616277

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DATE: January 26, 2016

TO: Jeff Catanzarita U.S. EPA/ERT

THROUGH: Rick Leuser, SERAS Deputy Program Manager

FROM: Christopher Gussman, SERAS Task Leader

SUBJECT: Field Activities and Results

DIAMOND ALKALI- RIVER MILE 10.9
WORK ASSIGNMENT (WA) SERAS 0-267
TRIP REPORT

INTRODUCTION

Lockheed Martin's Scientific, Engineering, Response, and Analytical Services (SERAS) personnel provided technical support to the United States Environmental Protection Agency/Environmental Response Team (US EPA/ERT) and EPA Region 2 by collecting, analyzing and evaluating contaminated sediment at River Mile (RM) 10.9. SERAS oversaw sampling, analyses and evaluation of recently deposited sediments on top of the recently remediated RM 10.9 depositional mudflat for contaminants of concern as requested by Region 2 EPA. SERAS validated the analytical data. Surface sediment was also collected from nearby unremediated areas (i.e. the "no dredge zone"[NDZ]) and nearby depositional areas for comparison. In addition, surface sediment depths were measured on the cap and at several nearby depositional areas upstream and downstream of RM 10.9 as directed by Region 2. All data from this effort will be used by EPA Region 2 to compare with historical and future sediment data.

The Lower Passaic River Study Area Cooperating Parties Group (CPG) is a group of 67 companies working on the investigation and removal or capping of contaminated sediment at the RM 10.9 site in Lyndhurst, New Jersey (NJ). This work, occurring in a 5.5 acre area adjacent to Riverside County Park and Thomas F. Gallagher Memorial Recreation Area, has been completed with oversight from the U.S. EPA and other government entities. The removal action implementation at RM 10.9 included dredging of approximately 16,000 cubic yards (yd^3) of surface sediment defined as the top two feet. Followed by placement of an engineered cap over the removal area. The cap is approximately two feet thick and consists of erosion-resistant armor stone, a permeable fabric (known commonly as geotextile), sand and a layer of activated carbon. This cap was designed and installed to ensure that remaining contaminated sediment is isolated and does not pose unacceptable human health or ecological risks. This removal action was completed in May 2014. Recently, however, it has been noted that fine sediment is accumulating on top of the capped area. It was indicated by EPA Region 2 that prior to sampling this new depositional sediment already averaged about 20″ deep.

Sediment Sampling. SERAS subcontracted Aqua Survey (Flemington, NJ) to provide a vessel and assistance in the collection of river sediment and bathymetry measurements. SERAS was responsible for data management. Brooks Rand, Katahdin, TestAmerica West Sacramento, California (TA WSCA), and Test America Knoxville (TA KNOX) laboratories were subcontracted to analyze the samples and generate

the analytical data. SERAS QA/QC Chemists validated the analytical data and prepared an analytical report (Appendix A).

Fieldwork, which included the collection of sediment for analyses, commenced on September 29, 2015. Jeff Catanzarita (EPA/ERT), Christopher Gussman (SERAS Task Leader), and Jon McBurney (SERAS Engineer) traveled to the site and met with Robert Keegan (CDMSmith) and the crew from Aqua Survey (Jim and Bob) at a boat dock just south of RM 10.9. Also present were Helen Jones and Claire Murphy-Higgin (AECOM). SERAS, through Aqua Survey, collected ten (10) 1-foot (ft) sediment surface cores of recently deposited sediment over the constructed cap and nearby surface sediment from near the Passaic River 10.9 mile marker. These cores represented nine unique locations and one duplicate location. Each sample was labeled "PRSS" (for "Passaic River Sediment Sample") followed by a dash and a unique two digit number (e.g. "PRSS-04"). PRSS-01 through PRSS-03 were located on the RM 10.9 cap upstream of the NDZ with PRSS-01 the furthest upstream. PRSS-04 was collected from the NDZ, and PRSS-05 through PRSS-07 were collected on the RM 10.9 cap downstream of the NDZ with PRSS-08 the furthest downstream location. PRSS-08 and PRSS-09 were collected from sediment on the opposite bank of the river across from the RM 10.9 cap in areas not included in the capping activities. PRSS-09 is upstream of PRSS-08 and both are within a couple meters of the western bank. SERAS homogenized and processed the sediment samples on site and sent the collected samples to the laboratory for analyses the following day. All sample locations were recorded by Aqua Survey using Global Positioning System (GPS) technology. The sediment samples were analyzed for:

- Dioxin/furan by EPA Method 1613B
- PCB congeners by EPA Method 1668A
- Low level mercury by EPA Method 1631 (If Hg concentrations were found to be high in sediment the laboratory has the option to screen samples using EPA Method 7471).
- PAHs by modified California EPA Air Resources Board Method 429 and National Oceanic and Atmospheric Administration (NOAA) ORCA Method 130.
- TOC by the EPA Region II Lloyd Kahn Method
- Grain Size by American Society for Testing and Materials (ASTM) D422

Additional details regarding this project or the associated analytical methods may be found in the QUALITY ASSURANCE PROJECT PLAN Diamond Alkali - Phase II Sediment Removal Action, Newark, New Jersey, Revision 1 (September 29, 2015).

All analytical data were validated at Lockheed Martin/SERAS. The analytical report may be found in Appendix A. In general, contaminants were found in the new sediment on top of the RM 10.9 engineered cap but at lower concentrations than in the no dredge zone.

Bathymetry. SERAS' contractor, Aqua Survey, performed a bathymetric evaluation of the surface sediment at and nearby (upstream and downstream) Rivermile 10.9 as guided by EPA, EPA contractors at CDMSmith, and SERAS. A long steel pole with marked depth measurement was used to evaluate this surface sediment depth and estimate its texture (e.g. sand or silt) at several locations from which historical bathymetric information had been collected. Coordinates for each investigation point were collected using GPS and the data were recorded in field logbooks. Bathymetry work commenced on September 29, 2015 after completion of the sediment sample collection. Probing began just downstream of the bridge at RM 13.0 After twenty locations it was necessary to finish for the day as the tides were quickly falling and access to the boat ramp was limited. Additional probing commenced on October 13, 2015 and included sediment sampling locations proposed by AECOM. A storm event occurred shortly after the September 29 probing so several location were repeated for comparison. In addition, probing occurred on the cap and downstream of RM 10.9. Fifty-one locations were probed in all on this latter

date. The results from the bathymetric study may be found in Appendix B. Copies of the field logbooks may be found in Appendix C.

APPENDIX A

Analytical Report

January 2016

ANALYTICAL REPORT

Prepared by
LOCKHEED MARTIN

Diamond Alkali – River Mile 10.9
Lyndhurst, NJ

January 2016

EPA Work Assignment No. SERAS-267
LOCKHEED MARTIN Work Order No. SER00267
EPA Contract No. EP-W-09-031

Submitted to
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1/27/16

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1/27/16

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Appendices will be furnished on request.

TESTING LABORATORIES INFORMATION

Analysis of PCB Congeners in Sediment by Test America SOP WS-ID-0013 (Rev. 4.4),*" Preparation and Analysis of Polychlorinated Biphenyls (PCBs) by HRGC/HRMS (methods 1668A & 1668C."*

Analysis of Dioxins/Furans by Test America SOP WS-ID-0007 (1613B), "*Analysis of Tetra-Through Octa Chlorinated Dioxins and Furans By Isotopic Dilution HRGC/HRMS By Method 1613B (Method 1613B)"*

Analysis of Polynuclear Aromatic Hydrocarbons by Test America SOP Knox-ID-0016 (Mod 8270C), *"Isotopic Dilution Analysis of Selected Semivolatile Organic Compounds and Alkylated PAHs by Gas Chromatography/Mass Spectrometry Selected Ion Monitoring (GC/MS-SIM)*

Analysis of Mercury in water by Brooks Rand Method 1631 (SOP BR-0006), *Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry, EPA 821-R-02-019*

Analysis of Mercury in sediment by Brooks Rand Appendix Method 1631(SOP BR-0002), *Total Mercury in Tissue, Sludge, Sediment, and Soil by Acid Digestion and BrCl Oxidation, EPA 821-R-01-013*

Analysis of Total Organic Carbon in Soil by Katahdin (CA-741-05), *Determination of Total Organic Carbon in Solids Using the EPA Region II Method Lloyd Kahn and SW846 9060 Mod.*

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West Sacramento, CA 95605

Katahdin Analytical Services
Scarborough, ME 04074

Brooks Applied Labs
18804 North Creek Pkwy,
Bothell, WA 98011

All analyses were performed according to our NELAP-approved quality assurance program. The test results meet the requirements of the current NELAP standards, where applicable, except as noted in the laboratory case narrative provided. Results are intended to be considered in their entirety and apply only to those analyzed and reported herein.

Test America Sacramento is certified by the Oregon Department of Environmental Protection, NELAP Laboratory Certification ID #CA 200005 for PAH, Dioxins/Furans and PCB Congeners analysis in water and solid matrices.

Katahdin Analytical is certified by the New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #ME 002 for Total Organic Carbon analysis in solid matrices.

Brooks Applied Labs is certified by the New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #WA 009 for Mercury analysis in water and solid matrices.

Detailed Sample Information

Laboratory Sample #	Field Sample #
320-15260-1	SERAS 267-0038
320-15260-2	SERAS 267-0039
320-15260-3	SERAS 267-0040
320-15260-4	SERAS 267-0041
320-15260-5	SERAS 267-0042
320-15260-6	SERAS 267-0043
320-15260-7	SERAS 267-0044
320-15260-8	SERAS 267-0045
320-15260-9	SERAS 267-0046
320-15260-10	SERAS 267-0047
320-15260-11	SERAS 267-0048
1541029-01	SERAS 267-0038
1541029-02	SERAS 267-0039
1541029-03	SERAS 267-0040
1541029-04	SERAS 267-0041
1541029-05	SERAS 267-0042
1541029-06	SERAS 267-0043
1541029-07	SERAS 267-0044
1541029-08	SERAS 267-0045
1541029-09	SERAS 267-0046
1541029-10	SERAS 267-0047
1541029-11	SERAS 267-0048
S17685-01	SERAS 267-0038
S17685-02	SERAS 267-0039
S17685-03	SERAS 267-0040
S17685-04	SERAS 267-0041
S17685-05	SERAS 267-0042
S17685-06	SERAS 267-0043
S17685-07	SERAS 267-0044
S17685-08	SERAS 267-0045
S17685-09	SERAS 267-0046
S17685-10	SERAS 267-0047
S17685-11	SERAS 267-0048
H5J050417-001	PRSS-01
H5J050417-002	PRSS-02
H5J050417-003	PRSS-03
H5J050417-004	PRSS-04
H5J050417-005	PRSS-05
H5J050417-006	PRSS-06
H5J050417-007	PRSS-07
H5J050417-008	PRSS-08
H5J050417-009	PRSS-09
H5J050417-010	PRSS-105
H5J050417-011	RB-01

REPORT OF LABORATORY ANALYSIS
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Introduction

SERAS personnel, in response to WA# SERAS-267, provided analytical support for environmental samples collected from the Diamond Alkali – River Mile 10.9 Site in Lyndhurst, New Jersey as described in the following table. The support also included QA/QC, data review and preparation of an analytical report containing analytical and QA/QC results.

Chain of Custody #	Number of Samples	Sampling Date	Date Received	Date Analyzed	Matrix	Analysis/ Method	Laboratory	Data Package
2-092915-141945-0008	10	09/29/15	10/01/15	10/09/15 through 10/21/15	Sediment	PCB Congeners/ EPA 1668A/C	TestAmerica	AA 157
	1				Water			
2-092915-141254-0006	10		10/01/15	10/20/15 through 10/30/15	Sediment	Mercury/ EPA 1631 (SOP BR-0006) (SOP BR-0002)	Brooks	AA 163
	1				Water			
2-092915-141945-0008	10		10/01/15	10/06/15 through 10/19/15	Sediment	Dioxin/Furans/ SOP WS-ID-0007 (1613B)	TestAmerica	AA 159
	1				Water			
320-56179.1 320-56181.1	10		10/03/15	10/16/15	Sediment	PAHs/ SOP Knox-ID-0016 SIM (Mod. SW-846 8270C)	TestAmerica	AA 158
	1				Water			
2-092915-141734-0007	10		10/01/15	10/02/15 & 10/06/15	Sediment	TOC/Katahdin SOP CA-741-05	Katahdin Analytical	AA 153

Case Narrative

Sampling was conducted as per the site-specific Quality Assurance Project Plan (QAPP) and analyzed by the analytical methods as stated in the QAPP. The laboratory reported the data to two or three significant figures. Any other representation of the data is the responsibility of the user. Data were validated using a Stage 4 validation done manually (S4VM) in accordance with the "Guidance for Labeling Externally Validated Data for Superfund Use." All data validation flags have been inserted into the results tables.

<u>PCB Congeners in Sediment/Rinsate Package AA 157</u>

The following congeners were detected in the method blank (320-87923-1-A) for water matrix at levels that were below the reporting limit (RL): PCB-44/47/65, PCB-52, PCB-90/101/113, and PCB-183. The detected results for all of these analytes in sample SERAS 267-0048 were qualified as non-detect (U) because the sample concentration was less than the RL.

Several congeners were detected in the method blank (320-88141-1-A) for solid matrix at levels that were above the estimated detection limit (EDL) but below the RL. Also, several congeners were detected in the rinsate blank (SERAS-267-0048) at levels that were below the RL. The following detected results were qualified as non-detect (U) because the congener was found in the method and/or rinsate blank and the sample concentration for the congener was below the RL: PCB-1 in samples SERAS 267-0041, SERAS 267-0045, and SERAS 267-0046.

All identification criteria have been checked and were found to be met for all samples included in this data package, except that the results for the following analytes were qualified "EMPC" because the measured ion ratio did not meet qualitative identification criteria, indicating a possible interference:

- PCB-54, PCB-184, PCB-185, and PCB-191 in sample SERAS 267-0041
- PCB-35 in sample SERAS 267-0042
- PCB-72 in sample SERAS 267-0044
- PCB-7, PCB-9, and PCB-185 in sample SERAS 267-0045
- PCB-57 in sample SERAS 267-0046
- PCB-139/140, PCB-185, and PCB-191 in sample SERAS 267-0047

Dioxins/Furans in Sediment/Rinsate Package AA 159

The aqueous method blank from 10/02/16 contained 1,2,3,4,7,8,9-HpCDF, 1,2,3,4,6,7,8-HpCDF, OCDD, 1,2,3,6,7,8-HxCDF, OCDF and 1,2,3,4,6,7,8-HpCDD below the RL. The rinsate blank (SERAS 267-0048) results for 1,2,3,4,7,8,9-HpCDF, OCDD, 1,2,3,6,7,8-HxCDF, OCDF and 1,2,3,4,6,7,8-HpCDD are qualified non-detect (U).

The rinsate blank (SERAS 267-0048) contained 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDD, 1,2,3,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,7,8-HxCDD and 1,2,3,4,7,8-HxCDF below the RL. The 1,2,3,7,8-PeCDF result for samples SERAS 267-0043 and SERAS 267-0046 and the 1,2,3,4,7,8-HxCDD result for sample SERAS 267-0046 are qualified non-detect (U).

The lock mass drift of the penta and hepta dioxin/furan channels exceed QC criteria for samples SERAS 267-0038, SERAS 267-0040 and SERAS 267-0046. The total penta furan and dioxin results for these sample are qualified estimated (J).

The lock mass drift of the penta dioxin/furan channel exceed QC criteria for sample SERAS 267-0039. The total penta furan and dioxin results for this sample are qualified estimated (J).

The lock mass drift of the tetra, penta, hexa and hepta dioxin/furan channels exceed QC criteria for samples SERAS 267-0042 and SERAS 267-0047. The total penta furan and dioxin results for these sample are qualified estimated (J).

The lock mass drift of the tetra, penta, and hepta dioxin/furan channels exceed QC criteria for samples SERAS 267-0043 and SERAS 267-0044. The total penta furan and dioxin results for these sample are qualified estimated (J).

The % recovery of the internal standards 13C-1,2,3,6,7,8-HxCDF and 13C-1,2,3,4,7,8-HxCDF were above QC limits for samples SERAS 267-0041 and SERAS 267-0045. The 1,2,3,6,7,8-HxCDF and 1,2,3,4,7,8-HxCDF results for these samples are qualified estimated (J).

The % recovery of the internal standard 13C-1,2,3,6,7,8-HxCDF was above QC limits for samples: SERAS 267-0042, SERAS 267-0043, SERAS 267-0046 and SERAS 267-0047. The 1,2,3,6,7,8-HxCDF results for these samples are qualified estimated (J).

PAHs in Sediment/Rinsate Package AA 158

The percent moisture for sample PRSS-07 exceeded 70. All results for this sample are qualified estimated (J or UJ).

The internal standard recoveries for benzo(a)anthracene-d_{12} and dibenz(ah)anthracene-d_{14} were above the QC limits for samples: PRSS-01, PRSS-03, PRSS-05, PRSS-06, PRSS-07 and PRSS-105. The benzo(a)anthracene and dibenz(ah)anthracene results for these sample are qualified estimated (J).

The internal standard recoveries for benzo(a)anthracene-d_{12}, indeno(1,2,3-cd)pyrene-d_{12} and dibenz(ah)anthracene-d_{14} were above QC limits for samples: PRSS-01MS, PRSS-01MSD and PRSS-02. The benzo(a)anthracene, indeno(1,2,3-cd)pyrene and dibenz(ah)anthracene results for PRSS-02 are qualified estimated (J).

The internal standard recovery for dibenz(ah)anthracene-d_{14} was above QC limits for samples: PRSS-04, PRSS-08 and PRSS-09. The dibenz(ah)anthracene result for these samples are qualified estimated (J).

Acenaphthene and naphthalene were below and fluorene was above the percent recovery criteria for the MS/MSD of sample PRSS-01. The results for acenaphthene, naphthalene and fluorene are qualified estimated (J) for sample PRSS-01.

TOC in Sediment Package AA 153

The data package was examined and found to be acceptable.

Mercury in Sediment/Water Package AA 163

The data package was examined and found to be acceptable.

The results presented in this report only relate to the samples analyzed. All results are intended to be considered in their entirety. The Environmental Response Team/Scientific, Engineering, Response and Analytical Services laboratory is not responsible for utilization of less than the complete report.

REPORT OF LABORATORY ANALYSIS
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Summary of Abbreviations

BFB	Bromofluorobenzene
BS	Blank Spike
BSD	Blank Spike Duplicate
^{O}C	Degree Centigrade
COC	Chain of Custody
conc	concentration
cont	continued
PCDD/PCDF	Polychlorinated dibenzo-p-dioxins (PCDD) and Polychlorinated dibenzofurans (PCDF)
DFTPP	Decafluorotriphenylphosphine
EMPC	Estimated maximum possible concentration
GC/ECD	Gas Chromatography/Electron Capture Detector
GC/MS	Gas Chromatography/ Mass Spectrometry
Hg-CVAA	Mercury-Cold Vapor Atomic Absorption
ICP-AES	Inductively Coupled Plasma- Atomic Emission Spectroscopy
ID	Identification
IS	Internal Standard
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MDA	Minimum Detectable Activity
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MW	Molecular Weight
NA	Not Applicable or Not Available
NAD	Normalized Absolute Difference
NC	Not Calculated
NR	Not Requested/Not Reported
% D	Percent Difference
% R	Percent Recovery
SOP	Standard Operating Procedure
PCB	Polychlorinated Biphenyl
PDS	Post Digestion Spike
Percent RSD	Percent Relative Standard Deviation
ppbv	parts per billion by volume
ppm	parts per million
pptv	parts per trillion by volume
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RL	Reporting Limit
RPD	Relative Percent Difference
S4VM	Stage 4 validation done manually
SIM	Selected Ion Monitoring
SERAS	Scientific Engineering Response and Analytical Services
TIC	Tentatively Identified Compound
TCLP	Toxicity Characteristic Leaching Procedure
SVOC	Semi Volatile Organic Compound
VOC	Volatile Organic Compound
*	Value exceeds the acceptable QC limits

m^3	cubic meter	g	gram	kg	kilogram	L	liter
µg	microgram	µL	microliter	mg	milligram	mL	milliliter
ng	nanogram	pg	picogram	pCi	picocurie	σ	sigma

Data Validation Flags

J	Value is estimated	R	Rejected or Value is unusable
J+	Value is estimated high	U	Not detected
J-	Value is estimated low	UJ	Not detected and RL is estimated

Rev. 01/01/15, YRM

REPORT OF LABORATORY ANALYSIS
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Table 1.1 Results of the Analysis of PCB Congeners in Water
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Method SW846 1668A

Laboratory Sample Number	MB 320-87923/1-A	320-15260-11
Sample Number	Method Blank	SERAS 267-0048
Sample Location	10/2/2015	RB-01

Analyte	Result pg/L	RL pg/L	Result pg/L	RL pg/L
PCB-1	U	200	U	190
PCB-2	U	200	U	190
PCB-3	U	200	U	190
PCB-4	U	200	U	190
PCB-5	U	200	U	190
PCB-6	U	200	U	190
PCB-7	U	200	U	190
PCB-8	U	200	U	190
PCB-9	U	200	U	190
PCB-10	U	200	U	190
PCB-11	U	200	U	190
PCB-12/13	U	400	U	380
PCB-14	U	200	U	190
PCB-15	U	200	U	190
PCB-16	U	200	U	190
PCB-17	U	200	U	190
PCB-18/30	U	400	U	380
PCB-19	U	200	U	190
PCB-20/28	U	400	U	380
PCB-21/33	U	400	U	380
PCB-22	U	200	U	190
PCB-23	U	200	U	190
PCB-24	U	200	U	190
PCB-25	U	200	U	190
PCB-26/29	U	400	U	380
PCB-27	U	200	U	190
PCB-31	U	200	U	190
PCB-32	U	200	U	190
PCB-34	U	200	U	190
PCB-35	U	200	U	190
PCB-36	U	200	U	190
PCB-37	U	200	U	190
PCB-38	U	200	U	190
PCB-39	U	200	U	190
PCB-40/71	U	400	U	380
PCB-41	U	200	U	190
PCB-42	U	200	U	190
PCB-43	U	200	U	190
PCB-44/47/65	U	600	U	570
PCB-45	U	200	U	190
PCB-46	U	200	U	190
PCB-48	U	200	U	190
PCB-49/69	U	400	U	380
PCB-50/53	U	400	U	380
PCB-51	U	200	U	190
PCB-52	U	200	U	190
PCB-54	U	200	U	190
PCB-55	U	200	U	190
PCB-56	U	200	U	190
PCB-57	U	200	U	190
PCB-58	U	200	U	190
PCB-59/62/75	U	600	U	570
PCB-60	U	200	U	190
PCB-61/70/74/76	U	800	U	760
PCB-63	U	200	U	190
PCB-64	U	200	U	190
PCB-66	U	200	U	190
PCB-67	U	200	U	190
PCB-68	U	200	U	190

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Table 1.1 (cont) Results of the Analysis of PCB Congeners in Water
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Method SW846 1668A

Laboratory Sample Number	MB 320-87923/1-A		320-15260-11	
Sample Number	Method Blank		SERAS 267-0048	
Sample Location	10/5/2015		RB-01	
Analyte	Result pg/L	RL pg/L	Result pg/L	RL pg/L
PCB-72	U	200	U	190
PCB-73	U	200	U	190
PCB-77	U	20	U	19
PCB-78	U	200	U	190
PCB-79	U	200	U	190
PCB-80	U	200	U	190
PCB-81	U	20	U	19
PCB-82	U	200	U	190
PCB-83	U	200	U	190
PCB-84	U	200	U	190
PCB-85/116/117	U	600	U	570
PCB-86/87/97/108/119/125	U	1200	U	1100
PCB-88/91	U	400	U	380
PCB-89	U	200	U	190
PCB-90/101/113	U	600	U	570
PCB-92	U	200	U	190
PCB-93/100	U	400	U	380
PCB-94	U	200	U	190
PCB-95	U	200	U	190
PCB-96	U	200	U	190
PCB-98/102	U	400	U	380
PCB-99	U	200	U	190
PCB-103	U	200	U	190
PCB-104	U	200	U	190
PCB-105	U	20	U	19
PCB-106	U	200	U	190
PCB-107/124	U	400	U	380
PCB-109	U	200	U	190
PCB-110/115	U	400	U	380
PCB-111	U	200	U	190
PCB-112	U	200	U	190
PCB-114	U	20	U	19
PCB-118	U	20	U	19
PCB-120	U	200	U	190
PCB-121	U	200	U	190
PCB-122	U	200	U	190
PCB-123	U	20	U	19
PCB-126	U	20	U	19
PCB-127	U	200	U	190
PCB-128/166	U	400	U	380
PCB-129/138/163	U	600	U	570
PCB-130	U	200	U	190
PCB-131	U	200	U	190
PCB-132	U	200	U	190
PCB-133	U	200	U	190
PCB-134/143	U	400	U	380
PCB-135/151	U	400	U	380
PCB-136	U	200	U	190
PCB-137	U	200	U	190
PCB-139/140	U	400	U	380
PCB-141	U	200	U	190
PCB-142	U	200	U	190
PCB-144	U	200	U	190
PCB-145	U	200	U	190
PCB-146	U	200	U	190
PCB-147/149	U	400	U	380
PCB-148	U	200	U	190
PCB-150	U	200	U	190
PCB-152	U	200	U	190
PCB-153/168	U	400	U	380

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Table 1.1 (cont) Results of the Analysis of PCB Congeners in Water
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Method SW846 1668A

Laboratory Sample Number	MB 320-87923/1-A		320-15260-11	
Sample Number	Method Blank		SERAS 267-0048	
Sample Location	10/5/2015		RB-01	
Analyte	Result pg/L	RL pg/L	Result pg/L	RL pg/L
PCB-154	U	200	U	190
PCB-155	U	200	U	190
PCB-156/157	U	40	U	38
PCB-158	U	200	U	190
PCB-159	U	200	U	190
PCB-160	U	200	U	190
PCB-161	U	200	U	190
PCB-162	U	200	U	190
PCB-164	U	200	U	190
PCB-165	U	200	U	190
PCB-167	U	20	U	19
PCB-169	U	20	U	19
PCB-170	U	200	U	190
PCB-171/173	U	400	U	380
PCB-172	U	200	U	190
PCB-174	U	200	U	190
PCB-175	U	200	U	190
PCB-176	U	200	U	190
PCB-177	U	200	U	190
PCB-178	U	200	U	190
PCB-179	U	200	U	190
PCB-180/193	U	400	U	380
PCB-181	U	200	U	190
PCB-182	U	200	U	190
PCB-183	U	200	U	190
PCB-184	U	200	U	190
PCB-185	U	200	U	190
PCB-186	U	200	U	190
PCB-187	U	200	U	190
PCB-188	U	200	U	190
PCB-189	U	20	U	19
PCB-190	U	200	U	190
PCB-191	U	200	U	190
PCB-192	U	200	U	190
PCB-194	U	200	U	190
PCB-195	U	200	U	190
PCB-196	U	200	U	190
PCB-197	U	200	U	190
PCB-198/199	U	400	U	380
PCB-200	U	200	U	190
PCB-201	U	200	U	190
PCB-202	U	200	U	190
PCB-203	U	200	U	190
PCB-204	U	200	U	190
PCB-205	U	200	U	190
PCB-206	U	200	U	190
PCB-207	U	200	U	190
PCB-208	U	200	U	190
PCB-209	U	200	U	190
Total Monochlorobiphenyls	U		U	
Total Dichlorobiphenyls	U		U	
Total Trichlorobiphenyls	U		U	
Total Tetrachlorobiphenyls	U		U	
Total Pentachlorobiphenyls	U		U	
Total Hexachlorobiphenyls	U		U	
Total Heptachlorobiphenyls	U		U	
Total Octachlorobiphenyls	U		U	
Total Nonachlorobiphenyls	U		U	

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Table 1.2 Results of the Analysis for PCB Congeners in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Method SW846 1668A

Laboratory Sample Number	MB 320-88141/1-A		320-15260-1		320-15260-2		320-15260-3	
Sample Number	Method Blank		SERAS 267-0038		SERAS 267-0039		SERAS 267-0040	
Sample Location	10/5/2015		PRSS-01		PRSS-02		PRSS-03	
Percent Solids			36		35		37	
Analyte	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g
PCB-1	U	20	950	57	800	57	840	55
PCB-2	U	20	270	57	260	57	240	55
PCB-3	U	20	750	57	690	57	630	55
PCB-4	U	20	2300	57	2000	57	2100	55
PCB-5	U	20	U	68	U	66	U	59
PCB-6	U	20	1200	66	1000	63	970	57
PCB-7	U	20	110	62	85	60	77	55
PCB-8	U	20	3700	59	3500	57	3200	55
PCB-9	U	20	220	75	170	72	150	65
PCB-10	U	20	190	57	170	57	170	55
PCB-11	U	20	4900	69	4900	66	4000	60
PCB-12/13	U	40	1500	110	1500	110	1400	110
PCB-14	U	20	U	59	U	57	U	55
PCB-15	U	20	9500	570	9400	570	8600	550
PCB-16	U	20	3400	57	3200	57	2800	55
PCB-17	U	20	5100	57	5000	57	4200	55
PCB-18/30	U	40	7900	110	7600	110	6700	110
PCB-19	U	20	1200	57	1200	57	1100	55
PCB-20/28	U	40	25000	1100	23000	1100	22000	1100
PCB-21/33	U	40	6200	250	5800	240	5000	200
PCB-22	U	20	6400	300	5700	570	5200	240
PCB-23	U	20	U	260	U	250	U	210
PCB-24	U	20	160	57	170	57	110	55
PCB-25	U	20	2400	250	2200	240	2000	210
PCB-26/29	U	40	3800	270	3600	260	3100	220
PCB-27	U	20	1200	57	1100	57	1000	55
PCB-31	U	20	17000	570	15000	570	14000	550
PCB-32	U	20	3500	57	3500	57	3000	55
PCB-34	U	20	U	290	U	280	U	240
PCB-35	U	20	1100	290	810	280	730	240
PCB-36	U	20	U	280	380	270	340	230
PCB-37	U	20	9300	570	8100	570	7500	550
PCB-38	U	20	U	290	U	280	U	240
PCB-39	U	20	U	260	U	250	U	220
PCB-40/71	U	40	11000	110	11000	110	9600	110
PCB-41	U	20	1200	57	1300	57	1100	55
PCB-42	U	20	5800	570	5400	570	5400	55
PCB-43	U	20	840	57	890	57	710	55
PCB-44/47/65	U	60	26000	1700	25000	1700	22000	1700
PCB-45	U	20	2900	57	2800	57	2400	55
PCB-46	U	20	1300	57	1300	57	1100	55
PCB-48	U	20	4000	57	3900	57	3500	55
PCB-49/69	U	40	16000	1100	15000	1100	13000	1100
PCB-50/53	U	40	4100	110	4000	110	3700	110
PCB-51	U	20	3700	57	3700	57	3600	55
PCB-52	U	20	26000	570	25000	570	21000	550
PCB-54	U	20	430	57	470	57	450	55
PCB-55	U	20	U	570	U	570	U	550
PCB-56	U	20	10000	570	10000	570	8700	550
PCB-57	U	20	U	160	U	140	U	140
PCB-58	U	20	500	150	490	140	550	130
PCB-59/62/75	U	60	2100	170	2100	170	1800	170
PCB-60	U	20	3400	150	3300	130	3000	130
PCB-61/70/74/76	U	80	34000	2300	34000	2300	29000	2200
PCB-63	U	20	640	140	510	130	640	130
PCB-64	U	20	8600	570	8200	570	7100	550
PCB-66	U	20	U	170	U	150	U	150
PCB-67	U	20	560	140	500	130	610	120

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Table 1.2 Results of the Analysis for PCB Congeners in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Method SW846 1668A

Laboratory Sample Number	MB 320-88141/1-A		320-15260-1		320-15260-2		320-15260-3	
Sample Number	Method Blank		SERAS 267-0038		SERAS 267-0039		SERAS 267-0040	
Sample Location	10/9/2015		PRSS-01		PRSS-02		PRSS-03	
Percent Solids			36		35		37	
Analyte	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g
PCB-68	U	20	210	140	200	120	210	120
PCB-72	U	20	270	150	250	130	250	130
PCB-73	U	20	U	57	U	57	U	55
PCB-77	U	2	3700	170	3300	140	3000	140
PCB-78	U	20	U	170	U	150	U	150
PCB-79	U	20	310	160	350	140	300	140
PCB-80	U	20	U	140	U	130	120	120
PCB-81	U	2	200	160	190	140	190	140
PCB-82	U	20	3200	630	3200	550	2800	350
PCB-83	U	20	2500	740	2500	650	1300	420
PCB-84	U	20	6000	690	4000	550	5000	590
PCB-85/116/117	U	60	4900	470	4600	410	4200	260
PCB-86/87/97/108/119/125	U	120	17000	480	17000	420	7000	330
PCB-88/91	U	40	3400	540	2300	480	3400	310
PCB-89	U	20	U	600	U	530	U	340
PCB-90/101/113	U	60	23000	1700	22000	1700	19000	1700
PCB-92	U	20	4600	570	3800	500	4200	320
PCB-93/100	U	40	1500	560	1500	490	1200	310
PCB-94	U	20	U	590	U	520	380	330
PCB-95	U	20	18000	630	18000	610	15000	550
PCB-96	U	20	250	57	230	57	200	55
PCB-98/102	U	40	1200	500	1100	440	1200	280
PCB-99	U	20	13000	570	13000	570	11000	550
PCB-103	U	20	U	520	510	460	510	290
PCB-104	U	20	180	57	200	57	200	55
PCB-105	U	2	9800	590	10000	560	8700	500
PCB-106	U	20	U	460	U	400	U	260
PCB-107/124	U	40	690	440	920	380	640	250
PCB-109	U	20	1800	440	2000	390	1500	250
PCB-110/115	U	40	27000	1100	26000	1100	22000	1100
PCB-111	U	20	U	380	U	340	U	220
PCB-112	U	20	U	380	U	340	U	220
PCB-114	U	2	540	460	540	400	460	250
PCB-118	U	2	22000	510	22000	490	19000	440
PCB-120	U	20	U	410	U	370	U	230
PCB-121	U	20	U	410	U	360	U	230
PCB-122	U	20	U	490	U	430	350	280
PCB-123	U	2	U	430	420	360	290	230
PCB-126	U	2	U	520	U	460	U	290
PCB-127	U	20	U	500	U	440	U	280
PCB-128/166	U	40	4400	200	4400	190	3800	180
PCB-129/138/163	U	60	25000	1700	24000	1700	21000	1700
PCB-130	U	20	1800	250	1800	240	1600	220
PCB-131	U	20	240	240	280	230	290	210
PCB-132	U	20	6800	570	6600	570	5700	550
PCB-133	U	20	420	220	440	210	390	190
PCB-134/143	U	40	1400	220	1400	210	1200	190
PCB-135/151	U	40	9800	210	10000	200	8900	180
PCB-136	U	20	3300	160	3600	150	3100	140
PCB-137	U	20	1300	220	1300	210	1100	190
PCB-139/140	U	40	480	200	400	190	440	170
PCB-141	U	20	5100	210	5100	200	4600	180
PCB-142	U	20	U	210	U	200	U	180
PCB-144	U	20	1200	200	1200	190	1100	170
PCB-145	U	20	U	150	U	140	U	130
PCB-146	U	20	4900	210	5000	200	4400	180
PCB-147/149	U	40	19000	1100	18000	1100	16000	1100
PCB-148	U	20	U	200	U	190	U	170
PCB-150	U	20	U	140	U	130	U	120
PCB-152	U	20	U	150	U	140	U	130
PCB-153/168	U	40	21000	1100	20000	1100	18000	1100

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Table 1.2 Results of the Analysis for PCB Congeners in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Method SW846 1668A

Laboratory Sample Number	MB 320-88141/1-A		320-15260-1		320-15260-2		320-15260-3	
Sample Number	Method Blank		SERAS 267-0038		SERAS 267-0039		SERAS 267-0040	
Sample Location	10/9/2015		PRSS-01		PRSS-02		PRSS-03	
Percent Solids			36		35		37	
Analyte	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g
PCB-154	U	20	690	180	700	170	640	150
PCB-155	U	20	260	140	320	140	290	130
PCB-156/157	U	4	3300	34	3300	36	2900	30
PCB-158	U	20	2800	160	2800	150	2500	140
PCB-159	U	20	U	210	U	210	U	200
PCB-160	U	20	U	190	U	180	U	170
PCB-161	U	20	U	160	U	150	U	140
PCB-162	U	20	U	300	U	300	U	270
PCB-164	U	20	1800	160	1900	160	1700	140
PCB-165	U	20	U	180	U	180	U	160
PCB-167	U	2	1100	21	1100	23	950	19
PCB-169	U	2	U	27	U	30	U	25
PCB-170	U	20	8100	570	8000	570	7100	550
PCB-171/173	U	40	2800	110	2800	110	2500	110
PCB-172	U	20	1500	57	1500	57	1400	55
PCB-174	U	20	8000	570	10000	57	7200	550
PCB-175	U	20	340	57	350	57	290	55
PCB-176	U	20	1000	57	780	570	890	55
PCB-177	U	20	4600	570	4500	570	4200	550
PCB-178	U	20	2000	57	2000	57	1700	55
PCB-179	U	20	4000	57	4200	57	3700	55
PCB-180/193	U	40	19000	1100	18000	1100	16000	1100
PCB-181	U	20	77	57	78	57	69	55
PCB-182	U	20	U	57	U	57	U	55
PCB-183	U	20	5400	57	5600	57	5300	55
PCB-184	U	20	U	57	U	57	U	55
PCB-185	U	20	1300	57	1000	57	940	55
PCB-186	U	20	U	57	U	57	U	55
PCB-187	U	20	10000	570	9900	570	8800	550
PCB-188	U	20	U	57	U	57	U	55
PCB-189	U	2	300	5.7	280	5.7	260	5.5
PCB-190	U	20	1900	57	1800	57	1700	55
PCB-191	U	20	360	57	370	57	330	55
PCB-192	U	20	U	57	U	57	U	55
PCB-194	U	20	5900	570	6000	570	5200	55
PCB-195	U	20	2000	57	2100	57	1900	55
PCB-196	U	20	2500	57	2500	57	2100	55
PCB-197	U	20	150	57	130	57	120	55
PCB-198/199	U	40	6700	110	6800	110	5700	110
PCB-200	U	20	570	57	610	57	490	55
PCB-201	U	20	630	57	670	57	550	55
PCB-202	U	20	1700	57	1800	57	1600	55
PCB-203	U	20	3800	57	3800	57	3200	55
PCB-204	U	20	U	57	U	57	U	55
PCB-205	U	20	250	57	250	57	220	55
PCB-206	U	20	4600	57	4500	57	4100	55
PCB-207	U	20	490	57	490	57	420	55
PCB-208	U	20	1700	57	1700	57	1500	55
PCB-209	U	20	4200	57	4100	57	3700	55
Total Monochlorobiphenyls	U		2000		1700		1700	
Total Dichlorobiphenyls	U		23000		22000		20000	
Total Trichlorobiphenyls	U		91000		87000		76000	
Total Tetrachlorobiphenyls	U		190000		170000		170000	
Total Pentachlorobiphenyls	U		160000		160000		140000	
Total Hexachlorobiphenyls	U		130000		140000		120000	
Total Heptachlorobiphenyls	U		77000		78000		70000	
Total Octachlorobiphenyls	U		24000		25000		21000	
Total Nonachlorobiphenyls	U		6700		6700		6000	

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Table 1.2 (cont) Results of the Analysis for PCB Congeners in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Method SW846 1668A

Laboratory Sample Number	320-15260-4		320-15260-5		320-15260-6		320-15260-7	
Sample Number	SERAS 267-0041		SERAS 267-0042		SERAS 267-0043		SERAS 267-0044	
Sample Location	PRSS-04		PRSS-05		PRSS-06		PRSS-07	
Percent Solids	52		37		46		31	
Analyte	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g
PCB-1	2000	7600	810	530	470	220	610	330
PCB-2	U	7600	U	530	U	220	U	330
PCB-3	U	7600	820	530	420	220	550	330
PCB-4	28000	7600	1600	530	1000	220	1400	330
PCB-5	U	7600	U	530	U	220	U	330
PCB-6	23000	7600	980	530	540	220	720	330
PCB-7	U	7600	U	530	U	220	U	330
PCB-8	78000	7600	3400	530	1800	220	2500	330
PCB-9	U	7600	U	530	U	220	U	330
PCB-10	U	7600	U	530	U	220	U	330
PCB-11	34000	7600	5200	530	2600	220	3100	330
PCB-12/13	U	15000	1400	1100	700	440	890	650
PCB-14	U	7600	U	530	U	220	U	330
PCB-15	56000	7600	8300	530	4600	220	5800	330
PCB-16	110000	7600	2800	530	1600	220	2000	330
PCB-17	130000	7600	4100	530	2300	220	3000	330
PCB-18/30	240000	15000	7000	1100	3800	440	4800	650
PCB-19	23000	7600	1000	530	560	220	830	330
PCB-20/28	440000	15000	22000	1100	12000	440	15000	650
PCB-21/33	190000	15000	5900	1100	3200	440	4100	650
PCB-22	140000	7600	5500	530	3100	220	3800	330
PCB-23	U	7600	U	530	U	220	U	330
PCB-24	U	7600	U	530	U	220	U	330
PCB-25	46000	7600	2300	530	1300	220	1600	330
PCB-26/29	64000	15000	3400	1100	1900	440	2500	650
PCB-27	18000	7600	980	530	540	220	710	330
PCB-31	350000	7600	14000	530	8200	220	10000	330
PCB-32	78000	7600	3300	530	1900	220	2400	330
PCB-34	U	7600	U	530	U	220	U	330
PCB-35	U	7600	U	530	350	220	600	330
PCB-36	U	7600	U	530	U	220	U	330
PCB-37	95000	7600	7200	530	4100	220	4900	330
PCB-38	U	7600	U	530	U	220	U	330
PCB-39	U	7600	U	530	U	220	U	330
PCB-40/71	160000	15000	9200	1100	5000	440	6200	650
PCB-41	23000	7600	1200	530	620	220	860	330
PCB-42	90000	7600	5100	530	2800	220	3400	330
PCB-43	19000	7600	800	530	470	220	540	330
PCB-44/47/65	350000	23000	24000	1600	13000	660	15000	980
PCB-45	55000	7600	2400	530	1300	220	1600	330
PCB-46	22000	7600	980	530	570	220	760	330
PCB-48	80000	7600	3400	530	1800	220	2200	330
PCB-49/69	210000	15000	14000	1100	7500	440	9100	650
PCB-50/53	51000	15000	3400	1100	1800	440	2200	650
PCB-51	21000	7600	3000	530	1600	220	2100	330
PCB-52	410000	7600	24000	530	13000	220	15000	330
PCB-54	U	7600	U	530	U	220	U	330
PCB-55	U	7600	U	530	U	220	U	330
PCB-56	160000	7600	8900	530	4800	220	6000	330
PCB-57	U	7600	U	530	250	220	U	330
PCB-58	U	7600	U	530	U	220	U	330
PCB-59/62/75	32000	23000	1900	1600	1000	660	1200	980
PCB-60	52000	7600	3400	530	1800	220	2300	330
PCB-61/70/74/76	550000	30000	30000	2100	16000	870	20000	1300
PCB-63	13000	7600	710	530	380	220	480	330
PCB-64	140000	7600	7700	530	4100	220	4900	330
PCB-66	350000	7600	22000	530	12000	220	15000	330
PCB-67	11000	7600	610	530	330	220	390	330

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Table 1.2 (cont) Results of the Analysis for PCB Congeners in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Method SW846 1668A

Laboratory Sample Number	320-15260-4		320-15260-5		320-15260-6		320-15260-7	
Sample Number	SERAS 267-0041		SERAS 267-0042		SERAS 267-0043		SERAS 267-0044	
Sample Location	PRSS-04		PRSS-05		PRSS-06		PRSS-07	
Percent Solids	52		37		46		31	
Analyte	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g
PCB-68	U	7600	U	530	U	220	U	330
PCB-72	U	7600	U	530	U	220	U	330
PCB-73	U	7600	U	530	U	220	U	330
PCB-77	41000	2800	3300	150	1700	79	2100	94
PCB-78	U	7600	U	530	U	220	U	330
PCB-79	U	7600	U	530	U	220	U	330
PCB-80	U	7600	U	530	U	220	U	330
PCB-81	U	2800	U	160	100	78	U	94
PCB-82	42000	7600	2800	530	1500	240	1800	330
PCB-83	12000	7600	850	600	570	290	480	380
PCB-84	79000	7600	5400	530	3000	240	3600	330
PCB-85/116/117	47000	23000	3700	1600	2000	660	2400	980
PCB-86/87/97/108/119/125	170000	46000	15000	3200	7700	1300	9500	2000
PCB-88/91	40000	15000	3400	1100	1900	440	2300	650
PCB-89	U	7600	U	530	U	230	U	330
PCB-90/101/113	250000	23000	21000	1600	11000	660	14000	980
PCB-92	46000	7600	4000	530	2200	220	2700	330
PCB-93/100	U	15000	1300	1100	640	440	760	650
PCB-94	U	7600	U	530	U	230	U	330
PCB-95	220000	7600	16000	530	8500	220	10000	330
PCB-96	U	7600	U	530	U	220	U	330
PCB-98/102	U	15000	U	1100	590	440	U	650
PCB-99	140000	7600	12000	530	6700	220	7800	330
PCB-103	U	7600	U	530	260	220	U	330
PCB-104	U	7600	U	530	U	220	U	330
PCB-105	100000	5000	9000	430	4700	200	6000	270
PCB-106	U	7600	U	530	U	220	U	330
PCB-107/124	U	15000	U	1100	U	440	U	650
PCB-109	15000	7600	1400	530	800	220	970	330
PCB-110/115	290000	15000	24000	1100	13000	440	16000	650
PCB-111	U	7600	U	530	U	220	U	330
PCB-112	U	7600	U	530	U	220	U	330
PCB-114	6900	4700	520	410	290	200	350	260
PCB-118	230000	4400	21000	370	11000	180	13000	230
PCB-120	U	7600	U	530	U	220	U	330
PCB-121	U	7600	U	530	U	220	U	330
PCB-122	U	7600	U	530	230	220	U	330
PCB-123	U	4500	U	380	U	180	240	230
PCB-126	U	5500	U	500	U	230	U	310
PCB-127	U	7600	U	530	U	220	U	330
PCB-128/166	27000	15000	4000	1100	2200	440	2800	650
PCB-129/138/163	180000	23000	28000	1600	15000	660	20000	980
PCB-130	11000	7600	1600	530	940	220	1200	330
PCB-131	U	7600	U	530	U	220	U	330
PCB-132	56000	7600	7900	530	4300	220	5600	330
PCB-133	U	7600	U	530	U	220	U	330
PCB-134/143	U	15000	U	1100	790	440	960	650
PCB-135/151	53000	15000	8700	1100	4700	440	6200	650
PCB-136	20000	7600	3000	530	1600	220	2200	330
PCB-137	8300	7600	1200	530	650	220	770	330
PCB-139/140	U	15000	U	1100	U	440	U	650
PCB-141	32000	7600	4800	530	2500	220	3600	330
PCB-142	U	7600	U	530	U	220	U	330
PCB-144	U	7600	1100	530	580	220	770	330
PCB-145	U	7600	U	530	U	220	U	330
PCB-146	23000	7600	4200	530	2300	220	3000	330
PCB-147/149	130000	15000	21000	1100	11000	440	15000	650
PCB-148	U	7600	U	530	U	220	U	330
PCB-150	U	7600	U	530	U	220	U	330
PCB-152	U	7600	U	530	U	220	U	330
PCB-153/168	140000	15000	23000	1100	13000	440	16000	650

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Table 1.2 (cont) Results of the Analysis for PCB Congeners in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Method SW846 1668A

Laboratory Sample Number	320-15260-4		320-15260-5		320-15260-6		320-15260-7	
Sample Number	SERAS 267-0041		SERAS 267-0042		SERAS 267-0043		SERAS 267-0044	
Sample Location	PRSS-04		PRSS-05		PRSS-06		PRSS-07	
Percent Solids	52		37		46		31	
Analyte	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g
PCB-154	U	7600	630	530	340	220	410	330
PCB-155	U	7600	U	530	U	220	U	330
PCB-156/157	29000	1500	3100	110	1600	44	2100	65
PCB-158	19000	7600	2700	530	1500	220	1900	330
PCB-159	U	7600	U	530	U	220	U	330
PCB-160	U	7600	U	530	U	220	U	330
PCB-161	U	7600	U	530	U	220	U	330
PCB-162	U	7600	U	530	U	220	U	330
PCB-164	11000	7600	1700	530	950	220	1300	330
PCB-165	U	7600	U	530	U	220	U	330
PCB-167	8300	760	960	53	550	22	660	33
PCB-169	U	760	U	53	U	22	U	33
PCB-170	51000	7600	6900	530	3600	220	4600	330
PCB-171/173	U	15000	2200	1100	1100	440	1500	650
PCB-172	8100	7600	1300	530	640	220	850	330
PCB-174	51000	7600	8000	530	4100	220	5600	330
PCB-175	U	7600	U	530	U	220	U	330
PCB-176	U	7600	960	530	500	220	690	330
PCB-177	28000	7600	4600	530	2500	220	3300	330
PCB-178	8100	7600	1900	530	970	220	1300	330
PCB-179	18000	7600	3700	530	1900	220	2700	330
PCB-180/193	110000	15000	17000	1100	8500	440	11000	650
PCB-181	U	7600	U	530	U	220	U	330
PCB-182	U	7600	U	530	U	220	U	330
PCB-183	25000	7600	4400	530	2300	220	3100	330
PCB-184	U	7600	U	530	U	220	U	330
PCB-185	U	7600	700	530	440	220	510	330
PCB-186	U	7600	U	530	U	220	U	330
PCB-187	53000	7600	12000	530	6000	220	8100	330
PCB-188	U	7600	U	530	U	220	U	330
PCB-189	1800	760	290	53	140	22	180	33
PCB-190	11000	7600	1500	530	790	220	1000	330
PCB-191	U	7600	U	530	U	220	U	330
PCB-192	U	7600	U	530	U	220	U	330
PCB-194	40000	7600	3700	530	2100	220	2400	330
PCB-195	13000	7600	1400	530	770	220	930	330
PCB-196	14000	7600	2400	530	1300	220	1600	330
PCB-197	U	7600	U	530	U	220	U	330
PCB-198/199	35000	15000	6600	1100	3500	440	4600	650
PCB-200	U	7600	620	530	340	220	440	330
PCB-201	U	7600	690	530	380	220	520	330
PCB-202	7800	7600	1400	530	760	220	1000	330
PCB-203	22000	7600	3700	530	2000	220	2600	330
PCB-204	U	7600	U	530	U	220	U	330
PCB-205	U	7600	U	530	U	220	U	330
PCB-206	25000	7600	4900	530	2100	220	2900	330
PCB-207	U	7600	U	530	220	220	U	330
PCB-208	U	7600	1800	530	800	220	1100	330
PCB-209	11000	7600	4000	530	1800	220	2200	330
Total Monochlorobiphenyls	3100		1900		1100		1300	
Total Dichlorobiphenyls	230000		21000		11000		15000	
Total Trichlorobiphenyls	1900000		80000		45000		56000	
Total Tetrachlorobiphenyls	2800000		170000		92000		110000	
Total Pentachlorobiphenyls	1700000		140000		79000		94000	
Total Hexachlorobiphenyls	760000		120000		65000		85000	
Total Heptachlorobiphenyls	400000		65000		34000		45000	
Total Octachlorobiphenyls	140000		21000		11000		14000	
Total Nonachlorobiphenyls	35000		7100		3200		4200	

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Table 1.2. (cont) Results of the Analysis for PCB Congeners in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Method SW846 1668A

Laboratory Sample Number	320-15260-8		320-15260-9		320-15260-10	
Sample Number	SERAS 267-0045		SERAS 267-0046		SERAS 267-0047	
Sample Location	PRSS-08		PRSS-09		PRSS-105	
Percent Solids	39		74		38	
Analyte	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g
PCB-1	U	20000	U	1100	750	540
PCB-2	U	20000	U	1100	U	540
PCB-3	U	20000	U	1100	710	540
PCB-4	50000	20000	2700	1100	1500	540
PCB-5	U	20000	U	1100	U	540
PCB-6	39000	20000	7100	1100	910	540
PCB-7	U	20000	U	1100	U	540
PCB-8	190000	20000	12000	1100	3100	540
PCB-9	U	20000	U	1100	U	540
PCB-10	U	20000	U	1100	U	540
PCB-11	150000	20000	4800	1100	4200	540
PCB-12/13	U	41000	2300	2100	1200	1100
PCB-14	U	20000	U	1100	U	540
PCB-15	160000	20000	12000	1100	7700	540
PCB-16	250000	20000	12000	1100	2800	540
PCB-17	300000	20000	15000	1100	4100	540
PCB-18/30	620000	41000	28000	2100	6900	1100
PCB-19	51000	20000	2700	1100	940	540
PCB-20/28	1100000	41000	58000	2100	21000	1100
PCB-21/33	500000	41000	21000	2100	6000	1100
PCB-22	350000	20000	19000	1100	5500	540
PCB-23	U	20000	U	1100	U	540
PCB-24	U	20000	U	1100	U	540
PCB-25	80000	20000	7200	1100	2300	540
PCB-26/29	150000	41000	11000	2100	3400	1100
PCB-27	44000	20000	2400	1100	970	540
PCB-31	900000	20000	45000	1100	14000	540
PCB-32	190000	20000	9900	1100	3300	540
PCB-34	U	20000	U	1100	U	540
PCB-35	U	20000	U	1100	U	540
PCB-36	U	20000	U	1100	U	540
PCB-37	260000	20000	13000	1100	7200	540
PCB-38	U	20000	U	1100	U	540
PCB-39	U	20000	U	1100	U	540
PCB-40/71	450000	41000	20000	2100	8700	1100
PCB-41	81000	20000	3500	1100	1200	540
PCB-42	250000	20000	12000	1100	4900	540
PCB-43	51000	20000	2200	1100	790	540
PCB-44/47/65	1000000	61000	43000	3200	22000	1600
PCB-45	170000	20000	7400	1100	2000	540
PCB-46	65000	20000	3000	1100	990	540
PCB-48	240000	20000	9700	1100	3200	540
PCB-49/69	590000	41000	27000	2100	13000	1100
PCB-50/53	160000	41000	6900	2100	3100	1100
PCB-51	49000	20000	3200	1100	3100	540
PCB-52	1200000	20000	47000	1100	22000	540
PCB-54	U	20000	U	1100	U	540
PCB-55	U	20000	U	1100	U	540
PCB-56	470000	20000	10000	1100	8400	540
PCB-57	21000	20000	U	1100	U	540
PCB-58	U	20000	U	1100	U	540
PCB-59/62/75	87000	61000	4400	3200	1800	1600
PCB-60	200000	20000	3400	1100	3100	540
PCB-61/70/74/76	1600000	82000	45000	4300	28000	2100
PCB-63	36000	20000	1300	1100	680	540
PCB-64	400000	20000	17000	1100	7300	540
PCB-66	1000000	20000	29000	1100	21000	540
PCB-67	27000	20000	1700	1100	560	540

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Table 1.2. (cont) Results of the Analysis for PCB Congeners in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Method SW846 1668A

Laboratory Sample Number	320-15260-8		320-15260-9		320-15260-10	
Sample Number	SERAS 267-0045		SERAS 267-0046		SERAS 267-0047	
Sample Location	PRSS-08		PRSS-09		PRSS-105	
Percent Solids	39		74		38	
Analyte	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g
PCB-68	U	20000	U	1100	U	540
PCB-72	U	20000	U	1100	U	540
PCB-73	U	20000	U	1100	U	540
PCB-77	110000	7800	2800	240	3000	160
PCB-78	U	20000	U	1100	U	540
PCB-79	U	20000	U	1100	U	540
PCB-80	U	20000	U	1100	U	540
PCB-81	U	7700	U	240	U	160
PCB-82	130000	20000	3600	1100	2600	540
PCB-83	35000	20000	1200	1100	750	590
PCB-84	230000	20000	7500	1100	5300	540
PCB-85/116/117	140000	61000	4500	3200	3400	1600
PCB-86/87/97/108/119/125	520000	120000	17000	6400	14000	3200
PCB-88/91	110000	41000	4200	2100	3400	1100
PCB-89	U	20000	U	1100	U	540
PCB-90/101/113	690000	61000	24000	3200	20000	1600
PCB-92	130000	20000	4400	1100	3900	540
PCB-93/100	U	41000	U	2100	1200	1100
PCB-94	U	20000	U	1100	U	540
PCB-95	620000	20000	22000	1100	15000	540
PCB-96	U	20000	U	1100	U	540
PCB-98/102	U	41000	U	2100	U	1100
PCB-99	370000	20000	13000	1100	11000	540
PCB-103	U	20000	U	1100	U	540
PCB-104	U	20000	U	1100	U	540
PCB-105	290000	14000	12000	620	8500	430
PCB-106	U	20000	U	1100	U	540
PCB-107/124	U	41000	U	2100	U	1100
PCB-109	41000	20000	1900	1100	1300	540
PCB-110/115	780000	41000	29000	2100	23000	1100
PCB-111	U	20000	U	1100	U	540
PCB-112	U	20000	U	1100	U	540
PCB-114	20000	13000	830	600	520	410
PCB-118	610000	12000	27000	550	20000	380
PCB-120	U	20000	U	1100	U	540
PCB-121	U	20000	U	1100	U	540
PCB-122	U	20000	U	1100	U	540
PCB-123	U	12000	U	560	U	370
PCB-126	U	16000	U	710	U	510
PCB-127	U	20000	U	1100	U	540
PCB-128/166	67000	41000	3900	2100	4000	1100
PCB-129/138/163	440000	61000	22000	3200	28000	1600
PCB-130	28000	20000	1300	1100	1700	540
PCB-131	U	20000	U	1100	U	540
PCB-132	140000	20000	6200	1100	7800	540
PCB-133	U	20000	U	1100	U	540
PCB-134/143	U	41000	U	2100	1100	1100
PCB-135/151	140000	41000	5700	2100	8700	1100
PCB-136	54000	20000	2100	1100	3100	540
PCB-137	20000	20000	1100	1100	1200	540
PCB-139/140	U	41000	U	2100	U	1100
PCB-141	85000	20000	3600	1100	4800	540
PCB-142	U	20000	U	1100	U	540
PCB-144	U	20000	U	1100	1100	540
PCB-145	U	20000	U	1100	U	540
PCB-146	56000	20000	2800	1100	4200	540
PCB-147/149	330000	41000	14000	2100	21000	1100
PCB-148	U	20000	U	1100	U	540
PCB-150	U	20000	U	1100	U	540
PCB-152	U	20000	U	1100	U	540
PCB-153/168	330000	41000	16000	2100	23000	1100

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Table 1.2. (cont) Results of the Analysis for PCB Congeners in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Method SW846 1668A

Laboratory Sample Number	320-15260-8		320-15260-9		320-15260-10	
Sample Number	SERAS 267-0045		SERAS 267-0046		SERAS 267-0047	
Sample Location	PRSS-08		PRSS-09		PRSS-105	
Percent Solids	39		74		38	
Analyte	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g
PCB-154	U	20000	U	1100	610	540
PCB-155	U	20000	3000	1100	U	540
PCB-156/157	71000	4100	4000	210	3000	110
PCB-158	49000	20000	2400	1100	2700	540
PCB-159	U	20000	U	1100	U	540
PCB-160	U	20000	U	1100	U	540
PCB-161	U	20000	U	1100	U	540
PCB-162	U	20000	U	1100	U	540
PCB-164	28000	20000	1300	1100	1800	540
PCB-165	U	20000	U	1100	U	540
PCB-167	20000	2000	1200	110	920	54
PCB-169	U	2000	U	110	U	54
PCB-170	110000	20000	5700	1100	6200	540
PCB-171/173	U	41000	U	2100	2000	1100
PCB-172	U	20000	U	1100	1200	540
PCB-174	120000	20000	5900	1100	7500	540
PCB-175	U	20000	U	1100	U	540
PCB-176	U	20000	U	1100	940	540
PCB-177	65000	20000	3100	1100	4300	540
PCB-178	U	20000	U	1100	1800	540
PCB-179	43000	20000	2000	1100	3600	540
PCB-180/193	250000	41000	13000	2100	15000	1100
PCB-181	U	20000	U	1100	U	540
PCB-182	U	20000	U	1100	U	540
PCB-183	59000	20000	2900	1100	4100	540
PCB-184	U	20000	U	1100	U	540
PCB-185	U	20000	U	1100	U	540
PCB-186	U	20000	U	1100	U	540
PCB-187	120000	20000	6700	1100	11000	540
PCB-188	U	20000	U	1100	U	540
PCB-189	4100	2000	240	110	240	54
PCB-190	25000	20000	1400	1100	1300	540
PCB-191	U	20000	U	1100	U	540
PCB-192	U	20000	U	1100	U	540
PCB-194	77000	20000	6400	1100	3800	540
PCB-195	27000	20000	1400	1100	1100	540
PCB-196	29000	20000	2100	1100	2000	540
PCB-197	U	20000	U	1100	U	540
PCB-198/199	70000	41000	8400	2100	5400	1100
PCB-200	U	20000	U	1100	U	540
PCB-201	U	20000	U	1100	610	540
PCB-202	U	20000	2100	1100	1300	540
PCB-203	44000	20000	5800	1100	3100	540
PCB-204	U	20000	U	1100	U	540
PCB-205	U	20000	U	1100	U	540
PCB-206	39000	20000	13000	1100	3800	540
PCB-207	U	20000	U	1100	U	540
PCB-208	U	20000	3800	1100	1400	540
PCB-209	30000	20000	3900	1100	3100	540
Total Monochlorobiphenyls	23000		1400		1700	
Total Dichlorobiphenyls	620000		42000		19000	
Total Trichlorobiphenyls	4800000		250000		79000	
Total Tetrachlorobiphenyls	8300000		300000		160000	
Total Pentachlorobiphenyls	4800000		180000		140000	
Total Hexachlorobiphenyls	1900000		93000		120000	
Total Heptachlorobiphenyls	910000		46000		61000	
Total Octachlorobiphenyls	280000		28000		18000	
Total Nonachlorobiphenyls	56000		17000		5600	

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Table 1.3 .Results of the Analysis for Dioxins/Furans in Water
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Method : TA SOP WS-ID-0007 (1613B)

Laboratory Sample Number	MB 320-87963	320-15260-11
Sample Number	Method Blank	SERAS 267-0048
Sample Location	10/2/2015	RB-01

Analyte	Result pg/L	RL pg/L	Result pg/L	RL pg/L
Total PeCDD	U		U	
2,3,4,6,7,8-HxCDF	U	50	0.56 J	49
1,2,3,7,8,9-HxCDD	U	50	1.0 J	49
1,2,3,4,7,8,9-HpCDF	0.586 J	50	U	49
1,2,3,4,6,7,8-HpCDF	1.36 J	50	1.5 EMPC	49
OCDD	5.57 J	100	U	98
2,3,7,8-TCDD	U	10	U	9.8
Total TCDF	U		U	
Total HxCDF	0.483 J		3.1 J	
1,2,3,7,8-PeCDD	U	50	U	49
1,2,3,7,8-PeCDF	U	50	0.86 J	49
1,2,3,6,7,8-HxCDD	U	50	U	49
2,3,7,8-TCDF	U	10	U	9.8
1,2,3,6,7,8-HxCDF	0.483 J	50	0.86 J	49
Total TCDD	U		U	
1,2,3,7,8,9-HxCDF	U	50	0.89 J	49
OCDF	4.89 J	100	U	98
Total PeCDF	U		0.86 J	
Total HpCDD	1.41 J		4.2 J	
1,2,3,4,7,8-HxCDD	U	50	0.55 J	49
Total HxCDD	U		2.3 J	
Total HpCDF	1.95 J		2.4 J	
1,2,3,4,7,8-HxCDF	U	50	0.73 J	49
1,2,3,4,6,7,8-HpCDD	1.41 J	50	U	49
2,3,4,7,8-PeCDF	U	50	U	49
Total TEQ	0.0850		0.0485	

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Table 1.4 Results of the Analysis for Dioxins/Furans in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Method : TA SOP WS-ID-0007 (1613B)

Laboratory Sample Number	MB 320-88195	320-15260-1	320-15260-2	320-15260-3
Sample Number	Method Blank	SERAS 267-0038	SERAS 267-0039	SERAS 267-0040
Sample Location	10/5/2015	PRSS-01	PRSS-02	PRSS-03
Percent Solids		36	35	37

Analyte	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g
Total PeCDD	U		25 J		25 J		26 J	
2,3,4,6,7,8-HxCDF	U	5.0	14	14	13 J	14	13 J	14
1,2,3,7,8,9-HxCDD	U	5.0	18	14	20	14	15	14
1,2,3,4,7,8,9-HpCDF	U	5.0	23	14	20	14	22	14
1,2,3,4,6,7,8-HpCDF	U	5.0	610	14	590	14	600	14
OCDD	2.14 J	10	10000	28	9300	28	7900	28
2,3,7,8-TCDD	U	1.0	310	2.8	310	2.8	680	2.8
Total TCDF	U		270		260		230	
Total HxCDF	U		460		450		430	
1,2,3,7,8-PeCDD	U	5.0	5.4 J	14	5.0 J	14	5.1 J	14
1,2,3,7,8-PeCDF	U	5.0	9.9 J	14	9.6 J	14	8.4 J	14
1,2,3,6,7,8-HxCDD	U	5.0	29	14	27	14	25	14
2,3,7,8-TCDF	U	1.0	26	2.8	26	2.8	22	2.8
1,2,3,6,7,8-HxCDF	U	5.0	27	14	26	14	23	14
Total TCDD	U		390		380		760	
1,2,3,7,8,9-HxCDF	U	5.0	U	14	U	14	U	14
OCDF	U	10	1100	28	1100	28	1200	28
Total PeCDF	U		270 J		310 J		270 J	
Total HpCDD	0.446		1700		1700		1400	
1,2,3,4,7,8-HxCDD	U	5.0	8.8 J	14	8.8 J	14	7.5 J	14
Total HxCDD	U		260		270		220	
Total HpCDF	U		1100		990		960	
1,2,3,4,7,8-HxCDF	U	5.0	91	14	91	14	94	14
1,2,3,4,6,7,8-HpCDD	0.446 J	5.0	760	14	740	14	640	14
2,3,4,7,8-PeCDF	U	5.0	18	14	18	14	16	14
Total TEQ	0.0051		355		359		725	

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Table 1.4 (cont) Results of the Analysis for Dioxins/Furans in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Method : TA SOP WS-ID-0007 (1613B)

Laboratory Sample Number	320-15260-4		320-15260-5		320-15260-6		320-15260-7	
Sample Number	SERAS 267-0041		SERAS 267-0042		SERAS 267-0043		SERAS 267-0044	
Sample Location	PRSS-04		PRSS-05		PRSS-06		PRSS-07	
Percent Solids	52		37		46		31	
Analyte	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g
Total PeCDD	66		21 J		13 J		16 J	
2,3,4,6,7,8-HxCDF	27	9.5	12 J	13	6.4 J	11	8.3 J	16
1,2,3,7,8,9-HxCDD	27	9.5	15	13	11	11	16	16
1,2,3,4,7,8,9-HpCDF	40	9.5	20	13	11	11	14 J	16
1,2,3,4,6,7,8-HpCDF	1400	9.5	560 J	13	300	11	360	16
OCDD	12000	190	8500	27	4900	22	6500	33
2,3,7,8-TCDD	5200	19	290	2.7	150	2.2	150	3.3
Total TCDF	2000		250		120		130	
Total HxCDF	1200		440		230		290	
1,2,3,7,8-PeCDD	17	9.5	5.0 J	13	2.9 J	11	4.3 J	16
1,2,3,7,8-PeCDF	16 EMPC	9.5	7.7 J	13	U	11	5.5 EMPC	16
1,2,3,6,7,8-HxCDD	60	9.5	28	13	16	11	19	16
2,3,7,8-TCDF	55	1.9	23	2.7	12	2.2	16	3.3
1,2,3,6,7,8-HxCDF	70 J	9.5	23 J	13	12 J	11	16	16
Total TCDD	5400		340		170		200	
1,2,3,7,8,9-HxCDF	U	9.5	U	13	U	11	U	16
OCDF	2900	19	1100	27	570	22	650	33
Total PeCDF	1900		280 J		150 J		170 J	
Total HpCDD	2300		1600		810		1200	
1,2,3,4,7,8-HxCDD	15	9.5	7.6 J	13	4.0 J	11	5.9 EMPC	16
Total HxCDD	460		260		140		180	
Total HpCDF	2200		920		510		610	
1,2,3,4,7,8-HxCDF	280 J	9.5	73	13	38	11	44	16
1,2,3,4,6,7,8-HpCDD	1100	9.5	700	13	360	11	510	16
2,3,4,7,8-PeCDF	35	9.5	17	13	9.0 J	11	11 J	16
Total TEQ	5310		334		174		181	

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Table 1.4 (cont) Results of the Analysis for Dioxins/Furans in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Method : TA SOP WS-ID-0007 (1613B)

Laboratory Sample Number	320-15260-8	320-15260-9	320-15260-10
Sample Number	SERAS 267-0045	SERAS 267-0046	SERAS 267-0047
Sample Location	PRSS-08	PRSS-09	PRSS-105
Percent Solids	39	74	38

Analyte	Result pg/g	RL pg/g	Result pg/g	RL pg/g	Result pg/g	RL pg/g
Total PeCDD	94		8.2 J		19 J	
2,3,4,6,7,8-HxCDF	56	13	3.5 J	6.6	11 J	13
1,2,3,7,8,9-HxCDD	53	13	5.3 J	6.6	14	13
1,2,3,4,7,8,9-HpCDF	97	13	4.8 J	6.6	19	13
1,2,3,4,6,7,8-HpCDF	2400	13	110	6.6	590	13
OCDD	26000	260	2900	13	8200	27
2,3,7,8-TCDD	9900	51	140	1.3	250	2.7
Total TCDF	4900		130		220	
Total HxCDF	2500		130		430	
1,2,3,7,8-PeCDD	34 EMPC	13	1.8 J	6.6	5.0 EMPC	13
1,2,3,7,8-PeCDF	42	13	U	6.6	7.8 J	13
1,2,3,6,7,8-HxCDD	130	13	13	6.6	23	13
2,3,7,8-TCDF	9900	26	12	1.3	21	2.7
1,2,3,6,7,8-HxCDF	140 J	13	6.6 J	6.6	27 J	13
Total TCDD	10000		150		310	
1,2,3,7,8,9-HxCDF	U	13	U	6.6	U	13
OCDF	6300	26	230	13	1200	27
Total PeCDF	4400		130 J		220 J	
Total HpCDD	5200		540		1800	
1,2,3,4,7,8-HxCDD	28	13	U	6.6	7.5 J	13
Total HxCDD	1300		110		230	
Total HpCDF	4000		200		930	
1,2,3,4,7,8-HxCDF	550 J	13	22	6.6	86	13
1,2,3,4,6,7,8-HpCDD	2500	13	270	6.6	660	13
2,3,4,7,8-PeCDF	75	13	10	6.6	15 EMPC	13
Total TEQ	10100		166		285	

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Table 1.5 Results of the Analysis for Polynuclear Aromatic Hydrocarbons in Water
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Method SW846 8270C (SIM)

Laboratory Sample Number	H5J060000-011		H5J050417-011	
Sample Number	Method Blank		SERAS-267-0048	
Sample Location	10/6/2015		RB-01	
Analyte	Result ng/L	RL ng/L	Result ng/L	RL ng/L
Acenaphthene	U	10	U	10
Acenaphthylene	U	10	U	10
Anthracene	U	10	U	10
Benzo(a)anthracene	U	10	U	10
Benzo(b)fluoranthene	U	10	U	10
Benzo(k)fluoranthene	U	10	U	10
Benzo(ghi)perylene	U	10	U	10
Benzo(a)pyrene	U	10	U	10
Chrysene	U	10	U	10
Dibenz(a,h)anthracene	U	10	U	10
Fluoranthene	U	10	U	10
Fluorene	U	10	U	10
Indeno(1,2,3-cd)pyrene	U	10	U	10
Naphthalene	U	50	U	50
Phenanthrene	U	20	U	20
Pyrene	U	10	U	10

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Table 1.6 Results of the Analysis for Polynuclear Aromatic Hydrocarbons in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results are Based on Dry Weight

Method SW846 8270C (SIM)

Laboratory Sample Number	H5J060000-012		H5J050417-001		H5J050417-002		H5J050417-003	
Sample Number	Method Blank		SERAS-267-0038		SERAS-267-0039		SERAS-267-0040	
Sample Location	10/7/2015		PRSS-01		PRSS-02		PRSS-03	
Percent Solids			31		32		35	
Analyte	Result ng/g	RL ng/g	Result ng/g	RL ng/g	Result ng/g	RL ng/g	Result ng/g	RL ng/g
Acenaphthene	U	1.0	180 J	47	170	46	140	43
Acenaphthylene	U	1.0	250	47	260	46	200	43
Anthracene	U	1.0	630	47	630	46	570	43
Benzo(a)anthracene	U	1.0	1700 J	47	1800 J	46	1600 J	43
Benzo(b)fluoranthene	U	1.0	4000	47	4800	46	3900	43
Benzo(k)fluoranthene	U	1.0	1400	47	1700	46	1800	43
Benzo(ghi)perylene	U	1.0	1700	47	2200	46	1900	43
Benzo(a)pyrene	U	1.0	2400	47	2900	46	2600	43
Chrysene	U	1.0	3300	47	3600	46	3100	43
Dibenz(a,h)anthracene	U	1.0	210 J	47	220 J	46	210 J	43
Fluoranthene	U	1.0	4000	47	4100	46	3700	43
Fluorene	U	1.0	200 J	47	220	46	180	43
Indeno(1,2,3-cd)pyrene	U	1.0	1400	47	1700 J	46	1600	43
Naphthalene	U	20	U J	950	U	930	U	860
Phenanthrene	U	2.0	1700	95	1800	93	1500	86
Pyrene	U	2.0	3900	95	4000	93	3500	86

Table 1.6 (cont) Results of the Analysis for Polynuclear Aromatic Hydrocarbons in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results are Based on Dry Weight

Method SW846 8270C (SIM)

Laboratory Sample Number	H5J050417-004		H5J050417-005		H5J050417-006		H5J050417-007	
Sample Number	SERAS-267-0041		SERAS-267-0042		SERAS-267-0043		SERAS-267-0044	
Sample Location	PRSS-04		PRSS-05		PRSS-06		PRSS-07	
Percent Solids	38		34		40		26	
Analyte	Result ng/g	RL ng/g	Result ng/g	RL ng/g	Result ng/g	RL ng/g	Result ng/g	RL ng/g
Acenaphthene	180	39	150	43	83	37	160 J	57
Acenaphthylene	180	39	220	43	130	37	230 J	57
Anthracene	720	39	550	43	320	37	520 J	57
Benzo(a)anthracene	1800	39	1800 J	43	940 J	37	1700 J	57
Benzo(b)fluoranthene	3300	39	4000	43	2200	37	3700 J	57
Benzo(k)fluoranthene	1600	39	2100	43	1000	37	1800 J	57
Benzo(ghi)perylene	1600	39	2100	43	1200	37	1900 J	57
Benzo(a)pyrene	2400	39	2800	43	1500	37	2700 J	57
Chrysene	3700	39	4100	43	1900	37	3900 J	57
Dibenz(a,h)anthracene	190 J	39	210 J	43	140 J	37	230 J	57
Fluoranthene	4200	39	4100	43	2300	37	4000 J	57
Fluorene	200	39	200	43	110	37	200 J	57
Indeno(1,2,3-cd)pyrene	1300	39	1600	43	920	37	1500 J	57
Naphthalene	U	780	U	860	U	750	U J	1100
Phenanthrene	2300	78	1800	86	900	75	1700 J	110
Pyrene	4200	78	3900	86	2200	75	3700 J	110

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Table 1.6 (cont) Results of the Analysis for Polynuclear Aromatic Hydrocarbons in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results are Based on Dry Weight

Method SW846 8270C (SIM)

Laboratory Sample Number	H5J050417-008		H5J050417-009		H5J050417-010	
Sample Number	SERAS-267-0045		SERAS-267-0046		SERAS-267-0047	
Sample Location	PRSS-08		PRSS-09		PRSS-105	
Percent Solids	37		73		35	
Analyte	Result ng/g	RL ng/g	Result ng/g	RL ng/g	Result ng/g	RL ng/g
Acenaphthene	410	40	61	20	140	41
Acenaphthylene	380	40	160	20	220	41
Anthracene	1600	40	240	20	540	41
Benzo(a)anthracene	2700	40	700	20	1700 J	41
Benzo(b)fluoranthene	4700	40	1000	20	3800	41
Benzo(k)fluoranthene	2500	40	530	20	1900	41
Benzo(ghi)perylene	2600	40	560	20	1900	41
Benzo(a)pyrene	3100	40	940	20	2600	41
Chrysene	5100	40	1000	20	3900	41
Dibenz(a,h)anthracene	220 J	40	82 J	20	200 J	41
Fluoranthene	5000	40	890	20	3800	41
Fluorene	630	40	63	20	180	41
Indeno(1,2,3-cd)pyrene	1800	40	460	20	1600	41
Naphthalene	880	790	U	410	U	820
Phenanthrene	3700	79	370	41	1700	82
Pyrene	5300	79	1300	41	3600	82

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Table 1.7 Results of the Analysis for Mercury in Water
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Method EPA Method 1631

Laboratory Sample Number	B151628-BLK	154029-11
Sample Number	Method Blank	SERAS 267-0048
Sample Location	10/12/2015	RB-01
Sublocation		

Analyte	Result ng/L	RL ng/L	Result ng/L	RL ng/L
Mercury	U	0.40	0.56	0.40

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Table 1.8 Results of the Analysis for Mercury in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results are Based on Dry Weight

Method EPA 1631

Laboratory Sample Number	B151639-BLK		1541029-01		1541029-02		1541029-03	
Sample Number	Method Blank		SERAS 267-0038		SERAS 267-0039		SERAS 267-0040	
Sample Location	10/14/2015		PRSS-01		PRSS-02		PRSS-03	
Percent Solids			31		32		37	
Analyte	Result ng/g	RL ng/g	Result ng/g	RL ng/g	Result ng/g	RL ng/g	Result ng/g	RL ng/g
Mercury	U	0.40	1810	31.1	2010	32.5	1700	28.4

Table 1.8 (cont) Results of the Analysis for Mercury in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results are Based on Dry Weight

Method EPA 1631

Laboratory Sample Number	1541029-04		1541029-05		1541029-06		1541029-07	
Sample Number	SERAS 267-0041		SERAS 267-0042		SERAS 267-0043		SERAS 267-0044	
Sample Location	PRSS-04		PRSS-05		PRSS-06		PRSS-07	
Percent Solids	52		36		41		27	
Analyte	Result ng/g	RL ng/g	Result ng/g	RL ng/g	Result ng/g	RL ng/g	Result ng/g	RL ng/g
Mercury	4220	18.2	1470	26.3	872	25.0	1300	40.7

Table 1.8 (cont) Results of the Analysis for Mercury in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results are Based on Dry Weight

Method EPA 1631

Laboratory Sample Number	1541029-08		1541029-09		1541029-10	
Sample Number	SERAS 267-0045		SERAS 267-0046		SERAS 267-0047	
Sample Location	PRSS-08		PRSS-09		PRSS-105	
Percent Solids	36		75		35	
Analyte	Result ng/g	RL ng/g	Result ng/g	RL ng/g	Result ng/g	RL ng/g
Mercury	11000	27.8	872	12.6	1730	28.4

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Table 1.9 Results of the Analysis of Total Organic Carbon in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Method : Lloyd Kahn/SW-846 9060 (mod.)

Laboratory Sample Number	WG171707-BLANK		SI7685-02		SI7685-03		SI7685-04	
Sample Number	Method Blank		SERAS 267-0039		SERAS 267-0040		SERAS 267-0041	
Sample Location	10/2/2015		PRSS-02		PRSS-03		PRSS-04	
Percent solids			31		34		51	
Analyte	Result µg/g	RL µg/g	Result µg/g	RL µg/g	Result µg/g	RL µg/g	Result µg/g	RL µg/g
TOC in Soil	U	400	68000	2900	64000	2200	56000	2000

Table 1.9 (cont) Results of the Analysis of Total Organic Carbon in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Method : Lloyd Kahn/SW-846 9060 (mod.)

Laboratory Sample Number	SI7685-05		SI7685-06		SI7685-07		SI7685-08	
Sample Number	SERAS 267-0042		SERAS 267-0043		SERAS 267-0044		SERAS 267-0045	
Sample Location	PRSS-05		PRSS-06		PRSS-07		PRSS-08	
Percent solids	35		41		99		36	
Analyte	Result µg/g	RL µg/g	Result µg/g	RL µg/g	Result µg/g	RL µg/g	Result µg/g	RL µg/g
TOC in Soil	67000	3000	36000	3000	17000	1100	71000	2100

Table 1.9 (cont) Results of the Analysis of Total Organic Carbon in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Method : Lloyd Kahn/SW-846 9060 (mod.)

Laboratory Sample Number	SI7685-09		SI7685-10	
Sample Number	SERAS 267-0046		SERAS 267-0047	
Sample Location	PRSS-09		PRSS-105	
Percent solids	77		35	
Analyte	Result µg/g	RL µg/g	Result µg/g	RL µg/g
TOC in Soil	13000	1000	66000	2100

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Table 1.9 (cont) Results of the Analysis of Total Organic Carbon in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Method : Lloyd Kahn/SW-846 9060 (mod.)

Laboratory Sample Number	WG171791	SI7685-01
Sample Number	Method Blank	SERAS 267-0038
Sample Location	10/6/2015	PRSS-01
Percent solids		31

Analyte	Result µg/g	RL µg/g	Result µg/g	RL µg/g
TOC In Soil(Avg)	U	400	69000	2900

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Table 2.1 Results of the Analysis for Labeled PCB Congeners in Water
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Laboratory Sample Number	MB 320-87923/1-A	320-15260-11	
Sample Number	Method Blank 10/2/2015	SERAS 267-0048	
Analyte	% Recovery	% Recovery	QC Limits % Recovery
PCB-1L	67	67	15 - 150
PCB-3L	68	68	15 - 150
PCB-4L	72	75	25 - 150
PCB-15L	69	73	25 - 150
PCB-19L	73	74	25 - 150
PCB-37L	69	67	25 - 150
PCB-54L	69	66	25 - 150
PCB-77L	84	88	25 - 150
PCB-81L	91	83	25 - 150
PCB-104L	80	75	25 - 150
PCB-105L	98	86	25 - 150
PCB-114L	98	88	25 - 150
PCB-118L	102	92	25 - 150
PCB-123L	94	85	25 - 150
PCB-126L	100	84	25 - 150
PCB-155L	73	70	25 - 150
PCB-156L/157L	94	86	25 - 150
PCB-167L	91	83	25 - 150
PCB-169L	109	97	25 - 150
PCB-188L	62	53	25 - 150
PCB-189L	82	70	25 - 150
PCB-202L	74	63	25 - 150
PCB-205L	96	84	25 - 150
PCB-206L	109	95	25 - 150
PCB-208L	85	76	25 - 150
PCB-209L	112	98	25 - 150
PCB-28L	81	80	30 - 135
PCB-111L	97	94	30 - 135
PCB-178L	91	88	30 - 135

Laboratory Sample Number	LCS	LCSD	
Sample Number	10/2/2015	10/2/2015	
Analyte	% Recovery	% Recovery	QC Limits % Recovery
PCB-1L	62	65	15 - 140
PCB-3L	63	67	15 - 140
PCB-4L	67	71	30 - 140
PCB-15L	66	69	30 - 140
PCB-19L	66	70	30 - 140
PCB-37L	66	69	30 - 140
PCB-54L	62	67	30 - 140
PCB-77L	92	95	30 - 140
PCB-81L	84	89	30 - 140
PCB-104L	72	73	30 - 140
PCB-105L	90	94	30 - 140
PCB-114L	91	93	30 - 140
PCB-118L	92	95	30 - 140
PCB-123L	88	90	30 - 140
PCB-126L	93	100	30 - 140
PCB-155L	70	68	30 - 140
PCB-156L/157L	92	90	30 - 140
PCB-167L	89	87	30 - 140
PCB-169L	107	108	30 - 140
PCB-188L	56	52	30 - 140
PCB-189L	80	75	30 - 140
PCB-202L	67	63	30 - 140
PCB-205L	94	89	30 - 140
PCB-206L	108	100	30 - 140
PCB-208L	80	75	30 - 140
PCB-209L	115	107	30 - 140
PCB-28L	78	55	30 - 135
PCB-111L	89	69	30 - 135
PCB-178L	84	65	30 - 135

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Table 2.2 Results of the Analysis for Labeled PCB Congeners in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Laboratory Sample Number	MB 320-88141/1-A	320-15260-1	320-15260-2	320-15260-3	320-15260-4	
Sample Number	Method Blank 10/5/2015	SERAS 267-0038	SERAS 267-0039	SERAS 267-0040	SERAS 267-0041	
Analyte	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	QC Limits % Recovery
PCB-1L	54	61	64	64	106	15-150
PCB-3L	55	72	72	74	104	15-150
PCB-4L	61	74	72	75	96	25-150
PCB-15L	55	86	88	90	98	25-150
PCB-19L	58	69	66	67	88	25-150
PCB-37L	51	94	98	102	119	25-150
PCB-54L	54	57	47	45	94	25-150
PCB-77L	63	98	105	103	111	25-150
PCB-81L	65	98	105	105	113	25-150
PCB-104L	54	63	55	50	98	25-150
PCB-105L	75	91	93	95	106	25-150
PCB-114L	72	91	93	96	106	25-150
PCB-118L	74	90	94	95	109	25-150
PCB-123L	70	93	95	96	104	25-150
PCB-126L	82	101	101	103	118	25-150
PCB-155L	55	87	95	91	96	25-150
PCB-156L/157L	80	92	98	104	126	25-150
PCB-167L	75	96	103	108	121	25-150
PCB-169L	99	95	97	104	150	25-150
PCB-188L	44	73	77	72	59	25-150
PCB-189L	69	85	89	88	105	25-150
PCB-202L	55	74	75	72	61	25-150
PCB-205L	92	85	88	88	104	25-150
PCB-206L	114	79	82	82	106	25-150
PCB-208L	72	77	86	92	78	25-150
PCB-209L	93	67	68	65	103	25-150
PCB-28L	53	86	90	87	0	30-135
PCB-111L	69	95	97	96	181	30-135
PCB-178L	70	70	68	61	188	30-135

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Table 2.2 (cont) Results of the Analysis for Labeled PCB Congeners in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Laboratory Sample Number	320-15260-5	320-15260-6	320-15260-7	320-15260-8	320-15260-9	
Sample Number	SERAS 267-0042	SERAS 267-0043	SERAS 267-0044	SERAS 267-0045	SERAS 267-0046	
Analyte	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	QC Limits % Recovery
PCB-1L	67	61	61	105	103	15-150
PCB-3L	70	65	66	104	103	15-150
PCB-4L	79	74	75	96	93	25-150
PCB-15L	86	80	82	99	101	25-150
PCB-19L	81	76	75	89	89	25-150
PCB-37L	94	89	96	117	118	25-150
PCB-54L	85	80	84	94	92	25-150
PCB-77L	89	88	90	108	112	25-150
PCB-81L	86	86	91	108	109	25-150
PCB-104L	99	95	93	95	95	25-150
PCB-105L	96	94	93	102	106	25-150
PCB-114L	95	93	93	102	104	25-150
PCB-118L	97	95	96	104	107	25-150
PCB-123L	96	95	95	101	103	25-150
PCB-126L	106	103	102	109	118	25-150
PCB-155L	85	85	87	102	94	25-150
PCB-156L/157L	75	75	71	119	122	25-150
PCB-167L	78	74	75	116	118	25-150
PCB-169L	75	73	69	137	143	25-150
PCB-188L	123	126	147	66	63	25-150
PCB-189L	87	89	93	105	102	25-150
PCB-202L	126	120	136	68	66	25-150
PCB-205L	86	84	82	104	104	25-150
PCB-206L	87	88	83	106	105	25-150
PCB-208L	102	99	105	82	79	25-150
PCB-209L	85	80	75	102	101	25-150
PCB-28L	79	76	79	0	146	30-135
PCB-111L	96	96	100	0	125	30-135
PCB-178L	86	86	84	164	108	30-135

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Table 2.2 (cont) Results of the Analysis for Labeled PCB Congeners in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Laboratory Sample Number	320-15260-10		LCSD 10/05/15	LCS 10/05/15	
Sample Number	SERAS 267-0047				
Analyte	% Recovery	QC Linits % Recovery	% Recovery	% Recovery	QC Linits % Recovery
PCB-1L	61	15-150	56	63	15-140
PCB-3L	66	15-150	56	64	15-140
PCB-4L	76	25-150	61	70	30-140
PCB-15L	85	25-150	56	61	30-140
PCB-19L	80	25-150	57	66	30-140
PCB-37L	90	25-150	55	59	30-140
PCB-54L	86	25-150	48	55	30-140
PCB-77L	89	25-150	66	69	30-140
PCB-81L	91	25-150	69	70	30-140
PCB-104L	102	25-150	48	57	30-140
PCB-105L	96	25-150	77	78	30-140
PCB-114L	97	25-150	75	76	30-140
PCB-118L	99	25-150	76	79	30-140
PCB-123L	101	25-150	72	74	30-140
PCB-126L	106	25-150	88	87	30-140
PCB-155L	89	25-150	58	61	30-140
PCB-156L/157L	69	25-150	85	83	30-140
PCB-167L	75	25-150	79	77	30-140
PCB-169L	68	25-150	106	103	30-140
PCB-188L	115	25-150	43	45	30-140
PCB-189L	76	25-150	74	72	30-140
PCB-202L	116	25-150	57	55	30-140
PCB-205L	93	25-150	94	92	30-140
PCB-206L	93	25-150	113	112	30-140
PCB-208L	84	25-150	79	75	30-140
PCB-209L	93	25-150	108	111	30-140
PCB-28L	83	30-135	55	58	30-135
PCB-111L	97	30-135	69	72	30-135
PCB-178L	85	30-135	65	68	30-135

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Table 2.3 Results of the LCS/LCSD Analysis for PCB Congeners in Water
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Sample ID: LCS 10/02/15

Analyte	LCS/LCSD Spike Added pg/L	LCS Spike pg/L	LCS % Recovery	LCSD Spike pg/L	LCSD % Recovery	RPD	RPD	QC Limits % Recovery
PCB-1	2000	1950	97	1880	94	3	50	50-150
PCB-3	2000	1910	96	1870	93	2	50	50-150
PCB-4	2000	1910	96	1880	94	2	50	50-150
PCB-15	2000	1780	89	1800	90	1	50	50-150
PCB-19	2000	2010	100	2000	100	0	50	50-150
PCB-37	2000	1880	94	1900	95	1	50	50-150
PCB-54	2000	2080	104	2070	104	1	50	50-150
PCB-77	2000	1880	94	1800	90	4	50	50-150
PCB-81	2000	1890	94	1890	95	0	50	50-150
PCB-104	2000	1830	92	1860	93	2	50	50-150
PCB-105	2000	1880	94	1880	94	0	50	50-150
PCB-114	2000	1870	93	1890	94	1	50	50-150
PCB-118	2000	1910	96	1930	97	1	50	50-150
PCB-123	2000	1810	90	1820	91	1	50	50-150
PCB-126	2000	1820	91	1810	90	1	50	50-150
PCB-155	2000	1880	94	1890	95	1	50	50-150
PCB-156/157	4000	3670	92	3730	93	2	50	50-150
PCB-167	2000	1790	89	1820	91	2	50	50-150
PCB-169	2000	1840	92	1820	91	1	50	50-150
PCB-188	2000	1930	96	1970	99	2	50	50-150
PCB-189	2000	1880	94	1880	94	0	50	50-150
PCB-202	2000	1900	95	1950	97	2	50	50-150
PCB-205	2000	1890	94	1890	94	0	50	50-150
PCB-206	2000	1820	91	1870	93	3	50	50-150
PCB-208	2000	1870	94	1890	94	1	50	50-150
PCB-209	2000	1790	90	1840	92	3	50	50-150

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Table 2.4 Results of the LCS/LCSD Analysis for PCB Congeners in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Sample ID: LCS 10/05/15

Analyte	LCS/LCSD Spike Added pg/g	LCS Spike Recovered pg/g	LCS % Recovery	LCSD Spike Recovered pg/g	LCSD % Recovery	RPD	RPD	QC Limits % Recovery
PCB-1	200	175	88	174	87	1	50	50-150
PCB-3	200	176	88	175	88	0	50	50-150
PCB-4	200	184	92	182	91	1	50	50-150
PCB-15	200	173	87	173	87	0	50	50-150
PCB-19	200	194	97	198	99	2	50	50-150
PCB-37	200	183	91	178	89	3	50	50-150
PCB-54	200	225	112	216	108	4	50	50-150
PCB-77	200	202	101	196	98	3	50	50-150
PCB-81	200	184	92	179	90	2	50	50-150
PCB-104	200	192	96	200	100	4	50	50-150
PCB-105	200	184	92	183	91	1	50	50-150
PCB-114	200	182	91	183	91	1	50	50-150
PCB-118	200	186	93	187	93	0	50	50-150
PCB-123	200	177	89	177	89	0	50	50-150
PCB-126	200	175	88	173	87	1	50	50-150
PCB-155	200	197	98	197	99	0	50	50-150
PCB-156/157	400	359	90	360	90	0	50	50-150
PCB-167	200	174	87	176	88	1	50	50-150
PCB-169	200	177	88	176	88	0	50	50-150
PCB-188	200	198	99	200	100	1	50	50-150
PCB-189	200	179	90	178	89	1	50	50-150
PCB-202	200	187	94	187	94	0	50	50-150
PCB-205	200	177	89	177	88	0	50	50-150
PCB-206	200	179	89	178	89	0	50	50-150
PCB-208	200	181	90	178	89	1	50	50-150
PCB-209	200	181	91	183	91	1	50	50-150

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Table 2.5 Results of the Analysis of Labeled Standards for Dioxins/Furans in Water
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Sample Number	MB 320-87963	SERAS 267-0048	
Analyte	Percent Recovery	Percent Recovery	QC limits Percent Recovery
13C-1,2,3,6,7,8-HxCDD	77	76	28-130
13C-2,3,7,8-TCDD	71	71	25 -164
13C-1,2,3,7,8-PeCDD	75	75	25-181
13C-1,2,3,7,8,9-HxCDF	70	70	29-147
13C-1,2,3,4,6,7,8-HpCDF	70	73	28-143
13C-1,2,3,7,8-PeCDF	79	77	24-185
13C-1,2,3,4,7,8-HxCDD	58	60	32-141
13C-2,3,7,8-TCDF	81	82	24-169
13C-1,2,3,6,7,8-HxCDF	72	75	26-123
13C-2,3,4,7,8-PeCDF	76	78	21-178
13C-1,2,3,4,6,7,8-HpCDD	66	68	23-140
13C-OCDD	50	52	17-157
13C-1,2,3,4,7,8-HxCDF	63	65	26-152
13C-2,3,4,6,7,8-HxCDF	74	74	28-136
13C-1,2,3,4,7,8,9-HpCDF	65	68	26-138

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Table 2.6 Results of the Analysis of Labeled Standards for Dioxins/Furans in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Sample Number	MB 320-88195	SERAS 267-0038	SERAS 267-0039	SERAS 267-0040	SERAS 267-0041	SERAS 267-0042	QC Limits
Analyte	Percent Recovery	Percent Recovery	Percent Recovery	Percent Recovery	Percent Recovery	Percent Recovery	Percent Recovery
13C-1,2,3,6,7,8-HxCDD	100	97	100	98	99	95	28 - 130
13C-2,3,7,8-TCDD	97	91	90	89	96	88	25 - 164
13C-1,2,3,7,8-PeCDD	97	100	99	99	113	103	25 - 181
13C-1,2,3,7,8,9-HxCDF	97	95	98	102	108	100	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	101	75	75	74	69	68	28 - 143
13C-1,2,3,7,8-PeCDF	105	104	106	105	109	105	24 - 185
13C-1,2,3,4,7,8-HxCDD	84	92	94	107	109	113	32 - 141
13C-2,3,7,8-TCDF	102	102	101	103	108	98	24 - 169
13C-1,2,3,6,7,8-HxCDF	95	108	111	121	138*	133*	26 - 123
13C-2,3,4,7,8-PeCDF	100	103	104	104	116	103	21 - 178
13C-1,2,3,4,6,7,8-HpCDD	100	75	74	71	68	60	23 - 140
13C-OCDD	93	67	66	62	112	48	17 - 157
13C-1,2,3,4,7,8-HxCDF	87	106	108	120	154*	136	26 - 152
13C-2,3,4,6,7,8-HxCDF	96	104	111	113	126	122	28 - 136
13C-1,2,3,4,7,8,9-HpCDF	100	76	78	75	77	67	26 - 138
37Cl4-2,3,7,8-TCDD	124	119	123	123	154	125	35 - 197

Sample Number	SERAS 267-0043	SERAS 267-0044	SERAS 267-0045	SERAS 267-0046	SERAS 267-0047	QC Limits
Analyte	Percent Recovery	Percent Recovery	Percent Recovery	Percent Recovery	Percent Recovery	Percent Recovery
13C-1,2,3,6,7,8-HxCDD	95	91	104	103	101	28 - 130
13C-2,3,7,8-TCDD	91	97	97	90	89	25 - 164
13C-1,2,3,7,8-PeCDD	103	105	113	104	96	25 - 181
13C-1,2,3,7,8,9-HxCDF	101	99	114	109	103	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	69	66	64	68	68	28 - 143
13C-1,2,3,7,8-PeCDF	108	108	115	112	101	24 - 185
13C-1,2,3,4,7,8-HxCDD	111	103	116	115	106	32 - 141
13C-2,3,7,8-TCDF	105	97	99	103	99	24 - 169
13C-1,2,3,6,7,8-HxCDF	124*	115	159*	137*	124*	26 - 123
13C-2,3,4,7,8-PeCDF	106	105	124	107	98	21 - 178
13C-1,2,3,4,6,7,8-HpCDD	67	62	56	64	60	23 - 140
13C-OCDD	57	51	119	58	50	17 - 157
13C-1,2,3,4,7,8-HxCDF	126	113	184*	144	126	26 - 152
13C-2,3,4,6,7,8-HxCDF	119	110	130	132	124	28 - 136
13C-1,2,3,4,7,8,9-HpCDF	72	66	67	69	65	26 - 138
37Cl4-2,3,7,8-TCDD	129	129	171	127	120	35 - 197

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Table 2.6 (cont.) Results of the Analysis of Labeled Standards for Dioxins/Furans in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Sample Number	LCS (10/2/15)	LCSD (10/2/15)	LCS (10/5/15)	LCSD (10/5/15)		QC Limits
Analyte	Percent Recovery	Percent Recovery	Percent Recovery	Percent Recovery	Percent Recovery	Percent Recovery
13C-1,2,3,6,7,8-HxCDD	74	72	94	99		25 - 163
13C-2,3,7,8-TCDD	70	70	90	92		20 - 175
13C-1,2,3,7,8-PeCDD	74	72	95	98		21 - 227
13C-1,2,3,7,8,9-HxCDF	70	71	95	93		17 - 205
13C-1,2,3,4,6,7,8-HpCDF	68	71	102	100		21 - 158
13C-1,2,3,7,8-PeCDF	75	76	101	106		21 - 192
13C-1,2,3,4,7,8-HxCDD	58	61	85	86		21 - 193
13C-2,3,7,8-TCDF	79	77	98	103		22 - 152
13C-1,2,3,6,7,8-HxCDF	71	71	94	95		21 - 159
13C-2,3,4,7,8-PeCDF	76	77	97	101		13 - 328
13C-1,2,3,4,6,7,8-HpCDD	62	67	101	96		26 - 166
13C-OCDD	50	53	91	88		13 - 199
13C-1,2,3,4,7,8-HxCDF	63	64	86	84		19 - 202
13C-2,3,4,6,7,8-HxCDF	72	72	94	96		22 - 176
13C-1,2,3,4,7,8,9-HpCDF	64	67	100	94		20 - 186
37Cl4-2,3,7,8-TCDD	125	125	119	125		35 - 197

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Table 2.7 Results of the LCS/LCSD Analysis for Dioxins/Furans in Water
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Sample ID: LCS 10/02/15

Analyte	LCS/LCSD Spike Added pg/L	LCS Spike Recovered pg/L	LCS % Recovery	LCSD Spike Recovered pg/L	LCSD % Recovery	RPD	QC Limits RPD	QC Limits % Recovery
2,3,4,6,7,8-HxCDF	1000	1180	118	1170	117	0	50	70-156
1,2,3,7,8,9-HxCDD	1000	1290	129	1240	124	4	50	64-162
1,2,3,4,7,8,9-HpCDF	1000	1260	126	1220	122	3	50	78-138
1,2,3,4,6,7,8-HpCDF	1000	1210	121	1160	116	4	50	82-122
OCDD	2000	2130	106	2160	108	2	50	78-144
2,3,7,8-TCDD	200	237	119	242	121	2	50	67-158
1,2,3,7,8-PeCDD	1000	1210	121	1200	120	2	50	70-142
1,2,3,7,8-PeCDF	1000	1240	124	1230	123	1	50	80-134
1,2,3,6,7,8-HxCDD	1000	1200	120	1220	122	1	50	76-134
2,3,7,8-TCDF	200	239	119	240	120	0	50	75-158
1,2,3,6,7,8-HxCDF	1000	1200	120	1170	117	3	50	84-130
1,2,3,7,8,9-HxCDF	1000	1220	122	1170	117	4	50	78-130
OCDF	2000	2480	124	2410	121	3	50	63-170
1,2,3,4,7,8-HxCDD	1000	1320	132	1230	123	7	50	70-164
1,2,3,4,7,8-HxCDF	1000	1270	127	1180	118	7	50	72-134
1,2,3,4,6,7,8-HpCDD	1000	1260	126	1160	116	8	50	70-140
2,3,4,7,8-PeCDF	1000	1300	130	1250	125	4	50	68-160

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Table 2.8 Results of the LCS/LCSD Analysis for Dioxins/Furans in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Sample ID: LCS 10/05/15

	LCS/LCSD	LCS		LCSD				
	Spike Added	Spike Recoverd	LCS	Spike Recoverd	LCSD		QC Limits	
Analyte	pg/g	pg/g	% Recovery	pg/g	% Recovery	RPD	RPD	% Recovery
2,3,4,6,7,8-HxCDF	100	107	107	108	108	0	50	70 - 156
1,2,3,7,8,9-HxCDD	100	116	116	111	111	4	50	64 - 162
1,2,3,4,7,8,9-HpCDF	100	118	118	118	118	1	50	78 - 138
1,2,3,4,6,7,8-HpCDF	100	113	113	114	114	1	50	82 - 122
OCDD	200	226	113	228	114	1	50	78 - 144
2,3,7,8-TCDD	20	22.1	111	22.9	115	4	50	67 - 158
1,2,3,7,8-PeCDD	100	111	111	112	112	1	50	70 - 142
1,2,3,7,8-PeCDF	100	112	112	113	113	1	50	80 - 134
1,2,3,6,7,8-HxCDD	100	112	112	107	107	4	50	76 - 134
2,3,7,8-TCDF	20	22.0	110	22.2	111	1	50	75 - 158
1,2,3,6,7,8-HxCDF	100	109	109	111	111	2	50	84 - 130
1,2,3,7,8,9-HxCDF	100	113	113	112	112	0	50	78 - 130
OCDF	200	246	123	234	117	5	50	63 - 170
1,2,3,4,7,8-HxCDD	100	115	115	110	110	4	50	70 - 164
1,2,3,4,7,8-HxCDF	100	112	112	115	115	3	50	72 - 134
1,2,3,4,6,7,8-HpCDD	100	112	112	115	115	3	50	70 - 140
2,3,4,7,8-PeCDF	100	116	116	116	116	1	50	68 - 160

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Table 2.9 Results of the LCS Analysis for Polynuclear Aromatic Hydrocarbons in Water
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Sample ID: LCS 10/06/15

Analyte	LCS Spike Added ng/L	LCS Recoverd ng/L	LCS % Recovery	QC Limits % Recovery
Acenaphthene	250	257	103	60 - 140
Acenaphthylene	250	253	101	60 - 140
Anthracene	250	242	97	60 - 140
Benzo(a)anthracene	250	202	81	60 - 140
Benzo(b)fluoranthene	250	210	84	60 - 140
Benzo(k)fluoranthene	250	245	98	60 - 140
Benzo(ghi)perylene	250	213	85	60 - 140
Benzo(a)pyrene	250	225	90	60 - 140
Chrysene	250	248	99	60 - 140
Dibenz(a,h)anthracene	250	209	84	60 - 140
Fluoranthene	250	229	92	60 - 140
Fluorene	250	246	98	60 - 140
Indeno(1,2,3-cd)pyrene	250	217	87	60 - 140
Naphthalene	250	258	103	60 - 140
Phenanthrene	250	239	96	60 - 140
Pyrene	250	227	91	60 - 140

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Table 2.10 Results of the LCS Analysis for Polynuclear Aromatic Hydrocarbons in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Sample ID: LCS 10/07/15

Analyte	LCS Spike Added ng/g	LCS Recoverd ng/g	LCS % Recovery	QC Limits % Recovery
Acenaphthene	25	25.1	100	60 - 140
Acenaphthylene	25	25.5	102	60 - 140
Anthracene	25	23.8	95	60 - 140
Benzo(a)anthracene	25	20.1	80	60 - 140
Benzo(b)fluoranthene	25	20.5	82	60 - 140
Benzo(k)fluoranthene	25	24.4	98	60 - 140
Benzo(ghi)perylene	25	20.9	84	60 - 140
Benzo(a)pyrene	25	22.0	88	60 - 140
Chrysene	25	24.2	97	60 - 140
Dibenz(a,h)anthracene	25	20.7	83	60 - 140
Fluoranthene	25	22.8	91	60 - 140
Fluorene	25	23.5	94	60 - 140
Indeno(1,2,3-cd)pyrene	25	21.7	87	60 - 140
Naphthalene	25	25.2	101	60 - 140
Phenanthrene	25	23.8	95	60 - 140
Pyrene	25	22.7	91	60 - 140

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Table 2.11 Results of the MS/MSD Analysis for Polynuclear Aromatic Hydrocarbons in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results are Based on Dry Weight

Sample ID PRSS-01

Analyte	Sample Result ng/g	MS/MSD Spike Added ng/g	MS Result ng/g	MS % Recovery		MSD Result ng/g	MSD % Recovery		RPD	QC Limits RPD	QC Limits % Recovery
Acenaphthene	180	40.2	209	60		201	40	*	4.0	25	60-140
Acenaphthylene	250	40.2	275	NC		270	NC		1.8	25	60-140
Anthracene	630	40.2	635	NC		615	NC		3.2	25	60-140
Benzo(a)anthracene	1700	40.2	1670	NC		1660	NC		0.0	25	60-140
Benzo(b)fluoranthene	4000	40.2	4280	NC		4370	NC		2.2	25	60-140
Benzo(k)fluoranthene	1400	40.2	1960	NC		1600	NC		20	25	60-140
Benzo(ghi)perylene	1700	40.2	1900	NC		1910	NC		0.85	25	60-140
Benzo(a)pyrene	2400	40.2	2790	NC		2640	NC		5.6	25	60-140
Chrysene	3300	40.2	3470	NC		3920	NC		12	25	60-140
Dibenz(a,h)anthracene	210	40.2	229	NC		224	NC		2.2	25	60-140
Fluoranthene	4000	40.2	4020	NC		3950	NC		1.8	25	60-140
Fluorene	200	40.2	264	156	*	239	94		9.9	25	60-140
Indeno(1,2,3-cd)pyrene	1400	40.2	1600	NC		1510	NC		5.8	25	60-140
Naphthalene	U	72.6	479	103		431	36	*	11	25	60-140
Phenanthrene	1700	40.2	1800	NC		1670	NC		7.5	25	60-140
Pyrene	3900	40.2	3850	NC		3790	NC		1.6	25	60-140

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Table 2.12 Results of the LCS Analysis for Mercury in Water
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Sample ID: LCS 10/12/15

Analyte	LCS Spike Added ng/L	LCS Recovered ng/L	LCS % Recovery	QC Limits % Recovery
Mercury	15.7	15.0	96	75 - 125

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Table 2.13 Results of the LCS/LCSD Analysis for Mercury in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Sample ID: LCS 10/14/15

Analyte	LCS/LCSD Spike Added ng/g	LCS Spike Recovered ng/g	LCS % Recovery	LCSD Spike Recovered ng/g	LCSD % Recovery	QC Limits % Recovery
Mercury	80	75.3	94	70.1	88	75 - 125

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Table 2.14 Results of the MS/MSD Analysis for Mercury in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results are Based on Dry Weight

Sample ID: SERAS 267-0038

Analyte	Sample Result ng/g	MS SpikeAdded ng/g	MS Result ng/g	MS % Recovery	MSD Spike Added ng/g	MSD Result ng/g	MSD % Recovery	RPD	QC Limits RPD	QC Limits % Recovery
Mercury	1810	1603	3604	112	1641	3248	88	10	30	70-130

Sample ID: SERAS 267-0042

Analyte	Sample Result ng/g	MS SpikeAdded ng/g	MS Result ng/g	MS % Recovery	MSD SpikeAdded ng/g	MSD Result ng/g	MSD % Recovery	RPD	QC Limits RPD	QC Limits % Recovery
Mercury	1472	1440	2920	101	1359	3130	122	7	30	70-130

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Table 2.15 Results of the Duplicate Analysis for Mercury in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Sample ID: SERAS 267-0038

Analyte	Initial Analysis ng/g	Duplicate Analysis ng/g	RPD	QC Limits RPD
Mercury	1810	1796	0.8	30

Sample ID: SERAS 267-0042

Analyte	Initial Analysis ng/g	Duplicate Analysis ng/g	RPD	QC Limits RPD
Mercury	1472	1656	12	30

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Table 2.16 Results of the LCS/LCSD Analysis for Total Organic Carbon in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9

Sample ID: LCS/LCSD 10/02/15

Analyte	LCS/LCSD Spike Added µg/g	LCS Spike Recovered µg/g	LCS % Recovery	LCSD Spike Recovered µg/g	LCSD % Recovery	RPD	QC Limits RPD	QC Limits % Recovery
Total Organic Carbon	400000	390000	98	390000	97	0	20	80-120

Sample ID: LCS/LCSD 10/06/15

Analyte	LCS/LCSD Spike Added µg/g	LCS Spike Recovered µg/g	LCS % Recovery	LCSD Spike Recovered µg/g	LCSD % Recovery	RPD	QC Limits RPD	QC Limits % Recovery
Total Organic Carbon	400000	420000	104	380000	96	8	20	80-120

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Table 2.17 Results of the MS Analysis for Total Organic Carbon in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Sample ID SERAS 267-0039

Analyte	Sample Result µg/g	MS Spike Aded µg/g	MS Spike Recoverd µg/g	MS % Recovery	QC Limits % Recovery
Total Organic Carbon	68000	64400	130000	93	75-125

Sample ID SERAS 267-0040

Analyte	Sample Result µg/g	MS Spike Aded µg/g	MS Spike Recoverd µg/g	MS % Recovery	QC Limits % Recovery
Total Organic Carbon	64000	59000	120000	92	75-125

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Table 2.18 Results of the Quadruplicate Analysis of Total Organic Carbon in Sediment
WA# SERAS-267 Diamond Alkali – River Mile 10.9
Results Based on Dry Weight

Sample ID: SERAS 267-0038

Analyte	Rep 1 µg/g	Rep 2 µg/g	Rep 3 µg/g	Rep 4 µg/g	Avg µg/g	Std Deviation Limit
Total Organic Carbon	66500	67800	69000	72900	69100	60720 - 77400
Range	66500 - 72900					

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LOCKHEED MARTIN

Lockheed Martin Information Systems & Global Solutions (IS&GS - Civil)
Environmental Services SERAS
2890 Woodbridge Avenue, Building 209 Annex
Edison, NJ 08837-3679
Telephone: 732-321-4200, Facsimile: 732-494-4021

Brooks Rand LLC.
18804 Northcreek Parkway, Suite 100
Bothell, WA 98011

Attn: Lydia Greaves
lydia@brooksrand.com
Direct: 206-753-6127

September 25, 2015

As per Lockheed Martin credit card ending in 3408, please analyze the following for project 0-267::

Analysis/Method	Matrix	# of samples	
Low Level Mercury by EPA Method 1631	Sediment/Rinsate	10/1	

The samples are expected to arrive at your laboratory on or about October 1, 2015. All applicable QA/QC (eg: Duplicates, MS/MSD) analysis as per method, will be performed on our sample matrix. The complete data package is due 20 business days after receipt of the samples.

Please submit all technical questions and reports concerning this project to **Misty Barkley at (732) 321-4205 or misty.barkley@lmco.com.**

Sincerely,

Jay Patel
Analytical Support Chemist
Lockheed Martin / SERAS Project

cc. J. Patel
K. Taylor
C. Gussman
J. Catanzarita
D. Killeen

LOCKHEED MARTIN

Lockheed Martin Information Systems & Global Solutions (IS&GS - Civil)
Environmental Services SERAS
2890 Woodbridge Avenue, Building 209 Annex
Edison, NJ 08837-3679
Telephone: 732-321-4200, Facsimile: 732-494-4021

Katahdin Analytical Services
600 Technology Way
Scarborough, ME 04074
207-874-2400x17

Attn: Jennifer Obrin

September 25, 2015

As per Lockheed Martin / SERAS BPA 4100882486, for Project 0-267, please analyze the following:

Analysis/Method	Matrix	# of samples	
Grain Size ASTM D422 – sieve only	Sediment	10	
TOC by Lloyd Kahn	Soil/Sediment	10	
Level four data package with .csv file			

The samples are expected to arrive at your laboratory on or about October 1, 2015. Preliminary sample and QC result tables plus a signed copy of our Chain of Custody must be emailed to SERAS within 10 business days of receipt of the samples. The complete data package is due 15 business days after receipt of the samples. The complete data package must include all items on the deliverables checklist.

Please submit all reports and questions concerning this project to Misty Barkley **at (732) 321-4205 or misty.barkley@lmco.com.**

Sincerely,

Jay Patel

Jay Patel
Analytical Support Chemist
Lockheed Martin / SERAS Project

cc. R. Singhvi
J. Patel
D. Killeen
C. Gussman
K. Taylor
J. Catanzarita

LOCKHEED MARTIN

Lockheed Martin Information Systems & Global Solutions (IS&GS - Civil)
Environmental Services SERAS
2890 Woodbridge Avenue, Building 209 Annex
Edison, NJ 08837-3679
Telephone: 732-321-4200, Facsimile: 732-494-4021

TestAmerica WSAC
880 Riverside Avenue
West Sacremento, CA 95605
916-373-5600

Attn: Laura Turpen

September 28, 2015

As per Lockheed Martin / SERAS BPA# 4102186726 for Project 0-267, please analyze the following:

Analysis/Method	Matrix	# of samples
17 Dioxin/Furans, homologs EPA 1613B	Sediment/ Rinsate	10/1
209 PCBs Congeners EPA 1668A Full List with Totals	Sediment/ Rinsate	10/1
PAHs by Isotope Dilution method# ID-0016	Sediment/ Rinsate	10/1

The samples are expected to arrive at your laboratory on or about October 1, 2015. **All applicable QA/QC (eg: MS/MSD) analysis as per method, will be performed on our sample matrix.** Preliminary sample and QC result tables plus a signed copy of our Chain of Custody must be emailed to SERAS 20 business days after receipt of samples. The complete data package is due 25 business days after receipt of the samples. The complete data package must include all items on the deliverables checklist.

Please submit all reports concerning this project to **Misty Barkley (732) 321-4205 or misty.barkley@lmco.com.**

Sincerely,

Jay Patel
Analytical Support Chemist
Lockheed Martin / SERAS Project

cc. J. Patel
D. Killeen
J. Catanzarita
C. Gussman
K. Taylor

USEPA
DateShipped:
CarrierName:
AirbillNo:

320-15260 Chain of Custody

CHAIN OF CUSTODY RECORD
Site #: SERAS 267
Contact Name: Misty Barkley
Contact Phone: 732-321-4244

No: 2-092915-141945-0008
Cooler #: 1
Lab: TestAmerica Laboratories, Inc. - Sacremento
Lab Phone: 916-374-4414

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	SERAS 267-0038	PRSS-01	Dioxins/209 PCB Congeners/ PAHs	Sediment	9/29/2015	2	4 oz AWM Jar	4 C	Y
	SERAS 267-0039	PRSS-02	Dioxins/209 PCB Congeners/ PAHs	Sediment	9/29/2015	1	4 oz AWM Jar	4 C	N
	SERAS 267-0040	PRSS-03	Dioxins/209 PCB Congeners/ PAHs	Sediment	9/29/2015	1	4 oz AWM Jar	4 C	N
	SERAS 267-0041	PRSS-04	Dioxins/209 PCB Congeners/ PAHs	Sediment	9/29/2015	1	4 oz AWM Jar	4 C	N
	SERAS 267-0042	PRSS-05	Dioxins/209 PCB Congeners/ PAHs	Sediment	9/29/2015	1	4 oz AWM Jar	4 C	N
	SERAS 267-0043	PRSS-06	Dioxins/209 PCB Congeners/ PAHs	Sediment	9/29/2015	1	4 oz AWM Jar	4 C	N
	SERAS 267-0044	PRSS-07	Dioxins/209 PCB Congeners/ PAHs	Sediment	9/29/2015	1	4 oz AWM Jar	4 C	N
	SERAS 267-0045	PRSS-08	Dioxins/209 PCB Congeners/ PAHs	Sediment	9/29/2015	1	4 oz AWM Jar	4 C	N
	SERAS 267-0046	PRSS-09	Dioxins/209 PCB Congeners/ PAHs	Sediment	9/29/2015	1	4 oz AWM Jar	4 C	N
	SERAS 267-0047	PRSS-105	Dioxins/209 PCB Congeners/ PAHs	Sediment	9/29/2015	1	4 oz AWM Jar	4 C	N

Special Instructions: Dioxins by EPA Method 1613B
PAHs by NOAA Method 130/CARB 429 / PCB Congeners 1668A

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
All/Analysis	[signature] LMSERAS	9/30/15 09:15	Joyce Payuyo TAWS	10/1/15 930	Good 3.6°C

USEPA
DateShipped:
CarrierName:
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: SERAS 267
Contact Name: Misty Barkley
Contact Phone: 732-321-4244

No: 2-092915-141945-0008
Cooler #: 1
Lab: TestAmerica Laboratories, Inc. - Sacremento
Lab Phone: 916-374-4414

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	SERAS 267-0048	RB-01	Dioxins	Water	9/29/2015	1	1 L Amber	4 C	N
	SERAS 267-0048	RB-01	PAHs	Water	9/29/2015	1	1 L Amber	4 C	N
	SERAS 267-0048	RB-01	PCB Congeners	Water	9/29/2015	1	1 L Amber	4 C	N

Special Instructions: Dioxins by EPA Method 1613B
PAHs by NOAA Method 130/CARB 429 / PCB Congeners By EPA 1668A

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
All Analyses	CM SERAS	9/30/15 0915	Joyce Pagayo TAWS	10/1/15 930	Good 3.6°C

BAL R[illegible]541029

USEPA
DateShipped: 9/30/2015
CarrierName: FedEx
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: SERAS 267
Contact Name: Misty Barkley
Contact Phone: 732-321-4244

No: 2-092915-141254-0006
Cooler #: 1
Lab: Brooks Rand
Lab Phone: 206-753-2167

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	SERAS 267-0038	PRSS-01	Mercury	Sediment	9/29/2015	1	4 oz HDPE Jar	4 C	N
	SERAS 267-0039	PRSS-02	Mercury	Sediment	9/29/2015	1	4 oz HDPE Jar	4 C	N
	SERAS 267-0040	PRSS-03	Mercury	Sediment	9/29/2015	1	4 oz HDPE Jar	4 C	N
	SERAS 267-0041	PRSS-04	Mercury	Sediment	9/29/2015	1	4 oz HDPE Jar	4 C	N
	SERAS 267-0042	PRSS-05	Mercury	Sediment	9/29/2015	1	4 oz HDPE Jar	4 C	N
	SERAS 267-0043	PRSS-06	Mercury	Sediment	9/29/2015	1	4 oz HDPE Jar	4 C	N
	SERAS 267-0044	PRSS-07	Mercury	Sediment	9/29/2015	1	4 oz HDPE Jar	4 C	N
	SERAS 267-0045	PRSS-08	Mercury	Sediment	9/29/2015	1	4 oz HDPE Jar	4 C	N
	SERAS 267-0046	PRSS-09	Mercury	Sediment	9/29/2015	1	4 oz ~~HDPE Jar~~	4 C	N
	SERAS 267-0047	PRSS-105	Mercury	Sediment	9/29/2015	1	4 oz HDPE Jar	4 C	N
	SERAS 267-0048	RB-01	Mercury	Water	9/29/2015	1	1 L Amber	4 C	N

AMBER WIM JAR

Special Instructions: Samples for Mercury (Hg) Analysis by EPA Method 1631

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
All/Analysis	LM SERAS	9/30/15	BAL	10/1/15 0945	

SERAS-267-DARR1-012616

USEPA
DateShipped: 9/30/2015
CarrierName: FedEx
AirbillNo:

517685

CHAIN OF CUSTODY RECORD
Site #: SERAS 267
Contact Name: Misty Barkley
Contact Phone: 732-321-4244

No: 2-092915-141734-0007
Cooler #: 1
Lab: Katahdin Analytical Services, Inc.
Lab Phone: 207-874-2400 ex. 17

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	SERAS 267-0038	PRSS-01	TOC/Grain Size	Sediment	9/29/2015	1	8 oz AWM Jar	4 C	N
	SERAS 267-0039	PRSS-02	TOC/Grain Size	Sediment	9/29/2015	1	8 oz AWM Jar	4 C	N
	SERAS 267-0040	PRSS-03	TOC/Grain Size	Sediment	9/29/2015	1	8 oz AWM Jar	4 C	N
	SERAS 267-0041	PRSS-04	TOC/Grain Size	Sediment	9/29/2015	1	8 oz AWM Jar	4 C	N
	SERAS 267-0042	PRSS-05	TOC/Grain Size	Sediment	9/29/2015	1	8 oz AWM Jar	4 C	N
	SERAS 267-0043	PRSS-06	TOC/Grain Size	Sediment	9/29/2015	1	8 oz AWM Jar	4 C	N
	SERAS 267-0044	PRSS-07	TOC/Grain Size	Sediment	9/29/2015	1	8 oz AWM Jar	4 C	N
	SERAS 267-0045	PRSS-08	TOC/Grain Size	Sediment	9/29/2015	1	8 oz AWM Jar	4 C	N
	SERAS 267-0046	PRSS-09	TOC/Grain Size	Sediment	9/29/2015	1	8 oz AWM Jar	4 C	N
	SERAS 267-0047	PRSS-105	TOC/Grain Size	Sediment	9/29/2015	1	8 oz AWM Jar	4 C	N

Special Instructions: Samples for TOC by Lloyd Kahn Method / GRAIN SIZE BY ASTM D422 JOM

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
All Analysis	LM SERAS	9/30/15 09:00	Katahdin Analytical	10/1/15 8:52	Good

SERAS-267-DARR1-012616

APPENDIX B

Bathymetric Study Results

January 2016

EPA/ERT and Lockheed Martin/SERAS-Passaic River Probing Locations

Notes	Date	Location	time	east	north	feet water depth	feet depth to refusal	Sediment Description
	9/29/2015	P-1	1252	596314.49	731119.66	4.8	1	sand to gravel
	9/29/2015	P-2	1255	596237.98	731118.19	18.2	1	silt to sand
	9/29/2015	P-3	1259	596208.66	730873.23	10.2	2.5	silt to rock
	9/29/2015	P-4	1303	596115.23	730823.65	17.5	1	silt to sand
	9/29/2015	P-5	1307	596230.76	730528.4	6.2	0.9	silt to sand
	9/29/2015	P-6	1308	596185.07	730527.23	15	2	silty sand
	9/29/2015	P-7	1311	596297.49	730299.33	8.5	2.6	silty sand
	9/29/2015	P-8	1314	596390.9	730124.19	7	3.8	silt to 1.9 than silty sand
	9/29/2015	P-9	1317	596492.44	729951.59	6.5	5	silt to 5.0 than hard sand
	9/29/2015	P-10	1320	596574.19	729777.18	8.2	2.5	1.3 silt to silty sand
	9/29/2015	P-11	1325	596618.73	729575.37	10.2	2.3	silt to sand and pebbles
	9/29/2015	P-12	1328	596661.44	729377.08	11	1.7	silty sand
	9/29/2015	P-13	1342	596567.81	726111.17	15	0.8	hard gravel
	9/29/2015	P-14	1344	596590.15	726006.54	16.5	1.1	silty sand
	9/29/2015	P-15	1345	596629.67	725956.71	13	0.8	gravel mixed with sand
	9/29/2015	P-16	1349	596454.79	725770.05	5	2.7	silty sand to hard gravel
	9/29/2015	P-17	1351	596504.84	725708.44	15	1.2	silty sand
	9/29/2015	P-18	1356	596603.57	725648.63	16	1.2	thin silt to sand
	9/29/2015	P-19	1401	596291.01	725402.8	1.5	0.8	silty sand with gravel
	9/29/2015	P-20	1405	596242.38	725213.67	5	3.5	silty sand
Lockheed September 29 Sampling Locations	10/13/2015	prss-01	900	593699.13	723424.97	7.7	1.7	Sediment on top of sand
Lockheed September 29 Sampling Locations	10/13/2015	prss-02	906	593449.28	723396.38	9.5	3.5	Sediment on top of sand
Lockheed September 29 Sampling Locations	10/13/2015	prss-03	913	593274.9	723281.27	7.7	1.5	Sediment on top of sand
Lockheed September 29 Sampling Locations	10/13/2015	prss-04	916	593094.03	723129.77	5.6	2.1	Sediment on top of sand
Lockheed September 29 Sampling Locations	10/13/2015	prss-05	921	592813.34	722971.43	7	1.3	Sediment on top of sand
Lockheed September 29 Sampling Locations	10/13/2015	prss-06	923	592702.48	722788	6.4	0.6	Sediment on top of sand
Lockheed September 29 Sampling Locations	10/13/2015	prss-07	928	592571.09	722600.57	11.4	1.6	Sediment on top of sand
Lockheed September 29 Sampling Locations	10/13/2015	prss-08	932	592482.3	722950.22	12	4.9	Sediment on top of sand
AECOM proposed sampling locations.	10/13/2015	`0601	1007	592626.09	722627.8	7.1	0.6	Sediment on top of sand
AECOM proposed sampling locations.	10/13/2015	`0603	1011	592768	722898.33	6.8	0.9	Sediment on top of sand
AECOM proposed sampling locations.	10/13/2015	`0604	1014	592892.51	723035.97	6.1	1	Sediment on top of sand
AECOM proposed sampling locations.	10/13/2015	`0605	1016	592987.28	723070.44	5.1	0.8	Sediment on top of sand
AECOM proposed sampling locations.	10/13/2015	`0606	1019	593136.55	723179.86	6.2	1.3	Sediment on top of sand
AECOM proposed sampling locations.	10/13/2015	`0607	1022	593397.99	723298.95	6.6	0.8	Sediment on top of sand
AECOM proposed sampling locations.	10/13/2015	`0608	1024	593512.42	723350.03	6.8	0.5	Sediment on top of sand
AECOM proposed sampling locations.	10/13/2015	`0609	1026	593661.43	723382.12	6.4	0.7	Sediment on top of sand
AECOM proposed sampling locations.	10/13/2015	`0610	1030	593906.41	723462.2	6	0.8	Sediment on top of sand
Repeat of location probed on 9/29/15	10/13/2015	13A	1052	596558.82	726158.12	16.1	1.3	sand to gravel
Repeat of location probed on 9/29/15	10/13/2015	14A	1057	596600.61	725994.98	18.5	0.4	hard sand
Repeat of location probed on 9/29/15	10/13/2015	15A	1100	596637.81	725949.11	18.1	0.6	hard sand
Repeat of location probed on 9/29/15	10/13/2015	16A	1105	596455.27	725756.8	10.2	1.4	sand to rock
Repeat of location probed on 9/29/15	10/13/2015	17A	1109	596520.45	725712.31	18.5	0.9	hard sand
Repeat of location probed on 9/29/15	10/13/2015	18A	1112	596607.11	725632.43	15.6	0.5	hard sand
Repeat of location probed on 9/29/15	10/13/2015	19A	1118	596312.08	725390.93	5.8	2.3	silty sand to sand
Repeat of location probed on 9/29/15	10/13/2015	20A	1122	596255.36	725215.05	7.7	1.8	silty sand to sand
	10/13/2015	P-21	1126	596342.54	725068.1	18.5	0.6	sand
	10/13/2015	P-22	1129	596419.78	724985.48	8.3	1.5	sand
Just downstream 3 bridge.	10/13/2015	P-23	1136	595953.22	724749.69	6.1	3.3	silt to sand
	10/13/2015	P-24	1141	596027.08	724647.83	19	1.3	sand
	10/13/2015	P-25	1145	596160.89	724565.47	14.8	3.8	silt to silty sand
	10/13/2015	P-26	1150	595628.6	724121.77	18.4	1.3	silty sand
	10/13/2015	P-27	1156	595568.71	724135.67	19	1.3	silty sand
	10/13/2015	P-28	1200	595467.54	724284.58	3.3	0.9	sand to rock
	10/13/2015	P-29	1217	594640.59	723933.73	5.4	1.7	silt to sand to rock
	10/13/2015	P-30	1220	594597.43	723848.77	17.2	1.7	sand
	10/13/2015	P-31	1222	594598.99	723720.05	17.2	0.8	sand
	10/13/2015	P-32	1225	594416.64	723660.75	15.6	0	hard pack sand
	10/13/2015	P-33	1227	594379.67	723756.99	14.1	1.7	sand
	10/13/2015	P-34	1231	594284.02	723869.02	4.4	3	silty sand
	10/13/2015	P-35	1234	594398.87	723938.13	5.2	1	gravel
	10/13/2015	P-36	1240	593454.7	723482.9	14.8	1.3	sand
	10/13/2015	P-37	1242	593429.14	723627.92	9.3	1.5	silty sand
	10/13/2015	P-38	1302	592265	719781.96	10.2	4.8	silt to silty sand
	10/13/2015	P-39	1305	592170.74	719776.52	17.8	0.8	sand
	10/13/2015	P-40	1308	592246.61	719499.59	11.2	3.1	silt to sand
	10/13/2015	P-41	1310	592149.74	719534.46	17.3	1.2	silt to sand
	10/13/2015	P-42	1312	592055.22	719539.45	15.2	2.9	silty sand to silt to sand
	10/13/2015	P-43	1317	592244.04	719052.6	3.1	9	silt firmer with depth
	10/13/2015	P-44	1319	592135.55	719075.23	13.3	4.9	silt to sand
	10/13/2015	P-45	1320	592040.43	719087.55	15	1.8	sand
	10/13/2015	P-46	1324	591930.25	719125.36	4.9	1.2	silt
	10/13/2015	P-47	1328	592174.75	718747.96	2.1	0	rock and sand
	10/13/2015	P-48	1330	592120.43	718675.35	2.6	0	rock
	10/13/2015	P-49	1332	591998.9	718711.57	13.9	3	rock
	10/13/2015	P-50	1348	591892.73	718786.01	11.5	2.1	silt to sand
	10/13/2015	P-51	1351	591838.88	718862.55	4.7	0.6	silty sand

APPENDIX C

Field Logbook Notes

January 2016

SERAS-B-0313

JOB BOOK

PROJECT NAME Diamond

PROJECT NUMBER 267

CREW Gussman

DATE 9/22 10/13/15 BOOK # 1 OF 2 (McBurney Acc)

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CURVE FORMULAS

$T = R \tan \frac{1}{2} I$

$T = \frac{50 \tan \frac{1}{2} I}{\text{Sin.} \frac{1}{2} D}$

$\text{Sin.} \frac{1}{2} D = \frac{50}{R}$

$\text{Sin.} \frac{1}{2} D = \frac{50 \tan \frac{1}{2} I}{T}$

$R = T \cot. \frac{1}{2} I$

$R = \frac{50}{\text{Sin.} \frac{1}{2} D}$

$E = R \text{ ex. sec } \frac{1}{2} I$

$E = T \tan \frac{1}{4} I$

$\text{Chord def.} = \frac{\text{chord}^2}{R}$

$\text{No. chords} = \frac{I}{D}$

Tan. def. = ½ chord def.

The square of any distance, divided by twice the radius, will equal the distance from tangent to curve. very nearly.

To find angle for a given distance and deflection.

Rule 1. Multiply the given distance by .01745 (def. for 1° for 1 ft.) and divide given deflection by the product.

Rule 2. Multiply given deflection by 57.3, and divide the product by the given distance.

To find deflection for a given angle and distance. Multiply the angle by .01745, and the product by the distance.

GENERAL DATA

RIGHT ANGLE TRIANGLES. Square the altitude, divide by twice the base. Add quotient to base for hypotenuse.

Given Base 100, Alt. $10.10^2 \div 200 = .5$. $100 + .5 = 100.5$ hyp.

Given Hyp. 100, Alt. $25.25^2 \div 200 = 3.125$; $100 - 3.125 = 96.875$ = Base.

Error in first example, .002; in last, .045.

To find Tons of Rail in one mile of track: multiply weight per yard by 11, and divide by 7.

LEVELING. The correction for curvature and refraction, in feet and decimals of feet is equal to $0.574\,d^2$, where d is the distance in miles. The correction for curvature alone is closely, $\frac{2}{3}d^2$. The combined correction is negative.

PROBABLE ERROR. If d_1, d_2, d_3, etc. are the discrepancies of various results from the mean, and if Σd^2 = the sum of the squares of these differences and n = the number of observations, then the probable error of the mean = $\pm 0.6745 \sqrt{\frac{\Sigma d^2}{n(n-1)}}$

MINUTES IN DECIMALS OF A DEGREE

1'	.0167	11'	.1833	21'	.3500	31'	.5167	41'	.6833	51'	.8500
2	.0333	12	.2000	22	.3667	32	.5333	42	.7000	52	.8667
3	.0500	13	.2167	23	.3833	33	.5500	43	.7167	53	.8833
4	.0667	14	.2333	24	.4000	34	.5667	44	.7333	54	.9000
5	.0833	15	.2500	25	.4167	35	.5833	45	.7500	55	.9167
6	.1000	16	.2667	26	.4333	36	.6000	46	.7667	56	.9333
7	.1167	17	.2833	27	.4500	37	.6167	47	.7833	57	.9500
8	.1333	18	.3000	28	.4667	38	.6333	48	.8000	58	.9667
9	.1500	19	.3167	29	.4833	39	.6500	49	.8167	59	.9833
10	.1667	20	.3333	30	.5000	40	.6667	50	.8333	60	1.0000

INCHES IN DECIMALS OF A FOOT

1-16	3-32	⅛	3-16	¼	5-16	⅜	½	⅝	¾	⅞
.0052	.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729

1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

SERAS-B-0313

5/28/15

FOR RAIL SURVEY JIM HERWATTE
WILL BE CONTACT, CELL: 609-410-3455

MEET SUN. AT 7:00
GO TO MILLER MUNICIPAL RAMP
Park Ave. & Rout. 21 Neptune, NJ
40.48.6N 74.02.730

2-16 PARK AVENUE MILLER.
Point Pleasant

13A to Asbury
or 15W to 7th

→ 5/29/15 OVERCAST
MET w/ HEGAN (FCDM)
BOB & SIM FROM Aqua Sea
ALLEN – NELSON JUNC.
CLEARING MP

7 TAMPICO 1 TO NO. PADDOCK, 3 x
each side on copy
Head upstream First

RASS-01 9:05
8 In one ± 1/4" accept

FIRST TRY MOUTH SAND JUST ≈1" sed on top
DUMPED & MOVED OUT ≈3.

PRSS03 – 8" SEDIMENT ON TOP OF 6" SAND
MILL CLEAR DEFINITION. 9:21
9:22 SEDIMENT ON TOP FIRM ENOUGH TO
HOLD FORM WHEN BECOMING

PRSS-03 FIRST GRAB SAND & PAR
9:13 RECOVERY, MOVE OUT A BIT
≈7" RECOVERY SEDIMENT, 1" SAND ON BOTTOM
≈9:35

NOMINAL FIRST 3-CORES TO JEFF C w/
≈9:45 park for processing.
9:1

PRSS-04, – NO DREDGE ZONE IN
LINE W/ PARKING CUT IN PARK
SOFT MATERIAL. BOTTOM
≈8" RECOVERY; BOTTOM 2-3" DARKER.
≈9:49

PRSS-05 ≈150' DOWNSTREAM OF NO ACC
9:54 ≈10" SEDIMENT ON 1" SAND
9:56

DUP COLLECTED AT [illegible]
DUP AT 10:10 [illegible]
OVER 2" SAND
SAND & SEDIMENT SEPARATED [illegible]

PRSS-06 JUST OUTSIDE
NEAR BEND. ≈150' UPR[illegible]
10:1 1ST TRY ≈3" SEDIMENT ON SAND
2ND TRY SAND, 3RD SEDIMENT
MOVED STRAIGHT UPRIVER
ALL SAND.

MOVED UPSTREAM A BIT. [illegible]
SO MOVED FURTHER UPSTREAM
ANOTHER 3 ALL SAND, MINIM[illegible]
CLOSER TO BANK ≈1" SAND [illegible]
SOFT SEDIMENT ON TOP.
MINIMAL SO DECISION TO [illegible]
SECOND GRAB TO GET [illegible]
FIRST ≈4" OF SEDIMENT ON TOP [illegible]
10:21 ≈10:20 > MIX-2
SECOND AT 10:23 [illegible]
≈5m FROM SHORELINE

PRSS-07 ~8" SEDIMENT ON SAND-
TWO SAMPLES HERE TO AVERAGE ALSO
10:32 & 10:37

PRSS-08 ON OPPOSITE BANK
NEAR CURVE BY HIGHWAY
DEEPER AREA
FULL RECOVERY
DARK, BLACK SEDIMENT BOTTOM 4, TOP 8" CLEAR
10:45

PRRS-09 SAME OPPOSITE BANK
UPSTREAM ACROSS FROM N.D.
JUST DOWNSTREAM OF THE OUTFALL
10:52 - SANDY BUT OK FOR SAMPLE
(NOT CAP)
RETURN TO SHORE

BACK OUT 12:15 FOR PROBING
FOOT TO MUDFLAT 12:15-1[illegible]

WENT TO OUTFALL & CLEANED
ON TOP OF CAP AREA
WASHING/RINSING THEM [illegible]

GOING TO GENERAL AREA
WATER AT 29' [illegible] 3 [illegible]
12:34 [illegible]
JUST DOWNSTREAM OF BRIDGE [illegible]
FIRST NEAR RM 13 [illegible]
P1 - P2 ACROSS RIVER

		WD	S.D.	
12:52	P1	4.8'	1.0	[illegible]
12:55	P2	18.2'	1.0'	[illegible]
12:59	200' DOWNSTREAM, NEAR (~10 M) [illegible]			
12:59	P3	10.2	2.5	[illegible] 1.5 [illegible]
13:03	P4	17.5'	1.0'	1.0 [illegible]
13:07	P5	6.2'	0.9'	[illegible]
13:08	P6	15'	2.0'	05 [illegible]
	↑ ACROSS FROM CULVERT			
13:11	P7	8.5'	2.6	[illegible]

		WD	SD.	DESCRIPTION
13:14	P8	7.0'	7.8	1.9' SILT, PEAT, SILT, SAND; 5.8 PEAT
~~13:17~~	P9	6.5'	5'	~~[illegible]~~ 5' SILT ~~[illegible]~~
13:20	P10	8.2'	2.5	1.3 - SILT ON SILTY SAND
13:25	P11	10.2'	2.3	SURFACE SILT CHANGES TO SANDY PEAT
13:28	P12	~~11.0'~~ 9.7'	1.7	SILTY SAND
	DOWN	NORTH OF	GAUGE	X RM. 11.7
13:42	P13	15'	0.8'	PEAT GRAVEL
13:44	P14	16.5'	1.1'	SILTY SAND
13:45	P15	13'	0.8'	GRAVEL, PEAT W/ SAND
13:49	P16	5.0'	2.7'	SILTY SAND AND STONE
13:51	P17	15'	1.2'	SILTY SAND
13:56	P18	~~14.2~~ 16'	1.2	THIN SILTY SAND

PROBE

		WD.	SD
10:01	P19	4.5	6.8
10:05	P20	5.3	3.5'

NORTH 3' GAUGE [illegible] 3.

[illegible] PARALLEL OF V.

10/13/15 [illegible]

[illegible]

C. COMMON [illegible]

STAND AT 2 CM. [illegible]

		WATER	SEDIMENT
~~[illegible]~~ 9:00	PESS-01	7.4'	1.7'
9:06	PESS-02	9.5'	1.5
9:13	PESS-03	7.7	1.5
9:16	PESS-04	5.6	2.4'
9:21	PESS-05	7.8	1.3
9:23	PESS-06	6.4	0.6
9:28	PESS-07	11.4	1.6
9:32	PESS-08	12.0	4.9
	PEORI	[illegible]	NORTH GAUGE
10:07 ~~[illegible]~~	ISD-1601	7.1	0.6
10:11 ~~[illegible]~~	1605	6.4	0.9
~~[illegible]~~	1605		
10:14 ~~[illegible]~~	1604	6.1	1.0
10:16 ~~[illegible]~~	1605	~~[illegible]~~	
		5.1	0.8

TIME	LOCATION	SEC'T DEPTH WATER	DEPTH SED	NOTES
10:19	15A-1606	6.2	1.3	TO SAND
10:22	1607	6.6	0.8	TO SAND
10:24	1608	6.8	0.5	TO SAND
10:26	1609	6.4	0.7	TO SAND
10:30	1610	6.0	0.8	SEAR FOUND SHOW
	HEAD UPSTREAM TO GET PREVIOUSLY			
	PROBED LOCATION			
~~P13A~~				
	P13A	19.5	0.0	ROCK
REACH CLOSER TO BRIDGE	P13A	18.5	0.0	ROCK SAND
10:52	P13A	16.1	1.3	GRAVEL SAND
10:57	P14A	18.5	0.4	HARD SAND
11:00	P15A	18.1	0.6	HARD SAND
11:05	P16A	10.2	1.4	SAND ROCK
11:09	P17A	18.5	0.9	HARD SAND
11:12	P18A	15.6	0.5	[illegible] SAND
11:18	P19A	5.8	2.3	SILT SILTY SAND TO SAND
11:22	P20A	7.7	1.8	SILTY SAND TO SAND
NEW LOCATIONS				
11:26	P21	18.5	>0.6	SEDIMENT
11:20	P22	8.5	1.5	SAND
	U.S. ROUTE 3 BRIDGE			
11:36	P23	6.1	3.3	SILT OVER SAND
11:41	P24	19	1.3	SAND, [illegible]

TIME	LOCATION	WATER DEPTH		
11:45	P25	14.8	3.8	
11:50	P26	18.4	1.3	SAND
11:56	P27	19.0	1.3	SILT
12:00	P28	9.3	0.9	SAND
	JUST U.S. 3rd RIVER BAR			
12:17	P29	5.4	1.7	
12:20	P30	17.2	1.7	
12:22	P31	17.2	0.8	
	JUST U.S. 3rd RIVER BAR			
12:25	P32	15.6	0.0	ROCK
12:27	P33	14.1	1.7	SAND
12:31	P34	4.4	3.0	
12:34	P35	5.2	1.0	
12:40	P36	14.8	1.3	
12:42	P37	9.3	1.5	SILT
13:02	P38	10.2	4.8	SILT
13:05	P39	17.8	0.8	
13:08	P40	11.2	3.1	SILT
13:10	P41	17.3	1.2	SILT
13:12	P42	15.2	2.9	SAND
13:17	P43	3.1	9.0 (SILT)	SILT
13:19	P44	13.3	4.9	SILT
13:20	P45	15.0	1.8	SILT
13:21	P46	4.9	1.2	SILT
13:24	P47	2.1	0	

13:30	48	2.6	0	
~~13:32~~	~~13.9~~	~~3.0~~	~~SILT~~	
13:22	49	13.9	3.0	SILT
13:48	50	11.5	2.1	SILT SAND
13:51	51	4.7	0.6	SILT SAND

NEAR BACK TO DOCK, 9106 COUNT OUT OUTLET!

Aqua Survey will send coordinates in a day or two.

Region 2 / Staff will later decide if additional information / additional depth profiles are needed.

No T.R. – Data will be validated, all information (Analytical Report, field probing information ~~[illegible]~~ will be sent to Region 2.

Difficulty getting boat out again due to low tides!

SERAS-B-0314

JOB BOOK

PROJECT NAME Diamond

PROJECT NUMBER 267

CREW McBurney

DATE 9/27/15 BOOK #1 OF

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CURVE FORMULAS

$T = R \tan \frac{1}{2} I$	$R = T \cot. \frac{1}{2} I$	Chord def. $= \frac{\text{chord}^2}{R}$
$T = \frac{50 \tan \frac{1}{2} I}{\text{Sin.} \frac{1}{2} D}$	$R = \frac{50}{\text{Sin.} \frac{1}{2} D}$	No. chords $= \frac{I}{D}$
$\text{Sin.} \frac{1}{2} D = \frac{50}{R}$	$E = R \text{ ex. sec } \frac{1}{2} I$	Tan. def. $= \frac{1}{2}$ chord def.
$\text{Sin.} \frac{1}{2} D = \frac{50 \tan \frac{1}{2} I}{T}$	$E = T \tan \frac{1}{4} I$	

The square of any distance, divided by twice the radius, will equal the distance from tangent to curve, very nearly.

To find angle for a given distance and deflection.

Rule 1. Multiply the given distance by .01745 (def. for 1° for 1 ft.) and divide given deflection by the product.

Rule 2. Multiply given deflection by 57.3, and divide the product by the given distance.

To find deflection for a given angle and distance. Multiply the angle by .01745, and the product by the distance.

GENERAL DATA

RIGHT ANGLE TRIANGLES. Square the altitude, divide by twice the base. Add quotient to base for hypotenuse.

Given Base 100, Alt. $10.10^2 \div 200 = .5$. $100 + .5 = 100.5$ hyp.

Given Hyp. 100, Alt. $25.25^2 \div 200 = 3.125$; $100 - 3.125 = 96.875 =$ Base.

Error in first example, .002; in last, .045.

To find Tons of Rail in one mile of track: multiply weight per yard by 11, and divide by 7.

LEVELING. The correction for curvature and refraction, in feet and decimals of feet is equal to $0.574 d^2$, where d is the distance in miles. The correction for curvature alone is closely, $\frac{2}{3} d^2$. The combined correction is negative.

PROBABLE ERROR. If d_1, d_2, d_3, etc. are the discrepancies of various results from the mean, and if Σd^2 = the sum of the squares of these differences and n = the number of observations, then the probable error of the mean $= \pm 0.6745 \sqrt{\frac{\Sigma d^2}{n(n-1)}}$

MINUTES IN DECIMALS OF A DEGREE

1′	.0167	11′	.1833	21′	.3500	31′	.5167	41′	.6833	51′	.8500
2	.0333	12	.2000	22	.3667	32	.5333	42	.7000	52	.8667
3	.0500	13	.2167	23	.3833	33	.5500	43	.7167	53	.8833
4	.0667	14	.2333	24	.4000	34	.5667	44	.7333	54	.9000
5	.0833	15	.2500	25	.4167	35	.5833	45	.7500	55	.9167
6	.1000	16	.2667	26	.4333	36	.6000	46	.7667	56	.9333
7	.1167	17	.2833	27	.4500	37	.6167	47	.7833	57	.9500
8	.1333	18	.3000	28	.4667	38	.6333	48	.8000	58	.9667
9	.1500	19	.3167	29	.4833	39	.6500	49	.8167	59	.9833
10	.1667	20	.3333	30	.5000	40	.6667	50	.8333	60	1.0000

INCHES IN DECIMALS OF A FOOT

1-16	3-32	⅛	3-16	¼	5-16	⅜	½	⅝	¾	⅞
.0052	.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729
1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

SERAS-B-0314

9/29/15 PASSAIC RIVER
ARRIVE ON SITE 8:15
SET-UP SAMPLE P[illegible]
AREA

9:05 PRSS-01
MS/MSD FOR D/PCB [illegible]

9:21 PRSS-02
0" SEDIMENT ON [illegible] SAND
SAND REMOVED ← RECOVERY [illegible]

9:35 PRSS-03 7½" SEDIMENT [illegible]
6" SEDIMENT 1½ [illegible]
SAND REMOVED FROM [illegible]

09:49 PRSS-04 8" RECOVERY
4" BLACK, 4" BROWN SEDIMENTS NO SAND 8" [illegible]

09:56 PRSS-05 11" RECOVERY
8½" SEDIMENT 2½" SAND
AU BROWN

09:56 PRSS-105
13½" RECOV. 8½" SED, AIRGAP (1) [illegible]

6 2 CORES TAKEN
AVG 5' RECOVERY
½ CORE 2 4½"
2½ 3" SAND 2"
ENT 2½ 3" SED. 2½"
RSS-07 2 CORES TAKEN
CORE 2
6½ 5"
2½ 1"
4" 4"
LOT OF LEAVES/ORGANICS
RSS-08
13½" RECOVERY
2' BROWN ON 5½" BLACK
STRONG PETROLEUM/RUBBER SMELL
SOME GRAVEL
RSS-09 BACKGROUND STATION
USING ALL MATERIAL INCL.
SAND.
7½" RECOVERY,
ALL SAND.
¼" FINE SEDIMENT ON TOP

Hg - EPA 1631
DIOXINS/PCB/
↳ 1613B
1668A
PAHs - NOAA 130/CARB 429

TOC LLOYD KAHN METHOD
GRAIN SIZE ASTM D422