EcoChem, INC.
Environmental Data Quality

DATA VALIDATION REPORT

Washington Department of Ecology Toxics Cleanup Program

Sediment Characterization Study in Port Gardner and Lower Snohomish Estuary - Port Gardner, WA

Prepared for:

SAIC
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EcoChem Project: C4126-1

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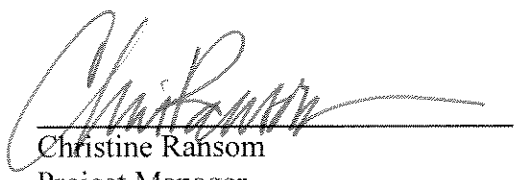
Approved for Release



Christine Ransom
Project Manager
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INTRODUCTION

Basis for the Data Validation

This report summarizes the results of the validation performed on sediment, tissue, and quality control (QC) sample data for the Washington Department of Ecology – Sediment Characterization Study in Port Gardner and Lower Snohomish Estuary, Port Gardner, Washington. A complete list of samples is provided in the **Sample Index**. Analytical Resources Incorporated, Tukwila, Washington performed most of the analyses with the exception of dioxin & furan compounds, which were analyzed by Axys Analytical Services, Sidney, British Columbia, and some sulfide samples which were analyzed by Test America, Tacoma, Washington. The analytical methods and EcoChem project chemists are listed below.

Analysis	Method of Analysis	Primary Review	Secondary Review
Semivolatile Organic Compounds	SW8270D	Jennifer Newkirk	Chris Ransom
Resin Acids			
Pesticides	SW8081	Melissa Swanson	Chris Ransom
PCB Aroclors	SW8082	Mark Brindle/ Melissa Swanson	Chris Ransom
Tributyl Tin	KRONE 1988-SIM	Jennifer Newkirk	Chris Ransom
Dioxin & Furan Compounds	EPA 1613B	Mark Brindle	Eric Strout
Metals	SW6020, SW7471A, SW7470A	Linda Holz	Chris Ransom
Conventionals: Total Solids, Preserved Total Solids, Total Organic Carbon, Total Volatile Solids, Ammonia as Nitrogen, Sulfides, Lipids, Grain Size	EPA 160.3,Plumb 1981, 160.4, 9030B/350.1, 376.2, NOAA, PSEP		

The data validation is based on QC criteria documented in the above listed methods, the *Sediment Characterization Study in Port Gardner and Lower Snohomish Estuary, Port Gardner, Washington Quality Assurance Project Plan (QAPP), (September 2008)*; and *USEPA National Functional Guidelines for Organic* (1999) *and Inorganic (2004) Data Review*. The QC criteria are summarized in **Appendix A.**

EcoChem's goal in assigning data validation qualifiers is to assist in proper data interpretation. If values are estimated (assigned a J), data may be used for site evaluation purposes but reasons for data qualification should be taken into consideration when interpreting sample concentrations. Values with no data qualifier meet all data quality goals as outlined in the EPA Functional Guidelines.

Data qualifier definitions and Data Validation Criteria Tables are included as **Appendix A**. **Appendix B** contains the Qualified Data Summary Table. Data validation worksheets are kept on file at EcoChem.

Sample Index
SAIC - Port Gardner

Sample ID	Laboratory ID	SVOC	Resin Acids	Pest	PCB	Dioxins	TBT	Metals	Sulfide	Ammonia	TOC	Total Solids	Total Volatile Solids	Grain Size	Lipids
PG-A1-31-S	NJ24A								✓	✓	✓	✓	✓		
PG-A1-38-S	NJ24B	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-44-S	NJ24C	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-46-S	NJ24D								✓	✓	✓	✓	✓		
PG-A2-10-S	NJ24E	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-10-D	NJ24F	✓			✓			✓							
PG-A2-10-T	NJ24G							✓							
PG-A2-11-S	NJ24H	✓			✓		✓	✓	✓	✓	✓	✓	✓	✓	
PG-A2-13-S	NJ24I	✓			✓		✓	✓	✓	✓	✓	✓	✓	✓	
PG-A2-22-S	NJ24J	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-28-S	NJ24K	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-30-S	NJ24L	✓	✓		✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-32-S	NJ24M	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	
PG-A2-36-S	NJ24N	✓	✓		✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-01-S	NJ29A	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-02-S	NJ29B	✓	✓		✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-03-S	NJ29C	✓			✓		✓	✓	✓	✓	✓	✓	✓	✓	
PG-A1-07-S	NJ29D	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-10-S	NJ29E	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-15-S	NJ29F	✓			✓		✓	✓	✓	✓	✓	✓	✓	✓	
PG-A1-15-D	NJ29G								✓	✓	✓	✓	✓	✓	
PG-A1-15-T	NJ29H								✓	✓	✓	✓	✓	✓	
PG-A1-16-S	NJ29I	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-18-S	NJ29J	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-23-S	NJ29K	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-24-S	NJ29L	✓	✓		✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-02-S	NJ89A	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A4-04-S	NJ89B	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A4-04-D	NJ89C	✓			✓										
PG-A4-05-S	NJ89D	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A4-05-D	NJ89E							✓							
PG-A4-05-T	NJ89F	✓						✓							
PG-A4-07-S	NJ89G	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	
PG-A3-05-S	NJ89H	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	
PG-A3-07B-S	NJ89I	✓			✓		✓	✓	✓	✓	✓	✓	✓	✓	
PG-A2-08-S	NJ89J	✓			✓			✓	✓	✓	✓	✓	✓	✓	

Sample Index
SAIC - Port Gardner

Sample ID	Laboratory ID	SVOC	Resin Acids	Pest	PCB	Dioxins	TBT	Metals	Sulfide	Ammonia	TOC	Total Solids	Total Volatile Solids	Grain Size	Lipids
PG-A2-07-S	NJ89K	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-37B-S	NJ89L	✓		✓	✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-38B-S	NJ89M	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-38-S	NJ89N	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-38-D	NJ89O								✓	✓	✓	✓	✓	✓	
PG-A2-38-T	NJ89P								✓	✓	✓	✓	✓	✓	
PG-A2-42-S	NJ89Q	✓		✓	✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-43B-S	NJ89R	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A3-13-S	NJ89S	✓			✓		✓	✓	✓	✓	✓	✓	✓	✓	
PG-A3-11-S	NJ89T	✓		✓	✓			✓	✓	✓	✓	✓	✓	✓	
PG-A3-09-S	NJ89U	✓		✓	✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-25-S	NJ89V	✓	✓		✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-14-S	NJ89W	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-31B	NK42A	✓			✓			✓	✓	✓	✓	✓	✓		
PG-A2-16-S	NK42B								✓	✓	✓	✓	✓		
PG-A2-18-S	NK42C	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓		
PG-A2-21-S	NK42D								✓	✓	✓	✓	✓		
PG-A2-23-S	NK42E	✓			✓			✓	✓	✓	✓	✓	✓		
PG-A2-26-S	NK42F	✓			✓			✓	✓	✓	✓	✓	✓		
PG-A2-29-S	NK42G	✓			✓			✓	✓	✓	✓	✓	✓		
PG-A2-33B-S	NK42H	✓			✓			✓	✓	✓	✓	✓	✓		
PG-A2-34-S	NK42I	✓			✓			✓	✓	✓	✓	✓	✓		
PG-A2-34B-S	NK42J	✓			✓			✓	✓	✓	✓	✓	✓		
PG-A2-46-S	NK42K	✓			✓			✓	✓	✓	✓	✓	✓		
PG-A3-05B-S	NK42L								✓	✓	✓	✓	✓		
PG-A3-05D-S	NK42M								✓	✓	✓	✓	✓		
PG-A4-08B-S	NK42N	✓			✓			✓	✓	✓	✓	✓	✓		
PG-A4-09-S	NK42O	✓			✓			✓	✓	✓	✓	✓	✓		
PG-A2-T1-DC-M-A	NL50A				✓			✓							✓
PG-A2-T1-DC-H-A	NL50B				✓			✓							✓
PG-A2-T1-ES-A	NL50C				✓			✓							✓
PG-A2-T2-DC-M-A	NL50D				✓			✓							✓
PG-A2-T2-DC-H-A	NL50E				✓			✓							✓
PG-A2-T2-ES-A	NL50F				✓			✓							✓
PG-A1-T3-DC-M-A	NL50G				✓			✓							✓
PG-A1-T3-DC-H-A	NL50H				✓			✓							✓

Sample Index
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Sample ID	Laboratory ID	SVOC	Resin Acids	Pest	PCB	Dioxins	TBT	Metals	Sulfide	Ammonia	TOC	Total Solids	Total Volatile Solids	Grain Size	Lipids
PG-A1-T3-ES-A	NL50I				✓			✓							✓
PG-A2-30-C1-3	NL51A	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-30-C3-5	NL51B	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-32-C1-3	NL51C	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-32-C3-5	NL51D	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-18-C1-3	NL51E	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-18-C3-5	NL51F	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A3-05-C1-3	NL51G	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A3-05-C3-5	NL51H	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-03-C1-3	NL51I	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-03-C3-5	NL51J	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-25-C1-3	NL51K	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-25-C3-5	NL51L	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-11-C1-3	NL52A	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A4-04-C1-3	NL52B	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-18-C1-3	NL52C	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-07-C1-3	NL52D	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-07-C3-5	NL52E	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-07-C1-3	NL52F	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-37B-C1-3	NL52G	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-18-C3-5	NL52H	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-24-C1-3	NL52I	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-24-C3-5	NL52J	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-15-C1-3	NL52K	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-15-C3-5	NL52L	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-02-C1-3	NL56A	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-25B-S	NL56B	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A2-18B-S	NL56C	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-A1-46B-S	NL56D	✓			✓			✓	✓	✓	✓	✓	✓	✓	
PG-00-RB	NL56E	✓			✓			✓							
PG-00-ER	NL56F	✓			✓			✓							
PG-A1-46B-VC-A	NL56G				✓			✓							✓
PG-A2-25B-MY-A	NL56H				✓			✓							✓
PG-A2-18B-MY-A	NL56I				✓			✓							✓
PG-A1-31B-VC-A	NL56J				✓			✓							✓
PG-A2-21-S	NT54A	✓	✓								✓	✓	✓		

Sample Index
SAIC - Port Gardner

Sample ID	Laboratory ID	SVOC	Resin Acids	Pest	PCB	Dioxins	TBT	Metals	Sulfide	Ammonia	TOC	Total Solids	Total Volatile Solids	Grain Size	Lipids
PG-A2-07-S	NT54B														
PG-A1-24-S	NT54C										✓	✓	✓		
PG-A1-10-S	NT54D										✓	✓	✓		
PG-A1-07-S	NT54E							✓			✓	✓	✓		
PG-A1-03-S	NT54F										✓	✓	✓		
PG-A1-01-S	NT54G										✓	✓	✓		
PG-A1-16-S	NT54H										✓	✓	✓		
PG-A2-10-S	NT54I										✓	✓	✓		
PG-A2-11-S	NT54J										✓	✓	✓		
PG-A2-13-S	NT54K							✓			✓	✓	✓		
PG-A2-18-S	NT54L										✓	✓	✓		
PG-A2-25-S	NT54M										✓	✓	✓		
PG-A2-36-S	NT54N										✓	✓	✓		
PG-A2-14-S	NT54O										✓	✓	✓		
PG-A4-08B-S	NT54P										✓	✓	✓		
PG-A3-07B-S	NT54Q										✓	✓	✓		
PG-A3-05E-S	NT54R										✓	✓	✓		
PG-A3-06B-S	NT54S	✓			✓			✓			✓	✓	✓		
CR-22S-S	NT94A										✓	✓	✓		
CR-23-S	NT94B										✓	✓	✓		
CR-20/40-S	NT94C										✓	✓	✓		
PG-A2-21-S	NU49A							✓							
PG-A3-14-TULE	NV04A			✓	✓			✓							
PG-A3-14-CATAIL	NV04B			✓	✓			✓							
PG-A3-15-TULE	NV04C			✓	✓			✓							
PG-A3-15-CATAIL	NV04D			✓	✓			✓							
SB-REF-48	OB85A										✓	✓	✓	✓	
SB-REF-76	OB85B										✓	✓	✓	✓	
CR-20/24-65	OB85C										✓	✓	✓	✓	
CR-23-49	OB85D										✓	✓	✓	✓	

Sample Index
SAIC - Port Gardner

Sample ID	Laboratory ID	SVOC	Resin Acids	Pest	PCB	Dioxins	TBT	Metals	Sulfide	Ammonia	TOC	Total Solids	Total Volatile Solids	Grain Size	Lipids
PG-A1-03-S	L11588-1					✓									
PG-A3-05-S	L11588-10					✓									
PG-A4-07-S	L11588-11					✓									
PG-A1-31B-S	L11588-12					✓									
PG-A1-10-S	L11588-2					✓									
PG-A1-18-S	L11588-3					✓									
PG-A1-24-S	L11588-4					✓									
PG-A2-02-S	L11588-5 i2					✓									
PG-A2-08-S	L11588-6					✓									
PG-A2-30-S	L11588-7 R					✓									
PG-A2-32-S	L11588-8 (A)					✓									
PG-A2-37B-S	L11588-9					✓									
PG-A2-18B-S	L11641-1					✓									
PG-A2-25B-S	L11641-2					✓									
PG-A1-46B-S	L11641-3 i					✓									
PG-A2-30-C1-3	L11641-4					✓									
PG-A2-32-C1-3	L11641-5					✓									
PG-A3-05-C1-3	L11641-6					✓									
PG-A2-18-C1-3	L11641-7					✓									
PG-A1-24-C1-3	L11641-8					✓									
PG-A2-T2-DC-M-A	L11643-1					✓									
PG-A2-T2-DC-H-A	L11643-2					✓									
PG-A2-T2-ES-A	L11643-3					✓									
PG-A2-T1-DC-M-A	L11643-4					✓									
PG-A2-T1-DC-H-A	L11643-5					✓									
PG-A2-T1-ES-A	L11643-6					✓									
PG-A1-T3-DC-H-A	L11643-7					✓									
PG-A1-T3-DC-M-A	L11643-8 (A)					✓									
PG-A1-T3-ES-A	L11643-9					✓									
PG-A2-18B-MY-A	L11643-10 R					✓									
PG-A1-31B-VC-A	L11643-11					✓									
PG-A1-46B-VC-A	L11643-12					✓									
PG-A2-25B-MY-A	L11643-13					✓									

Sample Index
SAIC - Port Gardner

Sample ID	Laboratory ID	SVOC	Resin Acids	Pest	PCB	Dioxins	TBT	Metals	Sulfide	Ammonia	TOC	Total Solids	Total Volatile Solids	Grain Size	Lipids
CR-22S-S	D8J110182-001								✓						
CR-23	D8J110182-002								✓						
CR20/24	D8J110182-003								✓						
PG-A2-21-S	D8J09343-001								✓						
PG-A1-24-S	D8J09343-002								✓						
PG-A1-10-S	D8J09343-003								✓						
PG-A1-07-S	D8J09343-004								✓						
PG-A1-03-S	D8J09343-005								✓						
PG-A1-01-S	D8J09343-006								✓						
PG-A1-16-S	D8J09343-007								✓						
PG-A2-10-S	D8J09343-008								✓						
PG-A2-11-S	D8J09343-009								✓						
PG-A2-13-S	D8J09343-010								✓						
PG-A2-18-S	D8J09343-011								✓						
PG-A2-25-S	D8J09343-012								✓						
PG-A2-36-S	D8J09343-013								✓						
PG-A2-14-S	D8J09343-014								✓						
PG-A4-08B-S	D8J09343-015								✓						
PG-A3-07B-S	D8J09343-016								✓						
PG-A3-05E-S	D8J09343-017								✓						
PG-A3-06B-S	D8J09343-018								✓						

DATA VALIDATION REPORT
Port Gardner Sediment Characterization
Semivolatile Organic Compounds and Guaiacols
by EPA Method 8270D

This report documents the review of analytical data from the analyses of sediment samples and the associated laboratory and field quality control (QC) samples. Analytical Resources, Inc., Tukwila, Washington, analyzed the samples. Summary (Level III) validation was performed for all data. See the **Sample Index** for a complete list of samples for which data were reviewed.

SDG	Number of Samples
NJ24	11 Sediment
NJ29	10 Sediment
NJ89	19 Sediment
NK42	11 Sediment
NL51	12 Sediment
NL52	12 Sediment
NL56	4 Sediment & 2 Field Blanks
NT54	1 Sediment

I. 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.

II. EDD TO HARDCOPY VERIFICATION

A verification of the electronic data deliverables (EDD) results was performed by comparison to the hardcopy laboratory data package. No errors were found.

SDG NL56: The laboratory incorrectly transcribed Sample PG-A2-02-C1-3 as PG-A2-02-C1-38. The sample ID was corrected in the EDD.

III. TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

1	Holding Times and Sample Preservation	2	Laboratory Control Samples (LCS)
	GC/MS Instrument Performance Check	2	Matrix Spikes/Matrix Spike Duplicates (MS/MSD)
	Initial Calibration (ICAL)	1	Standard Reference Material (SRM)
2	Continuing Calibration (CCAL)	1	Field Replicates
	Laboratory Blanks		Internal Standards
1	Field Blanks		Target Analyte List
1	Surrogate Compounds	1	Reporting Limits

[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.*

Holding Times and Sample Preservation

The validation guidance documents state that the cooler temperature should be within an advisory temperature range of 2°C to 6°C. Several coolers were received outside of this range, with temperatures ranging from -0.8°C to 8.2°C. It was determined that these temperature outliers did not impact data quality and no qualifiers were assigned.

Continuing Calibration (CCAL)

All values for the relative response factor (RRF) were greater than the 0.05 minimum control limits. The values for percent difference (%D) were within the ±25% control limits, with the exceptions noted below. Results and reporting limits in samples associated with outliers indicative of a low bias were estimated (J/UJ-5B). For outliers indicative of a potential high bias, associated positive results were estimated (J-5B). No qualification was necessary for non-detects associated with high bias.

SDG	CCAL Date/Time	Instrument ID	Analyte	Bias
NJ29	8/27/08 13:25	NT6	Benzyl alcohol	Low
NJ89	8/22/08 13:13	NT6	4,2-dichloroguaiacol	High
NL51	9/3/08 11:42	NT6	Benzyl alcohol	Low
	9/3/08 13:07	NT6	Benzyl alcohol	Low
NL56	9/3/08 13:07	NT6	Benzyl alcohol	Low

Laboratory Blanks

To assess the impact of each blank contaminant on the reported sample results, an action level is established at five times 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). If the result is also less than the reporting limit, then the result is elevated to the reporting limit. No action is taken for non-detected results.

Method blanks were analyzed at the appropriate frequency. Various target analytes were detected in the method blanks, however only the following analyte was qualified as not detected based on blank contamination:

SDG NL52: Benzo(g,h,i)perylene (7 results)

Field Blanks

SDG NL56: Two field blanks, PG-00-RB and PG-00-ER, were submitted. There were no positive results for any target analyte.

Surrogate Compounds

The surrogate percent recovery (%R) values were within the laboratory control limits, with the following exceptions:

SDG NJ24: The %R values for 2,4,6-tribromophenol were greater than the upper control limit in

Samples PG-A2-11-S and PG-A2-22-S. One surrogate outlier per fraction is permitted; no qualifiers were required.

SDG NL52: The %R values for d14-p-terphenyl were greater than the upper control limit in Samples PG-A2-11-C1-3, PG-A4-04-C1-3, and PG-A2-07-C1-3. The %R values for 2,4,6-tribromophenol were greater than the upper control limits in Samples PG-A2-11-C1-S, PG-A1-07-C3-5, and PG-A1-24-C1-3. One surrogate outlier per fraction is permitted, therefore no qualifiers were required.

Laboratory Control Samples (LCS)

A laboratory control sample (LCS) was analyzed at the proper frequency of one per batch. The percent recovery (%R) values were within the laboratory control limits, with the following exception:

SDG NT54: The LCS recovery for benzyl alcohol was less than the lower control limit. This analyte was not detected in the associated sample; the reporting limit was estimated (UJ-10) to indicate a potential low bias.

Matrix Spike/Matrix Spike Duplicates (MS/MSD)

Matrix spike/matrix spike duplicate samples (MS/MSD) were analyzed at the proper frequency of one per 20 samples or one per batch; whichever was more frequent. The percent recovery (%R) values were within the laboratory control limits, with the exceptions noted below. For %R values less than the lower control limit, the results in the parent sample only were estimated (J/UJ-8) to indicate a possible low bias. If the recoveries were less than 10%, non-detects were rejected (R-8) due to the extreme low bias. For recoveries that were greater than the upper control limit, results in the parent sample were estimated (J-8) only if the compounds were detected.

The MS/MSD relative percent difference values were less than the control limit of 35%, with the exceptions noted below. For RPD outliers, the associated results in the parent sample were qualified only if the analytes were detected.

The Samples used for QC and outliers that resulted in qualification of data are listed below:

SDG NJ24: QC Sample PG-A2-30-S: indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene - low bias (UJ-8)

SDG NJ29: QC Sample PG-A1-24-S: bis(2-ethylhexyl)phthalate – (J-9) RPD

SDG NK42: QC Sample PG-A2-18-S: benzyl alcohol – no recovery, extreme low bias (R-8)

SDG NL52: QC Sample PG-A4-04-C1-3: 2,4-dimethylphenol - low bias (UJ-8)

Standard Reference Material

The laboratory analyzed the standard reference material SQ-1 in association with the sediment samples. The recoveries for several compounds were less than the lower control limits. This reference material is not certified, therefore no data were qualified based on recovery outliers.

Field Replicates

The following acceptance criteria were used to evaluate field precision: the relative percent difference (RPD) control limit is 50% for results greater than five times the reporting limit (RL). For results less than five times the RL, the difference between the sample and replicate must be less than two times the RL.

SDG NJ24: Samples PG-A2-10-S and PG-A2-10-D: All field precision criteria were met.

SDG NJ89: Samples PG-A4-04-S and PG-A4-04-D: All field precision criteria were met.

Reporting Limits (MDL and MRL)

The detection limits specified by the QAPP were not met for 1,2-dichlorobenzene (3.2 µg/kg), 1,4-dichlorobenzene (3.2 µg/kg), 1,2,4-trichlorobenzene (6 µg/kg), hexachlorobenzene (12 µg/kg), 2-methylphenol (6µg/kg), 2,4-dimethylphenol (6 µg/kg), pentachlorophenol (61 µg/kg), benzyl alcohol (6 µg/kg), benzoic alcohol (6 µg/kg), and n-nitrosodiphenylamine (12 µg/kg). Lab limits of 20 µg/kg were reported for all above compounds with the exceptions of pentachlorophenol at 100 µg/kg and benzoic acid at 200 µg/kg.

SDG NJ29: Sample PG-A1-01-S required dilution based on matrix interference. Reporting limits were elevated accordingly.

IV. OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable as demonstrated by the surrogate, LCS, and MS/MSD percent recovery values, with the exceptions noted above. Precision was also acceptable as demonstrated by the MS/MSD and field replicate RPD values, with the exceptions previously noted.

One data point for benzyl alcohol was rejected based on MS/MSD %R values that were less than 10%.

Data were qualified as not-detected based on blank contamination. Data were estimated based on CCAL %D, MS/MSD %R, and MS/MSD RPD outliers.

Rejected data should not be used for any purpose. All other data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Port Gardner Sediment Characterization
Resin Acids by EPA Method 8270D

This report documents the review of analytical data from the analyses of sediment samples and the associated laboratory and field quality control (QC) samples. Analytical Resources, Inc., Tukwila, Washington, analyzed the samples. Summary (Level III) validation was performed for all data. See the **Sample Index** for a complete list of samples for which data were reviewed.

SDG	Number of Samples
NJ24	3 Sediment
NJ29	2 Sediment
NJ89	3 Sediment
NK42	1 Sediment
NT54	1 Sediment

I. 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.

II. EDD TO HARDCOPY VERIFICATION

A verification of the electronic data deliverables (EDD) results was performed by comparison to the hardcopy laboratory data package. No errors were found.

III. TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

1	Holding Times and Sample Preservation	2	Laboratory Control Samples (LCS)
	GC/MS Instrument Performance Check	2	Matrix Spikes/Matrix Spike Duplicates (MS/MSD)
	Initial Calibration (ICAL)		Internal Standards
	Continuing Calibration (CCAL)		Target Analyte List
	Blanks (Laboratory and Field)	1	Reporting Limits
	Surrogate Compounds		

[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.*

Holding Times and Sample Preservation

The validation guidance documents state that the cooler temperature should be within an advisory temperature range of 2°C to 6°C. Several coolers were received outside of this range, with temperatures ranging from -0.8°C to 8.2°C. It was determined that these temperature outliers did not impact data quality and no qualifiers were assigned.

Laboratory Control Samples (LCS)

Laboratory control samples (LCS) were analyzed at the proper frequency of one per batch. Recoveries were within the laboratory control limits, with the following exceptions:

SDGs NJ89 & NK42: The LCS percent recovery (%R) value for abietic acid was less than the lower control limit. All associated results were estimated (J/UJ-10) to indicate a potential low bias.

SDG NT54: The LCS recovery for abietic acid was greater than the upper control limit. The associated positive result was estimated (J-10) to indicate a potential high bias.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Matrix spike/matrix spike duplicate samples (MS/MSD) were analyzed at the proper frequency of one per 20 samples or one per batch; whichever was more frequent. The percent recovery (%R) and relative percent difference (RPD) values were within the laboratory control limits, with the exceptions noted below:

SDGs NJ24 & NJ29: For QC Sample PG-A2-30-S, the MS/MSD %R values for abietic acid were less than the lower control limit. In addition, the RPD value exceeded the control limit. The result for this compound in the parent sample was estimated (UJ-8,9).

SDGs NJ89 & NK42: For QC Sample PG-A4-07-S, abietic acid was not recovered in the MS/MSD samples. The positive result for this sample was estimated (J-8) to indicate a potential low bias.

SDG NT54: For QC Sample PG-A2-21-S, the MS %R value for abietic acid was greater than the upper control limit. The MSD %R was in control, therefore no action was taken. In addition, the RPD value exceeded the control limit. The result for this compound in the parent sample was estimated (J-9).

Reporting Limits

SDG NJ29: Sample PG-A1-24-S was analyzed at dilution because of matrix interference. Reporting limits were elevated accordingly.

SDG NJ89: Sample PG-A2-25-S was analyzed at dilution because of matrix interference. Reporting limits were elevated accordingly.

SDG NK42: Sample PG-A2-18-S was analyzed at dilution because of matrix interference. Reporting limits were elevated accordingly.

IV. OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable as demonstrated by the surrogate, LCS, and MS/MSD percent recovery values, with the exceptions noted above. Precision was also acceptable as demonstrated by the MS/MSD RPD values, with the above noted exceptions.

Data were estimated due to LCS %R, MS/MSD %R, and MS/MSD RPD outliers.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Port Gardner Sediment Characterization
Chlorinated Pesticides by Method SW846 8081A

This report documents the review of analytical data from the analyses of sediment samples and the associated laboratory quality control (QC) samples. Analytical Resources, Inc., Tukwila, analyzed the samples. Summary (Level III) validation was performed for all data. See the **Sample Index** for a complete list of samples for which data were reviewed.

SDG	Number of Samples
NJ24	1 Sediment
NJ89	5 Sediment
NK42	1 Sediment
NV04	4 Tissue

I. DATA PACKAGE COMPLETENESS

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

II. EDD TO HARDCOPY VERIFICATION

A verification of the electronic data deliverables (EDD) results was performed by comparison to the hardcopy laboratory data package. No errors were found.

III. TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

1	Holding Times and Sample Preservation	1	Matrix Spike/Matrix Spike Duplicates (MS/MSD)
	Initial Calibration (ICAL)	1	Standard Reference Material (SRM)
	Continuing Calibration (CCAL)		Field Replicates
	Laboratory Blanks		Internal Standards
	Field Blanks	2	Reporting Limits
	Surrogate Compounds		Compound Identification
	Laboratory Control Samples (LCS)		

[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.*

Holding Times and Sample Preservation

The validation guidance documents state that the cooler temperature should be within an advisory temperature range of 2°C to 6°C. Several coolers were received outside of this range, with temperatures ranging from 0.8°C to 8.2°C. It was determined that these temperature outliers did not impact data quality and no qualifiers were assigned.

Matrix Spike/Matrix Spike Duplicates (MS/MSD)

Matrix spike/matrix spike duplicate samples (MS/MSD) were analyzed at the proper frequency of one per 20 samples or one per batch; whichever was more frequent. The percent recovery (%R) values and relative percent difference (RPD) values were within the laboratory control limits, with the following exception:

SDG NV04: For QC Sample PG-A3-14-Catail, the MS %R value for endrin aldehyde (29.8%) was less than the lower control limit of 30%. The MSD and laboratory control sample recoveries were acceptable, therefore no qualifiers were applied for this single outlier.

Standard Reference Material

The laboratory analyzed the standard reference material SQ-1 in association with the sediment samples. The recoveries for gamma-BHC, heptachlor, and 4,4'-DDE were greater than the upper control limit, however this SRM is not certified and no action was taken based on the recovery values.

Reporting Limits

The method reporting limits were sometimes greater than the limits specified in the QAPP. Several chromatograms indicated non-target background interference. The reporting limits for these Aroclors were flagged "Y" by the laboratory. These "Y" flagged results were qualified as not-detected (U-22). The following results were qualified:

SDG NV04: Sample PG-A3-14-Tule: aldrin, gamma chlordane

Sample PG-A3-15-Tule: aldrin, gamma chlordane, alpha chlordane

Sample PG-A3-15-Catail: gamma-BHC

IV. OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable, as demonstrated by the surrogate, laboratory control sample, and MS/MSD percent recovery values, with the exception noted above. Precision was also acceptable as demonstrated by the RPD values for the MS/MSD analyses.

Data were qualified as not detected at elevated reporting limits due to matrix interferences.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Port Gardner Sediment Characterization
PCB Aroclors by Method SW846 8082

This report documents the review of analytical data from the analyses of sediment and tissue samples and the associated field and laboratory quality control (QC) samples. Analytical Resources, Inc., Tukwila, Washington, analyzed the samples. Summary (Level III) validation was performed for all data. See the **Sample Index** for a complete list of samples for which data were reviewed.

SDG	Number of Samples
NJ24	11 Sediment
NJ29	10 Sediment
NJ89	19 Sediment
NK42	11 Sediment
NL50	9 Tissue
NL51	12 Sediment
NL52	12 Sediment
NL56	4 Tissue, 4 Sediment, 2 Field Blank
NT54	1 Sediment
NV04	4 Tissue

I. DATA PACKAGE COMPLETENESS

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

II. EDD TO HARDCOPY VERIFICATION

A verification of the electronic data deliverables (EDD) results was performed by comparison to the hardcopy laboratory data package. No errors were found.

SDG NL56: The laboratory incorrectly transcribed Sample PG-A2-02-C1-3 as PG-A2-02-C1-38. The sample ID was corrected in the EDD.

III. TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

1	Holding Times and Sample Preservation	2	Matrix Spike/Matrix Spike Duplicates (MS/MSD)
	Initial Calibration (ICAL)	1	Standard Reference Material (SRM)
	Continuing Calibration (CCAL)	1	Field Duplicates
	Laboratory Blanks		Internal Standards
1	Field Blanks	1	Reporting Limits
2	Surrogate Compounds	2	Compound Identification
1	Laboratory Control Samples (LCS)		

[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.***

Holding Times and Sample Preservation

The validation guidance documents state that the cooler temperature should be within an advisory temperature range of 2°C to 6°C. Several coolers were received outside of this range, with temperatures ranging from -0.8°C to 12.8°C. It was determined that these temperature outliers did not impact data quality and no qualifiers were assigned.

Field Blanks

SDG NL56: Two field blanks, PG-00-RB and PG-00-ER, were submitted. No target analytes were detected in these blanks.

Surrogate Compounds

The surrogate percent recovery (%R) values were within the laboratory control limits, with the following exceptions:

SDG NK42: The %R values for decachlorobiphenyl (DCBP) and tetrachlorometaxylene (TCMX) were less than the lower control limit in the laboratory control sample (LCS). No qualifiers are required for QC samples.

SDG NL50: The TCMX recoveries for Samples PG-A2-T2-DC-H-A and PG-A2-T2-ES-A were greater than the upper control limit. The DCBP recoveries were acceptable; no action was taken for the single surrogate outlier for the above samples.

Laboratory Control Samples (LCS)

Laboratory control samples (LCS) were analyzed at the proper frequency of one per batch. The recoveries were within the laboratory control limits with the following exception:

SDG NL56: The recovery for Aroclor 1016 in the LCS associated with the field blanks was greater than the upper control limit. This Aroclor was not detected in the associated sample, therefore no action was necessary based on the potential high bias.

Matrix Spike/Matrix Spike Duplicates (MS/MSD)

Matrix spike/matrix spike duplicate samples (MS/MSD) were analyzed at the proper frequency of one per 20 samples or one per batch; whichever was more frequent. The percent recovery (%R) values were within the laboratory control limits, with the following exceptions:

SDG NL56: For QC Sample PG-A2-25B-MY-A, the percent recovery (%R) values for Aroclor 1016 (44%, 49%) were less than the lower control limit of 57%. This Aroclor was not detected in the parent sample; the reporting limit was estimated (UJ-8) to indicate a potential low bias.

SDG NL50: No MS/MSD analyses were done for this SDG. Precision and accuracy were evaluated using the LCS and laboratory control sample duplicate (LCSD).

Standard Reference Material

The laboratory analyzed the standard reference material SQ-1 in association with the sediment samples. There are no certified values for Aroclors in this reference material; therefore no action was taken based on the results.

Field Duplicates

The following acceptance criteria were applied for field duplicates: the relative percent difference (RPD) control limit is 50% for results greater than five times the reporting limit (RL). For results less than five times the RL, the difference between the sample and duplicate must be less than two times the RL.

SDG NJ89: One set of field duplicates were submitted, PG-A4-04-S & PG-A4-04-D. No target analytes were detected in either sample; field precision was acceptable.

Reporting Limits

The method reporting limits were sometimes greater than the limits specified in the QAPP. Chromatograms indicated non-target background interference. The reporting limits for these Aroclors were flagged "Y" by the laboratory. These "Y" flagged results were qualified as not-detected (U). The following samples had elevated reporting limits:

SDG NJ24: Sample PG-A2-10-S: Aroclor 1248 (U-22)

SDG NL51: Sample PG-A1-03-C1-3: Aroclor 1248 (U-22)

Compound Identification

The results from the two analytical columns were compared for agreement. In cases where the RPD value between the two columns was greater than 40% the reported result was "P" flagged by the laboratory. The elevated RPD value may indicate the presence of an interferent resulting in a high bias. When the RPD value was greater than 40% but less than 60% the reported value was estimated (J). If the RPD value was greater than 60%, the result was qualified as a tentative identification (NJ).

The following confirmation outliers were noted:

SDG NJ29: Sample PG-A1-24-S: Aroclor 1260 (66%) - tentatively identified (NJ-3)

SDG NL50: Sample PG-A2-T1-DC-H-A: Aroclor 1254 (63%) - tentatively identified (NJ-3)

Sample PG-A2-T2-DC-H-A: Aroclor 1254 (93%) - tentatively identified (NJ-3)

Sample PG-A2-T1-ES-A: Aroclor 1221 (105%) - tentatively identified (NJ-3)

Sample PG-A1-T3-DC-H-A: Aroclor 1254 (43%) - estimated (J-3)

IV. OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable, as demonstrated by the surrogate, LCS, and MS/MSD percent recovery values, with the exceptions noted above. Precision was also acceptable as demonstrated by the RPD values for the MS/MSD and field replicate analyses.

Data were qualified as not detected at elevated reporting limits due to matrix interferences. Data were estimated due to MS/MSD accuracy recovery outliers. Data were qualified as estimated or tentatively identified based on confirmation criteria outliers.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Port Gardner Sediment Characterization
Dioxin & Furan Compounds
Axys Method MLA-017 (EPA 1613B)

This report documents the review of analytical data from the analyses of tissue and sediment samples and the associated laboratory and field quality control (QC) samples. Samples were analyzed by Axys Analytical Services, Ltd. of Sidney, British Columbia, Canada. Summary (Level III) validation was performed for all data. See the **Sample Index** for a complete list of samples for which data were reviewed.

SDG	Number of Samples
WG26338	12 Sediments
WG26443	8 Sediment
WG26319	11 Tissue
WG26471	1 Tissue

I. 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.

II. EDD TO HARDCOPY VERIFICATION

A complete (100%) verification of the electronic data deliverable (EDD) results was performed by comparison to the hardcopy laboratory data package. Laboratory QC results were also verified (10%).

III. TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

	Holding Times and Sample Receipt	1	Matrix Spike/Matrix Spike Duplicates (MS/MSD)
	Initial Calibration (ICAL)		Ongoing Precision and Recovery (OPR)
	Continuing Calibration (CCAL)		Standard Reference Material (SRM)
2	Laboratory Blanks	2	Compound Identification
	Labeled Compounds		Reporting Limits (MDL and MRL)
	Laboratory Duplicates		Calculation Verification (full validation only)

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

Laboratory Blanks

Method blanks were analyzed at the appropriate frequency. For the analytical batches noted below, one or more target analytes were reported in the method blank. To assess the impact of each blank contaminant on the reported sample results, an action level is established at five times 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). If the result is also less than the reporting limit, then the result is elevated to the reporting limit. No action is taken if the sample result is greater than the action level, or for non-detected results.

SDG WG26471: Positive results for 2,3,7,8-TCDF and total tetra-furans were reported in the method blank associated with Sample PG-A2-18B-MY-A. The 2,3,7,8-TCDF result was already qualified as not-detected (U-22) because the ion ratio criteria were not met. No further action was necessary. The result for total tetra-furans was qualified as not-detected (U-7).

Matrix Spike/Matrix Spike Duplicates

No matrix spike/matrix spike duplicate (MS/MSD) samples were analyzed. Accuracy and precision were assessed using labeled compound recovery, ongoing precision and recovery (OPR) samples, and laboratory duplicate samples.

Compound Identification

The laboratory assigned a" K" flag to one or more analytes in most samples to indicate the ion ratio criteria were not met. Since the ion abundance ratio is the primary identification criterion for high resolution mass spectroscopy, an outlier indicates that the reported result may be a false positive. These results were qualified as not detected (U-22).

IV. OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable, as demonstrated by the labeled compound and OPR percent recovery values. Precision was acceptable as demonstrated by the laboratory duplicate relative percent difference values.

Data were qualified as not detected based on ion ratio criteria outliers and method blank contamination.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Port Gardner Sediment Characterization
Tributyl Tins by Krone 1988-SIM

This report documents the review of analytical data from the analyses of sediment samples and the associated laboratory and field quality control (QC) samples. Analytical Resources, Inc., Tukwila, Washington, analyzed the samples. Summary (Level III) validation was performed for all data. See the **Sample Index** for a complete list of samples for which data were reviewed.

SDG	Number of Samples
NJ24	3 Sediment
NJ29	2 Sediment
NJ89	4 Sediment

I. 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.

II. EDD TO HARDCOPY VERIFICATION

A complete (100%) verification of the electronic data deliverable (EDD) results was performed by comparison to the hardcopy laboratory data package. Laboratory QC results were also verified (10%).

III. TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

1	Holding Times and Sample Preservation		Laboratory Control Samples (LCS)
	GC/MS Instrument Performance Check	1	Standard Reference Material (SRM)
	Initial Calibration (ICAL)		Field Replicates
	Continuing Calibration (CCAL)		Internal Standards
	Blanks (Laboratory and Field)		Target Analyte List
	Surrogate Compounds	1	Reporting Limits
1	Matrix Spikes/Matrix Spike Duplicates (MS/MSD)		

[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.*

Holding Times and Sample Receipt

The validation guidance documents state that the cooler temperature should be within an advisory temperature range of 2°C to 6°C. Several coolers were received outside of this range, with temperatures ranging from -0.8°C to 8.2°C. It was determined that these temperature outliers did not impact data quality and no qualifiers were assigned.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

SDG NJ29: No matrix spike/matrix spike duplicate (MS/MSD) analyses were reported with this SDG. Accuracy was evaluated using the laboratory control sample. Precision could not be assessed.

Standard Reference Material

The laboratory analyzed the standard reference material SQ-1 in association with the sediment samples. The recovery for tributyl tin was less than the lower control limit. No qualification was necessary as this reference material is not certified.

Reporting Limits

The reported reporting limits for tributyl tin (3.9 µg/kg), dibutyl tin (5.7-5.8 µg/kg), and butyl tin (4.0-4.1 µg/kg) did not meet the QAAP target detection limit of 0.1 µg/kg. No action was taken other than to note the discrepancy.

IV. OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable as demonstrated by the surrogate, laboratory control sample, and MS/MSD percent recovery values, with the exceptions noted above. Precision was also acceptable as demonstrated by the MS/MSD relative percent difference values.

No data were qualified for any reason.

All data, as reported, are acceptable for use.

DATA VALIDATION REPORT
Port Gardner Sediment Characterization
Metals by Methods SW6010B and 7470A/7471A

This report documents the review of analytical data from the analyses of sediment and tissue samples and the associated laboratory quality control (QC) samples. Analytical Resources, Inc., Tukwila, Washington, analyzed the samples. Summary (Level III) validation was performed for all data. See the **Sample Index** for a complete list of samples for which data were reviewed.

SDG	Number of Samples
NJ24	12 Sediment
NJ29	10 Sediment
NJ89	20 Sediment
NK42	11 Sediment
NL50	9 Tissue
NL51	12 Sediment
NL52	12 Sediment
NL56	4 Tissue, 4 Sediment, 2 Field Blanks
NT54	4 Sediment
NU49	1 Sediment
NV04	4 Tissue

I. 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.

II. EDD TO HARDCOPY VERIFICATION

A verification of the electronic data deliverables (EDD) results was performed by comparison to the hardcopy laboratory data package. No errors were found.

SDG NL56: The laboratory incorrectly transcribed Sample PG-A2-02-C1-3 as PG-A2-02-C1-38. The sample ID was corrected in the EDD.

III. TECHNICAL DATA VALIDATION

The QC requirements for review are listed below.

2	Holding Times and Sample Preservation	2	Matrix Spikes (MS)
	Initial Calibration	2	Laboratory Duplicates
	Calibration Verification	1	Field Replicates
2	CRDL Standards		Interference Check Samples
1	Laboratory Blanks		Serial Dilutions
1	Field Blanks		Reported Results
2	Laboratory Control Samples (LCS)		

[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.*

Holding Times and Sample Preservation

The validation guidance documents state that the cooler temperature should be within an advisory temperature range of 2°C to 6°C. Several coolers were received outside of this range, with temperatures ranging from -0.8°C to 12.8°C. It was determined that these temperature outliers did not impact data quality and no qualifiers were assigned.

SDG NJ24: All samples were extracted and analyzed for mercury beyond the 28 day holding time; these results were estimated (J/UJ-1).

SDG NJ89: Several samples were extracted and analyzed for mercury beyond the 28 day holding time; these results were estimated (J/UJ-1). No action was taken if extraction was done before the holding time expired.

SDG NL52: Several samples were analyzed for mercury beyond the 28 day holding time. The extraction was done within the holding time, therefore no action was taken.

Contract Required Detection Limit Standard

Contract required detection limit (CRDL) standards were analyzed at the beginning of each analytical sequence. For recovery values greater than upper control limit of 130%, positive results less than two times (<2x) the CRDL are estimated (J) to indicate a potential high bias. For recoveries less than the lower control limit of 70%, positive results less than twice (<2x) the CRDL and non-detects are estimated (J/UJ) to indicate a potential low bias. The following outliers resulted in qualification of data:

SDG NJ24: zinc – low bias

SDG NL50: chromium – high bias

SDG NV04: arsenic and cadmium – low bias

Laboratory Blanks

SDG NL51: Zinc was detected in the method blank at a level greater than the method detection limit (MDL). In order to evaluate the effect on the sample data, an action level of five times the blank concentration was established. All associated sample results were greater than the action level, therefore no qualification of data was necessary.

SDG NL52: Zinc was detected in the method blank at a level greater than the MDL. All associated sample results were greater than the action level; therefore no qualification of data was necessary.

Field Blanks

SDG NL56: Two field blanks, PG-00-RB and PG-00-ER, were submitted. There were no positive results for the target analytes in either blank.

Laboratory Control Samples (LCS)

A laboratory control sample (LCS) was analyzed at the proper frequency of one per batch. The percent recovery (%R) values were within the control limits of 80% - 120%, with the exception noted below. All associated results were estimated (J/UJ-10) to indicate a potential low bias.

SDG NL50: chromium (79.0%) – low bias

Matrix Spikes (MS)

A matrix spike sample (MS) was analyzed at the proper frequency of one per 20 samples or one per batch; whichever was more frequent. The percent recovery (%R) values were within the laboratory control limits, with the exceptions noted below. For %R values greater than the upper control limit, the associated positive results were estimated (J-8) to indicate a possible high bias. No action was taken for non-detects. For %R values less than the lower control limit, the associated positive results and non-detects were qualified as estimated (J/UJ-8) to indicate a possible low bias. For cases where the recovery was also less than 30%, the post digestion spike was also evaluated. If the post spike recovery was within 75%-125%, then associated results were estimated (J/UJ-8). If the post spike recovery was not acceptable or was not analyzed, then the associated non-detected results were rejected (R-8) instead of being estimated.

The Samples used for QC and recovery outliers are listed below:

SDG NJ29: QC Sample PG-A1-01-S: sediment - zinc (57.4%) low bias

SDG NL50: QC Sample PG-A2-T1-DC-M-A: tissue - silver (30.8%) low bias

SDG NL56: QC Sample PG-A1-46B-VC-A: tissue - silver (18.4%) low bias

Laboratory Duplicates

Laboratory duplicate relative percent difference (RPD) values were used to evaluate precision. The RPD values were within the control limit of 35% for sample results greater than five times the reporting limit (for results less than five times the reporting limit, the difference was less than twice the reporting limit) with the exceptions noted below. For RPD or difference values exceeding the control limits, associated positive results and non-detects were estimated (J/UJ-9).

SDG NJ24: QC Sample PG-A1-38-S: sediment - chromium (36.6%)

SDG NV04: QC Sample PG-A3-14-TULE: tissue – copper and zinc (difference >2x RL)

Field Replicates

The following acceptance criteria were used to evaluate precision: the percent relative standard deviation (%RSD) control limit is 50% for results greater than five times the reporting limit (RL). For results less than five times the RL, the difference between the sample and replicate must be less than two times the RL.

SDG NJ24: Samples PG-A2-10-S, PG-A2-10-D, and PG-A2-10-T: All field precision criteria were met.

SDG NJ89: Samples PG-A4-05-S, PG-A4-05-D, and PG-A4-05-T: All field precision criteria were met.

IV. OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical methods. The laboratory duplicate RPD and field replicate %RSD values indicated acceptable precision, except as noted above. Accuracy was also acceptable, as demonstrated by the MS and LCS recoveries, except as previously noted.

Data were estimated based on exceeded holding times and LCS %R, MS %R, laboratory duplicate RPD, and CRDL standard %R outliers.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
Port Gardner Sediment Characterization
Conventional Parameter Analyses

This report documents the review of analytical data from the analyses of sediment and tissue samples and the associated laboratory quality control (QC) samples. Analytical Resources, Inc., Tukwila, Washington, and TestAmerica Laboratories, Inc, Tacoma, Washington, analyzed the samples. Summary (Level III) validation was performed for all data. See the **Sample Index** for a complete list of samples for which data were reviewed.

SDG	Number of Samples
NJ24	12 Sediment
NJ29	12 Sediment
NJ89	20 Sediment
NK42	15 Sediment
NL50	9 Tissue
NL51	12 Sediment
NL52	12 Sediment
NL56	4 Tissue, 4 Sediment
NT54	18 Sediment
NT94	3 Sediment
OB85	4 Sediment
580-11528-1	18 Sediment
580-11557-1	3 Sediment

The analytical tests that were performed are summarized below:

Parameter	Method
Total Solids	160.3
Total Volatile Solids	160.4
Preserved Total Solids	160.3
Ammonia as Nitrogen	350.1M
Total Organic Carbon	Plumb, 1981
Sulfide	376.2 (ARI)
Sulfide	9030B (Test America)
Lipids	NOAA
Grain Size	PSEP

I. 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.

II. EDD TO HARDCOPY VERIFICATION

A verification of the electronic data deliverables (EDD) results was performed by comparison to the hardcopy laboratory data package. No errors were found.

SDG NL56: The laboratory incorrectly transcribed Sample PG-A2-02-C1-3 as PG-A2-02-C1-38. The sample ID was corrected in the EDD.

III. TECHNICAL DATA VALIDATION

The QC requirements for review are listed below.

2	Holding Times and Sample Preservation	2	Matrix Spikes (MS)
	Initial Calibration	2	Laboratory Replicates
	Calibration Verification	1	Field Replicates
	Laboratory Blanks		Reporting Limits
	Laboratory Control Samples (LCS)		

[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.***

Holding Times and Sample Preservation

The validation guidance documents state that the cooler temperature should be within an advisory temperature range of 2°C to 6°C. Several coolers were received outside of this range, with temperatures ranging from -0.8°C to 8.2°C. It was determined that these temperature outliers did not impact data quality and no qualifiers were assigned.

SDG NJ24: All samples were analyzed for total organic carbon beyond the 28 day holding time. All of the total organic carbon samples were extracted within the holding time, therefore no action was taken.

SDG NJ29: All samples were analyzed for total organic carbon beyond the 28 day holding time. All of the total organic carbon samples were extracted within the holding time, therefore no action was taken.

SDG NJ89: All samples were analyzed for total organic carbon beyond the 28 day holding time. All samples were extracted within the holding time, therefore no action was taken. Several samples were analyzed for ammonia beyond the seven (7) day holding time; however, these samples were extracted within the holding time and no action was taken.

SDG NK42: All samples were analyzed for total organic carbon beyond the 28 day holding time. All of the total organic carbon samples were extracted within the holding time, therefore no action was taken. Several samples were analyzed for ammonia and sulfide beyond the seven (7) day holding time; however, these samples were extracted within the holding time and no action was taken.

SDG NL51: All samples were analyzed for total organic carbon beyond the 28 day holding time.

All samples were extracted within the holding time, therefore no action was taken. All samples were extracted and analyzed for ammonia and sulfide beyond the seven (7) day holding time; these results were estimated (J/UJ-1).

SDG NL52: All samples were analyzed for total organic carbon beyond the 28 day holding time. All samples were extracted within the holding time, therefore no action was taken. All samples were extracted and analyzed for ammonia and sulfide beyond the seven (7) day holding time; these results were estimated (J/UJ-1).

SDG NL56: Samples PG-A2-02-C1-38, PG-A2-25B-S, and PG-A2-18B-S were extracted and analyzed for sulfide beyond the 7 day holding time; these results were estimated (J/UJ-1).

All samples were extracted and analyzed for ammonia beyond the seven (7) day holding time; results were estimated (J-1).

SDG NT54: All samples were analyzed for total organic carbon beyond the 28 day holding time. All samples were extracted within the holding time, therefore no action was taken. One sample was analyzed for ammonia beyond the seven (7) day holding time; however, this sample was also extracted within the holding time and no action was taken.

Matrix Spikes (MS)

A matrix spike sample (MS) was analyzed at the proper frequency of one per 20 samples or one per batch; whichever was more frequent. The percent recovery (%R) values were within the laboratory control limits, with the exception noted below. For %R values greater than the upper control limit, the associated positive results were estimated (J-8) to indicate a possible high bias. No action was taken for non-detects. The following outlier was noted:

SDG NJ29: QC Sample PG-A1-01-S: sediment - sulfide (236.3%) high bias

SDGs 580-11528-1 & 580-11557-1: There was insufficient sample available to analyze matrix spikes. Accuracy was assessed from the laboratory control samples.

Laboratory Replicates

Laboratory replicate relative percent difference (RPD) or percent relative standard deviation (%RSD) values were used to evaluate precision. The RPD or %RSD values were within the control limit of 35% for sample results greater than five times the reporting limit with the exceptions noted below. For results less than five times the reporting limit (RL), the difference was less than twice the RL. For RPD or difference values exceeding the control limits, associated positive results and non-detects were estimated (J/UJ-9).

SDG NJ24: QC Sample PG-A2-13-S: sediment - ammonia (35.6%)

SDG NL51: QC Sample PG-A1-03-C3-5: sediment - grain size, phi scale 3 to 4 (62.6%)

SDG OB85: Batch QC Sample: sediment - grain size, phi scale 4 to 5 (36.6%)

Field Replicates

The following acceptance criteria were used to evaluate precision: the percent relative standard deviation (%RSD) control limit is 50% for results greater than five times the reporting limit (RL). For results less than five times the RL, the difference between the sample and replicate must be less than two times the RL. For field precision outliers, the results for the replicate samples were estimated (J). Field replicates and any outliers are noted below.

SDG NJ29: Samples PG-A1-15-S, PG-A1-15-D, and PG-A1-15-T: sulfide (65.4%) – (J-9)

SDG NJ89: Samples PG-A2-38-S, PG-A2-38-D, and PG-A2-38-T: All field precision criteria were met.

Reporting Limits

SDGs 580-11528-1 & 580-11557-1: The method detection limit (MDL) for sulfide of 2.5 mg/kg was greater than the QAPP specified MDL of 1 mg/kg.

IV. OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical methods. The laboratory duplicate RPD and field replicate %RSD values indicated acceptable precision, except as noted above. Accuracy was also acceptable as demonstrated by the matrix spike and laboratory control sample recoveries, except as previously noted.

Data were estimated based on exceeded holding times and MS %R, laboratory duplicate RPD, and field replicate %RSD outliers.

All data, as qualified, are acceptable for use.

EcoChem, INC.
Environmental Data Quality

APPENDIX A
DATA QUALIFIER DEFINITIONS REASON CODES AND CRITERIA TABLES

DATA VALIDATION QUALIFIER CODES
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.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents the approximate concentration.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

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

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

DATA QUALIFIER REASON CODES

1	Holding Time/Sample Preservation
2	Chromatographic pattern in sample does not match pattern of calibration standard.
3	Compound Confirmation
4	Tentatively Identified Compound (TIC) (associated with NJ only)
5A	Calibration (initial)
5B	Calibration (continuing)
6	Field Blank Contamination
7	Lab Blank Contamination (e.g., method blank, instrument, etc.)
8	Matrix Spike(MS & MSD) Recoveries
9	Precision (all replicates)
10	Laboratory Control Sample Recoveries
11	A more appropriate result is reported (associated with "R" and "DNR" only)
12	Reference Material
13	Surrogate Spike Recoveries (a.k.a., labeled compounds & recovery standards)
14	Other (define in validation report)
15	GFAA Post Digestion Spike Recoveries
16	ICP Serial Dilution % Difference
17	ICP Interference Check Standard Recovery
18	Trip Blank Contamination
19	Internal Standard Performance (e.g., area, retention time, recovery)
20	Linear Range Exceeded
21	Potential False Positives
22	Elevated Detection Limit Due to Interference (i.e., laboratory, chemical and/or matrix)

EcoChem Validation Guidelines for Semivolatile Analysis by GC/MS (Based on Organic NFG 1999)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature	4°C ±2°	J(+)/UJ(-) if greater than 6 deg. C **(EcoChem PJ)**	1
Holding Time	Water: 7 days from collection Soil: 14 days from collection Analysis: 40 days from extraction	Water: J(+)/UJ(-) if ext. > 7 and < 21 days J(+)/R(-) if ext > 21 days **(EcoChem PJ)** Solids/Wastes: J(+)/UJ(-) if ext. > 14 and < 42 days J(+)/R(-) if ext. > 42 days **(EcoChem PJ)** J(+)/UJ(-) if analysis >40 days	1
Tuning	DFTPP Beginning of each 12 hour period Method acceptance criteria	R(+/-) all analytes in all samples associated with the tune	5A
Initial Calibration (Minimum 5 stds.)	RRF > 0.05	**(EcoChem PJ, see TM-06)** If MDL= reporting limit: J(+)/R(-) if RRF < 0.05 If reporting limit > MDL: note in worksheet if RRF <0.05	5A
	%RSD < 30%	**(EcoChem PJ, see TM-06)** J(+) if %RSD > 30%	5A
Continuing Calibration (Prior to each 12 hr. shift)	RRF > 0.05	**(EcoChem PJ, see TM-06)** If MDL= reporting limit: J(+)/R(-) if RRF < 0.05 If reporting limit > MDL: note in worksheet if RRF <0.05	5B
	%D <25%	**(EcoChem PJ, see TM-06)** If > +/-90%: J+/R- If -90% to -26%: J+ (high bias) If 26% to 90%: J+/UJ- (low bias)	5B
Method Blank	One per matrix per batch No results > CRQL	U(+) if sample (+) result is less than CRQL and less than appropriate 5X or 10X rule (raise sample value to CRQL)	7
		U(+) if sample (+) result is greater than or equal to CRQL and less than appropriate 5X and 10X rule (at reported sample value)	7
	No TICs present	R(+) TICs using 10X rule	7
Field Blanks (Not Required)	No results > CRQL	Apply 5X/10X rule; U(+) < action level	6

EcoChem Validation Guidelines for Semivolatile Analysis by GC/MS (Based on Organic NFG 1999)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
MS/MSD (recovery)	One per matrix per batch Use method acceptance criteria	Qualify parent only unless other QC indicates systematic problems: J(+) if both %R > UCL J(+)/UJ(-) if both %R < LCL J(+)/R(-) if both %R < 10% **PJ if only one %R outlier**	8
MS/MSD (RPD)	One per matrix per batch Use method acceptance criteria	J(+) in parent sample if RPD > CL	9
LCS **low conc. H2O SVOA**	One per lab batch Within method control limits	J(+) assoc. cmpd if > UCL J(+)/R(-) assoc. cmpd if < LCL J(+)/R(-) all cmpds if half are < LCL	10
LCS **regular SVOA (H2O & solid)**	One per lab batch Lab or method control limits	J(+) if %R > UCL J(+)/UJ(-) if %R <LCL J(+)/R(-) if %R < 10% **(EcoChem PJ)**	10
LCS/LCSD *(if required)*	One set per matrix and batch of 20 samples RPD < 35%	J(+)/UJ(-) assoc. cmpd. in all samples	9
Surrogates	Minimum of 3 acid and 3 base/neutral compounds Use method acceptance criteria	Do not qualify if only 1 acid and/or 1 B/N surrogate is out unless <10% J(+) if %R > UCL J(+)/UJ(-) if %R < LCL J(+)/R(-) if %R < 10%	13
Internal Standards	Added to all samples Acceptable Range: IS area 50% to 200% of CCAL area RT within 30 seconds of CC RT	J(+) if > 200% J(+)/UJ(-) if < 50% J(+)/R(-) if < 25% RT>30 seconds, **narrate and Notify PM**	19
Field Duplicates	**Use QAPP limits. If no QAPP:** Solids: RPD <50% OR absolute diff. < 2X RL (for results < 5X RL) Aqueous: RPD <35% OR absolute diff. < 1X RL (for results < 5X RL)	Narrate and qualify if required by project **(EcoChem PJ)**	9
TICs	Major ions (>10%) in reference must be present in sample; intensities agree within 20%; check identification	NJ the TIC unless: R(+) common laboratory contaminants **See Technical Director for ID issues**	4
Quantitation/ Identification	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	**See Technical Director if outliers**	14 21 (false +)

EcoChem Validation Guidelines for Pesticides/PCBs by GC/ECD (Based on Organic NFG 1999 & EPA SW-846 Method 8081/8082)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature	4°C ±2°	J(+)/UJ(-) if greater than 6 deg. C **(EcoChem PJ)**	1
Holding Time	Water: 7 days from collection Soil: 14 days from collection Analysis: 40 days from extraction	J(+)/UJ(-) if ext/analyzed > HT J(+)/R(-) if ext/analyzed > 3X HT **(EcoChem PJ)**	1
Resolution Check	Beginning of ICAL Sequence Within RTW Resolution >90%	Narrate (Use Professional Judgement to qualify)	14
Instrument Performance (Breakdown)	DDT Breakdown: < 20% Endrin Breakdown: <20% Combined Breakdown: <30% Compounds within RTW	J(+) DDT NJ(+) DDD and/or DDE R(-) DDT - If (+) for either DDE or DDD J(+) Endrin NJ(+) EK and/or EA R(-) Endrin - If (+) for either EK or EA	5A
Retention Times	Surrogates: TCX (+/- 0.05); DCB (+/- 0.10) Target compounds: elute before heptachlor epoxide (+/- 0.05) elute after heptachlor epoxide (+/- 0.07)	NJ(+)/R(-) results for analytes with RT shifts **For full DV, use PJ based on examination of raw data**	5B
Initial Calibration	Pesticides: Low=CRQL, Mid=4X, High=16X Multiresponse - one point Calibration %RSD<20% %RSD<30% for surr; two comp. may exceed if <30% Resolution in Mix A and Mix B >90%	J(+)/UJ(-)	5A
Continuing Calibration	Alternating PEM standard and INDA/INDB standards every 12 hours (each preceeded by an inst. Blank) %D < 25% Resolution >90% in IND mixes; 100% for PEM	J(+)/UJ(-) J(+)R(-) if %D > 90% **PJ for resolution**	5B
Method Blank	One per matrix per batch No results > CRQL	U(+) if sample result is < CRQL and < 5X rule (raise sample value to CRQL) U(+) if sample result is > or equal to CRQL and < 5X rule (at reported sample value)	7
Instrument Blanks	Analyzed at the beginning of every 12 hour sequence No analyte > 1/2 CRQL	Same as Method Blank	7
Field Blanks	Not addressed by NFG No results > CRQL	Apply 5X rule; U(+) < action level	6

EcoChem Validation Guidelines for Pesticides/PCBs by GC/ECD (Based on Organic NFG 1999 & EPA SW-846 Method 8081/8082)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
MS/MSD (recovery)	One set per matrix per batch Method Acceptance Criteria	Qualify parent only unless other QC indicates systematic problems: J(+) if both %R > UCL J(+)/UJ(-) if both %R < LCL J(+)/R(-) if both %R < 10% **PJ if only one %R outlier**	8
MS/MSD (RPD)	One set per matrix per batch Method Acceptance Criteria	J(+) in parent sample if RPD > CL	9
LCS	One per SDG Method Acceptance Criteria	J(+) if %R > UCL J(+)/UJ(-) if %R < LCL J(+)/R(-) using PJ if %R <<LCL (< 10%)	10
LCS/LCSD *(if required)*	One set per matrix and batch of 20 samples RPD < 35%	J(+)/UJ(-) assoc. cmpd. in all samples	9
Surrogates	TCX and DCB added to every sample %R = 30-150%	J(+)/UJ(-) if both %R = 10 - 60% J(+) if both >150% J(+)/R(-) if any %R <10%	13
Quantitation/ Identification	Quantitated using ICAL calibration factor (CF) RPD between columns <40%	J(+) if RPD = 40 - 60% NJ(+) if RPD >60% **EcoChem PJ - See TM-08**	3
Two analyses for one sample	Report only one result per analyte	"DNR" results that should not be used to avoid reporting two results for one sample	11
Sample Clean-up	GPC required for soil samples Florisil required for all samples Sulfur is optional Clean-up standard check %R within CLP limits	J(+)/UJ(-) if %R < LCL J(+) if %R > UCL	14
Field Duplicates	**Use QAPP limits. If no QAPP:** Solids: RPD <50% OR absolute diff. < 2X RL (for results < 5X RL) Aqueous: RPD <35% OR absolute diff. < 1X RL (for results < 5X RL)	Narrate **(Qualifiy if required by project QAPP)**	9

EcoChem Validation Guidelines for Dioxin/Furan Analysis by HRMS (Based on EPA Reg. 10 SOP, Rev. 2, 1996 & EPA SW-846, Methods 1613b and 8290)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler/Storage Temperature	Waters/Solids < 4°C Tissues <-10°C	**EcoChem PJ, see TM-05**	1
Holding Time	Extraction - Water: 30 days from collection *Note:* Under CWA, SDWA, and RCRA the HT for H2O is 7 days* Extraction - Soil: 30 days from collection Analysis: 40 days from extraction	J(+)/UJ(-) if ext > 30 days J(+)/UJ(-) if analysis > 40 Days **EcoChem PJ, see TM-05**	1
Mass Resolution	>=10,000 resolving power at m/z 304.9824 Exact mass of m/z 380.9760 w/in 5 ppm of theoretical value (380.97410 to 380.97790) . Analyzed prior to ICAL and at the start and end of each 12 hr. shift	R(+/-) if not met	14
Window Defining Mix and Column Performance Mix	Window defining mixture/Isomer specificity std run before ICAL and CCAL Valley < 25% (valley = (x/y)*100%) x = ht. of TCDD y = baseline to bottom of valley For all isomers eluting near 2378-TCDD/TCDF isomers (TCDD only for 8290)	J(+) if valley > 25%	5A (ICAL) 5B (CCAL
Initial Calibration	Minimum of five standards %RSD < 20% for native compounds %RSD <30% for labeled compounds (%RSD <35% for labeled compounds under 1613b)	J(+) natives if %RSD > 20%	5A
	Abs. RT of $^{13}C_{12}$-1234-TCDD >25 min on DB5 >15 min on DB-225	**EcoChem PJ, see TM-05**	
	Ion Abundance ratios within QC limits **(Table 8 of method 8290)** **(Table 9 of method 1613B)**	**EcoChem PJ, see TM-05**	
	S/N ratio > 10 for all native and labeled compounds in CS1 std.	If <10, elevate Det. Limit or R(-)	

EcoChem Validation Guidelines for Dioxin/Furan Analysis by HRMS (Based on EPA Reg. 10 SOP, Rev. 2, 1996 & EPA SW-846, Methods 1613b and 8290)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Continuing Calibration	Analyzed at the start and end of each 12 hour shift. %D+/-20% for native compounds %D +/-30% for labeled compounds (Must meet limits in **Table 6, Method 1613B**) (If %Ds in the closing CCAL are w/in 25%/35% the avg RF from the two CCAL may be used to calculate samples per **Method 8290, Section 8.3.2.4**)	Do not qualify labeled compounds. Narrate in report for labeled compound %D outliers. For native compound %D outliers: 8290: J(+)/UJ(-) if %D = 20% - 75% J(+)/R(-) if %D > 75% 1613: J(+)/UJ(-) if %D is outside Table 6 limits J(+)/R(-) if %D is +/- 75% of Table 6 limit	5B
	Abs. RT of $^{13}C_{12}$-1234-TCDD and $^{13}C12$-123789-HxCDD +/- 15 sec of ICAL.	**EcoChem PJ, see ICAL section of TM-05**	
	RRT of all other compounds must meet Table 2 of 1613B.	**EcoChem PJ, see TM-05**	
	Ion Abundance ratios within QC limits (Table 8 of method 8290) (Table 9 of method 1613B)	**EcoChem PJ, see TM-05**	
	S/N ratio > 10	If <10, elevate Det. Limit or R(-)	
Method Blank	One per matrix per batch No positive results	If sample result <5X action level, qualify U at reported value.	7
Field Blanks (Not Required)	No positive results	If sample result <5X action level, qualify U at reported value.	6
LCS / OPR	Concentrations must meet limits in **Table 6, Method 1613B** or lab limits.	J(+) if %R > UCL J(+)/UJ(-) if %R < LCL J(+)/R(-) using PJ if %R <<LCL (< 10%)	10
MS/MSD (recovery)	May not analyze MS/MSD %R should meet lab limits.	Qualify parent only unless other QC indicates systematic problems: J(+) if both %R > UCL J(+)/UJ(-) if both %R < LCL J(+)/R(-) if both %R < 10% **PJ if only one %R outlier**	8
MS/MSD (RPD)	May not analyze MS/MSD RPD < 20%	J(+) in parent sample if RPD > CL	9

EcoChem Validation Guidelines for Dioxin/Furan Analysis by HRMS (Based on EPA Reg. 10 SOP, Rev. 2, 1996 & EPA SW-846, Methods 1613b and 8290)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Lab Duplicate	RPD <25% if present.	J(+)/UJ(-) if outside limts	9
Labeled Compounds / Internal Standards	*Method 8290:* %R = 40% - 135% in all samples --- *Method 1613B:* %R must meet limits specified in **Table 7, Method 1613**	J(+)/UJ(-) if %R = 10% to LCL J(+) if %R > UCL J(+)/R(-) if %R < 10%	13
Quantitation/ Identification	Ions for analyte, IS, and rec. std. must max w/in 2 sec. S/N >2.5 IA ratios meet limits in **Table 9 of 1613B** or **Table 8 of 8290** RRTs w/in limits in **Table 2 of 1613B**	If RT criteria not met, use PJ (**see TM-05**) If S/N criteria not met, J(+). if unlabelled ion abundance not met, change to EMPC If labelled ion abundance not met, J(+).	21
EMPC (estimated maximum possible concentration)	If quantitation idenfication criteria are not met, laboratory should report an EMPC value.	If laboratory correctly reported an EMPC value, qualify with U to indicate that the value is a detection limit.	14
Interferences	PCDF interferences from PCDPE	If both detected, change PCDF result to EMPC	14
Second Column Confirmation	All 2378-TCDF hits must be confirmed on a DB-225 (or equiv) column. All QC specs in this table must be met for the confirmation analysis.	Report lower of the two values. If not performed use PJ (**see TM-05**).	3
Field Duplicates	**Use QAPP limits. If no QAPP:** Solids: RPD <50% OR absolute diff. < 2X RL (for results < 5X RL) Aqueous: RPD <35% OR absolute diff. < 1X RL (for results < 5X RL)	Narrate and qualify if required by project **(EcoChem PJ)**	9
Two analyses for one sample	Report only one result per analyte	"DNR" results that should not be used	11

EcoChem Validation Guidelines for Metals Analysis by ICP (Based on Inorganic NFG 1994 & 2004)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature and Preservation	Cooler temperature: 4°C ±2° Waters: Nitric Acid to pH < 2 For Dissolved Metals: 0.45um filter & preserve after filtration Tissues: Frozen	EcoChem Professional Judgment - no qualification based on cooler temperature outliers J(+)/UJ(-) if pH preservation requirements are not met	1
Holding Time	180 days from date sampled Frozen tissues - HT extended to 2 years	J(+)/UJ(-) if holding time exceeded	1
Initial Calibration	Blank + minimum 1 standard If more than 1 standard, r > 0.995	J(+)/UJ(-) if r < 0.995 (multi point cal)	5A
Initial Calibration Verification (ICV)	Independent source analyzed immediately after calibration %R within ±10% of true value	J(+)/UJ(-) if %R 75-89% J(+) if %R = 111-125% R(+) if %R > 125% R(+/-) if %R < 75%	5A
Continuing Calibration Verification (CCV)	Every ten samples, immediately following ICV/ICB and at end of run %R within ±10% of true value	J(+)/UJ(-) if %R = 75-89% J(+) if %R 111-125% R(+) if %R > 125% R(+/-) if %R < 75%	5B

Initial and Continuing Calibration Blank (ICB/CCB)	After each ICV and CCV
	every ten samples and end of run
	| blank | < IDL (MDL)
		Action level is 5x absolute value of blank conc.
		For (+) blanks, U(+) results < action level
		For (-) blanks, J(+)/UJ(-) results < action level
		(Refer to TM-02 for additional information)
			7

Reporting Limit Standard	2x RL analyzed beginning of run Not required for Al, Ba, Ca, Fe, Mg, Na, K %R = 70%-130% (50%-150% Sb, Pb, Tl)	R(-)/J(+) < 2x RL if %R <50% (< 30% Sb, Pb, Tl) J(+) < 2x RL, UJ(-) if %R 50-69% (30-49% Sb, Pb,Tl) J(+) < 2x RL if %R 130-180% (150-200% Sb, Pb, Tl) R(+) < 2x RL if %R > 180% (200% Sb, Pb, Tl)	14
Interference Check Samples (ICSA/ICSAB)	ICSAB %R 80 - 120% for all spiked elements | ICSA | < MDL for all unspiked elements except: K, Na	For samples with Al, Ca, Fe, or Mg > ICS levels R(+/-) if %R < 50% J(+) if %R >120% J(+)/UJ(-) if %R= 50 to 79% Use Professional Judgment for ICSA to determine if bias is present see **TM-09** for additional details	17
Method Blank	One per matrix per batch (batch not to exceed 20 samples) blank < MDL	Action level is 5x blank concentration U(+) results < action level	7

EcoChem Validation Guidelines for Metals Analysis by ICP (Based on Inorganic NFG 1994 & 2004)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Laboratory Control Sample (LCS)	One per matrix per batch		10
	Blank Spike: %R within 80-120%	R(+/-) if %R < 50% J(+)/UJ(-) if %R = 50-79% J(+) if %R >120%	
	CRM: Result within manufacturer's certified acceptance range or project guidelines	J(+)/UJ(-) if < LCL, J(+) if > UCL	
Matrix Spikes	One per matrix per batch 75-125% for samples less than 4x spike level	J(+) if %R > 125% J(+)/UJ(-) if %R < 75% J(+)/R(-) if %R < 30% **or** J(+)/UJ(-) if Post Spike %R 75-125% Qualify all samples in batch	8
Post-digestion Spike	If Matrix Spike is outside 75-125%, spike at twice the sample conc.	No qualifiers assigned based on this element	
Laboratory Duplicate (or MS/MSD)	One per matrix per batch RPD < 20% for samples > 5x RL Diff < RL for samples >RL and < 5x RL (Diff < 2x RL for solids)	J(+)/UJ(-) if RPD > 20% or diff > RL (2x RL for solids) qualify all samples in batch	9
Serial Dilution	5x dilution one per matrix %D < 10% for original sample conc. > 50x MDL	J(+)/UJ(-) if %D >10% qualify all samples in batch	16
Field Blank	Blank < MDL	Action level is 5x blank conc. U(+) sample values < action level in associated field samples only	6
Field Duplicate	For results > 5x RL: Water: RPD < 35% Solid: RPD < 50% For results < 5 x RL: Water: Diff < RL Solid: Diff < 2x RL	J(+)/UJ(-) in parent samples only	9
Linear Range	Sample concentrations must fall within range	J values over range	20

EcoChem Validation Guidelines for Metals Analysis by ICP-MS (Based on Inorganic NFG 1994 & 2004)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature and Preservation	Cooler temperature: 4°C ±2° Waters: Nitric Acid to pH < 2 For Dissolved Metals: 0.45um filter & preserve after filtration	EcoChem Professional Judgment - no qualification based on cooler temperature outliers J(+)/UJ(-) if pH preservation requirements are not met	1
Holding Time	180 days from date sampled Frozen tissues - HT extended to 2 years	J(+)/UJ(-) if holding time exceeded	1
Tune	Prior to ICAL monitoring compounds analyzed 5 times with Std Dev. ≤ 5% mass calibration <0.1 amu from True Value Resolution < 0.9 AMU @ 10% peak height or <0.75 amu @ 5% peak height	Use Professional Judgment to evaluate tune J(+)/UJ(-) if tune criteria not met	5A
Initial Calibration	Blank + minimum 1 standard If more than 1 standard, r>0.995	J(+)/UJ(-) if r<0.995 (for multi point cal)	5A
Initial Calibration Verification (ICV)	Independent source analyzed immediately after calibration %R within ±10% of true value	J(+)/UJ(-) if %R 75-89% J(+) if %R = 111-125% R(+) if %R > 125% R(+/-) if %R < 75%	5A
Continuing Calibration Verification (CCV)	Every ten samples, immediately following ICV/ICB and at end of run ±10% of true value	J(+)/UJ(-) if %R = 75-89% J(+) if %R 111-125% R(+) if %R > 125% R(+/-) if %R < 75%	5B

Initial and Continuing Calibration Blanks (ICB/CCB)	After each ICV and CCV
	every ten samples and end of run
	| blank | < IDL (MDL)
		Action level is 5x absolute value of blank conc.
		For (+) blanks, U(+) results < action level
		For (-) blanks, J(+)/UJ(-) results < action level
		refer to **TM-02** for additional details
			7

Reporting Limit Standard (CRI)	2x RL analyzed beginning of run Not required for Al, Ba, Ca, Fe, Mg, Na, K %R = 70%-130% (50%-150% Co,Mn, Zn)	R(-),(+) < 2x RL if %R < 50% (< 30% Co,Mn, Zn) J(+) < 2x RL, UJ(-) if %R 50-69% (30%-49% Co,Mn, Zn) J(+) < 2x RL if %R 130%-180% (150%-200% Co,Mn, Zn) R(+) < 2x RL if %R > 180% (200% Co, Mn, Zn)	14
Interference Check Samples (ICSA/ICSAB)	Required by SW 6020, but not 200.8 ICSAB %R 80% - 120% for all spiked elements | ICSA | < IDL (MDL) for all unspiked elements	For samples with Al, Ca, Fe, or Mg > ICS levels R(+/-) if %R < 50% J(+) if %R >120% J(+)/UJ(-) if %R = 50% to 79% Use Professional Judgment for ICSA to determine if bias is present see **TM-09** for additional details	17
Method Blank	One per matrix per batch (batch not to exceed 20 samples) blank < MDL	Action level is 5x blank concentration U(+) results < action level	7
Laboratory Control Sample (LCS)	One per matrix per batch Blank Spike: %R within 80%-120%	R(+/-) if %R < 50% J(+)/UJ(-) if %R = 50-79% J(+) if %R >120%	10
	CRM: Result within manufacturer's certified acceptance range or project guidelines	J(+)/UJ(-) if < LCL, J(+) if > UCL	
Matrix Spike/ Matrix Spike Duplicate (MS/MSD)	One per matrix per batch 75-125% for samples where results do not exceed 4x spike level	J(+) if %R>125% J(+)/UJ(-) if %R <75% J(+)/R(-) if %R<30% **or** J(+)/UJ(-) if Post Spike %R 75%-125% Qualify all samples in batch	8
Post-digestion Spike	If Matrix Spike is outside 75-125%, Spike parent sample at 2x the sample conc.	No qualifiers assigned based on this element	

EcoChem Validation Guidelines for Metals Analysis by ICP-MS (Based on Inorganic NFG 1994 & 2004)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Laboratory Duplicate (or MS/MSD)	One per matrix per batch RPD < 20% for samples > 5x RL Diff < RL for samples > RL and < 5 x RL (Diff < 2x RL for solids)	J(+)/UJ(-) if RPD > 20% or diff > RL all samples in batch	9
Serial Dilution	5x dilution one per matrix %D < 10% for original sample values > 50x MDL	J(+)/UJ(-) if %D >10% All samples in batch	16
Internal Standards	Every sample SW6020: 60%-125% of cal blank IS 200.8: 30%-120% of cal blank IS	J (+)/UJ (-) all analytes associated with IS outlier	19
Field Blank	Blank < MDL	Action level is 5x blank conc. U(+) sample values < AL in associated field samples only	6
Field Duplicate	For results > 5x RL: Water: RPD < 35% Solid: RPD < 50% For results < 5 x RL: Water: Diff < RL Solid: Diff < 2x RL	J(+)/UJ(-) in parent samples only	9
Linear Range	Sample concentrations must fall within range	J values over range	20

EcoChem Validation Guidelines for Mercury Analysis by CVAA (Based on Inorganic NFG 1994 & 2004)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature and Preservation	Cooler temperature: 4°C ±2° Waters: Nitric Acid to pH < 2 For Dissolved Metals: 0.45um filter & preserve after filtration	EcoChem Professional Judgment - no qualification based on cooler temperature outliers J(+)/UJ(-) if pH preservation requirements are not met	1
Holding Time	28 days from date sampled Frozen tissues: HT extended to 6 months	J(+)/UJ(-) if holding time exceeded	1
Initial Calibration	Blank + 4 standards, one at RL r > 0.995	J(+)/UJ(-) if r<0.995	5A
Initial Calibration Verification (ICV)	Independent source analyzed immediately after calibration %R within ±20% of true value	J(+)/UJ(-) if %R = 65%-79% J(+) if %R = 121-135% R(+/-) if %R < 65% R(+) if %R > 135%	5A
Continuing Calibration Verification (CCV)	Every ten samples, immediately following ICV/ICB and at end of run %R within ±20% of true value	J(+)/UJ(-) if %R = 65%-79% J(+) if %R = 121-135% R(+/-) if %R < 65% R(+) if %R > 135%	5B

Initial and Continuing Calibration Blanks (ICB/CCB)	after each ICV and CCV
	every ten samples and end of run
	| blank | < IDL (MDL)
		Action level is 5x absolute value of blank conc.
		For (+) blanks, U(+) results < action level
		For (-) blanks, J(+)/UJ(-) results < action level
		refer to **TM-02** for additional details
			7

Reporting Limit Standard (CRA)	conc at RL - analyzed beginning of run %R = 70-130%	R(-),(+)<2xRL if %R <50% J(+)<2x RL, UJ(-) if %R 50-69% J(+) <2x RL if %R 130-180% R(+)<2x RL if %R>180%	14
Method Blank	One per matrix per batch (batch not to exceed 20 samples) blank < MDL	Action level is 5x blank concentration U(+) results < action level	7
Laboratory Control Sample (LCS)	One per matrix per batch		10
	Blank Spike: %R within 80-120%	R(+/-) if %R < 50% J(+)/UJ(-) if %R = 50-79% J(+) if %R >120%	
	CRM: Result within manufacturer's certified acceptance range or project guidelines	J(+)/UJ(-) if < LCL, J(+) if > UCL	
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One per matrix per batch 5% frequency 75-125% for samples less than 4x spike level	J(+) if %R>125% J(+)/UJ(-) if %R <75% J(+)/R(-) if %R<30% all samples in batch	8
Laboratory Duplicate (or MS/MSD)	One per matrix per batch RPD < 20% for samples > 5x RL Diff < RL for samples > RL and < 5x RL (Diff < 2x RL for solids)	J(+)/UJ(-) if RPD > 20% or diff > RL all samples in batch	9

EcoChem Validation Guidelines for Mercury Analysis by CVAA (Based on Inorganic NFG 1994 & 2004)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Field Blank	Blank < MDL	Action level is 5x blank conc. U(+) sample values < action level in associated field samples only	6
Field Duplicate	For results > 5x RL: Water: RPD < 35% Solid: RPD < 50% For results < 5x RL: Water: Diff<RL Solid: Diff < 2x RL	J(+)/UJ(-) in parent samples only	9

EcoChem Validation Guidelines for Conventional Chemistry Analysis (Based on EPA Standard Methods)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature and Preservation	Cooler Temperature 4°C ±2°C Preservation: Method Specific	Use Professional Judgment to qualify based to qualify for coole temp outliers J(+)/UJ(-) if preservation requirements not met	1
Holding Time	Method Specific	Professional Judgment J(+)/UJ(-) if holding time exceeded J(+)/R(-) if HT exceeded by > 3X	1
Initial Calibration	Method specific r>0.995	**Use professional judgment** J(+)/UJ(-) for r < 0.995	5A
Initial Calibration Verification (ICV)	Where applicable to method Independent source analyzed immediately after calibration %R method specific, usually 90% - 110%	R(+/-) if %R significantly < LCL J(+)/UJ(-) if %R < LCL J(+) if %R > UCL R(+) if %R significantly > UCL	5A
Continuing Cal Verification (CCV)	Where applicable to method Every ten samples, immed. following ICV/ICB and end of run %R method specific, usually 90% - 110%	R(+/-) if %R significantly < LCL J(+)/UJ(-) if %R < LCL J(+) if %R > UCL R(+) if %R significantly > UCL	5B

Initial and Continuing Cal Blanks (ICB/CCB)	Where applicable to method
	After each ICV and CCV every ten samples and end of run
	| blank| < MDL
		Action level is 5x absolute value of blank conc.
		For (+) blanks, U(+) results < action level
		For (-) blanks, J(+)/UJ(-) results < action level
		refer to TM-02 for additional details
			7

Method Blank	One per matrix per batch
	(not to exceed 20 samples)
	blank < MDL
		Action level is 5x absolute value of blank conc.
		For (+) blk value, U(+) results < action level
		For (-) blk value, J(+)/UJ(-) results < action level
			7

Laboratory Control Sample	Waters: One per matrix per batch %R (80-120%)	R(+/-) if %R < 50% J(+)/UJ(-) if %R = 50-79% J(+) if %R >120%	10
	Soils: One per matrix per batch Result within manufacturer's certified acceptance range	J(+)/UJ(-) if < LCL, J(+) if > UCL	10
Matrix Spike	One per matrix per batch; 5% frequency 75-125% for samples less than 4 x spike level	J(+) if %R > 125% or < 75% UJ(-) if %R = 30-74% R(+/-) results < IDL if %R < 30%	8
Laboratory Duplicate	One per matrix per batch RPD <20% for samples > 5x RL Diff <RL for samples >RL and <5 x RL (may use RPD < 35%, Diff < 2X RL for solids)	J(+)/UJ(-) if RPD > 20% or diff > RL all samples in batch	9

EcoChem Validation Guidelines for Conventional Chemistry Analysis (Based on EPA Standard Methods)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Field Blank	blank < MDL	Action level is 5x blank conc. U(+) sample values < action level in associated field samples only	6
Field Duplicate	For results > 5X RL: Water: RPD < 35% Solid: RPD < 50% For results < 5 x RL: Water: Diff<RL Solid: Diff < 2X RL	J(+)/UJ(-) in parent samples only	9

EcoChem, INC.
Environmental Data Quality

APPENDIX B
QUALIFIED DATA SUMMARY TABLE

Qualified Data Summary Table
SAIC - Port Gardner

Laboratory ID	Sample_ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validator Qualifier	Validator Reason
NJ24A	PG-A1-31-S	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	1.37	mg/kg		J	9
NJ24B	PG-A1-38-S	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	1.57	mg/kg		J	9
NJ24B	PG-A1-38-S	SW6010B	Chromium	30.7	mg/kg		J	9
NJ24B	PG-A1-38-S	SW7470A	Mercury	0.05	mg/kg	U	UJ	1
NJ24C	PG-A1-44-S	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	3.29	mg/kg		J	9
NJ24C	PG-A1-44-S	SW6010B	Chromium	36.8	mg/kg		J	9
NJ24C	PG-A1-44-S	SW7470A	Mercury	0.06	mg/kg	U	UJ	1
NJ24D	PG-A1-46-S	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	2.93	mg/kg		J	9
NJ24E	PG-A2-10-S	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	4.58	mg/kg		J	9
NJ24E	PG-A2-10-S	SW6010B	Chromium	40.1	mg/kg		J	9
NJ24E	PG-A2-10-S	SW7470A	Mercury	0.08	mg/kg	U	UJ	1
NJ24F	PG-A2-10-D	SW6010B	Chromium	37.8	mg/kg		J	9
NJ24F	PG-A2-10-D	SW7470A	Mercury	0.07	mg/kg	U	UJ	1
NJ24G	PG-A2-10-T	SW6010B	Chromium	38.7	mg/kg		J	9
NJ24G	PG-A2-10-T	SW7470A	Mercury	0.08	mg/kg	U	UJ	1
NJ24H	PG-A2-11-S	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	4.13	mg/kg		J	9
NJ24H	PG-A2-11-S	SW6010B	Chromium	31.9	mg/kg		J	9
NJ24H	PG-A2-11-S	SW7470A	Mercury	0.06	mg/kg	U	UJ	1
NJ24I	PG-A2-13-S	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	8.79	mg/kg		J	9
NJ24I	PG-A2-13-S	SW6010B	Chromium	59	mg/kg		J	9
NJ24I	PG-A2-13-S	SW7470A	Mercury	0.12	mg/kg		J	1
NJ24J	PG-A2-22-S	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	0.13	mg/kg	U	UJ	9
NJ24J	PG-A2-22-S	SW6010B	Chromium	22.0	mg/kg		J	9
NJ24J	PG-A2-22-S	SW7470A	Mercury	0.05	mg/kg	U	UJ	1
NJ24K	PG-A2-28-S	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	0.11	mg/kg	U	UJ	9
NJ24K	PG-A2-28-S	SW6010B	Chromium	22.2	mg/kg		J	9
NJ24K	PG-A2-28-S	SW7470A	Mercury	0.04	mg/kg	U	UJ	1
NJ24L	PG-A2-30-S	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	0.12	mg/kg	U	UJ	9
NJ24L	PG-A2-30-S	PSDDA SW8270D	Benzo(g,h,i)perylene	20	ug/kg	U	UJ	8
NJ24L	PG-A2-30-S	PSDDA SW8270D	Dibenz(a,h)anthracene	20	ug/kg	U	UJ	8
NJ24L	PG-A2-30-S	PSDDA SW8270D	Indeno(1,2,3-cd)pyrene	20	ug/kg	U	UJ	8
NJ24L	PG-A2-30-S	SW6010B	Chromium	22.3	mg/kg		J	9
NJ24L	PG-A2-30-S	SW7470A	Mercury	0.05	mg/kg	U	UJ	1
NJ24L	PG-A2-30-S	SW8270D	Abietic Acid	98	ug/kg	U	UJ	8,9
NJ24M	PG-A2-32-S	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	0.13	mg/kg	U	UJ	9
NJ24M	PG-A2-32-S	SW6010B	Chromium	24.9	mg/kg		J	9
NJ24M	PG-A2-32-S	SW7470A	Mercury	0.05	mg/kg	U	UJ	1
NJ24N	PG-A2-36-S	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	10.7	mg/kg		J	9
NJ24N	PG-A2-36-S	SW6010B	Chromium	44.2	mg/kg		J	9
NJ24N	PG-A2-36-S	SW7470A	Mercury	0.08	mg/kg	U	UJ	1
NJ29A	PG-A1-01-S	EPA376.2	Sulfide	3780	mg/kg		J	8
NJ29A	PG-A1-01-S	SW6010B	Zinc	301	mg/kg		J	8
NJ29B	PG-A1-02-S	EPA376.2	Sulfide	2460	mg/kg		J	8
NJ29B	PG-A1-02-S	SW6010B	Zinc	164	mg/kg		J	8
NJ29C	PG-A1-03-S	EPA376.2	Sulfide	2540	mg/kg		J	8
NJ29C	PG-A1-03-S	SW6010B	Zinc	230	mg/kg		J	8
NJ29D	PG-A1-07-S	EPA376.2	Sulfide	3030	mg/kg		J	8
NJ29D	PG-A1-07-S	SW6010B	Zinc	156	mg/kg		J	8
NJ29E	PG-A1-10-S	EPA376.2	Sulfide	1560	mg/kg		J	8

Qualified Data Summary Table
SAIC - Port Gardner

Laboratory ID	Sample_ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validator Qualifier	Validator Reason
NJ29E	PG-A1-10-S	SW6010B	Zinc	191	mg/kg		J	8
NJ29F	PG-A1-15-S	EPA376.2	Sulfide	13.3	mg/kg		J	8,9
NJ29F	PG-A1-15-S	SW6010B	Zinc	53	mg/kg		J	8
NJ29G	PG-A1-15-D	EPA376.2	Sulfide	9.82	mg/kg		J	8,9
NJ29H	PG-A1-15-T	EPA376.2	Sulfide	2.40	mg/kg		J	8,9
NJ29I	PG-A1-16-S	EPA376.2	Sulfide	169	mg/kg		J	8
NJ29I	PG-A1-16-S	SW6010B	Zinc	78	mg/kg		J	8
NJ29J	PG-A1-18-S	EPA376.2	Sulfide	11.7	mg/kg		J	8
NJ29J	PG-A1-18-S	PSDDA SW8270D	Benzyl Alcohol	19	ug/kg	U	UJ	5B
NJ29J	PG-A1-18-S	SW6010B	Zinc	56	mg/kg		J	8
NJ29K	PG-A1-23-S	EPA376.2	Sulfide	73.0	mg/kg		J	8
NJ29K	PG-A1-23-S	PSDDA SW8270D	Benzyl Alcohol	20	ug/kg	U	UJ	5B
NJ29K	PG-A1-23-S	SW6010B	Zinc	76	mg/kg		J	8
NJ29L	PG-A1-24-S	EPA376.2	Sulfide	377	mg/kg		J	8
NJ29L	PG-A1-24-S	PSDDA SW8082	PCB-Aroclor 1260	40	ug/kg	P	NJ	3
NJ29L	PG-A1-24-S	PSDDA SW8270D	Benzyl Alcohol	20	ug/kg	U	UJ	5B
NJ29L	PG-A1-24-S	PSDDA SW8270D	bis(2-Ethylhexyl)phthalate	200	ug/kg		J	9
NJ29L	PG-A1-24-S	SW6010B	Zinc	415	mg/kg		J	8
NJ89A	PG-A2-02-S	SW7470A	Mercury	0.06	mg/kg	U	UJ	1
NJ89B	PG-A4-04-S	SW7470A	Mercury	0.05	mg/kg	U	UJ	1
NJ89D	PG-A4-05-S	SW7470A	Mercury	0.06	mg/kg	U	UJ	1
NJ89E	PG-A4-05-D	SW7470A	Mercury	0.05	mg/kg	U	UJ	1
NJ89F	PG-A4-05-T	SW7470A	Mercury	0.06	mg/kg	U	UJ	1
NJ89G	PG-A4-07-S	SW7470A	Mercury	0.06	mg/kg	U	UJ	1
NJ89G	PG-A4-07-S	SW8270D	Abietic Acid	300	ug/kg		J	8,10
NJ89H	PG-A3-05-S	SW7470A	Mercury	0.07	mg/kg	U	UJ	1
NJ89H	PG-A3-05-S	SW8270D	Abietic Acid	98	ug/kg	U	UJ	10
NJ89I	PG-A3-07B-S	SW7470A	Mercury	0.08	mg/kg	U	UJ	1
NJ89J	PG-A2-08-S	SW7470A	Mercury	0.06	mg/kg	U	UJ	1
NJ89K	PG-A2-07-S	SW7470A	Mercury	0.19	mg/kg		J	1
NJ89L	PG-A2-37B-S	SW7470A	Mercury	0.05	mg/kg	U	UJ	1
NJ89M	PG-A2-38B-S	SW7470A	Mercury	0.07	mg/kg	U	UJ	1
NJ89N	PG-A2-38-S	SW7470A	Mercury	0.05	mg/kg	U	UJ	1
NJ89Q	PG-A2-42-S	SW7470A	Mercury	0.05	mg/kg	U	UJ	1
NJ89R	PG-A2-43B-S	SW7470A	Mercury	0.05	mg/kg	U	UJ	1
NJ89V	PG-A2-25-S	SW8270D	Abietic Acid	200	ug/kg	U	UJ	10
NK42C	PG-A2-18-S	PSDDA SW8270	Benzyl Alcohol	20	ug/kg	U	R	8
NK42C	PG-A2-18-S	SW8270D	Abietic Acid	200	ug/kg	U	UJ	10
NL50A	PG-A2-T1-DC-M-A	SW6010B	Chromium	0.1	mg/kg		J	10,14
NL50A	PG-A2-T1-DC-M-A	SW6010B	Silver	0.11	mg/kg		J	8
NL50B	PG-A2-T1-DC-H-A	SW6010B	Chromium	0.4	mg/kg		J	10
NL50B	PG-A2-T1-DC-H-A	SW6010B	Silver	0.3	mg/kg		J	8
NL50B	PG-A2-T1-DC-H-A	SW8082	PCB-Aroclor 1248	40	ug/kg	Y	U	22
NL50B	PG-A2-T1-DC-H-A	SW8082	PCB-Aroclor 1254	130	ug/kg		NJ	3
NL50C	PG-A2-T1-ES-A	SW6010B	Chromium	0.6	mg/kg		J	10
NL50C	PG-A2-T1-ES-A	SW6010B	Silver	0.06	mg/kg	U	UJ	8
NL50C	PG-A2-T1-ES-A	SW8082	PCB-Aroclor 1221	330	ug/kg	P	NJ	3
NL50D	PG-A2-T2-DC-M-A	SW6010B	Chromium	0.1	mg/kg		J	10,14
NL50D	PG-A2-T2-DC-M-A	SW6010B	Silver	0.09	mg/kg		J	8

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Laboratory ID	Sample_ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validator Qualifier	Validator Reason
NL50E	PG-A2-T2-DC-H-A	SW6010B	Chromium	0.1	mg/kg		J	10,14
NL50E	PG-A2-T2-DC-H-A	SW6010B	Silver	0.43	mg/kg		J	8
NL50E	PG-A2-T2-DC-H-A	SW8082	PCB-Aroclor 1248	39	ug/kg	Y	U	22
NL50E	PG-A2-T2-DC-H-A	SW8082	PCB-Aroclor 1254	52	ug/kg		NJ	3
NL50F	PG-A2-T2-ES-A	SW6010B	Chromium	0.5	mg/kg		J	10
NL50F	PG-A2-T2-ES-A	SW6010B	Silver	0.06	mg/kg	U	UJ	8
NL50G	PG-A1-T3-DC-M-A	SW6010B	Chromium	0.1	mg/kg	U	UJ	10
NL50G	PG-A1-T3-DC-M-A	SW6010B	Silver	0.11	mg/kg		J	8
NL50H	PG-A1-T3-DC-H-A	SW6010B	Chromium	0.2	mg/kg		J	10
NL50H	PG-A1-T3-DC-H-A	SW6010B	Silver	0.74	mg/kg		J	8
NL50H	PG-A1-T3-DC-H-A	SW8082	PCB-Aroclor 1248	30	ug/kg	Y	U	22
NL50H	PG-A1-T3-DC-H-A	SW8082	PCB-Aroclor 1254	85	ug/kg		J	3
NL50I	PG-A1-T3-ES-A	SW6010B	Chromium	0.3	mg/kg		J	10
NL50I	PG-A1-T3-ES-A	SW6010B	Silver	0.06	mg/kg	U	UJ	8
NL51A	PG-A2-30-C1-3	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	53.9	mg/kg		J	1
NL51A	PG-A2-30-C1-3	EPA376.2	Sulfide	1520	mg/kg		J	1
NL51A	PG-A2-30-C1-3	PSDDA SW8270	Benzyl Alcohol	20	ug/kg	U	UJ	5B
NL51A	PG-A2-30-C1-3	PSEP-PS	Particle/Grain Size, Phi Scale 3 to 4	23.3	%		J	9
NL51B	PG-A2-30-C3-5	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	55.1	mg/kg		J	1
NL51B	PG-A2-30-C3-5	EPA376.2	Sulfide	283	mg/kg		J	1
NL51B	PG-A2-30-C3-5	PSDDA SW8270	Benzyl Alcohol	20	ug/kg	U	UJ	5B
NL51B	PG-A2-30-C3-5	PSEP-PS	Particle/Grain Size, Phi Scale 3 to 4	23.5	%		J	9
NL51C	PG-A2-32-C1-3	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	0.11	mg/kg	U	UJ	1
NL51C	PG-A2-32-C1-3	EPA376.2	Sulfide	1.20	mg/kg	U	UJ	1
NL51C	PG-A2-32-C1-3	PSDDA SW8270	Benzyl Alcohol	19	ug/kg	U	UJ	5B
NL51C	PG-A2-32-C1-3	PSEP-PS	Particle/Grain Size, Phi Scale 3 to 4	0.20	%		J	9
NL51D	PG-A2-32-C3-5	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	0.17	mg/kg		J	1
NL51D	PG-A2-32-C3-5	EPA376.2	Sulfide	1.10	mg/kg	U	UJ	1
NL51D	PG-A2-32-C3-5	PSDDA SW8270	Benzyl Alcohol	20	ug/kg	U	UJ	5B
NL51D	PG-A2-32-C3-5	PSEP-PS	Particle/Grain Size, Phi Scale 3 to 4	0.10	%		J	9
NL51E	PG-A2-18-C1-3	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	58.3	mg/kg		J	1
NL51E	PG-A2-18-C1-3	EPA376.2	Sulfide	55.0	mg/kg		J	1
NL51E	PG-A2-18-C1-3	PSDDA SW8270	Benzyl Alcohol	19	ug/kg	U	UJ	5B
NL51E	PG-A2-18-C1-3	PSEP-PS	Particle/Grain Size, Phi Scale 3 to 4	13.4	%		J	9
NL51F	PG-A2-18-C3-5	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	30.2	mg/kg		J	1
NL51F	PG-A2-18-C3-5	EPA376.2	Sulfide	585	mg/kg		J	1
NL51F	PG-A2-18-C3-5	PSDDA SW8270	Benzyl Alcohol	20	ug/kg	U	UJ	5B
NL51F	PG-A2-18-C3-5	PSEP-PS	Particle/Grain Size, Phi Scale 3 to 4	29.8	%		J	9
NL51G	PG-A3-05-C1-3	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	0.13	mg/kg	U	UJ	1
NL51G	PG-A3-05-C1-3	EPA376.2	Sulfide	16.4	mg/kg		J	1
NL51G	PG-A3-05-C1-3	PSDDA SW8270	Benzyl Alcohol	19	ug/kg	U	UJ	5B
NL51G	PG-A3-05-C1-3	PSEP-PS	Particle/Grain Size, Phi Scale 3 to 4	5.50	%		J	9
NL51H	PG-A3-05-C3-5	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	0.11	mg/kg	U	UJ	1
NL51H	PG-A3-05-C3-5	EPA376.2	Sulfide	1.76	mg/kg		J	1
NL51H	PG-A3-05-C3-5	PSDDA SW8270	Benzyl Alcohol	20	ug/kg	U	UJ	5B
NL51H	PG-A3-05-C3-5	PSEP-PS	Particle/Grain Size, Phi Scale 3 to 4	2.80	%		J	9
NL51I	PG-A1-03-C1-3	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	208	mg/kg		J	1
NL51I	PG-A1-03-C1-3	EPA376.2	Sulfide	1230	mg/kg		J	1
NL51I	PG-A1-03-C1-3	PSDDA SW8270	Benzyl Alcohol	60	ug/kg	U	UJ	5B

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Laboratory ID	Sample_ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validator Qualifier	Validator Reason
NL51I	PG-A1-03-C1-3	PSEP-PS	Particle/Grain Size, Phi Scale 3 to 4	5.70	%		J	9
NL51J	PG-A1-03-C3-5	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	141	mg/kg		J	1
NL51J	PG-A1-03-C3-5	EPA376.2	Sulfide	401	mg/kg		J	1
NL51J	PG-A1-03-C3-5	PSDDA SW8270	Benzyl Alcohol	20	ug/kg	U	UJ	5B
NL51J	PG-A1-03-C3-5	PSEP-PS	Particle/Grain Size, Phi Scale 3 to 4	5.40	%		J	9
NL51K	PG-A2-25-C1-3	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	1.69	mg/kg		J	1
NL51K	PG-A2-25-C1-3	EPA376.2	Sulfide	9.64	mg/kg		J	1
NL51K	PG-A2-25-C1-3	PSDDA SW8270	Benzyl Alcohol	19	ug/kg	U	UJ	5B
NL51K	PG-A2-25-C1-3	PSEP-PS	Particle/Grain Size, Phi Scale 3 to 4	11.8	%		J	9
NL51L	PG-A2-25-C3-5	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	4.12	mg/kg		J	1
NL51L	PG-A2-25-C3-5	EPA376.2	Sulfide	23.8	mg/kg		J	1
NL51L	PG-A2-25-C3-5	PSDDA SW8270	Benzyl Alcohol	20	ug/kg	U	UJ	5B
NL51L	PG-A2-25-C3-5	PSEP-PS	Particle/Grain Size, Phi Scale 3 to 4	11.5	%		J	9
NL52A	PG-A2-11-C1-3	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	56.9	mg/kg		J	1
NL52A	PG-A2-11-C1-3	EPA376.2	Sulfide	800	mg/kg		J	1
NL52A	PG-A2-11-C1-3	PSDDA SW8270	Benzo(g,h,i)perylene	43	ug/kg	B	U	7
NL52B	PG-A4-04-C1-3	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	0.12	mg/kg	U	UJ	1
NL52B	PG-A4-04-C1-3	EPA376.2	Sulfide	1.23	mg/kg	U	UJ	1
NL52B	PG-A4-04-C1-3	PSDDA SW8270	2,4-Dimethylphenol	20	ug/kg	U	UJ	8
NL52C	PG-A1-18-C1-3	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	8.09	mg/kg		J	1
NL52C	PG-A1-18-C1-3	EPA376.2	Sulfide	98.8	mg/kg		J	1
NL52C	PG-A1-18-C1-3	PSDDA SW8270	Benzo(g,h,i)perylene	38	ug/kg	B	U	7
NL52D	PG-A1-07-C1-3	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	229	mg/kg		J	1
NL52D	PG-A1-07-C1-3	EPA376.2	Sulfide	3.00	mg/kg	U	UJ	1
NL52D	PG-A1-07-C1-3	PSDDA SW8270	Benzo(g,h,i)perylene	74	ug/kg	B	U	7
NL52E	PG-A1-07-C3-5	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	273	mg/kg		J	1
NL52E	PG-A1-07-C3-5	EPA376.2	Sulfide	1510	mg/kg		J	1
NL52E	PG-A1-07-C3-5	PSDDA SW8270	Benzo(g,h,i)perylene	94	ug/kg	B	U	7
NL52F	PG-A2-07-C1-3	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	9.57	mg/kg		J	1
NL52F	PG-A2-07-C1-3	EPA376.2	Sulfide	86.4	mg/kg		J	1
NL52G	PG-A2-37B-C1-3	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	17.9	mg/kg		J	1
NL52G	PG-A2-37B-C1-3	EPA376.2	Sulfide	1360	mg/kg		J	1
NL52H	PG-A1-18-C3-5	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	24.3	mg/kg		J	1
NL52H	PG-A1-18-C3-5	EPA376.2	Sulfide	187	mg/kg		J	1
NL52H	PG-A1-18-C3-5	PSDDA SW8270	Benzo(g,h,i)perylene	26	ug/kg	B	U	7
NL52I	PG-A1-24-C1-3	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	93.7	mg/kg		J	1
NL52I	PG-A1-24-C1-3	EPA376.2	Sulfide	799	mg/kg		J	1
NL52I	PG-A1-24-C1-3	PSDDA SW8270	Benzo(g,h,i)perylene	32	ug/kg	B	U	7
NL52J	PG-A1-24-C3-5	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	120	mg/kg		J	1
NL52J	PG-A1-24-C3-5	EPA376.2	Sulfide	300	mg/kg		J	1
NL52J	PG-A1-24-C3-5	PSDDA SW8270	Benzo(g,h,i)perylene	41	ug/kg	B	U	7
NL52K	PG-A1-15-C1-3	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	4.57	mg/kg		J	1
NL52K	PG-A1-15-C1-3	EPA376.2	Sulfide	23.5	mg/kg		J	1
NL52L	PG-A1-15-C3-5	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	14.8	mg/kg		J	1
NL52L	PG-A1-15-C3-5	EPA376.2	Sulfide	12.8	mg/kg		J	1
NL56A	PG-A2-02-C1-3	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	1.33	mg/kg		J	1
NL56A	PG-A2-02-C1-3	EPA376.2	Sulfide	1.21	mg/kg	U	UJ	1
NL56A	PG-A2-02-C1-3	PSDDA SW8270	Benzyl Alcohol	20	ug/kg	U	UJ	5B
NL56B	PG-A2-25B-S	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	4.38	mg/kg		J	1

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Laboratory ID	Sample_ID	Method	Analyte	Result	Units	Laboratory Qualifier	Validator Qualifier	Validator Reason
NL56B	PG-A2-25B-S	EPA376.2	Sulfide	23.0	mg/kg		J	1
NL56B	PG-A2-25B-S	PSDDA SW8270	Benzyl Alcohol	20	ug/kg	U	UJ	5B
NL56C	PG-A2-18B-S	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	5.44	mg/kg		J	1
NL56C	PG-A2-18B-S	EPA376.2	Sulfide	24.5	mg/kg		J	1
NL56C	PG-A2-18B-S	PSDDA SW8270	Benzyl Alcohol	20	ug/kg	U	UJ	5B
NL56D	PG-A1-46B-S	EPA350.1M	Ammonia (NH3) as Nitrogen (N)	0.90	mg/kg		J	1
NL56D	PG-A1-46B-S	PSDDA SW8270	Benzyl Alcohol	20	ug/kg	U	UJ	5B
NL56G	PG-A1-46B-VC-A	SW6010B	Silver	0.06	mg/kg	U	UJ	8
NL56H	PG-A2-25B-MY-A	PSDDA SW8082	PCB-Aroclor 1016	20	ug/kg	U	UJ	8
NL56H	PG-A2-25B-MY-A	SW6010B	Silver	0.06	mg/kg	U	UJ	8
NL56I	PG-A2-18B-MY-A	SW6010B	Silver	0.06	mg/kg	U	UJ	8
NL56J	PG-A1-31B-VC-A	SW6010B	Silver	0.06	mg/kg	U	UJ	8
NT54A	PG-A2-21-S	SW8270D	Abietic Acid	290	ug/kg		J	9,10
NT54S	PG-A3-06B-S	SW8270D	Benzyl Alcohol	20	ug/kg	U	UJ	10
NV04A	PG-A3-14-TULE	SW6010B	Arsenic	5	mg/kg	U	UJ	14
NV04A	PG-A3-14-TULE	SW6010B	Cadmium	0.2	mg/kg	U	UJ	14
NV04A	PG-A3-14-TULE	SW6010B	Copper	0.8	mg/kg		J	9
NV04A	PG-A3-14-TULE	SW6010B	Zinc	4	mg/kg		J	9
NV04A	PG-A3-14-TULE	SW8081A	Aldrin	9.4	ug/kg	Y	U	22
NV04A	PG-A3-14-TULE	SW8081A	gamma Chlordane	3.8	ug/kg	Y	U	22
NV04B	PG-A3-14-CATAIL	SW6010B	Arsenic	5	mg/kg	U	UJ	14
NV04B	PG-A3-14-CATAIL	SW6010B	Cadmium	0.2	mg/kg	U	UJ	14
NV04B	PG-A3-14-CATAIL	SW6010B	Copper	2.5	mg/kg		J	9
NV04B	PG-A3-14-CATAIL	SW6010B	Zinc	7	mg/kg		J	9
NV04C	PG-A3-15-TULE	SW6010B	Arsenic	5	mg/kg	U	UJ	14
NV04C	PG-A3-15-TULE	SW6010B	Cadmium	0.2	mg/kg	U	UJ	14
NV04C	PG-A3-15-TULE	SW6010B	Copper	0.9	mg/kg		J	9
NV04C	PG-A3-15-TULE	SW6010B	Zinc	3	mg/kg		J	9
NV04C	PG-A3-15-TULE	SW8081A	Aldrin	25	ug/kg	Y	U	22
NV04C	PG-A3-15-TULE	SW8081A	alpha Chlordane	6.9	ug/kg	Y	U	22
NV04C	PG-A3-15-TULE	SW8081A	gamma Chlordane	2.7	ug/kg	Y	U	22
NV04D	PG-A3-15-CATAIL	SW6010B	Arsenic	5	mg/kg	U	UJ	14
NV04D	PG-A3-15-CATAIL	SW6010B	Cadmium	0.2	mg/kg	U	UJ	14
NV04D	PG-A3-15-CATAIL	SW6010B	Copper	6.3	mg/kg		J	9
NV04D	PG-A3-15-CATAIL	SW6010B	Zinc	9.6	mg/kg		J	9
NV04D	PG-A3-15-CATAIL	SW8081A	gamma-BHC (Lindane)	1.4	ug/kg	Y	U	22
OB85A	SB-REF-48	PSEP-PS	Particle/Grain Size, Phi Scale 4 to 5	5.3	%		J	9
OB85B	SB-REF-76	PSEP-PS	Particle/Grain Size, Phi Scale 4 to 5	5.1	%		J	9
OB85C	CR-20/24-65	PSEP-PS	Particle/Grain Size, Phi Scale 4 to 5	40.4	%		J	9
OB85D	CR-23-49	PSEP-PS	Particle/Grain Size, Phi Scale 4 to 5	28.6	%		J	9