT810B-FD	22L0246-10	✓			✓	✓	✓				✓
22L0246	LDW22-IT810D	22L0246-11	✓			✓	✓	✓				✓
22L0246	LDW22-IT810E	22L0246-12	✓			✓	✓	✓				✓
22L0246	LDW22-IT810F	22L0246-13	✓			✓	✓	✓				✓
22L0246	LDW22-IT810G	22L0246-14	✓			✓	✓	✓				✓
22L0246	LDW22-SC779A	22L0246-15					✓	✓				✓
22L0246	LDW22-SC779B	22L0246-16					✓	✓				✓
22L0246	LDW22-SC779C	22L0246-17					✓	✓				✓
22L0246	LDW22-SC779D	22L0246-18					✓	✓				✓
22L0246	LDW22-SC779D-FD	22L0246-19					✓	✓				✓
22L0246	LDW22-SC779E	22L0246-20					✓	✓				✓
22L0246	LDW22-SC779F	22L0246-21					✓	✓				✓
22L0246	LDW22-SC779G	22L0246-22					✓	✓				✓
22L0246	LDW22-SC779H	22L0246-23					✓	✓				✓
22L0246	LDW22-SC779I	22L0246-24					✓	✓				✓
22L0246	LDW22-SC779J	22L0246-25					✓	✓				✓
22L0246	LDW22-SC777A	22L0246-26					✓	✓				✓
22L0246	LDW22-SC777B	22L0246-27					✓	✓				✓
22L0246	LDW22-SC777C	22L0246-28					✓	✓				✓
22L0246	LDW22-SC777D	22L0246-29					✓	✓				✓
22L0246	LDW22-SC777E	22L0246-30					✓	✓				✓
22L0246	LDW22-SC777F	22L0246-31					✓	✓				✓

Sample Index
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Dioxins 1613B	cPAH	PAH	SVOC (Short List)	PCB	TOC	Mercury	Lead	Arsenic	Total Solids
22L0246	LDW22-SC777G	22L0246-32					✓	✓				✓
22L0246	LDW22-SC777H	22L0246-33					✓	✓				✓
22L0246	LDW22-SC777I	22L0246-34					✓	✓				✓
22L0246	LDW22-SC759C	22L0246-35					✓	✓				✓
22L0246	LDW22-SC759D	22L0246-36					✓	✓				✓
22L0246	LDW22-SC759E	22L0246-37					✓	✓				✓
22L0246	LDW22-SC759F	22L0246-38					✓	✓				✓
22L0246	LDW22-SC759G	22L0246-39					✓	✓				✓
22L0246	LDW22-SC759H	22L0246-40					✓	✓				✓
22L0246	LDW22-SC759B	22L0246-41					✓	✓				✓
22L0246	LDW22-IT809A	22L0246-42	✓				✓	✓				✓
22L0246	LDW22-IT809B	22L0246-43	✓			✓	✓	✓				✓
22L0246	LDW22-IT809C	22L0246-44	✓			✓	✓	✓				✓
22L0246	LDW22-IT809D	22L0246-45	✓			✓	✓	✓				✓
22L0246	LDW22-IT809E	22L0246-46	✓			✓	✓	✓				✓
22L0246	LDW22-IT809F	22L0246-47	✓			✓	✓	✓				✓
22L0246	LDW22-IT809G	22L0246-48	✓			✓	✓	✓				✓
22L0307	LDW22-IT793A	22L0307-01					✓	✓				✓
22L0307	LDW22-IT793B	22L0307-02					✓	✓				✓
22L0307	LDW22-IT793C	22L0307-03					✓	✓				✓
22L0307	LDW22-IT793D	22L0307-04					✓	✓				✓
22L0307	LDW22-IT793D-FD	22L0307-05					✓	✓				✓
22L0307	LDW22-IT793E	22L0307-06					✓	✓				✓
22L0307	LDW22-IT793F	22L0307-07					✓	✓				✓
22L0307	LDW22-IT795B	22L0307-08					✓	✓				✓
22L0307	LDW22-IT795C	22L0307-09					✓	✓				✓
22L0307	LDW22-IT795C-FD	22L0307-10					✓	✓				✓
22L0307	LDW22-IT795D	22L0307-11					✓	✓				✓
22L0307	LDW22-IT795E	22L0307-12					✓	✓				✓
22L0307	LDW22-IT795F	22L0307-13					✓	✓				✓
22L0307	LDW22-IT795G	22L0307-14					✓	✓				✓
22L0307	LDW22-IT806A	22L0307-15					✓	✓				✓

Sample Index
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Dioxins 1613B	cPAH	PAH	SVOC (Short List)	PCB	TOC	Mercury	Lead	Arsenic	Total Solids
22L0307	LDW22-IT806B	22L0307-16					✓	✓				✓
22L0307	LDW22-IT806C	22L0307-17					✓	✓				✓
22L0307	LDW22-IT806D	22L0307-18					✓	✓				✓
22L0307	LDW22-IT806E	22L0307-19					✓	✓				✓
22L0307	LDW22-IT806F	22L0307-20					✓	✓				✓
22L0307	LDW22-SC750A	22L0307-21					✓	✓				✓
22L0307	LDW22-SC750B	22L0307-22					✓	✓				✓
22L0307	LDW22-SC750C	22L0307-23					✓	✓				✓
22L0307	LDW22-SC750D	22L0307-24					✓	✓				✓
22L0307	LDW22-SC750E	22L0307-25					✓	✓				✓
22L0307	LDW22-SC750F	22L0307-26					✓	✓				✓
22L0307	LDW22-SC750G	22L0307-27					✓	✓				✓
22L0307	LDW22-SC750H	22L0307-28					✓	✓				✓
22L0307	LDW22-IT808A	22L0307-29	✓				✓	✓				✓
22L0307	LDW22-IT808B	22L0307-30	✓				✓	✓				✓
22L0307	LDW22-IT808C	22L0307-31	✓				✓	✓				✓
22L0307	LDW22-IT808D	22L0307-32	✓				✓	✓				✓
22L0307	LDW22-IT808E	22L0307-33	✓				✓	✓				✓
22L0307	LDW22-IT808F	22L0307-34	✓				✓	✓				✓
22L0307	LDW22-SC804B	22L0307-35				✓	✓	✓				✓
22L0307	LDW22-SC804C	22L0307-36				✓	✓	✓				✓
22L0307	LDW22-SC804D	22L0307-37				✓	✓	✓				✓
22L0307	LDW22-SC804E	22L0307-38				✓	✓	✓				✓
22L0307	LDW22-SC804F	22L0307-39				✓	✓	✓				✓
22L0307	LDW22-SC804F-FD	22L0307-40				✓	✓	✓				✓
22L0307	LDW22-SC804G	22L0307-41				✓	✓	✓				✓
22L0307	LDW22-SC804H	22L0307-42				✓	✓	✓				✓
22L0307	LDW22-SC752A	22L0307-43					✓	✓				✓
22L0307	LDW22-SC752B	22L0307-44					✓	✓				✓
22L0307	LDW22-SC752C	22L0307-45					✓	✓				✓
22L0307	LDW22-SC752D	22L0307-46					✓	✓				✓
22L0307	LDW22-SC752E	22L0307-47					✓	✓				✓

Sample Index
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Dioxins 1613B	cPAH	PAH	SVOC (Short List)	PCB	TOC	Mercury	Lead	Arsenic	Total Solids
22L0307	LDW22-SC752F	22L0307-48					✓	✓				✓
22L0307	LDW22-SC752G	22L0307-49					✓	✓				✓
22L0307	LDW22-SC752H	22L0307-50					✓	✓				✓
22L0307	LDW22-SC752B-FD	22L0307-51					✓	✓				✓
22L0307	LDW22-SC800A	22L0307-52					✓	✓				✓
22L0307	LDW22-SC800B	22L0307-53					✓	✓				✓
22L0307	LDW22-SC800C	22L0307-54					✓	✓				✓
22L0307	LDW22-SC800D	22L0307-55					✓	✓				✓
22L0307	LDW22-SC800E	22L0307-56					✓	✓				✓
22L0307	LDW22-SC800F	22L0307-57					✓	✓				✓
22L0307	LDW22-SC800G	22L0307-58					✓	✓				✓
22L0307	LDW22-SC800H	22L0307-59					✓	✓				✓
22L0307	LDW22-SC783B	22L0307-60					✓	✓				✓
22L0307	LDW22-SC783C	22L0307-61					✓	✓				✓
22L0307	LDW22-SC783D	22L0307-62					✓	✓				✓
22L0307	LDW22-SC783E	22L0307-63					✓	✓				✓
22L0307	LDW22-SC783F	22L0307-64					✓	✓				✓
22L0307	LDW22-SC783G	22L0307-65					✓	✓				✓
22L0307	LDW22-SC783H	22L0307-66					✓	✓				✓
22L0329	LDW22-IT799A	22L0329-01					✓	✓				✓
22L0329	LDW22-IT799B	22L0329-02					✓	✓				✓
22L0329	LDW22-IT799C	22L0329-03					✓	✓				✓
22L0329	LDW22-IT799D	22L0329-04					✓	✓				✓
22L0329	LDW22-IT799E	22L0329-05					✓	✓				✓
22L0329	LDW22-IT799F	22L0329-06					✓	✓				✓
22L0329	LDW22-SC788B	22L0329-07					✓	✓			✓	✓
22L0329	LDW22-SC788C	22L0329-08					✓	✓			✓	✓
22L0329	LDW22-SC788D	22L0329-09					✓	✓			✓	✓
22L0329	LDW22-SC788E	22L0329-10					✓	✓			✓	✓
22L0329	LDW22-SC788E-FD	22L0329-11					✓	✓			✓	✓
22L0329	LDW22-SC788F	22L0329-12					✓	✓			✓	✓
22L0329	LDW22-SC788G	22L0329-13					✓	✓			✓	✓

Sample Index
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Dioxins 1613B	cPAH	PAH	SVOC (Short List)	PCB	TOC	Mercury	Lead	Arsenic	Total Solids
22L0329	LDW22-SC788H	22L0329-14					✓	✓			✓	✓
22L0329	LDW22-IT791A	22L0329-15					✓	✓				✓
22L0329	LDW22-IT791B	22L0329-16					✓	✓				✓
22L0329	LDW22-IT791C	22L0329-17					✓	✓				✓
22L0329	LDW22-IT791D	22L0329-18					✓	✓				✓
22L0329	LDW22-IT791E	22L0329-19					✓	✓				✓
22L0329	LDW22-IT791F	22L0329-20					✓	✓				✓
22L0329	LDW22-IT791G	22L0329-21					✓	✓				✓
22L0329	LDW22-SC781B	22L0329-22					✓	✓				✓
22L0329	LDW22-SC781C	22L0329-23					✓	✓				✓
22L0329	LDW22-SC781D	22L0329-24					✓	✓				✓
22L0329	LDW22-SC781E	22L0329-25					✓	✓				✓
22L0329	LDW22-SC781F	22L0329-26					✓	✓				✓
22L0329	LDW22-SC781G	22L0329-27					✓	✓				✓
22L0329	LDW22-SC781H	22L0329-28					✓	✓				✓
22L0329	LDW22-SC765B	22L0329-29					✓	✓				✓
22L0329	LDW22-SC765C	22L0329-30					✓	✓				✓
22L0329	LDW22-SC765D	22L0329-31					✓	✓				✓
22L0329	LDW22-SC765E	22L0329-32					✓	✓				✓
22L0329	LDW22-SC757A	22L0329-33					✓	✓				✓
22L0329	LDW22-SC757B	22L0329-34					✓	✓				✓
22L0329	LDW22-SC757C	22L0329-35					✓	✓				✓
22L0329	LDW22-SC757D	22L0329-36					✓	✓				✓
22L0329	LDW22-SC757E	22L0329-37					✓	✓				✓
22L0329	LDW22-SC757F	22L0329-38					✓	✓				✓
22L0329	LDW22-SC757G	22L0329-39					✓	✓				✓
22L0329	LDW22-SC757H	22L0329-40					✓	✓				✓
22L0329	LDW22-SC754A	22L0329-41					✓	✓				✓
22L0329	LDW22-SC754B	22L0329-42					✓	✓				✓
22L0329	LDW22-SC754C	22L0329-43					✓	✓				✓
22L0329	LDW22-SC754D	22L0329-44					✓	✓				✓
22L0329	LDW22-SC754E	22L0329-45					✓	✓				✓

Sample Index
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Dioxins 1613B	cPAH	PAH	SVOC (Short List)	PCB	TOC	Mercury	Lead	Arsenic	Total Solids
22L0329	LDW22-SC754F	22L0329-46					✓	✓				✓
22L0329	LDW22-SC754G	22L0329-47					✓	✓				✓
22L0329	LDW22-SC754H	22L0329-48					✓	✓				✓
22L0473	LDW22-IT814B	22L0473-01					✓	✓				✓
22L0473	LDW22-IT814C	22L0473-02					✓	✓				✓
22L0473	LDW22-IT814D	22L0473-03					✓	✓				✓
22L0473	LDW22-SC767A	22L0473-04					✓	✓				✓
22L0473	LDW22-SC767B	22L0473-05			✓		✓	✓	✓			✓
22L0473	LDW22-SC767C	22L0473-06			✓		✓	✓	✓			✓
22L0473	LDW22-SC767D	22L0473-07			✓		✓	✓	✓			✓
22L0473	LDW22-SC767E	22L0473-08			✓		✓	✓	✓			✓
22L0473	LDW22-SC767F	22L0473-09			✓		✓	✓	✓			✓
22L0473	LDW21-IT699AX	22L0473-10					✓	✓				✓
22L0473	LDW21-IT632A	22L0473-11	✓				✓	✓				✓

DATA VALIDATION REPORT
LDW AOC4 Phase 3
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 Analytical Resources, Inc. (ARI), Tukwila, Washington. Refer to the **Sample Index** for a complete list of samples.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
22L0155	1 Sediment	EPA Stage 2B
22L0246	15 Sediment	EPA Stage 4
22L0307	6 Sediment	EPA Stage 2B
22L0473	1 Sediment	EPA Stage 2B

DATA PACKAGE COMPLETENESS

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

SDG 22L0246: The labeled compound recovery outliers were not documented in the laboratory case narrative. Qualifiers for outliers were applied as described in the **Labeled Compound Recovery** section. A revised PDF was not requested.

SDG 22L0307: The laboratory report was missing the case narrative. The laboratory was contacted and submitted a revised report with the missing information.

EDD TO HARDCOPY VERIFICATION

All sample IDs reported in the electronic data deliverable (EDD) were verified (100%) by comparing the EDD to the hardcopy laboratory data package. Sample results and laboratory quality control sample results were also verified (10%).

TECHNICAL DATA VALIDATION

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

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

✓ *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, and Holding Times

The validation guidance documents state that the cooler temperatures should be within an advisory temperature range of 2° to 6°C. With the following exception noted below, the laboratory received the sample coolers within the advisory temperature range.

SDG 22L0473: The sample was pulled from frozen archive (original SDG 21G0223). The sample was extracted past the 365-day holding time at 546 days; all sample results were estimated (J-1).

Calibration Verification

SDG 22L0246: For the calibration verification (CV) standards associated with samples analyzed on 3/8/23, outliers were noted as presented in the table below. Results associated with the native compound outlier were estimated (J-5BH) to indicate a potential high bias. Qualifiers are not assigned to labeled compounds.

CALIBRATION STANDARD	COMPOUND	BIAS	QUALIFIER
SLC0101-ICV1	1,2,3,7,8,9-HxCDD	high	J-5BH
	13C12-1,2,3,4,6,7,8-HpCDF	high	None, labeled compound
SLC0101-CCV1	13C12-1,2,3,7,8-PeCDF	high	None, labeled compound
	13C12-2,3,4,7,8-PeCDF	high	None, labeled compound

Laboratory Blanks

Method blanks were analyzed at the appropriate frequency. 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 ion abundance identification criteria. These values are "estimated maximum possible concentrations". When these occurred in the method blank and were less than the reporting limit (RL), the results were considered as false positives, and no action levels were established for these analytes. EMPC values greater than the RL in the method blank were considered positive results, and action levels were established.

SDG 22L0155: There was a positive result for OCDD in the method blank. All associated sample results were greater than the 5x action level; no data were qualified.

SDG 22L0246: There was a positive result for OCDD in the method blank. All associated sample results less than the 5x action levels were qualified as not detected (U-7).

SDG 22L0307: There were positive results for OCDD, OCDF, and 1,2,3,6,7,8-HxCDF. All associated sample results less than the 5x action levels were qualified as not detected (U-7).

SDG 22L0473: There were positive results for OCDD, OCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDD, and 1,2,3,7,8,9-HxCDD. All associated sample results were greater than the 5x action levels; no data were qualified.

Field Blanks

No field blanks were submitted.

Labeled Compound Recovery

SDG 22L0246: For Sample LDW22-IT809C, the percent recovery (%R) values for several labeled compounds were less than the lower control limits. Associated results were estimated (J/UJ-13L).

Matrix Spike/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate (MS/MSD) analyses are not required for this method. Accuracy was assessed using labeled compound recoveries and laboratory control samples. Precision was evaluated using the laboratory and field duplicate analyses.

Laboratory Duplicates

One sample from each laboratory batch was extracted and analyzed in duplicate. The relative percent difference (RPD) control limit is 25% for results greater than five times the RL. For results less than 5x the RL, the control limit for the difference between the sample and duplicate is 2x the RL. With the exceptions noted below, RPD and difference values were within the acceptance criteria.

SDG 22L0246: Sample LDW22-IT810A was analyzed as the laboratory duplicate sample. The RPD values for 1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, OCDD, OCDF, Total HpCDD and Total HpCDF were greater than the control limit; the associated parent and laboratory duplicate results were estimated (J-9).

SDG 22L0307: Sample LDW22-IT808A was analyzed as the laboratory duplicate sample. The RPD values for OCDD and OCDF were greater than the control limit; the associated parent and laboratory duplicate results were estimated (J-9).

SDG 22L0473: Batch QC was performed using a sample from another SDG. As per the case narrative, there were RPD outliers for several analytes. The parent sample was not in this SDG; no qualifiers were assigned.

Standard Reference Material

The Puget Sound Reference Material was analyzed with each batch. All recoveries were within the advisory limits of 50% – 150%.

Field Duplicates

For sediment samples, the RPD control limit is 50% 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 22L0246: Samples LDW22-IT810B and LDW22-IT810B-FD were submitted as field duplicates. The RPD values for 1,2,3,4,7,8-HxCDF and OCDD were greater than the control limit, at 101% and 52% respectively.

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 uses an RTX-Dioxin2 column which adequately separates 2,3,7,8-TCDF from TCDF isomers.

The laboratory reported EMPC, or "estimated maximum possible concentrations", when a peak was detected but did not meet the ion abundance identification criteria as required by the method. Native EMPC values less than the RL were qualified as not detected (U-25) as per project guidelines. Native EMPC values greater than the RL and homolog group EMPC values were estimated (J-25).

The laboratory assigned "X" flags to several of the reported results to indicate that diphenyl ether interference was present, which may result in a high bias to the reported result. All results that were X- flagged by the laboratory were estimated (J-23H).

Reported Results

SDG 22L0246: Samples LDW22-IT809C and LDW-IT809D were initially analyzed on 2/2/23. The estimated detection limits (EDL) for these samples were greater than the reporting limits. The laboratory reanalyzed the samples on 3/8/23, resulting in EDLs that were less than the reporting limits. The results from the re-analyses should be used; results from the initial analyses were qualified as do-not-report (DNR-11).

Calculation Verification

SDG 22L0246: Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

OVERALL ASSESSMENT

As 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 OPR recoveries and precision was acceptable as indicated by the laboratory and field duplicate RPD values.

Reporting limits were elevated due to method blank contamination. EMPC values that were less than the RL were also flagged as not detected at an elevated reporting limit. EMPC values greater than the reporting limit were estimated. Data were also estimated due to exceeded holding times, calibration verification outliers, labeled compound recovery outliers, laboratory duplicate precision outliers, and matrix interferences.

Data were flagged as do-not-report (DNR) to indicate which results should not be used from multiple reported analyses.

Data qualified DNR should not be used. All other data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
LDW AOC4 Phase 3
Semi-Volatile Organic Compounds by EPA SW8270E

This report documents the review of analytical data from the analysis 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	VALIDATION LEVEL
22L0104	2 Sediment	EPA Stage 2B
22L0136	6 Sediment	EPA Stage 4
22L0246	13 Sediment	EPA Stage 4
22L0155	1 Sediment	EPA Stage 2B
22L0307	8 Sediment	EPA Stage 2B

DATA PACKAGE COMPLETENESS

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

SDG 22L0136: Bis(2-ethylhexyl) phthalate was missing from the Certified Reference Material (CRM) summary form. The laboratory submitted a revised PDF and EDD.

EDD TO HARDCOPY VERIFICATION

All sample IDs reported in the electronic data deliverable (EDD) were verified (100%) by comparing the EDD to the hardcopy laboratory data package. Sample results and laboratory quality control sample results were also verified (10%).

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)	1	Internal Standards
2	Continuing Calibration (CCAL)	2	Certified Reference Material
1	Laboratory Blanks	✓	Reporting Limits
1	Field Blanks	✓	Reported Results
✓	Surrogate Compounds	✓	Compound Identification
1	Laboratory Control Samples (LCS/LCSD)	1	Calculation Verification
1	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 $\leq 6^{\circ}\text{C}$.

SDG 22L0136: The laboratory received several sample coolers at temperatures greater than the upper control limit ranging from 9.6°C to 9.9°C . Samples were in the coolers for less than an hour, an insufficient amount of time to cool to $\leq 6^{\circ}\text{C}$. These outliers did not impact data quality and no results were qualified.

Continuing Calibration

A continuing calibration verification (CCAL) standard was analyzed at the required frequency. Relative response factors (RRF) were acceptable. With the noted exceptions, the percent difference (%D) values were within the required control limits. 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 were noted:

SDG	CCAL DATE	COMPOUND	POTENTIAL BIAS	ACTION
22L0307	1/6/23	Butyl benzyl phthalate	High	J-5BH
22L0246	1/6/23 @ 12:05	Butyl benzyl phthalate	High	None - Samples ND
22L0246	1/6/23 @ 22:27	Butyl benzyl phthalate	High	None - Samples ND

Laboratory Blanks

A method blank was analyzed at the required frequency of one per batch of 20 or fewer samples. Action levels were established at five times (5x) the concentration reported in the field 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.

SDG 22L0136: Bis(2-ethylhexyl) phthalate was detected in Blank BKL0193. Results for this analyte in the associated sample was greater than the action limit; no qualification was required.

Field Blanks

No field blanks were submitted.

Laboratory Control Samples

Laboratory control samples (LCS) were analyzed at the required frequency of one per batch of 20 or fewer samples. With the following exception, all spike recoveries were within the laboratory control limits.

SDG 22L0307: The percent recovery value (%R) for butyl benzyl phthalate was greater than the upper control limit in the LCSD sample, but was in control in the associated LCS sample; no data were qualified for a single outlier.

SDG 22L0246: For Batch BKL0585, the %R value for butyl benzyl phthalate was greater than the upper control limit in the LCSD sample, but was in control in the associated LCS sample; no data were qualified for a single outlier.

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 %R values are outside the control limits for MS/MSD %R outliers. MS/MSD %R values are not evaluated when the parent concentration is greater than 4x the spike concentration. 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-8). Only the associated positive results are estimated (J-8) if the %R values indicate a potential high bias. Associated positive results are estimated (J-9) if the RPD values indicate uncertainty.

SDG 22L0246: The MS/MSD analyses were performed using Sample LDW22-IT809D. The MS/MSD %R values for butyl benzyl phthalate were greater than the upper control limit; however, butylbenzyl phthalate was not detected in the parent sample. No data were qualified.

Field Duplicates

For sediment samples, the QAPP RPD control limit is 50% 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 22L0136: Samples LDW22-SS771 and LDW22-SS771-FD were submitted as field duplicates. These samples were analyzed for 4-methylphenol. Field precision was acceptable.

SDG 22L0307: Samples LDW22-SC804F and LDW22-SC804F-FD were submitted as field duplicates. These samples were analyzed for butyl benzyl phthalate. Field precision was acceptable.

SDG 22L0246: Samples LDW22-IT810B and LDW22-IT810B-FD were submitted as field duplicates. These samples were analyzed for butyl benzyl phthalate. Field precision was acceptable.

Internal Standards

Internal standards were added to all samples and laboratory QC samples. With the noted exception, all internal standard areas were within 50 – 200% of the initial calibration midpoint standard areas.

SDG 22L0136: Internal standard di-n-octylphthalate-d4 was less than the lower control limit in the method blank. No qualifiers are assigned to laboratory QC samples.

Certified Reference Material

Certified reference material (CRM), CRM143 (Sandy Loam) was analyzed with these analytical data sets. All acceptance criteria were met.

SDG 22L0307: The %R value for butyl benzyl phthalate was greater than the upper control limit; positive results in the associated samples were estimated (J-12H).

SDG 22L0246: For Batch BKL0585, the %R value for butyl benzyl phthalate was greater than the upper control limit; however, butylbenzyl phthalate was not detected in the associated samples. No data were qualified.

Calculation Verification

SDG 22L0136: Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

SDG 22L0246: 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 exception noted previously, accuracy was acceptable as demonstrated by the surrogate, LCS/LCSD, MS/MSD and CRM recovery values. Precision was acceptable as demonstrated by the RPD values for the LCS/LCSD, MS/MSD and field duplicate analyses.

Results were estimated due to CCAL %D outliers and CRM accuracy outliers.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
LDW AOC4 Phase 3
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAH)
Polycyclic Aromatic Hydrocarbons (PAH)
by EPA SW8270E-SIM

This report documents the review of analytical data from the analysis 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	ANALYTES	NUMBER OF SAMPLES	VALIDATION LEVEL
22L0136	cPAH	2 Sediment	EPA Stage 2B
	PAH	1 Sediment	
22L0155	PAH	13 Sediment	EPA Stage 4
22L0473	PAH	5 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 reported in the electronic data deliverable (EDD) were verified (100%) by comparing the EDD to the hardcopy laboratory data package. Sample results and laboratory quality control sample results were also verified (10%).

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
✓	Continuing Calibration (CCAL)	1	Certified Reference Material
2	Laboratory Blanks	✓	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 $\leq 6^{\circ}\text{C}$.

SDG 22L0136: The laboratory received several sample coolers at temperatures greater than the upper control limit ranging from 9.6°C to 9.9°C . Samples were in the coolers for less than an hour, an insufficient amount of time to cool to $\leq 6^{\circ}\text{C}$. These outliers did not impact data quality and no results were qualified.

SDG 22L0473: Samples in this analytical data set are archived samples stored frozen from the following SDG:

CLIENT ID	ARI ORIGINAL SDG	ARI SAMPLE #
LDW22-SC767B	22L0254	18
LDW22-SC767C		19
LDW22-SC767D		20
LDW22-SC767E		21
LDW22-SC767F		22

Laboratory Blanks

A method blank was analyzed at the required frequency of one per batch of 20 or fewer samples. Action levels were established at five times (5x) the concentration reported in the field 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.

SDG 22L0136: For method blank BKL0196, 2-methylnaphthalene, fluorene, pyrene, phenanthrene, acenaphthene, and fluoranthene were detected. Results in the associated samples were greater than the action levels; no qualifiers were assigned.

SDG 22L0473: For method blank BKL0610, 2-methylnaphthalene, naphthalene, fluorene, pyrene, phenanthrene, acenaphthene, and fluoranthene were detected. Results in the associated samples that were less than the 5x action levels were qualified as not detected (U-7).

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. MS/MSD %R values are not evaluated when the parent concentration is greater than 4x the spike concentration. Precision is evaluated using the relative percent difference (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 22L0136: The MS/MSD analyses were performed using Sample LDW22-SS818. The MS/MSD %R values for benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were less than the lower control limits; the associated parent sample results were estimated (J-8L).

SDG 22L0155: The MS/MSD analyses were performed using Sample LDW22-SC768D. The MSD %R value for indeno(1,2,3-cd)pyrene was less than the lower control limit, but was in control in the associated MS sample; no data were qualified for a single outlier. The MS/MSD %R values for benzo(b)fluoranthene were less than the lower control limits; the associated parent sample result was estimated (J-8L).

SDG 22L0473: The MS/MSD analyses were performed using Sample LDW22-SC767C. The MSD %R values for benzo(b)fluoranthene and indeno(1,2,3-cd)pyrene were less than the lower control limits, but were in control in the associated MS sample; no data were qualified for single outliers.

Field Duplicates

For sediment samples, the RPD control limit is 50% 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 22L0155: Samples LDW22-SC768F and LDW22-SC768F-FD were submitted as field duplicates. Field precision was acceptable.

Certified Reference Material

Certified reference material (CRM) SQC017 (LRAC9745) was analyzed with these analytical data sets. All acceptance criteria were met.

Reported Results

SDG 22L0155: Several results in Samples LDW22-SC768H, LDW22-SC768J, LDW22-SC768K, and LDW22-SC768L were E-flagged by the laboratory to indicate that the concentration exceeded the calibration range of the instrument. These results were estimated (J-20).

Calculation Verification

SDG 22L0155: 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 noted exceptions, accuracy was acceptable as demonstrated by the surrogate, LCS/LCSD, MS/MSD, and CRM recovery values. Precision was acceptable as demonstrated by the RPD values for the LCS/LCSD, MS/MSD, and field duplicate analyses.

Reporting limits were elevated due to method blank contamination. Results were estimated due to MS/MSD accuracy outliers. Other results were estimated because of calibration range exceedances.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
LDW 2023 AOC4 Phase 3
PCB Aroclors by SW8082A

This report documents the review of analytical data from the analysis 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	VALIDATION LEVEL
22L0104	2 Sediment	EPA Stage 2B
22L0105	33 Sediment	EPA Stage 2B
22L0136	12 Sediment	EPA Stage 2B
22L0137	69 Sediment	EPA Stage 2B
22L0155	64 Sediment	EPA Stage 2B
22L0156	5 Sediment	EPA Stage 2B
22L0199	70 Sediment	EPA Stage 2B
22L0329	48 Sediment	EPA Stage 4
22L0246	48 Sediment	EPA Stage 2B
22L0307	66 Sediment	EPA Stage 2B
22L0473	11 Sediment	EPA Stage 2B

DATA PACKAGE COMPLETENESS

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

SDG 22L0137: For Batch BKL0282, MS/MSD results were missing for Aroclor 1016 in the PDF. The laboratory was contacted and submitted a revised PDF and EDD.

SDG 22L0307: For the continuing calibration verification analyzed on 1/7/23, the summary forms and raw data were missing from the PDF. The laboratory was contacted and submitted a revised PDF.

SDG 22L0473: For Sample LDW21-IT699AX, the laboratory did not H-flag results to indicate that the sample was extracted past the holding time. Results were qualified based on the holding time outliers (see **Sample Receipt, Preservation, and Holding Time** section). A revised PDF was not requested.

EDD TO HARDCOPY VERIFICATION

All sample IDs reported in the electronic data deliverable (EDD) were verified (100%) by comparing the EDD to the hardcopy laboratory data package. Sample results and laboratory quality control sample results were also verified (10%).

SDG 22L0105: For Sample LDW22-SC782B, the result for Aroclor 1254 was incorrectly P1-flagged in the EDD and on the sample summary form to indicate poor precision between column results. The EDD was corrected by the client. A corrected PDF summary form was not requested.

TECHNICAL DATA VALIDATION

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

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

✓ 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, and Holding Times

SDG 22L0137: The laboratory received several sample coolers at temperatures greater than the upper control limit ranging from 9.6°C to 9.9°C. Samples were in the coolers for less than one hour, an insufficient amount of time to cool to ≤ 6°C. These outliers did not impact data quality and no results were qualified.

SDG 22L0155: The following client identifications (ID) did not match between the container and the chains-of-custody (COC). The COC ID was used for login purposes:

CONTAINER CLIENT ID	COC CLIENT ID
LDW22-SC775H	LDW22-SC755H
LDW22-SC775H-FD	LDW22-SC755H-FD
LDW22-SC775I	LDW22-SC755I
LDW22-SC775J	LDW22-SC755J

SDG 22L0473: Samples LDW21-IT699AX and LDW21-IT632A were extracted past the one-year holding time for frozen samples at 515 and 536 days. Results were estimated (J/UJ-1).

Samples in this analytical data set are archived samples stored frozen from the following SDGs:

CLIENT ID	ARI ORIGINAL SDG	ARI SAMPLE #
LDW22-IT814B	22L0254	14
LDW22-IT814C		15
LDW22-IT814D		16
LDW22-SC767A		17
LDW22-SC767B		18
LDW22-SC767C		19
LDW22-SC767D		20
LDW22-SC767E		21
LDW22-SC767F		22
LDW21-IT699AX		21H0033
LDW21-IT632A	21G0223	16

Continuing Calibration (CCAL)

CCALs were analyzed at the appropriate frequency. With the noted exceptions, the percent drift (%D) values were within $\pm 20\%$.

SDG 22L0105: For the CCALs analyzed on 12/18/22 at 03:41 and 07:56, the %D values for Aroclor 1260 were greater than the upper control limit on column 1. The %D values on column 2 were acceptable. Results for Aroclor 1260 in the associated samples were reported from column 2; no qualifiers were assigned.

SDG 22L0137: For several CCALs, the %D values were greater than the control limit on column 1. Sample values were reported from column 2; no qualifiers were assigned.

For the CCAL analyzed on 12/21/22 at 03:36, the %D value for Aroclor 1260 on column 1 was greater than the control limit. Aroclor 1260 results were reported from this column and were estimated (J-5BH) for the following samples:

LDW22-SC769C	LDW22-SC769F
LDW22-SC769D	LDW22-SC769H
LDW22-SC769E	LDW22-SC769I

SDG 22L0155: For several CCALs, the %D values one or more Aroclors were outside the control limits on column 1. The %D values on column 2 were acceptable. Results associated with the outliers were reported from column 2; no qualifiers were assigned.

SDG 22L0199: For several CCALs, the %D values for Aroclor 1260 on column 1 were greater than the control limit indicating a potential high bias. The Aroclor 1260 %D values were acceptable on column 2. For the associated samples, positive results for Aroclor 1260 were reported from column 2. No qualifiers were assigned.

For several CCALs, the %D values for Aroclor 1016 were greater than the control limit on column 1 indicating a potential high bias. There were no positive results for Aroclor 1016 in the associated samples; no qualifiers were assigned.

For several CCALs, the %D values for DCBP surrogate were greater than the control limit. No qualifiers were assigned to surrogate compounds.

SDG 22L0246: For the CCALs analyzed on 1/4/23 at 10:05, 16:25 and 22:44, the %D values for Aroclor 1016 were greater than the control limit. Aroclor 1016 was not detected in the associated samples; no qualifiers were assigned.

For the CCALs analyzed on 1/5/23 at 11:46 and 23:17 and 1/6/23 at 09:49 and 13:40, the %D values for Aroclor 1260 were greater than the control limit on column 1. Aroclor 1260 was either not detected or reported from column 2 for the associated samples; no qualifiers were assigned.

For the CCAL analyzed on 1/6/23 at 13:19, the %D value for Aroclor 1242 was greater than the control limit. Aroclor 1242 was either not detected or reported from column 2 for the associated samples; no qualifiers were assigned.

SDG 22L0307: For several CCALs, the %D values were greater than the control limit on column 1. Sample values were reported from column 2; no qualifiers were assigned.

SDG 22L0329: For the CCAL analyzed on 1/10/23 @00:10, the %D value for Aroclor 1254 was greater than the upper control limit on column 1, indicating a potential high bias. The Aroclor 1254 result from Sample LDW22-IT799E was reported from column 1; the result was estimated (J-5BH). For all other samples associated with this CCAL, the Aroclor 1254 was either not detected or was reported from column 2; no qualifiers were required.

For two CCALs, the %D values for Aroclor 1260 on column 1 were greater than the control limit indicating a potential high bias. The Aroclor 1260 %D values were acceptable on column 2. For the associated samples, positive results for Aroclor 1260 were reported from column 2. No qualifiers were assigned.

For one CCAL, the %D value for Aroclor 1254 on column 1 was greater than the control limit indicating a potential high bias. The Aroclor 1260 %D values were acceptable on column 2. For the associated samples, positive results for Aroclor 1254 were reported from column 2. No qualifiers were assigned.

SDG 22L0473: For the CCALs analyzed on 1/5/23 at 23:17, 1/6/23 at 05:36 and 09:49, the %D values for Aroclor 1260 were greater than the control limit one of the two columns. Aroclor 1260 was not detected in the associated samples; no qualifiers were assigned.

For the CCAL analyzed on 1/10/23 at 00:10, the %D value for Aroclor 1254 was greater than the control limit on column 1. Aroclor 1254 was reported from column 2 for the associated sample; no qualifiers were assigned.

For the CCAL analyzed on 1/10/23 at 23:09, the %D value for Aroclor 1260 was greater than the control limit on column 1. Aroclor 1260 was reported from column 2 for the associated samples; no qualifiers were assigned.

Field Blanks

Field blanks were not collected with these samples.

Surrogate Compounds

Surrogate compounds tetrachloro-m-xylene (TCMX) and decachlorobiphenyl (DCBP) were added to all samples and laboratory QC samples. The samples were analyzed using dual column confirmation. Percent recovery (%R) values were reported from both columns. No qualifiers were assigned if three of the four %R values were within control limits. No qualifiers are assigned to laboratory QC samples.

SDG 22L0137: For Sample LDW22-SC784L, the %R values of DCBP were greater than the control limit on both analytical columns. There were no positive results for target compounds in this sample; no qualifiers were assigned.

SDG 22L0155: For several field and laboratory quality control samples, the %R value for DCBP on one column was greater than the control limit. All other surrogate %R values were acceptable; no qualifiers were assigned.

For Samples LDW22-SC755H-FD and LDW22-SC755J, the %R values for DCBP were greater than the control limit on both columns. There were no positive results for target compounds in these samples; no qualifiers were assigned.

For Samples LDW22-SC-768I, LDW22-SC755F, LDW22-SC751G, and LDW22-SC803, the %R values for DCBP were greater than the control limit on both columns. Positive results in these samples were estimated (J-13H).

SDG 22L0199: For several samples, the %R values for DCBP were greater than the control limit on column 1. The results on column 2 were acceptable; no qualifiers were assigned.

For several samples and laboratory QC samples, the %R values for DCBP were greater than the control limit on both columns. There were no positive results for target compounds in these samples; no qualifiers were assigned.

For the following samples, two or more surrogate %R values were greater than the upper control limit; positive results were estimated (J-13H):

LDW22-SC802H	LDW22-SC758B
LDW22-SC787I	LDW22-SC758C
LDW22-SC787J	

SDG 22L0246: For several samples, the %R values for DCBP were greater than the control limit on column 1. The results on column 2 were acceptable; no qualifiers were assigned.

For Samples LDW22-SC778B, LDW22-SC778C and LDW22-SC779E, the %R values for DCBP were greater than the control limit on both columns. Positive results were estimated (J-13H).

SDG 22L0307: For Sample LDW22-IT795B, the %R value for DCBP was greater than the control limit on column 1. The %R value on column 2 were acceptable; no qualifiers were assigned.

For Sample LDW22-SC804D, the %R values for DCBP were greater than the control limit on both columns. Positive results were estimated (J-13H).

SDG 22L0329: Due the high concentration of some target analytes, Sample LDW22-SC788G was reported at a 100X dilution. Surrogates were diluted below the detection limit, and no values were reported. No qualifiers were assigned.

Matrix Spike/Matrix Spike Duplicates (MS/MSD)

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. MS/MSD %R values are not evaluated when the parent concentration is greater than 4x the spike concentration. Precision is evaluated using the relative percent difference (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 22L0137: For Batch BKL0282, an MS/MSD was analyzed using Sample LDW22-SC769K. The %R values of Aroclor 1016 were greater than the upper control limit. Aroclor 1016 was not detected in the parent sample; no qualifiers were assigned.

SDG 22L0246: Sample LDW22-IT810G was used for the MS/MSD analyses for batch BKL0490. The %R values of Aroclor 1016 were less than the lower control limit for the MS/MSD. The Aroclor 1016 result in the parent sample was qualified (UJ-8L).

SDG 22L0307: Sample LDW22-SC783H was used for the MS/MSD analyses for batch BKL0584. The %R value of Aroclor 1260 was less than the lower control limit for the MS but within control limits for the MSD; no qualifiers were assigned for the single outlier.

Laboratory Control Samples (LCS/LCSD)

Laboratory control sample/laboratory control sample duplicates (LCS/LCSD) were analyzed at the required frequency. No action is taken for percent recovery (%R) value outliers unless both the LCS

and LCSD %R values are outside the control limits. Precision is evaluated using the relative percent difference (RPD) values calculated between the LCS and LCSD results. Any RPD values outside the control limits indicate uncertainty in the measured results for the sample. Qualifiers are assigned to all samples in an extraction batch. With the noted exceptions, all %R and RPD values were within the control limits.

SDG 22L0105: For Batch BKL0158, the RPD values for Aroclors 1016 and 1260 were greater than the control limit. Positive results for these compounds were estimated (J-9) in all samples from this batch.

SDG 22L0155: For Batch BKL0364, the %R value for Aroclor 1260 for the LCSD were greater than the upper control limit. The %R value for the LCS was acceptable. No qualifiers were assigned for the single outlier.

Field Duplicates

For sediment samples, the RPD control limit is 50% 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 22L0136: Samples LDW22-SS771 and LDW22-SS771-FD were submitted as field duplicates. The difference values for Aroclors 1248 and 1254 were greater than the control limit.

SDG 22L0137: Three sets of field duplicates were submitted:

- LDW22-SC748B and LDW22-SC748B-FD. Field precision was acceptable.
- LDW22-SC785A and LDW22-SC785A-FD. The RPD values for Aroclors 1248 and 1254 were greater than the control limit.
- LDW22-SC776E and LDW22-SC776E-FD. The RPD value for Aroclor 1260 was greater than the control limit.

SDG 22L0155: Four sets of field duplicates were submitted. Field precision was acceptable.

- LDW22-SC768F and LDW22-SC768F-FD
- LDW22-SC755H and LDW22-SC755H-FD
- LDW22-SC753C and LDW22-SC753H-FD
- LDW22-SC751E and LDW-SC751E-FD

SDG 22L0199: Three sets of field duplicates were submitted. Field precision was acceptable.

- LDW22-IT789I and LDW22-IT789I-FD
- LDW22-SC802C and LDW22-SC802C-FD
- LDW22-SC761D and LDW22-SC761D-FD

SDG 22L0246: Three sets of field duplicates were submitted. Field precision was acceptable.

- LDW22-SC778C and LDW22-SC778C-FD
- LDW22-IT810B and LDW22-IT810B-FD
- LDW22-SC779D and LDW22-SC779D-FD

SDG 22L0307: Four sets of field duplicates were submitted. Field precision was acceptable.

- LDW22-IT793D and LDW22-IT793D-FD
- LDW22-IT795C and LDW22-IT795C-FD
- LDW22-SC804F and LDW22-SC804F-FD
- LDW22-SC752B and LDW22-SC752B-FD

SDG 22L0329: Samples LDW22-SC788E and LDW22-SC788E-FD were submitted as field duplicates. Field precision was acceptable.

Internal Standards

Internal standards (IS) hexabromobiphenyl (HBBP) and 1-bromo-2-nitrobenzene (BNB) were added to all samples and laboratory QC samples. When the IS area is less than 50%, associated positive results and reporting limits are estimated (J/UJ-19). When the IS area is greater than 200%, only associated positive results are estimated (J-19). All samples were analyzed on two columns. In cases where there was an outlier on only one column, and the associated result was reported from the column with acceptable IS recovery, no qualifiers were assigned. HBBP is associated with Aroclor 1260 results, and BNB is associated with Aroclors 1016, 1221, 1232, 1242, 1248, and 1254 results. With the noted exceptions, all internal standard areas were within 50 – 200% of the associated initial calibration midpoint standard.

SDG	SAMPLE	OUTLIER	QUALIFIER	COMMENT
22L0105	LDW22-SC775B	HBBP low	J-19	
	LDW22-SC775E	HBBP low	J-19	
	LDW22-SC775F	HBBP low	J-19	
	LDW22-SC775G	HBBP low	J-19	
	LDW22-SC775J (1x)	HBBP low	DNR-11	Report from 5x. See Reported Results Section
	LDW22-SC775K (1x)	HBBP low	DNR-11	Report from 5x. See Reported Results Section
	LDW22-SC782B	HBBP low	None	Reported from other column
	LDW22-SC782C	HBBP low	None	Reported from other column
	LDW22-SC782D	HBBP low	J-19	
	LDW22-SC782C MSD	HBBP low	None	Reported from other column
22L0136	LDW22-SS823	HBBP low	None	Reported from other column
22L0137	LDW22-SC785F	HBBP low	J-19	
22L0155	LDW22-SC785F	HBBP low	UJ-19	
	LDW22-SC755H-FD (1x)	HBBP low	DNR-11	Report from 5x. See Reported Results Section
	LDW22-SC755J (1x)	HBBP low	DNR-11	Report from 5x. See Reported Results Section

SDG	SAMPLE	OUTLIER	QUALIFIER	COMMENT
22L0199	LDW22-SC762A	HBBP low	None	Reported from other column
	LDW22-IT790K	BNB high	None	No positive results
	LDW22-SC787H	HBBP low	None	Reported from other column
	LDW22-SC761C	BNB high	J-19	Positive results
	LDW22-SC761D	BNB high	J-19	Positive results
	LDW22-SC761F	BNB high	J-19	Positive results
22L0246	LDW22-SC777G	BNB high	J-19	Positive results
	LDW22-IT810B	BNB high	None	Reported from other column
	Several Samples	HBBP low	None	Reported from other column
	LDW22-SC777I	HBBP low	J-19	AR1260
22L0307	LDW22-IT795F	BNB high	J-19	Positive results
	LDW22-IT795G	BNB high	J-19	Positive results
	LDW22-IT806A	BNB high	J-19	Positive results
	LDW22-IT806B	BNB high	J-19	AR1248
	LDW22-SC750A	BNB high	J-19	Positive results
	LDW22-IT808A	BNB high	J-19	Positive results
	LDW22-SC804B	BNB high	J-19	Positive results
	LDW22-SC804C	BNB high	J-19	Positive results
	LDW22-SC804E	BNB high	J-19	Positive results
	LDW22-SC783C	BNB high	J-19	Positive results
	LDW22-SC783H	BNB high	J-19	Positive results
	LDW22-SC800B	HBBP low	J-19	AR1260
	LDW22-SC800C	HBBP low	J-19	AR1260
	LDW22-SC800G	HBBP low	J-19	AR1260
	LDW22-SC800H	HBBP low	J-19	AR1260
	LDW22-SC804D	HBBP low	J-19	AR1260
	Several Samples	BNB high	None	No positive results
	LDW22-SC752F	HBBP low	None	No positive result/OK on other column
	Several Samples	BNB high	None	No positive results
	Several Samples	HBBP low	None	Reported from other column
22L0329	LDW22-IT799B	HBBP low	J-19	AR1260
	Several Samples	HBBP low	None	Reported from other column
22L0473	LDW21-IT632A	HBBP low	None	Reported from other column

Standard Reference Material

Puget Sound Reference Material was analyzed with each batch. All concentrations were within the advisory limits of 41 – 180 ug/Kg for AR1260.

Reporting Limits

All SDGs: Several samples were analyzed at dilutions due to the high concentration of some target analytes. Reporting limits were adjusted accordingly. Some reporting limits for non-detected analytes were greater than the QAPP-required reporting limits.

Reported Results

SDG 22L0105: Two samples were analyzed at a 1X and 5X dilution due to the high concentration of Aroclors 1248 and 1254. Both sets of results were reported. Results were qualified as do-not report (DNR) to indicate which of the multiple results should not be used.

SAMPLE	AROCLOR	1x	5x	COMMENT
LDW22-SC775J LDW22-SC775K	AR1248, AR1254	DNR-20	--	Exceeded calibration Range
	AR1260	DNR-11	--	IS outlier in 1x
	AR1016, AR1221, AR1232, AR1242	--	DNR-11	

SDG 22L0137: Several samples analyzed at both 1X and 5X dilutions due to the high concentration of some target analytes. Results that were greater than the instrument calibration range, and non-detect results with elevated reporting limits were qualified as do-not-report (DNR) and should not be used.

SAMPLE	AROCLOR	1x	5x	COMMENT
LDW22-SC785I LDW22-SC776C LDW22-SC776D LDW22-SC776F	AR1248, AR1254	DNR-20	--	Exceeded calibration Range
	AR1016, AR1221, AR1232, AR1242, AR1260	--	DNR-11	
LDW22-SC776E-FD LDW22-SC776L	AR1260	DNR-20	--	Exceeded calibration Range
	AR1016, AR1221, AR1232, AR1242, AR1248, AR1254	--	DNR-11	
LDW22-SC785J LDW22-SC776H	AR1254	DNR-20	--	Exceeded calibration Range
	AR1016, AR1221, AR1232, AR1242, AR1248, AR1260	--	DNR-11	
LDW22-SC769G LDW22-SC769J LDW22-SC769K	AR1260	DNR-11	--	CCAL outlier associated with 1x
	AR1016, AR1221, AR1232, AR1242, AR1248, AR1254	--	DNR-11	
LDW22-SC785H LDW22-SC785L LDW22-SC785M LDW22-SC770I LDW22-SC770J LDW22-SC770K	All	--	DNR-11	No QC issues with 1x

SDG 22L0155: Samples LDW22-SC755H-FD and LDW22-SC755J were initially analyzed at 1x. The areas for the internal standard used to quantitate Aroclor 1260 was less than the lower control limit. The samples were reanalyzed at a 5x resulting in acceptable internal standard area recoveries. The results for Aroclor 1260 should be reported from the 5x dilution. Aroclor 1260 results from the 1x

analyses were qualified as do-not-report (DNR-11). Results for all other Aroclors should be reported from the 1x analyses and were qualified as do-not-report (DNR-11) in the 5x analyses.

Compound Identification

All samples were analyzed using dual column confirmation. When RPD values were between 40% and 60%, the results were estimated (J-3). When the RPD values were greater than 60%, the results were qualified as tentatively identified (NJ-3). With the noted exceptions, the dual column RPD values were less than 40%.

SDG	SAMPLE	AROCLOR	RPD	QUALIFIER
22L0105	LDW22-SC775A	AR1254	60.6	NJ-3
	LDW22-SC775F	AR1254	41.2	J-3
22L0137	LDW22-SC813	AR1254	40.3	J-3
	LDW22-SC784D	AR1254	40.4	J-3
	LDW22-SC785E	AR1254	43.4	J-3
	LDW22-SC785F	AR1254	41.2	J-3
	LDW22-SC785G	AR1254	41.9	J-3
	LDW22-SC770A	AR1248	40.4	J-3
22L0155	LDW22-SC768I	AR1254	76.2	NJ-3
	LDW22-SC801	AR1254	74.4	NJ-3
	LDW22-SC768H	AR1254	43.0	J-3
22L0199	LDW22-SC802H	AR1248	47.0	J-3
22L0329	LDW22-IT799C	AR1248	47.7	J-3
	LDW22-SC788G	AR1254	65.4	NJ-3
22L0246	LDW22-SC778F	AR1254	74.8	NJ-3
	LDW22-IT810E	AR1254	53.9	J-3
	LDW22-SC777G	AR1254	52.5	J-3
	LDW22-SC777H	AR1254	71.0	NJ-3
	LDW22-SC759E	AR1248	58.1	J-3
22L0307	LDW22-SC800B	AR1254	52.4	J-3
	LDW22-SC800E	AR1254	40.7	J-3

SDG 22L0105: As discussed previously, for Sample LDW22-SC782B, the result for Aroclor 1254 was incorrectly P1-flagged in the EDD and on the sample summary. The RPD value between columns was less than 40%. The EDD was corrected by the client. A corrected PDF summary form was not requested.

Calculation Verification

SDG 22L0329: 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 noted exceptions, accuracy was acceptable as demonstrated by the surrogate, LCS/LCSD,

MS/MSD and SRM %R values. Precision was acceptable as demonstrated by the MS/MSD, LCS/LCSD and field duplicate relative percent difference values.

Data were qualified based on CCAL %D outliers, surrogate, internal standard, and MS/MSD accuracy outliers, LCS/LCSD and dual column RPD precision outliers, and holding time outliers.

Data were qualified as do-not-report (DNR) to indicate which result of multiple results should not be used. Data qualified DNR should not be used for any purpose.

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

DATA VALIDATION REPORT
Lower Duwamish Waterway: AOC4 Phase 3
Total Metals by SW6020B
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	VALIDATION LEVEL
22L0136	1 Sediment (Lead only)	EPA Stage 2B
22L0155	13 Sediment (Mercury only)	EPA Stage 4
22L0156	1 Sediment (Mercury only)	EPA Stage 2B
22L0199	25 Sediment (Arsenic only)	EPA Stage 2B
22L0329	8 Sediment (Arsenic only)	EPA Stage 4
22L0473	5 Sediment (Mercury 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.

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.

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

Field Blanks

Field blanks were not submitted.

Matrix Spike/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate samples (MS/MSD) were analyzed at the proper frequency. With the exceptions noted below, recoveries were within the control limits of 75%-125%. 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). Qualifiers are assigned to all samples in the QC batch. No action is taken if only one of the MS/MSD recoveries is outside of the control limits.

Precision is evaluated using the relative percent difference (RPD) between the MS and MSD values. RPD values outside the control limits indicate uncertainty in the measured results. Associated positive results are estimated (J-9) if the RPD is greater than the control limit of 20%.

SDGs 22L0136: The laboratory did not report the MS/MSD results as the parent sample was not from this project. The raw data was reviewed; the MS/MSD %R and RPD values were acceptable.

SDGs 22L0155, 22L0156, 22L0473: Sample LDW22-SC768A was used for the MS/MSD analyses. The MSD recovery value for mercury was less than the lower control limit. The MS recovery was acceptable; no action was taken based on the single outlier. The MS/MSD RPD value was greater than the control limit; associated positive results were estimated (J-9).

Laboratory Duplicates

SDGs 22L0136: The laboratory did not report the laboratory duplicate results as the parent sample was not from this project. The raw data was reviewed; the RPD value was acceptable.

Reference Materials

SDGs 22L0155, 22L0156: The reference material D112-540 (Metals in Soil) was analyzed for mercury. The recovery was within the control limits.

Field Duplicates

For sediment samples, the QAPP RPD control limit is 50% 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 on the reported results.

SDG 22L0155: Samples LDW22-SC768F and LDW22-SC768F-FD were submitted as field duplicates. All acceptance criteria were met.

SDG 22L0199: Samples LDW22-IT789I and LDW22-IT789I-FD were submitted as field duplicates. All acceptance criteria were met.

SDG 22L0329: Samples LDW22-SC788E and LDW22-SC788E-FD were submitted as field duplicates. All acceptance criteria were met.

Calculation Verification

SDGs 22L0155, 22L0329: 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. With the exceptions noted above, accuracy was acceptable as demonstrated by the LCS, SRM, and MS/MSD %R values and precision was acceptable as demonstrated by the laboratory duplicate, MS/MSD, and field duplicate RPD values.

Results were estimated based on an MS/MSD precision outlier.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
LDW: AOC4 Phase 3
TOC by 9060A and Total Solids by SM 2540 G-97

This report documents the review of analytical data from the analysis 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 list of samples reviewed.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
22L0104	2 Sediment	EPA Stage 2B
22L0105	33 Sediment	EPA Stage 2B
22L0136	12 Sediment	EPA Stage 2B
22L0137	69 Sediment	EPA Stage 2B
22L0155	64 Sediment	EPA Stage 2B
22L0156	5 Sediment	EPA Stage 2B
22L0199	70 Sediment	EPA Stage 2B
22L0246	48 Sediment	EPA Stage 2B
22L0329	48 Sediment	EPA Stage 3
22L0307	66 Sediment	EPA Stage 2B
22L0473	11 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 reported in the electronic data deliverable (EDD) were verified (100%) by comparing the EDD to the hardcopy laboratory data package. Sample results and laboratory quality control sample results were also verified (10%).

SDG 22L0246: The total solids result for method blank BKL0380 was incorrect on the bench sheet, method blank summary form, and EDD due to a typo. The dry weight recorded on the bench sheet as “.78.7833”. The correct weight is “0.7833”. When using the correct weight, the TS result for the method blank is acceptable.

TECHNICAL DATA VALIDATION

The QC requirements for review are listed below.

2	Sample Receipt, Preservation, and Holding Times	2	Laboratory Duplicates/Triplicates
1	Laboratory Blanks	1	Field Duplicates
1	Field Blanks	1	Reporting Limits
1	Reference Materials	✓	Reported Results
2	Matrix Spike (MS)	1	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 $\leq 6^{\circ}\text{C}$.

SDG 22L0136, 22L0137: The laboratory received several sample coolers at temperatures greater than the upper control limit ranging from 9.6°C to 9.9°C . Samples were in the coolers for less than one hour, an insufficient amount of time to cool to $\leq 6^{\circ}\text{C}$. These outliers did not impact data quality and no results were qualified.

SDG 22L0155: The following client identifications (ID) did not match between the container and the chains-of-custody (COC). The COC ID was used for login purposes:

CONTAINER CLIENT ID	COC CLIENT ID
LDW22-SC775H	LDW22-SC755H
LDW22-SC775H-FD	LDW22-SC755H-FD
LDW22-SC775I	LDW22-SC755I
LDW22-SC775J	LDW22-SC755J

SDG 22L0473: Samples LDW21-IT699AX and LDW21-IT632A were analyzed past the 6-month holding time of 180 days between 506-535 days; all results for these sample were estimated (J-1).

Samples in this analytical data set are archived samples stored frozen from the following SDGs:

CLIENT ID	ARI ORIGINAL SDG	ARI SAMPLE #
LDW22-IT814B	22L0254	14
LDW22-IT814C		15
LDW22-IT814D		16
LDW22-SC767A		17
LDW22-SC767B		18
LDW22-SC767C		19
LDW22-SC767D		20
LDW22-SC767E		21
LDW22-SC767F		22
LDW21-IT699AX		21H0033
LDW21-IT632A	21G0223	16

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.

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

SDGs 22L0104, 22L0105: The total solids method blank, BKL0134-BLK1, had a detected value. All sample results were greater than the 5x action level; no data were qualified.

SDG 22L0246: The total solids result for method blank BKL0380 was incorrect on the bench sheet, method blank summary form, and EDD due to a typo. The dry weight recorded on the bench sheet as “.78.7833”. The correct weight is “0.7833”. When using the correct weight, the TS result for the method blank is acceptable. No qualifiers were assigned.

Field Blanks

Field blanks were not submitted.

Reference Material

A standard reference material, NIST 1941B, was analyzed with each batch of total organic carbon analyses. The acceptance criteria of 2.99% ± 0.24% were met.

Matrix Spike

Matrix spike samples (MS) were analyzed at the proper frequency of one per 20 samples or one per batch for TOC sediment samples. MS %R values are not evaluated when the parent concentration is greater than 4x the spike concentration. Qualifiers were applied to all samples in an analytical batch.

When the MS %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.

SDG 22L0137: For Batch BKL0385, Sample LDW22-SC776D was analyzed as the MS sample. The TOC %R value was greater than the upper control limit; positive results in the associated samples and laboratory duplicate were estimated (J-8H).

SDGs 22L0137, 22L0155: For Batch BKL0386, Sample LDW22-SC770J was analyzed as the MS sample. The TOC %R value was greater than the upper control limit; positive results in the associated samples and lab duplicate were estimated (J-8H).

Laboratory Duplicates/Triplicates

Total Solids: One sample from each laboratory batch was prepared and analyzed in triplicate. Relative standard deviation (RSD) values were calculated for detected analytes where results are greater than five times the reporting limit (RL). Laboratory precision was acceptable.

TOC: One sample from each laboratory batch was analyzed in duplicate or triplicate to evaluate laboratory precision. Relative percent difference (RPD) or RSD values for detected analytes must be less than 20% for results greater than five times the RL. For results less than 5x the RL, the absolute difference between the sample and duplicate must be less than 2x the RL.

Outliers indicate uncertainty in the measured results for the samples. Associated results were estimated (J/UJ-9) in all samples in a batch if the RPD or difference values indicate uncertainty. The laboratory duplicate result was also estimated. With the noted exceptions, laboratory precision was acceptable.

SDG 22L0155: For Batch BKL0387, Sample LDW22-SC768F was analyzed in duplicate. The RPD value for TOC was greater than the control limit. Results for this analyte were estimated (J/UJ-9) for all samples and the laboratory duplicate sample in the batch.

SDG 22L0307: For Batch BKL0586, Sample LDW22-SC804H was analyzed in duplicate. The RPD value for TOC was greater than the control limit. Results for TOC were estimated (J-9) for all samples and the laboratory duplicate sample in the batch.

SDG 22L0329: For Batch BKL650, Sample LDW22-IT799A was analyzed in triplicate. The RSD value for TOC was greater than the control limit. Results for this analyte were estimated (J-9) for all samples and the laboratory replicate samples in the batch.

Field Duplicates

For sediment samples, the RPD control limit is 50% 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 22L0136: Samples LDW22-SS771 and LDW22-SS771-FD were submitted as field duplicates. All acceptance criteria were met.

SDG 22L0137: Three sets of field duplicates were submitted. Field precision was acceptable.

- LDW22-SC785A & LDW22-SC785A-FD
- LDW22-SC784B & LDW22-SC784B-FD
- LDW22-SC776E & LDW22-SC776E-FD

SDG 22L0155: Four sets of field duplicates were submitted. With the noted exception, field precision was acceptable.

- LDW22-SC751E & LDW22-SC751E-FD
- LDW22-SC755H & LDW22-SC755H-FD
- LDW22-SC753C & LDW22-SC753C-FD
- LDW22-SC768F & LDW22-SC768F-FD

For Samples LDW22-SC768F & LDW22-SC768F-FD, the RPD value for TOC was greater than the control limit at 63%. No data were qualified.

SDG 22L0199: Three sets of field duplicates were submitted. Field precision was acceptable.

- LDW22-IT789I & LDW22-IT789I-FD
- LDW22-SC761D & LDW22-SC761D-FD
- LDW22-SC802C & LDW22-SC802C-FD

SDG 22L0246: Three sets of field duplicates were submitted. Field precision was acceptable.

- LDW22-SC778C & LDW22-SC778C-FD
- LDW22-IT810B & LDW22-IT810B-FD
- LDW22-SC779D & LDW22-SC779D-FD

SDG 22L0307: Four sets of field duplicates were submitted. Field precision was acceptable.

- LDW22-IT793D & LDW22-IT793D-FD
- LDW22-IT795C & LDW22-IT795C-FD
- LDW22-SC804F & LDW22-SC804F-FD
- LDW22-SC752B & LDW22-SC752B-FD

SDG 22L0329: Samples LDW22-SC788E and LDW22-SC788E-FD were submitted as field duplicates. Field precision was acceptable.

Reporting Limits

For TOC analyses, the QAPP-required method detection limit (MDL) of 0.018% was not met. The method reporting limit (MRL) of 0.02% was met. No action was taken.

Calculation Verification

SDGs 22L0329: Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

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 LCS, CRM, and MS recoveries and precision was acceptable as indicated by the laboratory and field duplicate RPD values as well as the laboratory triplicate RSD values.

Results were estimated based on holding time outliers, MS recovery outliers, and laboratory replicate precision outliers.

All data, as qualified, are acceptable for use.



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.
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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	2 nd 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

¹H = high bias indicated

L = low bias indicated

**Draft Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2016 and Method EPA 1613B)**

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments ³
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 (PFK)(Tuning)	PFK (Perfluorokerosene) Analyzed prior to ICAL and at the beginning and end of each 12 hr. shift. ≥10,000 resolving power at m/z low and high mass (e.g. 304.9824 and 380.9760) Lock-mass for each descriptot w/in 5 ppm of theoretical value	NFG ⁽¹⁾ Method ⁽²⁾	R(pos/ND) all analytes in all samples associated with the tune	24	
Windows Defining Mix (WDM)	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	
AND Isomer Specificity Check (ISC)	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	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
OR Column Performance Solution (CPS) (combined WDM and ISC)	Peaks for first and last eluters must be within established retention time windows for each selector group (chlorination level) 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	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 J(pos) if valley > 25%	24	EcoChem PJ, see TM-05, Rev. 2; Note: TCDF is evaluated only if second column confirmation is performed

**Draft Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2016 and Method EPA 1613B)**

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments ³
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
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) (Tables 8 and 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

**Draft Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2016 and Method EPA 1613B)**

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments ³
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)	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	5B (H,L) ⁴	
	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	
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) 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 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⁾ Ecochem standard policy	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) ⁴	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	

**Draft Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2016 and Method EPA 1613B)**

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments ³
Precision and Accuracy (continued)					
Labeled Compounds (Internal Standards and cleanup standards)	Added to all samples %R = 40% - 135% in all samples 8290 %R must meet limits in Table 7 Method 1613B	NFG ⁽¹⁾ Method ^(2,3)	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) ⁴	
	Ion Abundance Ratio Method 1613B: Table 8 (required m/z to monitor) Table 9 (QC limits) Method 8290A: Table 8				
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 and default criteria	Narrate and qualify (J/UJ) if required by project	9	QAPP may have other specified control limits Control limit for this project is 75%
Compound ID and Calculation					
Quantitation/ Identification	All ions for each isomer must maximize within +/- 2 seconds. S/N ratio >2.5 Table 9 of 1613B; RRTs w/in limits in Table 2 of 1613B	NFG ⁽¹⁾ Method ^(2,3)	Narrate in report; qualify if necessary U(pos) for retention time outliers. J(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 ^(2,3)	If laboratory correctly reported an EMPC value, qualify the native compound J(pos) to indicate that the value is a detection limit and qualify total homolog groups J (pos)	25	Projec SAP/QAPP may require EMPCS to be considered ND; in that csae U-25 natives, J-25 Totals professional judgment See TM-18
Interferences	Interferences from chlorodiphenyl ether compounds	NFG ⁽¹⁾ Method ^(2,3)	J(pos)/UJ(ND) if present	23	See TM-16
	Lock masses must not deviate +/- 20% from values in Table 8 of 1613B	Method ^(2,3)	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 ^(2,3)	Report the DB-225 value. If not performed use PJ.		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.

**Draft Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2016 and Method EPA 1613B)**

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments ³
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 National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) & Chlorinated Dibenzofurans (CDFs) Data Review, September 2016
National Functional Guidelines for High Resolution Superfunds Methods Data Review, April 2016

² EPA Method 1613, Rev.B, Tetra-through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGS/HRMS, October 1994
NFG suggests using "+ / -" to indicate bias; EcoChem has chosen "H" = high bias indicated; "L" = low bias indicated.

³ Tech Memos (TM) on file at EcoChem

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

Semivolatile Organic Compounds by Gas Chromatography-Mass Spectroscopy (GC-MS)
(Based on Organic NFG 2017 and SW-846 Method 8270E)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	<6°C sediment/tissues may require storage at -20°C	NFG ⁽¹⁾ Method ⁽²⁾	If required by project: J (pos)/UJ (ND) if greater than 6° C	1	Use PJ for temp outliers; see TM20
Holding Time	Extraction Aqueous: 7 days from collection Extraction Solid: 14 days from collection Analysis (all matrices): 40 days from extraction Extraction Holding Time may be extended to 1 year for frozen sediments/tissues	NFG ⁽¹⁾ Method ⁽²⁾	J (pos)/UJ (ND) if HT exceeded J (pos)/R (ND) if gross exceedance (> 2x HT)	1	Use PJ for Gross Exceedance Gross exceedance = > 2x HT
Instrument Performance					
Tuning	DFTPP Beginning of each 12 hour period Use method criteria	NFG ⁽¹⁾ Method ⁽²⁾	R (pos/ND) all analytes in all samples associated with the tune	24	tune requirement waived if opening CCV passes
Initial Calibration Sensitivity	RRF ≥ 0.05 except: RRF ≥ 0.01 poor responders *	NFG ⁽¹⁾ Method ⁽²⁾ EcoChem standard policy	Use PJ to qualify J (pos)/UJ (ND)	5A	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 ⁽²⁾	J (pos) %R > UCL J (pos)/UJ (ND) %R < LCL	5A (H,L) ⁴	QAPP may have overriding accuracy limits.
Instrument Performance (continued)					
Continuing Calibration Sensitivity	RRF ≥ 0.05 except: RRF ≥ 0.01 poor responders *	NFG ⁽¹⁾ Method ⁽²⁾	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 ⁽²⁾	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 ⁽¹⁾ Method ⁽²⁾	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 ⁽¹⁾ Method ⁽²⁾	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	NFG ⁽¹⁾ Method ⁽²⁾ EcoChem standard policy	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%. IF UCL is < 100% and %R is > UCL but less than 100%, don't qualify for high bias QAPP may have overriding accuracy limits. Qualify all associated samples.
LCS/LCSD (RPD)	If LCSD analyzed RPD < lab limits	Method ⁽²⁾	J (pos)	9	Qualify all associated samples. QAPP may have overriding precision limits.
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 ⁽²⁾ EcoChem standard policy	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 ⁽²⁾ EcoChem standard policy	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)

DATA VALIDATION CRITERIA

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 ⁽²⁾	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
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 ⁽²⁾	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 ⁽²⁾	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, January 2017

² Method SW846 8270E Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

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

(pos): Positive Result

(ND): Not detected

* "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.

PCB Aroclors by GC
(Based on Organic NFG 2017 and SW-846 Method 8082A)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	0-6°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 Extraction 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	1	Use PJ to qualify for holding times Current SW846 does not have an extraction holding time limit, but recommends one year. ⁽³⁾
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 (r ² -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	
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⁾ EcoChem Standard Policy	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.

PCB Aroclors by GC
(Based on Organic NFG 2017 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 (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⁾ EcoChem Standard Policy	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
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 Standard Policy	J (pos)/UJ (ND) Qualify only parent and field duplicate samples	9	QAPP may have overriding limits
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, January 2017

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

(pos): Positive Result

(ND): Not detected

Metals by ICP-MS
(Based on Inorganic NFG 2017 and SW-846 6020B)

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 $\leq 6^{\circ} \text{C}$ 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. No quals for pH if samples preserved by lab 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	Use PJ for gross exceedences (>2x HT)
Instrument Performance					
Tune	Analyzed prior to ICAL Mass Cal < 0.1 amu difference from target mass Peak 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 criteria 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, $r \geq 0.995$	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 $\pm 10\%$ 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 = 80%-120%	Method ⁽²⁾	J (pos) < 2x RL / R (ND) if %R <50% J (pos) < 2x RL / UJ (ND) if %R 50 - 79% J (pos) < 2x RL if %R > 120%	5A (H,L) ³	for ICVL, qualify all samples in run for CCVL, qualify bracketed samples
Continuing Calibration Verification (CCV)	Immediately following ICV/ICB, then every two hours or ten samples, and at end of run. %R within $\pm 10\%$ 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 interfering elements > 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 RL/UJ (ND) for ICSA <Neg MDL J (pos) < 2x RL for ICSA >MDL	17 (H,L) ³	Method may only require ICSA (or SIC) Use PJ and molecular interferences to evaluate ICSA to determine if bias is present. Due to low levels of some target analytes in the supplier stock solutions, there may be a true value for some unspike analytes in the ICSA Refer to TM-14 for additional information.
Spectral Interference Check (SIC)	Interferents: Al, Ca, Fe, Mg, Na P, K, S, C, Cl, Mo, Ti daily SIC - unspiked analytes < +/- 2x LOQ	NFG ⁽¹⁾ Method ⁽²⁾	For samples with Interfering elements > SIC levels: J (pos)< 2x SIC/UJ (ND) for SIC <Neg 2x LOQ J (pos) < 2x SIC for SIC > 2x LOQ	17 (H,L) ³	Use PJ and molecular interferences (Table 1 in method) to evaluate SIC to determine if bias is present. Refer to TM-14 for additional information.

Metals by ICP-MS
(Based on Inorganic NFG 2017 and SW-846 6020B)

QC Element	EcoChem Acceptance Criteria	Source of Criteria	EcoChem Action for Non-Conformance	Reason Code	Discussion and Comments
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, qualify 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					
Internal Standards (IS)	Added to all samples. All analytes must be associated with an internal standard %R > 30% compared to cal blank IS	NFG ⁽¹⁾ Method ⁽²⁾	J(pos)/UJ(ND) all analytes associated with IS outlier	19	NFG criteria 65%-125%
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.
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.
Post Digestion Spikes	If MS is outside 75-125%, post-spike should be analyzed %R 75%-125%	NFG ⁽¹⁾ Method ⁽²⁾	Only used to support MS qualification decisions	NA	No qualifiers assigned based solely on this element.
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 2017 and SW-846 6020B)**

QC Element	EcoChem Acceptance Criteria	Source of Criteria	EcoChem 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
Serial Dilution	Analyze one sample per matrix at a 5x dilution %D <20% for original sample conc. > 25X LLOQ (RL)	Method ⁽²⁾	J(pos)/UJ(ND) if %D > 20%	16	Note: make sure comparing like units for soils samples Qualify all samples in batch. NFG stil uses 10% D for results >50x MDL
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 (2017)

² Method SW846 6020B Inductively Coupled Plasma-Mass Spectrometry (ICP-MS), Revision 2, July 2014.

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 2017 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 0-6°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
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, qualify as needed #2 - Review IB, qualify as needed #3 - Review FB, qualify as needed

Mercury by CVAA
(Based on Inorganic NFG 2017 and SW846 7470A & 7471B)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
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 (recovery)	One per matrix per batch (of ≤ 20 samples); LCSD not required %R between 80-120%	Method ⁽²⁾ EcoChem standard policy	J (pos)/R (ND) if %R < 50% J (pos)/UJ (ND) if %R 50% - 79% J (pos) if %R > 120%	10 (H,L) ³	No action if only one spike %R is outside criteria. Qualify all samples in batch. QAPP may have overriding accuracy limits.
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.
Matrix 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⁾ EcoChem standard policy	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.
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

**Mercury by CVAA
(Based on Inorganic NFG 2017 and SW846 7470A & 7471B)**

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
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 2017.

(pos): Positive Result

² Method SW846 7470A Mercury in Liquid Waste (Manual Cold-Vapor Technique), Revision 1, September 1994.

(ND): Not Detected

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

DATA VALIDATION CRITERIA

Conventional Methods with Instrument Calibrations (e.g., Ion Chromatography, Total Organic Carbon) (Based on Inorganic NFG 2017 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: 0-6°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 $r \geq 0.995$	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
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, qualify 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 limits 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.

Conventional Methods with Instrument Calibrations (e.g., Ion Chromatography, Total Organic Carbon)
(Based on Inorganic NFG 2017 and EPA methods)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Reference Materials (RM, CRM, SRM)	Result \pm 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
Matrix Spike/ Matrix Spike Duplicate (MS/MSD)	Where applicable to method; MSD may not be required One per matrix per batch (of \leq 20 samples) For samples <4x spike level, %R within method control limits (or Laboratory control limits 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 \geq 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 \leq 20 samples) RPD \leq 20% for results \geq 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 \geq 5x RL) OR difference < 2X RL (for results < 5X RL) Aqueous: RPD <35% (for results \geq 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 2017.

² SW846 or EPA Standard Methods

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

(pos): Positive Result

(ND): Not Detected

DATA VALIDATION CRITERIA

Conventional Methods by Gravimetric Analysis (e.g., Total Solids, Total Dissolved Solids, Total Suspended Solids, Grain Size) (Based on Inorganic NFG 2017 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
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.

**Conventional Methods by Gravimetric Analysis (e.g., Total Solids, Total Dissolved Solids, Total Suspended Solids, Grain Size)
(Based on Inorganic NFG 2017 and EPA methods)**

QC Element	EcoChem Acceptance Criteria	Source of Criteria	EcoChem Action for Non-Conformance	Reason Code	Discussion and Comments
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 2017.

² SW846 or EPA Standard Methods

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

(pos): Positive Result

(ND): Not Detected



APPENDIX B

QUALIFIED DATA SUMMARY TABLE

Qualified Data Summary Table
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0105	LDW22-IT796	22L0105-19	EPA 8082A	Aroclor-1260	140	ug/kg	D	J	9
22L0105	LDW22-IT798	22L0105-20	EPA 8082A	Aroclor-1260	18.2	ug/kg		J	9
22L0105	LDW22-SC775A	22L0105-06	EPA 8082A	Aroclor-1254	10.7	ug/kg	P1	NJ	3
22L0105	LDW22-SC775B	22L0105-07	EPA 8082A	Aroclor-1260	21.2	ug/kg		J	19
22L0105	LDW22-SC775E	22L0105-10	EPA 8082A	Aroclor-1260	69.5	ug/kg		J	19
22L0105	LDW22-SC775F	22L0105-11	EPA 8082A	Aroclor-1254	47.4	ug/kg	P1	J	3
22L0105	LDW22-SC775F	22L0105-11	EPA 8082A	Aroclor-1260	67.1	ug/kg		J	19
22L0105	LDW22-SC775G	22L0105-12	EPA 8082A	Aroclor-1260	142	ug/kg		J	19
22L0105	LDW22-SC775J	22L0105-15RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0105	LDW22-SC775J	22L0105-15RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0105	LDW22-SC775J	22L0105-15RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0105	LDW22-SC775J	22L0105-15RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0105	LDW22-SC775J	22L0105-15	EPA 8082A	Aroclor-1248	241	ug/kg	E	DNR	20
22L0105	LDW22-SC775J	22L0105-15	EPA 8082A	Aroclor-1254	234	ug/kg	E	DNR	20
22L0105	LDW22-SC775J	22L0105-15	EPA 8082A	Aroclor-1260	157	ug/kg		DNR	11
22L0105	LDW22-SC775K	22L0105-16RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0105	LDW22-SC775K	22L0105-16RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0105	LDW22-SC775K	22L0105-16RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0105	LDW22-SC775K	22L0105-16RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0105	LDW22-SC775K	22L0105-16	EPA 8082A	Aroclor-1248	294	ug/kg	E	DNR	20
22L0105	LDW22-SC775K	22L0105-16	EPA 8082A	Aroclor-1254	230	ug/kg	E	DNR	20
22L0105	LDW22-SC775K	22L0105-16	EPA 8082A	Aroclor-1260	115	ug/kg		DNR	11
22L0105	LDW22-SC775L	22L0105-17	EPA 8082A	Aroclor-1260	108	ug/kg	D	J	9
22L0105	LDW22-SC775M	22L0105-18	EPA 8082A	Aroclor-1260	119	ug/kg	D	J	9
22L0105	LDW22-SC782B	22L0105-21	EPA 8082A	Aroclor-1260	54.6	ug/kg		J	9
22L0105	LDW22-SC782C	22L0105-22	EPA 8082A	Aroclor-1260	33.9	ug/kg		J	9
22L0105	LDW22-SC782D	22L0105-23	EPA 8082A	Aroclor-1260	53.6	ug/kg		J	9,19
22L0105	LDW22-SC782E	22L0105-24	EPA 8082A	Aroclor-1260	129	ug/kg	D	J	9
22L0105	LDW22-SC782F	22L0105-25	EPA 8082A	Aroclor-1260	187	ug/kg	D	J	9

**Qualified Data Summary Table
LDW AOC4 Phase 3**

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0105	LDW22-SC782G	22L0105-26	EPA 8082A	Aroclor-1260	136	ug/kg	D	J	9
22L0105	LDW22-SC782H	22L0105-27	EPA 8082A	Aroclor-1260	128	ug/kg	D	J	9
22L0105	LDW22-SC782I	22L0105-28	EPA 8082A	Aroclor-1260	206	ug/kg	D	J	9
22L0105	LDW22-SC782J	22L0105-29	EPA 8082A	Aroclor-1260	333	ug/kg	D	J	9
22L0105	LDW22-SC782K	22L0105-30	EPA 8082A	Aroclor-1260	365	ug/kg	D	J	9
22L0105	LDW22-SC782L	22L0105-31	EPA 8082A	Aroclor-1260	94.1	ug/kg	D	J	9
22L0105	LDW22-SC782M	22L0105-32	EPA 8082A	Aroclor-1260	16.4	ug/kg		J	9
22L0136	LDW22-SS818	22L0136-06	EPA 8270E-SIM	Benzo(b)fluoranthene	19.4	ug/kg	D	J	8L
22L0136	LDW22-SS818	22L0136-06	EPA 8270E-SIM	Dibenzo(a,h)anthracene	6.3	ug/kg	J D	J	8L
22L0136	LDW22-SS818	22L0136-06	EPA 8270E-SIM	Indeno(1,2,3-cd)pyrene	18.2	ug/kg	D	J	8L
22L0137	LDW22-SC769A	22L0137-59	EPA 9060	Total Organic carbon (TOC)	1.37	%		J	8H
22L0137	LDW22-SC769B	22L0137-60	EPA 9060	Total Organic carbon (TOC)	1.52	%		J	8H
22L0137	LDW22-SC769C	22L0137-61	EPA 8082A	Aroclor-1260	34.7	ug/kg		J	5BH
22L0137	LDW22-SC769C	22L0137-61	EPA 9060	Total Organic carbon (TOC)	1.47	%		J	8H
22L0137	LDW22-SC769D	22L0137-62	EPA 8082A	Aroclor-1260	91.7	ug/kg		J	5BH
22L0137	LDW22-SC769D	22L0137-62	EPA 9060	Total Organic carbon (TOC)	1.95	%		J	8H
22L0137	LDW22-SC769E	22L0137-63	EPA 8082A	Aroclor-1260	52.9	ug/kg		J	5BH
22L0137	LDW22-SC769E	22L0137-63	EPA 9060	Total Organic carbon (TOC)	1.39	%		J	8H
22L0137	LDW22-SC769F	22L0137-64	EPA 8082A	Aroclor-1260	49.4	ug/kg		J	5BH
22L0137	LDW22-SC769F	22L0137-64	EPA 9060	Total Organic carbon (TOC)	1.63	%		J	8H
22L0137	LDW22-SC769G	22L0137-65RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0137	LDW22-SC769G	22L0137-65RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0137	LDW22-SC769G	22L0137-65RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0137	LDW22-SC769G	22L0137-65RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0137	LDW22-SC769G	22L0137-65RE1	EPA 8082A	Aroclor-1248	201	ug/kg	D	DNR	11
22L0137	LDW22-SC769G	22L0137-65RE1	EPA 8082A	Aroclor-1254	169	ug/kg	D	DNR	11
22L0137	LDW22-SC769G	22L0137-65	EPA 8082A	Aroclor-1260	67	ug/kg		DNR	11
22L0137	LDW22-SC769G	22L0137-65	EPA 9060	Total Organic carbon (TOC)	1.91	%		J	8H
22L0137	LDW22-SC769H	22L0137-66	EPA 8082A	Aroclor-1260	43.3	ug/kg		J	5BH

Qualified Data Summary Table
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0137	LDW22-SC769H	22L0137-66	EPA 9060	Total Organic carbon (TOC)	1.77	%		J	8H
22L0137	LDW22-SC769I	22L0137-67	EPA 8082A	Aroclor-1260	66.4	ug/kg		J	5BH
22L0137	LDW22-SC769I	22L0137-67	EPA 9060	Total Organic carbon (TOC)	1.86	%		J	8H
22L0137	LDW22-SC769J	22L0137-68RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0137	LDW22-SC769J	22L0137-68RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0137	LDW22-SC769J	22L0137-68RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0137	LDW22-SC769J	22L0137-68RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0137	LDW22-SC769J	22L0137-68RE1	EPA 8082A	Aroclor-1248	202	ug/kg	D	DNR	11
22L0137	LDW22-SC769J	22L0137-68RE1	EPA 8082A	Aroclor-1254	170	ug/kg	D	DNR	11
22L0137	LDW22-SC769J	22L0137-68	EPA 8082A	Aroclor-1260	67	ug/kg		DNR	11
22L0137	LDW22-SC769J	22L0137-68	EPA 9060	Total Organic carbon (TOC)	2.01	%		J	8H
22L0137	LDW22-SC769K	22L0137-69RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0137	LDW22-SC769K	22L0137-69RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0137	LDW22-SC769K	22L0137-69RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0137	LDW22-SC769K	22L0137-69RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0137	LDW22-SC769K	22L0137-69RE1	EPA 8082A	Aroclor-1248	181	ug/kg	D	DNR	11
22L0137	LDW22-SC769K	22L0137-69RE1	EPA 8082A	Aroclor-1254	265	ug/kg	D	DNR	11
22L0137	LDW22-SC769K	22L0137-69	EPA 8082A	Aroclor-1260	90.6	ug/kg		DNR	11
22L0137	LDW22-SC769K	22L0137-69	EPA 9060	Total Organic carbon (TOC)	2.1	%		J	8H
22L0137	LDW22-SC770A	22L0137-47	EPA 8082A	Aroclor-1248	7.7	ug/kg	P1	J	3
22L0137	LDW22-SC770A	22L0137-47	EPA 9060	Total Organic carbon (TOC)	1.34	%		J	8H
22L0137	LDW22-SC770B	22L0137-48	EPA 9060	Total Organic carbon (TOC)	1.57	%		J	8H
22L0137	LDW22-SC770C	22L0137-49	EPA 9060	Total Organic carbon (TOC)	1.68	%		J	8H
22L0137	LDW22-SC770D	22L0137-50	EPA 9060	Total Organic carbon (TOC)	2.48	%		J	8H
22L0137	LDW22-SC770E	22L0137-51	EPA 9060	Total Organic carbon (TOC)	2.54	%		J	8H
22L0137	LDW22-SC770F	22L0137-52	EPA 9060	Total Organic carbon (TOC)	1.69	%		J	8H
22L0137	LDW22-SC770G	22L0137-53	EPA 9060	Total Organic carbon (TOC)	2.17	%		J	8H
22L0137	LDW22-SC770H	22L0137-54	EPA 9060	Total Organic carbon (TOC)	2.3	%		J	8H
22L0137	LDW22-SC770I	22L0137-55RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11

Qualified Data Summary Table
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0137	LDW22-SC770I	22L0137-55RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0137	LDW22-SC770I	22L0137-55RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0137	LDW22-SC770I	22L0137-55RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0137	LDW22-SC770I	22L0137-55RE1	EPA 8082A	Aroclor-1248	214	ug/kg	D	DNR	11
22L0137	LDW22-SC770I	22L0137-55RE1	EPA 8082A	Aroclor-1254	176	ug/kg	D	DNR	11
22L0137	LDW22-SC770I	22L0137-55RE1	EPA 8082A	Aroclor-1260	69.1	ug/kg	D	DNR	11
22L0137	LDW22-SC770I	22L0137-55	EPA 9060	Total Organic carbon (TOC)	2.17	%		J	8H
22L0137	LDW22-SC770J	22L0137-56RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0137	LDW22-SC770J	22L0137-56RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0137	LDW22-SC770J	22L0137-56RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0137	LDW22-SC770J	22L0137-56RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0137	LDW22-SC770J	22L0137-56RE1	EPA 8082A	Aroclor-1248	212	ug/kg	D	DNR	11
22L0137	LDW22-SC770J	22L0137-56RE1	EPA 8082A	Aroclor-1254	178	ug/kg	D	DNR	11
22L0137	LDW22-SC770J	22L0137-56RE1	EPA 8082A	Aroclor-1260	63	ug/kg	D	DNR	11
22L0137	LDW22-SC770J	22L0137-56	EPA 9060	Total Organic carbon (TOC)	2.07	%		J	8H
22L0137	LDW22-SC770JDUP1	BKL0386-DUP1	EPA 9060	Total Organic carbon (TOC)	2.11	%		J	8H
22L0137	LDW22-SC770K	22L0137-57RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0137	LDW22-SC770K	22L0137-57RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0137	LDW22-SC770K	22L0137-57RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0137	LDW22-SC770K	22L0137-57RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0137	LDW22-SC770K	22L0137-57RE1	EPA 8082A	Aroclor-1248	186	ug/kg	D	DNR	11
22L0137	LDW22-SC770K	22L0137-57RE1	EPA 8082A	Aroclor-1254	159	ug/kg	D	DNR	11
22L0137	LDW22-SC770K	22L0137-57RE1	EPA 8082A	Aroclor-1260	82.5	ug/kg	D	DNR	11
22L0137	LDW22-SC770K	22L0137-57	EPA 9060	Total Organic carbon (TOC)	1.98	%		J	8H
22L0137	LDW22-SC770L	22L0137-58	EPA 9060	Total Organic carbon (TOC)	2.18	%		J	8H
22L0137	LDW22-SC776C	22L0137-35RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0137	LDW22-SC776C	22L0137-35RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0137	LDW22-SC776C	22L0137-35RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0137	LDW22-SC776C	22L0137-35RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11

Qualified Data Summary Table
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0137	LDW22-SC776C	22L0137-35	EPA 8082A	Aroclor-1248	570	ug/kg	E	DNR	20
22L0137	LDW22-SC776C	22L0137-35	EPA 8082A	Aroclor-1254	403	ug/kg	E	DNR	20
22L0137	LDW22-SC776C	22L0137-35RE1	EPA 8082A	Aroclor-1260	157	ug/kg	D	DNR	11
22L0137	LDW22-SC776D	22L0137-36RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0137	LDW22-SC776D	22L0137-36RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0137	LDW22-SC776D	22L0137-36RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0137	LDW22-SC776D	22L0137-36RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0137	LDW22-SC776D	22L0137-36	EPA 8082A	Aroclor-1248	762	ug/kg	E	DNR	20
22L0137	LDW22-SC776D	22L0137-36	EPA 8082A	Aroclor-1254	531	ug/kg	E	DNR	20
22L0137	LDW22-SC776D	22L0137-36RE1	EPA 8082A	Aroclor-1260	160	ug/kg	D	DNR	11
22L0137	LDW22-SC776D	22L0137-36	EPA 9060	Total Organic carbon (TOC)	1.74	%		J	8H
22L0137	LDW22-SC776DDUP1	BKL0385-DUP1	EPA 9060	Total Organic carbon (TOC)	1.93	%		J	8H
22L0137	LDW22-SC776E	22L0137-37	EPA 9060	Total Organic carbon (TOC)	1.58	%		J	8H
22L0137	LDW22-SC776E-FD	22L0137-38RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0137	LDW22-SC776E-FD	22L0137-38RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0137	LDW22-SC776E-FD	22L0137-38RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0137	LDW22-SC776E-FD	22L0137-38RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0137	LDW22-SC776E-FD	22L0137-38RE1	EPA 8082A	Aroclor-1248	147	ug/kg	D	DNR	11
22L0137	LDW22-SC776E-FD	22L0137-38RE1	EPA 8082A	Aroclor-1254	168	ug/kg	D	DNR	11
22L0137	LDW22-SC776E-FD	22L0137-38	EPA 8082A	Aroclor-1260	205	ug/kg	E	DNR	20
22L0137	LDW22-SC776E-FD	22L0137-38	EPA 9060	Total Organic carbon (TOC)	1.64	%		J	8H
22L0137	LDW22-SC776F	22L0137-39RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0137	LDW22-SC776F	22L0137-39RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0137	LDW22-SC776F	22L0137-39RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0137	LDW22-SC776F	22L0137-39RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0137	LDW22-SC776F	22L0137-39	EPA 8082A	Aroclor-1248	290	ug/kg	E	DNR	20
22L0137	LDW22-SC776F	22L0137-39	EPA 8082A	Aroclor-1254	315	ug/kg	E	DNR	20
22L0137	LDW22-SC776F	22L0137-39RE1	EPA 8082A	Aroclor-1260	148	ug/kg	D	DNR	11
22L0137	LDW22-SC776F	22L0137-39	EPA 9060	Total Organic carbon (TOC)	1.72	%		J	8H

Qualified Data Summary Table
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0137	LDW22-SC776G	22L0137-40	EPA 9060	Total Organic carbon (TOC)	2.71	%		J	8H
22L0137	LDW22-SC776H	22L0137-41RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0137	LDW22-SC776H	22L0137-41RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0137	LDW22-SC776H	22L0137-41RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0137	LDW22-SC776H	22L0137-41RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0137	LDW22-SC776H	22L0137-41RE1	EPA 8082A	Aroclor-1248	218	ug/kg	D	DNR	11
22L0137	LDW22-SC776H	22L0137-41	EPA 8082A	Aroclor-1254	337	ug/kg	E	DNR	20
22L0137	LDW22-SC776H	22L0137-41RE1	EPA 8082A	Aroclor-1260	128	ug/kg	D	DNR	11
22L0137	LDW22-SC776H	22L0137-41	EPA 9060	Total Organic carbon (TOC)	2.28	%		J	8H
22L0137	LDW22-SC776I	22L0137-42	EPA 9060	Total Organic carbon (TOC)	1.6	%		J	8H
22L0137	LDW22-SC776J	22L0137-43	EPA 9060	Total Organic carbon (TOC)	1.86	%		J	8H
22L0137	LDW22-SC776K	22L0137-44	EPA 9060	Total Organic carbon (TOC)	2.63	%		J	8H
22L0137	LDW22-SC776L	22L0137-45RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0137	LDW22-SC776L	22L0137-45RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0137	LDW22-SC776L	22L0137-45RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0137	LDW22-SC776L	22L0137-45RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0137	LDW22-SC776L	22L0137-45RE1	EPA 8082A	Aroclor-1248		ug/kg	U	DNR	11
22L0137	LDW22-SC776L	22L0137-45RE1	EPA 8082A	Aroclor-1254		ug/kg	U	DNR	11
22L0137	LDW22-SC776L	22L0137-45	EPA 8082A	Aroclor-1260	255	ug/kg	E	DNR	20
22L0137	LDW22-SC776L	22L0137-45	EPA 9060	Total Organic carbon (TOC)	3.8	%		J	8H
22L0137	LDW22-SC776M	22L0137-46	EPA 9060	Total Organic carbon (TOC)	2.61	%		J	8H
22L0137	LDW22-SC784D	22L0137-08	EPA 8082A	Aroclor-1254	34.2	ug/kg	P1	J	3
22L0137	LDW22-SC785E	22L0137-22	EPA 8082A	Aroclor-1254	31.9	ug/kg	P1	J	3
22L0137	LDW22-SC785F	22L0137-23	EPA 8082A	Aroclor-1254	55.9	ug/kg	P1	J	3
22L0137	LDW22-SC785F	22L0137-23	EPA 8082A	Aroclor-1260	94.3	ug/kg		J	19
22L0137	LDW22-SC785G	22L0137-24	EPA 8082A	Aroclor-1254	53.5	ug/kg	P1	J	3
22L0137	LDW22-SC785H	22L0137-25RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0137	LDW22-SC785H	22L0137-25RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0137	LDW22-SC785H	22L0137-25RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11

**Qualified Data Summary Table
LDW AOC4 Phase 3**

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0137	LDW22-SC785H	22L0137-25RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0137	LDW22-SC785H	22L0137-25RE1	EPA 8082A	Aroclor-1248	189	ug/kg	D	DNR	11
22L0137	LDW22-SC785H	22L0137-25RE1	EPA 8082A	Aroclor-1254	183	ug/kg	D	DNR	11
22L0137	LDW22-SC785H	22L0137-25RE1	EPA 8082A	Aroclor-1260	106	ug/kg	D	DNR	11
22L0137	LDW22-SC785I	22L0137-26RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0137	LDW22-SC785I	22L0137-26RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0137	LDW22-SC785I	22L0137-26RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0137	LDW22-SC785I	22L0137-26RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0137	LDW22-SC785I	22L0137-26	EPA 8082A	Aroclor-1248	230	ug/kg	E	DNR	20
22L0137	LDW22-SC785I	22L0137-26	EPA 8082A	Aroclor-1254	274	ug/kg	E	DNR	20
22L0137	LDW22-SC785I	22L0137-26RE1	EPA 8082A	Aroclor-1260	160	ug/kg	D	DNR	11
22L0137	LDW22-SC785J	22L0137-27RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0137	LDW22-SC785J	22L0137-27RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0137	LDW22-SC785J	22L0137-27RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0137	LDW22-SC785J	22L0137-27RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0137	LDW22-SC785J	22L0137-27RE1	EPA 8082A	Aroclor-1248	157	ug/kg	D	DNR	11
22L0137	LDW22-SC785J	22L0137-27	EPA 8082A	Aroclor-1254	202	ug/kg	E	DNR	20
22L0137	LDW22-SC785J	22L0137-27RE1	EPA 8082A	Aroclor-1260	95.1	ug/kg	D	DNR	11
22L0137	LDW22-SC785L	22L0137-29RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0137	LDW22-SC785L	22L0137-29RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0137	LDW22-SC785L	22L0137-29RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0137	LDW22-SC785L	22L0137-29RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0137	LDW22-SC785L	22L0137-29RE1	EPA 8082A	Aroclor-1248	142	ug/kg	D	DNR	11
22L0137	LDW22-SC785L	22L0137-29RE1	EPA 8082A	Aroclor-1254	206	ug/kg	D	DNR	11
22L0137	LDW22-SC785L	22L0137-29RE1	EPA 8082A	Aroclor-1260	80.2	ug/kg	D	DNR	11
22L0137	LDW22-SC785M	22L0137-30RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0137	LDW22-SC785M	22L0137-30RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0137	LDW22-SC785M	22L0137-30RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0137	LDW22-SC785M	22L0137-30RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11

Qualified Data Summary Table
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0137	LDW22-SC785M	22L0137-30RE1	EPA 8082A	Aroclor-1248	133	ug/kg	D	DNR	11
22L0137	LDW22-SC785M	22L0137-30RE1	EPA 8082A	Aroclor-1254	217	ug/kg	D	DNR	11
22L0137	LDW22-SC785M	22L0137-30RE1	EPA 8082A	Aroclor-1260	88.1	ug/kg	D	DNR	11
22L0137	LDW22-SC813	22L0137-04	EPA 8082A	Aroclor-1254	42.3	ug/kg	P1	J	3
22L0155	LDW22-IT805	22L0155-24	EPA 1613B	1,2,3,7,8-PeCDD	3.37	ng/kg	EMPC	J	25
22L0155	LDW22-IT805	22L0155-24	EPA 1613B	2,3,7,8-TCDD	0.749	ng/kg	EMPC J	U	25
22L0155	LDW22-IT805	22L0155-24	EPA 1613B	2,3,7,8-TCDF	3.68	ng/kg	X	J	23H
22L0155	LDW22-IT805	22L0155-24	EPA 9060	Total Organic carbon (TOC)	0.74	%		J	9
22L0155	LDW22-SC751G	22L0155-49	EPA 8082A	Aroclor-1248	7.5	ug/kg		J	13H
22L0155	LDW22-SC751G	22L0155-49	EPA 8082A	Aroclor-1254	10.6	ug/kg		J	13H
22L0155	LDW22-SC751G	22L0155-49	EPA 8082A	Aroclor-1260	7.3	ug/kg		J	13H
22L0155	LDW22-SC755C	22L0155-25	EPA 9060	Total Organic carbon (TOC)	1.57	%		J	9
22L0155	LDW22-SC755D	22L0155-26	EPA 9060	Total Organic carbon (TOC)	1.99	%		J	9
22L0155	LDW22-SC755F	22L0155-28	EPA 8082A	Aroclor-1248	115	ug/kg		J	13H
22L0155	LDW22-SC755F	22L0155-28	EPA 8082A	Aroclor-1254	161	ug/kg		J	13H
22L0155	LDW22-SC755F	22L0155-28	EPA 8082A	Aroclor-1260	107	ug/kg		J	13H
22L0155	LDW22-SC755H-FD	22L0155-31RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0155	LDW22-SC755H-FD	22L0155-31RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0155	LDW22-SC755H-FD	22L0155-31RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0155	LDW22-SC755H-FD	22L0155-31RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0155	LDW22-SC755H-FD	22L0155-31RE1	EPA 8082A	Aroclor-1248		ug/kg	U	DNR	11
22L0155	LDW22-SC755H-FD	22L0155-31RE1	EPA 8082A	Aroclor-1254		ug/kg	U	DNR	11
22L0155	LDW22-SC755H-FD	22L0155-31	EPA 8082A	Aroclor-1260		ug/kg	U	DNR	11
22L0155	LDW22-SC755J	22L0155-33RE1	EPA 8082A	Aroclor-1016		ug/kg	U	DNR	11
22L0155	LDW22-SC755J	22L0155-33RE1	EPA 8082A	Aroclor-1221		ug/kg	U	DNR	11
22L0155	LDW22-SC755J	22L0155-33RE1	EPA 8082A	Aroclor-1232		ug/kg	U	DNR	11
22L0155	LDW22-SC755J	22L0155-33RE1	EPA 8082A	Aroclor-1242		ug/kg	U	DNR	11
22L0155	LDW22-SC755J	22L0155-33RE1	EPA 8082A	Aroclor-1248		ug/kg	U	DNR	11
22L0155	LDW22-SC755J	22L0155-33RE1	EPA 8082A	Aroclor-1254		ug/kg	U	DNR	11

Qualified Data Summary Table
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0155	LDW22-SC755J	22L0155-33	EPA 8082A	Aroclor-1260		ug/kg	U	DNR	11
22L0155	LDW22-SC764E	22L0155-14	EPA 9060	Total Organic carbon (TOC)	0.03	%		J	9
22L0155	LDW22-SC764F	22L0155-15	EPA 9060	Total Organic carbon (TOC)	0.07	%		J	9
22L0155	LDW22-SC764G	22L0155-16	EPA 9060	Total Organic carbon (TOC)	0.09	%		J	9
22L0155	LDW22-SC764H	22L0155-17	EPA 9060	Total Organic carbon (TOC)		%	U	UJ	9
22L0155	LDW22-SC764I	22L0155-18	EPA 9060	Total Organic carbon (TOC)	0.05	%		J	9
22L0155	LDW22-SC764J	22L0155-19	EPA 9060	Total Organic carbon (TOC)	0.03	%		J	9
22L0155	LDW22-SC764K	22L0155-20	EPA 9060	Total Organic carbon (TOC)	0.04	%		J	9
22L0155	LDW22-SC764L	22L0155-21	EPA 9060	Total Organic carbon (TOC)	0.1	%		J	9
22L0155	LDW22-SC764M	22L0155-22	EPA 9060	Total Organic carbon (TOC)	0.23	%		J	9
22L0155	LDW22-SC764N	22L0155-23	EPA 9060	Total Organic carbon (TOC)	0.08	%		J	9
22L0155	LDW22-SC768A	22L0155-01	EPA 7471B	Mercury	0.0802	mg/kg		J	9
22L0155	LDW22-SC768A	22L0155-01	EPA 9060	Total Organic carbon (TOC)	1.2	%		J	8H
22L0155	LDW22-SC768ADUP1	BKL0496-DUP1	EPA 7471B	Mercury	0.103	mg/kg	L	J	9
22L0155	LDW22-SC768B	22L0155-02	EPA 7471B	Mercury	0.01	mg/kg	J	J	9
22L0155	LDW22-SC768C	22L0155-03	EPA 7471B	Mercury	0.0175	mg/kg	J	J	9
22L0155	LDW22-SC768D	22L0155-04	EPA 7471B	Mercury	0.0134	mg/kg	J	J	9
22L0155	LDW22-SC768D	22L0155-04	EPA 8270E-SIM	Benzo(b)fluoranthene	2.17	ug/kg	J	J	8L
22L0155	LDW22-SC768D	22L0155-04	EPA 9060	Total Organic carbon (TOC)	0.05	%		J	8H
22L0155	LDW22-SC768E	22L0155-05	EPA 7471B	Mercury	0.0568	mg/kg		J	9
22L0155	LDW22-SC768E	22L0155-05	EPA 9060	Total Organic carbon (TOC)	0.1	%		J	8H
22L0155	LDW22-SC768F	22L0155-06	EPA 7471B	Mercury	0.137	mg/kg		J	9
22L0155	LDW22-SC768F	22L0155-06	EPA 9060	Total Organic carbon (TOC)	1.19	%		J	8H
22L0155	LDW22-SC768F-FD	22L0155-07	EPA 7471B	Mercury	0.0821	mg/kg		J	9
22L0155	LDW22-SC768F-FD	22L0155-07	EPA 9060	Total Organic carbon (TOC)	0.62	%		J	9
22L0155	LDW22-SC768F-FDDUP1	BKL0387-DUP1	EPA 9060	Total Organic carbon (TOC)	0.81	%	*	J	9
22L0155	LDW22-SC768G	22L0155-08	EPA 7471B	Mercury	0.0228	mg/kg	J	J	9
22L0155	LDW22-SC768G	22L0155-08	EPA 9060	Total Organic carbon (TOC)	0.2	%		J	9
22L0155	LDW22-SC768H	22L0155-09	EPA 7471B	Mercury	0.0663	mg/kg		J	9

**Qualified Data Summary Table
LDW AOC4 Phase 3**

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0155	LDW22-SC768H	22L0155-09	EPA 8082A	Aroclor-1254	27.9	ug/kg	P1	J	3
22L0155	LDW22-SC768H	22L0155-09	EPA 8270E-SIM	Phenanthrene	1820	ug/kg	D E	J	20
22L0155	LDW22-SC768H	22L0155-09	EPA 9060	Total Organic carbon (TOC)	0.7	%		J	9
22L0155	LDW22-SC768I	22L0155-10	EPA 7471B	Mercury	0.182	mg/kg		J	9
22L0155	LDW22-SC768I	22L0155-10	EPA 8082A	Aroclor-1248	3.9	ug/kg	J	J	13H
22L0155	LDW22-SC768I	22L0155-10	EPA 8082A	Aroclor-1254	5.8	ug/kg	P1	NJ	3,13H
22L0155	LDW22-SC768I	22L0155-10	EPA 8082A	Aroclor-1260	22.5	ug/kg		J	13H
22L0155	LDW22-SC768I	22L0155-10	EPA 9060	Total Organic carbon (TOC)	1.82	%		J	9
22L0155	LDW22-SC768J	22L0155-11	EPA 7471B	Mercury	0.161	mg/kg		J	9
22L0155	LDW22-SC768J	22L0155-11	EPA 8270E-SIM	Naphthalene	3200	ug/kg	D E	J	20
22L0155	LDW22-SC768J	22L0155-11	EPA 8270E-SIM	Pyrene	1710	ug/kg	D E	J	20
22L0155	LDW22-SC768J	22L0155-11	EPA 9060	Total Organic carbon (TOC)	1.32	%		J	9
22L0155	LDW22-SC768K	22L0155-12	EPA 7471B	Mercury	0.129	mg/kg		J	9
22L0155	LDW22-SC768K	22L0155-12	EPA 8270E-SIM	2-Methylnaphthalene	1960	ug/kg	D E	J	20
22L0155	LDW22-SC768K	22L0155-12	EPA 8270E-SIM	Acenaphthene	1830	ug/kg	D E	J	20
22L0155	LDW22-SC768K	22L0155-12	EPA 8270E-SIM	Naphthalene	9300	ug/kg	D E	J	20
22L0155	LDW22-SC768K	22L0155-12	EPA 9060	Total Organic carbon (TOC)	1	%		J	9
22L0155	LDW22-SC768L	22L0155-13	EPA 7471B	Mercury	0.129	mg/kg		J	9
22L0155	LDW22-SC768L	22L0155-13	EPA 8082A	Aroclor-1260		ug/kg	U	UJ	19
22L0155	LDW22-SC768L	22L0155-13	EPA 8270E-SIM	2-Methylnaphthalene	1920	ug/kg	D E	J	20
22L0155	LDW22-SC768L	22L0155-13	EPA 8270E-SIM	Acenaphthene	2830	ug/kg	D E	J	20
22L0155	LDW22-SC768L	22L0155-13	EPA 8270E-SIM	Fluoranthene	4720	ug/kg	D E	J	20
22L0155	LDW22-SC768L	22L0155-13	EPA 8270E-SIM	Fluorene	2780	ug/kg	D E	J	20
22L0155	LDW22-SC768L	22L0155-13	EPA 8270E-SIM	Naphthalene	12100	ug/kg	D E	J	20
22L0155	LDW22-SC768L	22L0155-13	EPA 8270E-SIM	Phenanthrene	6840	ug/kg	D E	J	20
22L0155	LDW22-SC768L	22L0155-13	EPA 8270E-SIM	Pyrene	2940	ug/kg	D E	J	20
22L0155	LDW22-SC768L	22L0155-13	EPA 9060	Total Organic carbon (TOC)	1.99	%		J	9
22L0155	LDW22-SC801	22L0155-55	EPA 8082A	Aroclor-1254	96.3	ug/kg	P1	NJ	3
22L0155	LDW22-SC803	22L0155-56	EPA 8082A	Aroclor-1248	43.1	ug/kg		J	13H

**Qualified Data Summary Table
LDW AOC4 Phase 3**

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0155	LDW22-SC803	22L0155-56	EPA 8082A	Aroclor-1254	92.5	ug/kg		J	13H
22L0155	LDW22-SC803	22L0155-56	EPA 8082A	Aroclor-1260	85.5	ug/kg		J	13H
22L0156	LDW22-SS812	22L0156-03	EPA 7471B	Mercury	0.0312	mg/kg		J	9
22L0199	LDW22-SC758B	22L0199-61	EPA 8082A	Aroclor-1248	976	ug/kg	D	J	13H
22L0199	LDW22-SC758B	22L0199-61	EPA 8082A	Aroclor-1254	1210	ug/kg	D	J	13H
22L0199	LDW22-SC758B	22L0199-61	EPA 8082A	Aroclor-1260	362	ug/kg	D	J	13H
22L0199	LDW22-SC758C	22L0199-62	EPA 8082A	Aroclor-1248	900	ug/kg	D	J	13H
22L0199	LDW22-SC758C	22L0199-62	EPA 8082A	Aroclor-1254	979	ug/kg	D	J	13H
22L0199	LDW22-SC758C	22L0199-62	EPA 8082A	Aroclor-1260	381	ug/kg	D	J	13H
22L0199	LDW22-SC761C	22L0199-50	EPA 8082A	Aroclor-1248	394	ug/kg	D	J	19
22L0199	LDW22-SC761C	22L0199-50	EPA 8082A	Aroclor-1254	464	ug/kg	D	J	19
22L0199	LDW22-SC761D	22L0199-51	EPA 8082A	Aroclor-1248	275	ug/kg	D	J	19
22L0199	LDW22-SC761D	22L0199-51	EPA 8082A	Aroclor-1254	330	ug/kg	D	J	19
22L0199	LDW22-SC761F	22L0199-54	EPA 8082A	Aroclor-1248	437	ug/kg	D	J	19
22L0199	LDW22-SC761F	22L0199-54	EPA 8082A	Aroclor-1254	574	ug/kg	D	J	19
22L0199	LDW22-SC787I	22L0199-44	EPA 8082A	Aroclor-1248	1750	ug/kg	D	J	13H
22L0199	LDW22-SC787I	22L0199-44	EPA 8082A	Aroclor-1254	1290	ug/kg	D	J	13H
22L0199	LDW22-SC787I	22L0199-44	EPA 8082A	Aroclor-1260	277	ug/kg	D	J	13H
22L0199	LDW22-SC787J	22L0199-45	EPA 8082A	Aroclor-1248	1690	ug/kg	D	J	13H
22L0199	LDW22-SC787J	22L0199-45	EPA 8082A	Aroclor-1254	1100	ug/kg	D	J	13H
22L0199	LDW22-SC787J	22L0199-45	EPA 8082A	Aroclor-1260	240	ug/kg	D	J	13H
22L0199	LDW22-SC802H	22L0199-31	EPA 8082A	Aroclor-1248	1140	ug/kg	P1 D	J	3,13H
22L0199	LDW22-SC802H	22L0199-31	EPA 8082A	Aroclor-1254	724	ug/kg	D	J	13H
22L0199	LDW22-SC802H	22L0199-31	EPA 8082A	Aroclor-1260	142	ug/kg	D	J	13H
22L0246	LDW22-IT809A	22L0246-42	EPA 1613B	2,3,7,8-TCDD	1.07	ng/kg	EMPC	J	25
22L0246	LDW22-IT809A	22L0246-42	EPA 1613B	2,3,7,8-TCDF	8.36	ng/kg	X	J	23H
22L0246	LDW22-IT809B	22L0246-43	EPA 1613B	1,2,3,7,8-PeCDD	1.34	ng/kg	EMPC	J	25
22L0246	LDW22-IT809B	22L0246-43	EPA 1613B	2,3,7,8-TCDD	0.368	ng/kg	EMPC J	U	25
22L0246	LDW22-IT809B	22L0246-43	EPA 1613B	2,3,7,8-TCDF	5.75	ng/kg	X	J	23H

Qualified Data Summary Table
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	1,2,3,4,6,7,8-HpCDD	6.66	ng/kg	EMPC B	DNR	11
22L0246	LDW22-IT809C	22L0246-44RE1	EPA 1613B	1,2,3,4,6,7,8-HpCDD	3.95	ng/kg	B	J	13L
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	1,2,3,4,6,7,8-HpCDF	4.65	ng/kg	EMPC B	DNR	11
22L0246	LDW22-IT809C	22L0246-44RE1	EPA 1613B	1,2,3,4,6,7,8-HpCDF	3.04	ng/kg	B	J	13L
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	1,2,3,4,7,8,9-HpCDF		ng/kg	U	DNR	11
22L0246	LDW22-IT809C	22L0246-44RE1	EPA 1613B	1,2,3,4,7,8,9-HpCDF	1.13	ng/kg	EMPC	J	13L,25
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	1,2,3,4,7,8-HxCDD		ng/kg	U	DNR	11
22L0246	LDW22-IT809C	22L0246-44RE1	EPA 1613B	1,2,3,4,7,8-HxCDD		ng/kg	U	UJ	13L
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	1,2,3,4,7,8-HxCDF		ng/kg	U	DNR	11
22L0246	LDW22-IT809C	22L0246-44RE1	EPA 1613B	1,2,3,4,7,8-HxCDF	1.43	ng/kg		J	13L
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	1,2,3,6,7,8-HxCDD		ng/kg	U	DNR	11
22L0246	LDW22-IT809C	22L0246-44RE1	EPA 1613B	1,2,3,6,7,8-HxCDD		ng/kg	U	UJ	13L
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	1,2,3,6,7,8-HxCDF	1.69	ng/kg	B	DNR	11
22L0246	LDW22-IT809C	22L0246-44RE1	EPA 1613B	1,2,3,6,7,8-HxCDF	1.33	ng/kg	EMPC B	J	13L,25
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	1,2,3,7,8,9-HxCDD		ng/kg	U	DNR	11
22L0246	LDW22-IT809C	22L0246-44RE1	EPA 1613B	1,2,3,7,8,9-HxCDD	2.07	ng/kg		J	5BH,13L
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	1,2,3,7,8,9-HxCDF		ng/kg	U	DNR	11
22L0246	LDW22-IT809C	22L0246-44RE1	EPA 1613B	1,2,3,7,8,9-HxCDF	1.19	ng/kg	EMPC	J	13L,25
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	1,2,3,7,8-PeCDD		ng/kg	U	DNR	11
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	1,2,3,7,8-PeCDF		ng/kg	U	DNR	11
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	2,3,4,6,7,8-HxCDF		ng/kg	U	DNR	11
22L0246	LDW22-IT809C	22L0246-44RE1	EPA 1613B	2,3,4,6,7,8-HxCDF	1.37	ng/kg	EMPC	J	13L,25
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	2,3,4,7,8-PeCDF		ng/kg	U	DNR	11
22L0246	LDW22-IT809C	22L0246-44RE1	EPA 1613B	2,3,4,7,8-PeCDF	0.727	ng/kg	EMPC J	U	25
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	2,3,7,8-TCDD		ng/kg	U	DNR	11
22L0246	LDW22-IT809C	22L0246-44RE1	EPA 1613B	2,3,7,8-TCDD		ng/kg	U	UJ	13L
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	2,3,7,8-TCDF		ng/kg	U	DNR	11
22L0246	LDW22-IT809C	22L0246-44RE1	EPA 1613B	2,3,7,8-TCDF	2.54	ng/kg	EMPC	J	13L,25
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	OCDD	46.1	ng/kg	B	DNR	11

**Qualified Data Summary Table
LDW AOC4 Phase 3**

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0246	LDW22-IT809C	22L0246-44RE1	EPA 1613B	OCDD	22.8	ng/kg	EMPC B	J	25
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	OCDF	13.3	ng/kg	B	DNR	11
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	Total HpCDD	4.98	ng/kg		DNR	11
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	Total HpCDF		ng/kg	U	DNR	11
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	Total HxCDD		ng/kg	U	DNR	11
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	Total HxCDF	1.69	ng/kg		DNR	11
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	Total PeCDD		ng/kg	U	DNR	11
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	Total PeCDF	7.04	ng/kg		DNR	11
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	Total TCDD		ng/kg	U	DNR	11
22L0246	LDW22-IT809C	22L0246-44	EPA 1613B	Total TCDF		ng/kg	U	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	1,2,3,4,6,7,8-HpCDD	34.8	ng/kg	B	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	1,2,3,4,6,7,8-HpCDF	26.1	ng/kg	EMPC B	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	1,2,3,4,7,8,9-HpCDF	11.9	ng/kg	EMPC	DNR	11
22L0246	LDW22-IT809D	22L0246-45RE1	EPA 1613B	1,2,3,4,7,8-HxCDD	0.258	ng/kg	EMPC J	U	25
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	1,2,3,4,7,8-HxCDD		ng/kg	U	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	1,2,3,4,7,8-HxCDF	13.1	ng/kg	EMPC	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	1,2,3,6,7,8-HxCDD		ng/kg	U	DNR	11
22L0246	LDW22-IT809D	22L0246-45RE1	EPA 1613B	1,2,3,6,7,8-HxCDF	0.189	ng/kg	EMPC J B	U	25
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	1,2,3,6,7,8-HxCDF		ng/kg	U	DNR	11
22L0246	LDW22-IT809D	22L0246-45RE1	EPA 1613B	1,2,3,7,8,9-HxCDD	0.329	ng/kg	EMPC J	U	25
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	1,2,3,7,8,9-HxCDD	21.2	ng/kg	EMPC	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	1,2,3,7,8,9-HxCDF	9.54	ng/kg	EMPC	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	1,2,3,7,8-PeCDD		ng/kg	U	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	1,2,3,7,8-PeCDF		ng/kg	U	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	2,3,4,6,7,8-HxCDF	10.6	ng/kg	EMPC	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	2,3,4,7,8-PeCDF		ng/kg	U	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	2,3,7,8-TCDD		ng/kg	U	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	2,3,7,8-TCDF		ng/kg	U	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	OCDD	211	ng/kg	B	DNR	11

Qualified Data Summary Table
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	OCDF	80.1	ng/kg	B	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	Total HpCDD	62.5	ng/kg		DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	Total HpCDF	42.8	ng/kg		DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	Total HxCDD		ng/kg	U	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	Total HxCDF		ng/kg	U	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	Total PeCDD		ng/kg	U	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	Total PeCDF		ng/kg	U	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	Total TCDD		ng/kg	U	DNR	11
22L0246	LDW22-IT809D	22L0246-45	EPA 1613B	Total TCDF		ng/kg	U	DNR	11
22L0246	LDW22-IT809E	22L0246-46	EPA 1613B	OCDD	11.8	ng/kg	B	U	7
22L0246	LDW22-IT809F	22L0246-47	EPA 1613B	1,2,3,4,7,8-HxCDD	0.3	ng/kg	EMPC J	U	25
22L0246	LDW22-IT809F	22L0246-47	EPA 1613B	1,2,3,6,7,8-HxCDD	0.337	ng/kg	EMPC J	U	25
22L0246	LDW22-IT809F	22L0246-47	EPA 1613B	1,2,3,7,8,9-HxCDD	0.325	ng/kg	EMPC J	U	25
22L0246	LDW22-IT809F	22L0246-47	EPA 1613B	2,3,7,8-TCDD	0.337	ng/kg	EMPC J	U	25
22L0246	LDW22-IT809F	22L0246-47	EPA 1613B	OCDD	7.2	ng/kg	J B	U	7
22L0246	LDW22-IT809G	22L0246-48	EPA 1613B	1,2,3,4,7,8,9-HpCDF	0.224	ng/kg	EMPC J	U	25
22L0246	LDW22-IT809G	22L0246-48	EPA 1613B	1,2,3,6,7,8-HxCDF	0.224	ng/kg	EMPC J B	U	25
22L0246	LDW22-IT809G	22L0246-48	EPA 1613B	1,2,3,7,8,9-HxCDD	0.284	ng/kg	EMPC J	U	25
22L0246	LDW22-IT809G	22L0246-48	EPA 1613B	1,2,3,7,8-PeCDD	0.147	ng/kg	EMPC J	U	25
22L0246	LDW22-IT809G	22L0246-48	EPA 1613B	2,3,4,7,8-PeCDF	0.203	ng/kg	EMPC J	U	25
22L0246	LDW22-IT809G	22L0246-48	EPA 1613B	2,3,7,8-TCDD	0.185	ng/kg	EMPC J	U	25
22L0246	LDW22-IT809G	22L0246-48	EPA 1613B	OCDD	8.41	ng/kg	J B	U	7
22L0246	LDW22-IT810A	22L0246-07	EPA 1613B	1,2,3,4,6,7,8-HpCDD	353	ng/kg	B	J	9
22L0246	LDW22-IT810A	22L0246-07	EPA 1613B	1,2,3,4,6,7,8-HpCDF	107	ng/kg	B	J	9
22L0246	LDW22-IT810A	22L0246-07	EPA 1613B	1,2,3,4,7,8,9-HpCDF	12.7	ng/kg		J	9
22L0246	LDW22-IT810A	22L0246-07	EPA 1613B	2,3,7,8-TCDD	0.627	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810A	22L0246-07	EPA 1613B	2,3,7,8-TCDF	6.35	ng/kg	X	J	23H
22L0246	LDW22-IT810A	22L0246-07	EPA 1613B	OCDD	2720	ng/kg	B	J	9
22L0246	LDW22-IT810A	22L0246-07	EPA 1613B	OCDF	250	ng/kg	B	J	9

**Qualified Data Summary Table
LDW AOC4 Phase 3**

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0246	LDW22-IT810A	22L0246-07	EPA 1613B	Total HpCDD	677	ng/kg		J	9
22L0246	LDW22-IT810A	22L0246-07	EPA 1613B	Total HpCDF	387	ng/kg		J	9
22L0246	LDW22-IT810ADUP1	BKL0419-DUP1	EPA 1613B	1,2,3,4,6,7,8-HpCDD	463	ng/kg	* B	J	9
22L0246	LDW22-IT810ADUP1	BKL0419-DUP1	EPA 1613B	1,2,3,4,6,7,8-HpCDF	139	ng/kg	* B	J	9
22L0246	LDW22-IT810ADUP1	BKL0419-DUP1	EPA 1613B	1,2,3,4,7,8,9-HpCDF	17.4	ng/kg	*	J	9
22L0246	LDW22-IT810ADUP1	BKL0419-DUP1	EPA 1613B	1,2,3,7,8-PeCDD	4.06	ng/kg	EMPC	J	25
22L0246	LDW22-IT810ADUP1	BKL0419-DUP1	EPA 1613B	2,3,7,8-TCDD	0.729	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810ADUP1	BKL0419-DUP1	EPA 1613B	OCDD	3580	ng/kg	* B	J	9
22L0246	LDW22-IT810ADUP1	BKL0419-DUP1	EPA 1613B	OCDF	354	ng/kg	* B	J	9
22L0246	LDW22-IT810ADUP1	BKL0419-DUP1	EPA 1613B	Total HpCDD	899	ng/kg		J	9
22L0246	LDW22-IT810ADUP1	BKL0419-DUP1	EPA 1613B	Total HpCDF	531	ng/kg		J	9
22L0246	LDW22-IT810B	22L0246-08	EPA 1613B	1,2,3,4,7,8-HxCDD	0.81	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810B	22L0246-08	EPA 1613B	2,3,7,8-TCDD	0.331	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810B	22L0246-08	EPA 1613B	2,3,7,8-TCDF	5.25	ng/kg	X	J	23H
22L0246	LDW22-IT810B-FD	22L0246-10	EPA 1613B	1,2,3,4,7,8-HxCDD	0.82	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810B-FD	22L0246-10	EPA 1613B	2,3,7,8-TCDD	0.353	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810B-FD	22L0246-10	EPA 1613B	2,3,7,8-TCDF	4.1	ng/kg	X	J	23H
22L0246	LDW22-IT810C	22L0246-09	EPA 1613B	1,2,3,4,7,8-HxCDD	0.334	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810C	22L0246-09	EPA 1613B	1,2,3,6,7,8-HxCDD	1.25	ng/kg	EMPC	J	25
22L0246	LDW22-IT810C	22L0246-09	EPA 1613B	1,2,3,7,8,9-HxCDD	0.933	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810C	22L0246-09	EPA 1613B	1,2,3,7,8-PeCDD	0.579	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810C	22L0246-09	EPA 1613B	2,3,4,7,8-PeCDF	1.14	ng/kg	EMPC	J	25
22L0246	LDW22-IT810C	22L0246-09	EPA 1613B	2,3,7,8-TCDD	0.269	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810C	22L0246-09	EPA 1613B	2,3,7,8-TCDF	4.53	ng/kg	X	J	23H
22L0246	LDW22-IT810D	22L0246-11	EPA 1613B	1,2,3,6,7,8-HxCDD	1.53	ng/kg	EMPC	J	25
22L0246	LDW22-IT810D	22L0246-11	EPA 1613B	1,2,3,7,8,9-HxCDF	0.437	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810D	22L0246-11	EPA 1613B	2,3,7,8-TCDD	0.258	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810D	22L0246-11	EPA 1613B	2,3,7,8-TCDF	2.73	ng/kg	X	J	23H
22L0246	LDW22-IT810E	22L0246-12	EPA 1613B	1,2,3,6,7,8-HxCDF	0.686	ng/kg	EMPC J B	U	25

**Qualified Data Summary Table
LDW AOC4 Phase 3**

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0246	LDW22-IT810E	22L0246-12	EPA 1613B	1,2,3,7,8,9-HxCDF	0.396	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810E	22L0246-12	EPA 1613B	1,2,3,7,8-PeCDF	0.697	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810E	22L0246-12	EPA 1613B	2,3,7,8-TCDD	0.345	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810E	22L0246-12	EPA 1613B	2,3,7,8-TCDF	3.75	ng/kg	X	J	23H
22L0246	LDW22-IT810E	22L0246-12	EPA 8082A	Aroclor-1254	7.3	ug/kg	P1	J	3
22L0246	LDW22-IT810F	22L0246-13	EPA 1613B	1,2,3,4,7,8-HxCDD	0.33	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810F	22L0246-13	EPA 1613B	1,2,3,6,7,8-HxCDF	0.565	ng/kg	EMPC J B	U	25
22L0246	LDW22-IT810F	22L0246-13	EPA 1613B	1,2,3,7,8-PeCDD	0.482	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810F	22L0246-13	EPA 1613B	2,3,7,8-TCDF	1.75	ng/kg	X	J	23H
22L0246	LDW22-IT810F	22L0246-13	EPA 1613B	OCDD	15.4	ng/kg	B	U	7
22L0246	LDW22-IT810G	22L0246-14	EPA 1613B	1,2,3,6,7,8-HxCDF	0.573	ng/kg	EMPC J B	U	25
22L0246	LDW22-IT810G	22L0246-14	EPA 1613B	1,2,3,7,8,9-HxCDD	0.476	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810G	22L0246-14	EPA 1613B	1,2,3,7,8-PeCDF	0.417	ng/kg	EMPC J	U	25
22L0246	LDW22-IT810G	22L0246-14	EPA 1613B	2,3,7,8-TCDF	2.89	ng/kg	X	J	23H
22L0246	LDW22-IT810G	22L0246-14	EPA 1613B	OCDF	1.61	ng/kg	EMPC J B	U	25
22L0246	LDW22-IT810G	22L0246-14	EPA 8082A	Aroclor-1016		ug/kg	U	UJ	8L
22L0246	LDW22-SC759E	22L0246-37	EPA 8082A	Aroclor-1248	22.2	ug/kg	P1	J	3
22L0246	LDW22-SC777G	22L0246-32	EPA 8082A	Aroclor-1254	42.3	ug/kg	P1	J	3
22L0246	LDW22-SC777H	22L0246-33	EPA 8082A	Aroclor-1254	10.5	ug/kg	P1	NJ	3,19
22L0246	LDW22-SC777I	22L0246-34	EPA 8082A	Aroclor-1260	486	ug/kg	D	J	19
22L0246	LDW22-SC778B	22L0246-01	EPA 8082A	Aroclor-1248	15.8	ug/kg	D	J	13H
22L0246	LDW22-SC778B	22L0246-01	EPA 8082A	Aroclor-1254	14.8	ug/kg	D	J	13H
22L0246	LDW22-SC778B	22L0246-01	EPA 8082A	Aroclor-1260	4.5	ug/kg	D	J	13H
22L0246	LDW22-SC778C	22L0246-02	EPA 8082A	Aroclor-1248	771	ug/kg	D	J	13H
22L0246	LDW22-SC778C	22L0246-02	EPA 8082A	Aroclor-1254	830	ug/kg	D	J	13H
22L0246	LDW22-SC778C	22L0246-02	EPA 8082A	Aroclor-1260	353	ug/kg	D	J	13H
22L0246	LDW22-SC778F	22L0246-06	EPA 8082A	Aroclor-1254	97.9	ug/kg	P1 D	NJ	3
22L0246	LDW22-SC779E	22L0246-20	EPA 8082A	Aroclor-1248	1050	ug/kg	D	J	13H
22L0246	LDW22-SC779E	22L0246-20	EPA 8082A	Aroclor-1254	866	ug/kg	D	J	13H

Qualified Data Summary Table
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0246	LDW22-SC779E	22L0246-20	EPA 8082A	Aroclor-1260	216	ug/kg	D	J	13H
22L0307	LDW22-IT795F	22L0307-13	EPA 8082A	Aroclor-1254	5.3	ug/kg		J	19
22L0307	LDW22-IT795G	22L0307-14	EPA 8082A	Aroclor-1254	16	ug/kg		J	19
22L0307	LDW22-IT806A	22L0307-15	EPA 8082A	Aroclor-1248	14	ug/kg		J	19
22L0307	LDW22-IT806A	22L0307-15	EPA 8082A	Aroclor-1254	75.9	ug/kg		J	19
22L0307	LDW22-IT806B	22L0307-16	EPA 8082A	Aroclor-1248	53.7	ug/kg		J	19
22L0307	LDW22-IT808A	22L0307-29	EPA 1613B	1,2,3,6,7,8-HxCDF	1.92	ng/kg	EMPC B	J	25
22L0307	LDW22-IT808A	22L0307-29	EPA 1613B	1,2,3,7,8,9-HxCDF	1.47	ng/kg	EMPC	J	25
22L0307	LDW22-IT808A	22L0307-29	EPA 1613B	1,2,3,7,8-PeCDF	0.7	ng/kg	EMPC J	U	25
22L0307	LDW22-IT808A	22L0307-29	EPA 1613B	OCDD	1670	ng/kg	B	J	9
22L0307	LDW22-IT808A	22L0307-29	EPA 1613B	OCDF	136	ng/kg	B	J	9
22L0307	LDW22-IT808A	22L0307-29	EPA 8082A	Aroclor-1248	143	ug/kg		J	19
22L0307	LDW22-IT808A	22L0307-29	EPA 8082A	Aroclor-1254	188	ug/kg		J	19
22L0307	LDW22-IT808ADUP1	BKL0420-DUP1	EPA 1613B	1,2,3,4,7,8,9-HpCDF	3.97	ng/kg	EMPC	J	25
22L0307	LDW22-IT808ADUP1	BKL0420-DUP1	EPA 1613B	2,3,7,8-TCDF	1.19	ng/kg	X	J	23H
22L0307	LDW22-IT808ADUP1	BKL0420-DUP1	EPA 1613B	OCDD	1030	ng/kg	* B	J	9
22L0307	LDW22-IT808ADUP1	BKL0420-DUP1	EPA 1613B	OCDF	79.6	ng/kg	* B	J	9
22L0307	LDW22-IT808B	22L0307-30	EPA 1613B	2,3,7,8-TCDD	0.461	ng/kg	EMPC J	U	25
22L0307	LDW22-IT808B	22L0307-30	EPA 1613B	2,3,7,8-TCDF	2.67	ng/kg	X	J	23H
22L0307	LDW22-IT808C	22L0307-31	EPA 1613B	1,2,3,4,6,7,8-HpCDF	0.982	ng/kg	EMPC J	U	25
22L0307	LDW22-IT808C	22L0307-31	EPA 1613B	1,2,3,4,7,8-HxCDF	0.379	ng/kg	EMPC J	U	25
22L0307	LDW22-IT808C	22L0307-31	EPA 1613B	1,2,3,6,7,8-HxCDD	0.335	ng/kg	EMPC J	U	25
22L0307	LDW22-IT808C	22L0307-31	EPA 1613B	1,2,3,7,8,9-HxCDF	0.114	ng/kg	EMPC J	U	25
22L0307	LDW22-IT808C	22L0307-31	EPA 1613B	1,2,3,7,8-PeCDD	0.37	ng/kg	EMPC J	U	25
22L0307	LDW22-IT808C	22L0307-31	EPA 1613B	2,3,4,6,7,8-HxCDF	0.371	ng/kg	EMPC J	U	25
22L0307	LDW22-IT808C	22L0307-31	EPA 1613B	2,3,4,7,8-PeCDF	0.445	ng/kg	EMPC J	U	25
22L0307	LDW22-IT808C	22L0307-31	EPA 1613B	2,3,7,8-TCDD	0.171	ng/kg	EMPC J	U	25
22L0307	LDW22-IT808C	22L0307-31	EPA 1613B	2,3,7,8-TCDF	0.786	ng/kg	X J	J	23H
22L0307	LDW22-IT808C	22L0307-31	EPA 1613B	OCDF	0.607	ng/kg	EMPC J B	U	25

Qualified Data Summary Table
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0307	LDW22-IT808D	22L0307-32	EPA 1613B	1,2,3,6,7,8-HxCDF	0.399	ng/kg	EMPC J B	U	25
22L0307	LDW22-IT808D	22L0307-32	EPA 1613B	2,3,4,6,7,8-HxCDF	0.435	ng/kg	EMPC J	U	25
22L0307	LDW22-IT808D	22L0307-32	EPA 1613B	2,3,7,8-TCDF	1.84	ng/kg	X	J	23H
22L0307	LDW22-IT808D	22L0307-32	EPA 1613B	OCDF	0.951	ng/kg	EMPC J B	U	25
22L0307	LDW22-IT808E	22L0307-33	EPA 1613B	OCDD	2.22	ng/kg	J B	U	7
22L0307	LDW22-IT808E	22L0307-33	EPA 1613B	OCDF	0.632	ng/kg	EMPC J B	U	25
22L0307	LDW22-IT808F	22L0307-34	EPA 1613B	OCDD	2.47	ng/kg	J B	U	7
22L0307	LDW22-SC750A	22L0307-21	EPA 8082A	Aroclor-1254	3.1	ug/kg	J	J	19
22L0307	LDW22-SC752A	22L0307-43	epa 9060	Total Organic carbon (TOC)	0.53	%		J	9
22L0307	LDW22-SC752B	22L0307-44	epa 9060	Total Organic carbon (TOC)	0.64	%		J	9
22L0307	LDW22-SC752B-FD	22L0307-51	epa 9060	Total Organic carbon (TOC)	0.71	%		J	9
22L0307	LDW22-SC752C	22L0307-45	epa 9060	Total Organic carbon (TOC)	0.68	%		J	9
22L0307	LDW22-SC752D	22L0307-46	epa 9060	Total Organic carbon (TOC)	1.12	%		J	9
22L0307	LDW22-SC752E	22L0307-47	epa 9060	Total Organic carbon (TOC)	0.95	%		J	9
22L0307	LDW22-SC752F	22L0307-48	epa 9060	Total Organic carbon (TOC)	1.65	%		J	9
22L0307	LDW22-SC752G	22L0307-49	epa 9060	Total Organic carbon (TOC)	0.42	%		J	9
22L0307	LDW22-SC752H	22L0307-50	epa 9060	Total Organic carbon (TOC)	0.17	%		J	9
22L0307	LDW22-SC783B	22L0307-60	epa 9060	Total Organic carbon (TOC)	1.84	%		J	9
22L0307	LDW22-SC783C	22L0307-61	EPA 8082A	Aroclor-1248	23.2	ug/kg		J	19
22L0307	LDW22-SC783C	22L0307-61	EPA 8082A	Aroclor-1254	32	ug/kg		J	19
22L0307	LDW22-SC783C	22L0307-61	epa 9060	Total Organic carbon (TOC)	0.96	%		J	9
22L0307	LDW22-SC783H	22L0307-66	EPA 8082A	Aroclor-1248	74.4	ug/kg		J	19
22L0307	LDW22-SC783H	22L0307-66	EPA 8082A	Aroclor-1254	105	ug/kg		J	19
22L0307	LDW22-SC800A	22L0307-52	epa 9060	Total Organic carbon (TOC)	3.05	%		J	9
22L0307	LDW22-SC800B	22L0307-53	EPA 8082A	Aroclor-1254	94.7	ug/kg	P1	J	3
22L0307	LDW22-SC800B	22L0307-53	EPA 8082A	Aroclor-1260	57.3	ug/kg		J	19
22L0307	LDW22-SC800B	22L0307-53	epa 9060	Total Organic carbon (TOC)	2	%		J	9
22L0307	LDW22-SC800C	22L0307-54	EPA 8082A	Aroclor-1260	104	ug/kg		J	19
22L0307	LDW22-SC800C	22L0307-54	epa 9060	Total Organic carbon (TOC)	1.51	%		J	9

**Qualified Data Summary Table
LDW AOC4 Phase 3**

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0307	LDW22-SC800D	22L0307-55	epa 9060	Total Organic carbon (TOC)	1.81	%		J	9
22L0307	LDW22-SC800E	22L0307-56	EPA 8082A	Aroclor-1254	139	ug/kg	P1	J	3
22L0307	LDW22-SC800E	22L0307-56	epa 9060	Total Organic carbon (TOC)	2.06	%		J	9
22L0307	LDW22-SC800F	22L0307-57	epa 9060	Total Organic carbon (TOC)	2.28	%		J	9
22L0307	LDW22-SC800G	22L0307-58	EPA 8082A	Aroclor-1260	124	ug/kg		J	19
22L0307	LDW22-SC800G	22L0307-58	epa 9060	Total Organic carbon (TOC)	1.68	%		J	9
22L0307	LDW22-SC800H	22L0307-59	EPA 8082A	Aroclor-1260	129	ug/kg		J	19
22L0307	LDW22-SC800H	22L0307-59	epa 9060	Total Organic carbon (TOC)	3.29	%		J	9
22L0307	LDW22-SC804B	22L0307-35	EPA 8082A	Aroclor-1248	69.3	ug/kg		J	19
22L0307	LDW22-SC804B	22L0307-35	EPA 8082A	Aroclor-1254	98.3	ug/kg		J	19
22L0307	LDW22-SC804B	22L0307-35	EPA 8270E	Butyl benzyl phthalate	83.7	ug/kg	Q	J	5BH,12H
22L0307	LDW22-SC804C	22L0307-36	EPA 8082A	Aroclor-1248	12.3	ug/kg		J	19
22L0307	LDW22-SC804C	22L0307-36	EPA 8082A	Aroclor-1254	27.7	ug/kg		J	19
22L0307	LDW22-SC804C	22L0307-36	EPA 8270E	Butyl benzyl phthalate	23.1	ug/kg	Q	J	5BH,12H
22L0307	LDW22-SC804D	22L0307-37	EPA 8082A	Aroclor-1248	364	ug/kg	D	J	13H
22L0307	LDW22-SC804D	22L0307-37	EPA 8082A	Aroclor-1254	622	ug/kg	D	J	13H
22L0307	LDW22-SC804D	22L0307-37	EPA 8082A	Aroclor-1260	375	ug/kg	D	J	13H,19
22L0307	LDW22-SC804D	22L0307-37	EPA 8270E	Butyl benzyl phthalate	1310	ug/kg	Q D	J	5BH,12H
22L0307	LDW22-SC804E	22L0307-38	EPA 8082A	Aroclor-1254	6.9	ug/kg		J	19
22L0307	LDW22-SC804H	22L0307-42	epa 9060	Total Organic carbon (TOC)	0.49	%		J	9
22L0307	LDW22-SC804HDUP1	BKL0586-DUP1	epa 9060	Total Organic carbon (TOC)	0.4	%	*	J	9
22L0329	LDW22-IT791A	22L0329-15	EPA 9060	Total Organic carbon (TOC)	0.56	%		J	9
22L0329	LDW22-IT791B	22L0329-16	EPA 9060	Total Organic carbon (TOC)	0.05	%		J	9
22L0329	LDW22-IT791C	22L0329-17	EPA 9060	Total Organic carbon (TOC)	0.07	%		J	9
22L0329	LDW22-IT791D	22L0329-18	EPA 9060	Total Organic carbon (TOC)		%	U	UJ	9
22L0329	LDW22-IT791E	22L0329-19	EPA 9060	Total Organic carbon (TOC)	0.04	%		J	9
22L0329	LDW22-IT791F	22L0329-20	EPA 9060	Total Organic carbon (TOC)		%	U	UJ	9
22L0329	LDW22-IT799A	22L0329-01	EPA 9060	Total Organic carbon (TOC)	0.19	%		J	9
22L0329	LDW22-IT799ADUP1	BKL0650-DUP1	EPA 9060	Total Organic carbon (TOC)	0.37	%	*	J	9

Qualified Data Summary Table
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0329	LDW22-IT799ADUP2LT	BKL0650-DUP2	EPA 9060	Total Organic carbon (TOC)	0.22	%		J	9
22L0329	LDW22-IT799B	22L0329-02	EPA 8082A	Aroclor-1260	49.7	ug/kg		J	19
22L0329	LDW22-IT799B	22L0329-02	EPA 9060	Total Organic carbon (TOC)	0.61	%		J	9
22L0329	LDW22-IT799C	22L0329-03	EPA 8082A	Aroclor-1248	32.2	ug/kg	P1	J	3
22L0329	LDW22-IT799C	22L0329-03	EPA 9060	Total Organic carbon (TOC)	0.22	%		J	9
22L0329	LDW22-IT799D	22L0329-04	EPA 9060	Total Organic carbon (TOC)	0.44	%		J	9
22L0329	LDW22-IT799E	22L0329-05	EPA 8082A	Aroclor-1254	48.8	ug/kg		J	5BH
22L0329	LDW22-IT799E	22L0329-05	EPA 9060	Total Organic carbon (TOC)	0.34	%		J	9
22L0329	LDW22-IT799F	22L0329-06	EPA 9060	Total Organic carbon (TOC)	0.34	%		J	9
22L0329	LDW22-SC788B	22L0329-07	EPA 9060	Total Organic carbon (TOC)	1.55	%		J	9
22L0329	LDW22-SC788C	22L0329-08	EPA 9060	Total Organic carbon (TOC)	1.62	%		J	9
22L0329	LDW22-SC788D	22L0329-09	EPA 9060	Total Organic carbon (TOC)	1.92	%		J	9
22L0329	LDW22-SC788E	22L0329-10	EPA 9060	Total Organic carbon (TOC)	1.83	%		J	9
22L0329	LDW22-SC788E-FD	22L0329-11	EPA 9060	Total Organic carbon (TOC)	2.88	%		J	9
22L0329	LDW22-SC788F	22L0329-12	EPA 9060	Total Organic carbon (TOC)	1.18	%		J	9
22L0329	LDW22-SC788G	22L0329-13	EPA 8082A	Aroclor-1254	7690	ug/kg	P1 D	NJ	3
22L0329	LDW22-SC788G	22L0329-13	EPA 9060	Total Organic carbon (TOC)	1.69	%		J	9
22L0329	LDW22-SC788H	22L0329-14	EPA 9060	Total Organic carbon (TOC)	1.73	%		J	9
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	1,2,3,4,6,7,8-HpCDD	241	ng/kg	B	J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	1,2,3,4,6,7,8-HpCDF	51.2	ng/kg	B	J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	1,2,3,4,7,8,9-HpCDF	5.08	ng/kg		J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	1,2,3,4,7,8-HxCDD	2.69	ng/kg		J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	1,2,3,4,7,8-HxCDF	7.01	ng/kg	B	J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	1,2,3,6,7,8-HxCDD	10.1	ng/kg		J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	1,2,3,6,7,8-HxCDF	3.52	ng/kg	B	J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	1,2,3,7,8,9-HxCDD	6.88	ng/kg	B	J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	1,2,3,7,8,9-HxCDF	1.52	ng/kg	B	J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	1,2,3,7,8-PeCDD	2.84	ng/kg	B	J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	1,2,3,7,8-PeCDF	1.56	ng/kg		J	1

**Qualified Data Summary Table
LDW AOC4 Phase 3**

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	2,3,4,6,7,8-HxCDF	4.59	ng/kg	B	J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	2,3,4,7,8-PeCDF	2.77	ng/kg		J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	2,3,7,8-TCDD	0.776	ng/kg	J	J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	2,3,7,8-TCDF	2.99	ng/kg		J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	OCDD	1890	ng/kg	B	J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	OCDF	110	ng/kg	B	J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	Total HpCDD	524	ng/kg		J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	Total HpCDF	159	ng/kg		J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	Total HxCDD	93.7	ng/kg		J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	Total HxCDF	73.9	ng/kg		J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	Total PeCDD	12.2	ng/kg		J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	Total PeCDF	39.6	ng/kg		J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	Total TCDD	10.9	ng/kg		J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 1613B	Total TCDF	37.8	ng/kg		J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 8082A	Aroclor-1016		ug/kg	H U	UJ	1
22L0473	LDW21-IT632A	22L0473-11	EPA 8082A	Aroclor-1221		ug/kg	H U	UJ	1
22L0473	LDW21-IT632A	22L0473-11	EPA 8082A	Aroclor-1232		ug/kg	H U	UJ	1
22L0473	LDW21-IT632A	22L0473-11	EPA 8082A	Aroclor-1242		ug/kg	H U	UJ	1
22L0473	LDW21-IT632A	22L0473-11	EPA 8082A	Aroclor-1248	330	ug/kg	H D	J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 8082A	Aroclor-1254	743	ug/kg	H D	J	1
22L0473	LDW21-IT632A	22L0473-11	EPA 8082A	Aroclor-1260	249	ug/kg	H D	J	1
22L0473	LDW21-IT632A	22L0473-11	epa 9060	Total Organic carbon (TOC)	1.29	%	H	J	1
22L0473	LDW21-IT632A	22L0473-11	SM 2540-G	Total Solids	62.59	%	H	J	1
22L0473	LDW21-IT699AX	22L0473-10	EPA 8082A	Aroclor-1016		ug/kg	U	UJ	1
22L0473	LDW21-IT699AX	22L0473-10	EPA 8082A	Aroclor-1221		ug/kg	U	UJ	1
22L0473	LDW21-IT699AX	22L0473-10	EPA 8082A	Aroclor-1232		ug/kg	U	UJ	1
22L0473	LDW21-IT699AX	22L0473-10	EPA 8082A	Aroclor-1242		ug/kg	U	UJ	1
22L0473	LDW21-IT699AX	22L0473-10	EPA 8082A	Aroclor-1248		ug/kg	U	UJ	1
22L0473	LDW21-IT699AX	22L0473-10	EPA 8082A	Aroclor-1254		ug/kg	U	UJ	1

Qualified Data Summary Table
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0473	LDW21-IT699AX	22L0473-10	EPA 8082A	Aroclor-1260		ug/kg	U	UJ	1
22L0473	LDW21-IT699AX	22L0473-10	epa 9060	Total Organic carbon (TOC)	0.26	%	H	J	1
22L0473	LDW21-IT699AX	22L0473-10	SM 2540-G	Total Solids	77.9	%	H	J	1
22L0473	LDW22-SC767B	22L0473-05	EPA 7471B	Mercury	0.008	mg/kg	J	J	9
22L0473	LDW22-SC767B	22L0473-05	EPA 8270E-SIM	2-Methylnaphthalene	1.35	ug/kg	J	U	7
22L0473	LDW22-SC767B	22L0473-05	EPA 8270E-SIM	Acenaphthene	0.76	ug/kg	J	U	7
22L0473	LDW22-SC767B	22L0473-05	EPA 8270E-SIM	Fluoranthene	1.66	ug/kg	J	U	7
22L0473	LDW22-SC767B	22L0473-05	EPA 8270E-SIM	Phenanthrene	3.07	ug/kg	J	U	7
22L0473	LDW22-SC767B	22L0473-05	EPA 8270E-SIM	Pyrene	1.96	ug/kg	J	U	7
22L0473	LDW22-SC767C	22L0473-06	EPA 7471B	Mercury	0.0099	mg/kg	J	J	9
22L0473	LDW22-SC767C	22L0473-06	EPA 8270E-SIM	2-Methylnaphthalene	1.33	ug/kg	J	U	7
22L0473	LDW22-SC767C	22L0473-06	EPA 8270E-SIM	Acenaphthene	0.65	ug/kg	J	U	7
22L0473	LDW22-SC767C	22L0473-06	EPA 8270E-SIM	Fluoranthene	0.7	ug/kg	J	U	7
22L0473	LDW22-SC767C	22L0473-06	EPA 8270E-SIM	Naphthalene	1.51	ug/kg	J	U	7
22L0473	LDW22-SC767C	22L0473-06	EPA 8270E-SIM	Phenanthrene	1.46	ug/kg	J	U	7
22L0473	LDW22-SC767C	22L0473-06	EPA 8270E-SIM	Pyrene	0.72	ug/kg	J	U	7
22L0473	LDW22-SC767D	22L0473-07	EPA 7471B	Mercury	0.0143	mg/kg	J	J	9
22L0473	LDW22-SC767D	22L0473-07	EPA 8270E-SIM	2-Methylnaphthalene	1.39	ug/kg	J	U	7
22L0473	LDW22-SC767D	22L0473-07	EPA 8270E-SIM	Fluoranthene	0.85	ug/kg	J	U	7
22L0473	LDW22-SC767D	22L0473-07	EPA 8270E-SIM	Fluorene	3.42	ug/kg	J	U	7
22L0473	LDW22-SC767D	22L0473-07	EPA 8270E-SIM	Naphthalene	1.75	ug/kg	J	U	7
22L0473	LDW22-SC767D	22L0473-07	EPA 8270E-SIM	Phenanthrene	1.72	ug/kg	J	U	7
22L0473	LDW22-SC767D	22L0473-07	EPA 8270E-SIM	Pyrene	0.73	ug/kg	J	U	7
22L0473	LDW22-SC767E	22L0473-08	EPA 7471B	Mercury	0.009	mg/kg	J	J	9
22L0473	LDW22-SC767E	22L0473-08	EPA 8270E-SIM	Fluoranthene	1.65	ug/kg	J	U	7
22L0473	LDW22-SC767E	22L0473-08	EPA 8270E-SIM	Phenanthrene	2.24	ug/kg	J	U	7
22L0473	LDW22-SC767E	22L0473-08	EPA 8270E-SIM	Pyrene	2.07	ug/kg	J	U	7
22L0473	LDW22-SC767F	22L0473-09	EPA 7471B	Mercury	0.008	mg/kg	J	J	9
22L0473	LDW22-SC767F	22L0473-09	EPA 8270E-SIM	Fluoranthene	1.21	ug/kg	J	U	7

Qualified Data Summary Table
LDW AOC4 Phase 3

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validation Qualifier	Validation Reason
22L0473	LDW22-SC767F	22L0473-09	EPA 8270E-SIM	Fluorene	3.39	ug/kg	J	U	7
22L0473	LDW22-SC767F	22L0473-09	EPA 8270E-SIM	Phenanthrene	2.32	ug/kg	J	U	7
22L0473	LDW22-SC767F	22L0473-09	EPA 8270E-SIM	Pyrene	1.67	ug/kg	J	U	7