APPENDIX E
MATERIAL SOURCE TESTING RESULTS

October 6, 2015 KA Project No. 104-15010

Mr. Jesse Galligan Tel: (253)279-6809
Orion Marine Group E-Mail: jgalligan@orionmarinegroup.com

Port Gamble Capping and Material Placement Project
Port Gamble Bay, Washington

RE: Letter Report for:
Limited Soil Sampling and Analysis
Port Gamble Source Acceptance
Port Gamble Bay

Dear Mr. Galligan:

Krazan and Associates is providing this Letter Report in reference to limited sampling of capping material (sand) located at the Zimmer Gravel Pit, in Poulsbo, WA. Sample collection was conducted by Krazan representative Mr. Steven Padilla on September 29, 2015. This sampling was performed in accordance with federal, state and local regulatory requirements, and was limited to areas defined by the client.

1.0 Analytical Results

1.1 Soil Analytical Results

The material sampled did not exceed Table 352026-1 for capping material sediment quality standards contained in Division 35, Section 352026 of the Waterway and Marine Construction specification for the Port Gamble Cleanup Project. Compounds requested to be tested by Orion Construction did not indicate levels above corresponding capping material sediment quality standards. The laboratory analytical report is provided in Appendix A.

2.0 Sampling Methodology

The sampling location was defined by the client as a discreet sample taken of the capping material (sand) located at the Zimmer Gravel Pit, in Poulsbo, Washington. The sample was collected by carefully collecting one sample of sand in eight glass containers from a specified sand pile located at the Zimmer Gravel Pit in Poulsbo, Washington. Sample containers were then placed in an iced cooler for transportation to the laboratory. Data pertinent to the sample (e.g., date, sample number, material description, and material category) was recorded on a field data sheet.

2.1 Laboratory Analysis

One (1) discrete soil sample was collected in eight containers as part of the sample project. The sample was collected in eight containers to ensure that the laboratory had enough sample for the analysis requested by the Client. The sample containers were delivered to Friedman and Bruya (F&B) Laboratories in Seattle, Washington, under chain-of-custody protocol for analysis. F&B Laboratories is a Washington State accredited laboratory. In addition to in-house testing, F&B Laboratories supplied samples to Frontier Laboratories (Furan and Dioxin testing) and Fremont Laboratories (Chlorinated Pesticides and TOC testing). Analytical data reports, laboratory certifications, and chain-of-custody forms are provided in Appendix A.

3.0 Laboratory Sample Results

Table 1 and 2 include the sample number, sample location, sample description, and percent of contaminant.

Table 1 – Summary of Analytical Data – Metals (mg/kg)

Sample Number	Sample Location	Sample Material	% Moisture	Zinc	Nickel	Thallium	Copper	Antimony	Arsenic	Selenium	Chromium	Cadmium	Beryllium	Silver	Lead	Mercury
ZP-Sand	Zimmer Gravel Pit Poulsbo WA	Sand	3%	16.6	38.1	<1	9.35	<1	1.44	<1	18.1	<1	<10	<1	1.50	<0.1
WDOE Waste Characterization Levels	NA	Soil	NA	410	NR	NR	390	NR	57	NR	260	3.0	NR	6.1	450	0.41

Notes:
NR = Not Requested

Table 2 – Summary of Analytical Data

Sample Number	Sample Location	Sample Material	PCB	LPAH	HPAH	Chlorinate Hydrocarbons	Phthalates	Phenols	Misc. Extractables	Dioxins / Furans
ZP-Sand	Zimmer Gravel Pit Poulsbo WA	Sand	<4 ppb	LTDL (see attached)	LTDL (see attached)	LTDL (see attached)	LTDL (see attached)	LTDL (see attached)	LTDL (see attached)	ND
Table 352026-1 Standards	NA	Capping Material	130 ppb	See Table	See Table	See Table	See Table	See Table	See Table	5 ng/kg

Notes:
ND = None Detected; NA = Not Applicable; LTDL = Less Than Detection Limit

4.0 Conclusions

The material sampled did not exceed Table 352026-1 for capping material sediment quality standards contained in Division 35, Section 352026 of the Waterway and Marine Construction specification for the Port Gamble Cleanup Project. Compounds requested to be tested by Orion Construction did not indicate levels above corresponding capping material sediment quality standards. The laboratory analytical report is provided in Appendix A.

LIMITATIONS

This survey has been limited in scope to those areas defined by the client. This investigation is undertaken with the risk that visual observations and random sampling alone would not reveal the presence, full nature, and extent of Contaminants of Concern (COC). Krazan makes no representation as to the COC content of materials not sampled or that were inaccessible to our inspector. The sample locations are approximate, and are based on field notes and diagrams of sample locations. The opinions presented herein apply to the site condition existing at the time of the investigation. Opinions and recommendations provided herein may not apply to future conditions that may exist at the site.

The findings presented in this report were based on field observations and sampling as defined by the client. Therefore, the data obtained are clear and accurate only to the degree implied by the sources and methods used. The information presented herein is based on professional interpretation using presently

accepted methods with a degree of conservatism deemed proper as of the report date. We do not warrant that future technical developments cannot supersede such data.

This report is provided for the exclusive use of the client noted on the cover page and is subject to the terms and conditions in the applicable contract between the client and Krazan. The client is the only party to whom Krazan has explained the risks involved and has been involved in the shaping of the scope of services needed to satisfactorily manage those risks, if any, from the client's point of view. Any third party use of this report, including use by the Client's lender, prospective purchaser, or lessee will be subject to the terms and conditions governing the contractual work between the Client and Krazan. The unauthorized use of, reliance on, or release of the information contained in this report, without the expressed written consent of Krazan, is strictly prohibited and will be without risk or liability to Krazan.

Laboratory analysis was conducted by a laboratory accredited under the guidance of the EPA. The results of the analyses are accurate only to the degree of care exercised by the independent laboratories and the representative nature of the samples obtained.

Krazan appreciates the opportunity to provide you with this information and trusts that you will find it useful. If you have any questions or if we may be of further assistance, please do not hesitate to contact our office at (425) 485-5519.

Respectfully submitted,
KRAZAN & ASSOCIATES, INC.

R. Steven Padilla
NW Environmental Department Manager
Krazan & Associates

Appendix A

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

October 5, 2015

Steven Padilla, Project Manager
Krazan & Associates
4303 198th Street SW
Lynnwood, WA 98036

Dear Mr. Padilla:

Included is the amended report from the testing of material submitted on September 24, 2015 from the Port Gamble, PO 10415010, F&BI 509421 project. Per your request, the percent moisture was added to the report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
KRZ1002R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
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fbi@isomedia.com
www.friedmanandbruya.com

October 2, 2015

Steven Padilla, Project Manager
Krazan & Associates
4303 198th Street SW
Lynnwood, WA 98036

Dear Mr. Padilla:

Included are the results from the testing of material submitted on September 24, 2015 from the Port Gamble, PO 10415010, F&BI 509421 project. There are 23 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
KRZ1002R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on September 24, 2015 by Friedman & Bruya, Inc. from the Krazan & Associates Port Gamble, PO 10415010, F&BI 509421 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Krazan & Associates
509421 -01	ZP-SAND

The sample was sent to Fremont Analytical for chlorinated pesticides and total organic carbon analyses. In addition, the sample was sent to Frontier for dioxin and furan analysis. The report from Frontier is enclosed. The report from Fremont will be forwarded upon receipt.

A 6020A internal standard failed the acceptance criteria for sample ZP-SAND due to matrix interferences. The data were flagged accordingly. The sample was diluted and reanalyzed.

The 6020A silver matrix spike and the associated relative percent difference failed the acceptance criteria. The laboratory control sample passed the acceptance criteria, therefore the data were acceptable.

The 8270D laboratory control sample and laboratory control sample duplicate failed the relative percent difference for 4-chloroaniline. The analyte was not detected therefore the data were acceptable.

The 8082A laboratory control sample and laboratory control sample duplicate failed the relative percent difference. The analytes were not detected therefore the data were acceptable.

All other quality control requirements were acceptable.

Date of Report: 10/02/15
Date Received: 09/24/15
Project: Port Gamble, PO 10415010, F&BI 509421
Date Extracted: NA
Date Analyzed: 09/28/15

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES FOR PERCENT MOISTURE USING ASTM D2216-98

Sample ID Laboratory ID	% Moisture
ZP-SAND 509421-01	3

Analysis For Total Metals By EPA Method 6020A

Client ID:	ZP-SAND	Client:	Krazan & Associates
Date Received:	09/24/15	Project:	Port Gamble, PO 10415010, F&BI 509421
Date Extracted:	09/29/15	Lab ID:	509421-01
Date Analyzed:	09/30/15	Data File:	509421-01.020
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Lithium	131 vo	70	130
Germanium	101	70	130
Indium	94	70	130
Holmium	97	70	130

Analyte:	Concentration mg/kg (ppm)
Antimony	<1
Arsenic	1.44
Beryllium	<1 J
Cadmium	<1
Chromium	17.0
Copper	9.35
Lead	1.50
Nickel	34.5
Selenium	<1
Silver	<1
Thallium	<1
Zinc	16.6

Analysis For Total Metals By EPA Method 6020A

Client ID:	ZP-SAND	Client:	Krazan & Associates
Date Received:	09/24/15	Project:	Port Gamble, PO 10415010, F&BI 509421
Date Extracted:	09/29/15	Lab ID:	509421-01 x10
Date Analyzed:	09/30/15	Data File:	509421-01 x10.050
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Lithium	115	70	130
Germanium	93	70	130
Indium	89	70	130
Holmium	91	70	130

Analyte:	Concentration mg/kg (ppm)
Antimony	<10
Arsenic	<10
Beryllium	<10
Cadmium	<10
Chromium	18.1
Copper	<50
Lead	<10
Nickel	38.1
Selenium	<10
Silver	<10
Thallium	<10
Zinc	<50

Analysis For Total Metals By EPA Method 6020A

Client ID:	Method Blank	Client:	Krazan & Associates
Date Received:	Not Applicable	Project:	Port Gamble, PO 10415010, F&BI 509421
Date Extracted:	09/29/15	Lab ID:	I5-558 mb
Date Analyzed:	09/30/15	Data File:	I5-558 mb.017
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Lithium	123	70	130
Germanium	95	70	130
Indium	95	70	130
Holmium	98	70	130

Analyte:	Concentration mg/kg (ppm)
Antimony	<1
Arsenic	<1
Beryllium	<1
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Nickel	<1
Selenium	<1
Silver	<1
Thallium	<1
Zinc	<5

Date of Report: 10/02/15
Date Received: 09/24/15
Project: Port Gamble, PO 10415010, F&BI 509421
Date Extracted: 09/24/15
Date Analyzed: 09/24/15

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL MERCURY
USING EPA METHOD 1631E

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Total Mercury
ZP-SAND 509421-01	<0.1
Method Blank	<0.1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	ZP-SAND	Client:	Krazan & Associates
Date Received:	09/24/15	Project:	Port Gamble, PO 10415010, F&BI 509421
Date Extracted:	09/24/15	Lab ID:	509421-01
Date Analyzed:	09/24/15	Data File:	092413.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	62	142
Toluene-d8	101	55	145
4-Bromofluorobenzene	101	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Krazan & Associates
Date Received:	Not Applicable	Project:	Port Gamble, PO 10415010, F&BI 509421
Date Extracted:	09/24/15	Lab ID:	05-1953 mb
Date Analyzed:	09/24/15	Data File:	092412.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	62	142
Toluene-d8	100	55	145
4-Bromofluorobenzene	100	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	ZP-SAND	Client:	Krazan & Associates
Date Received:	09/24/15	Project:	Port Gamble, PO 10415010, F&BI 509421
Date Extracted:	09/30/15	Lab ID:	509421-01 1/0.25
Date Analyzed:	09/30/15	Data File:	093006.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	86	56	115
Phenol-d6	80	54	113
Nitrobenzene-d5	82	31	164
2-Fluorobiphenyl	83	47	133
2,4,6-Tribromophenol	88	35	141
Terphenyl-d14	93	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.025	Hexachlorocyclopentadiene	<0.0075
Bis(2-chloroethyl) ether	<0.0025	2,4,6-Trichlorophenol	<0.025
2-Chlorophenol	<0.025	2,4,5-Trichlorophenol	<0.025
1,3-Dichlorobenzene	<0.0025	2-Chloronaphthalene	<0.0025
1,4-Dichlorobenzene	<0.0025	2-Nitroaniline	<0.012
1,2-Dichlorobenzene	<0.0025	Dimethyl phthalate	<0.025
Benzyl alcohol	<0.025	2,6-Dinitrotoluene	<0.012
Bis(2-chloroisopropyl) ether	<0.0025	3-Nitroaniline	<0.25
2-Methylphenol	<0.025	2,4-Dinitrophenol	<0.075
Hexachloroethane	<0.0025	Dibenzofuran	<0.0025
N-Nitroso-di-n-propylamine	<0.0025	2,4-Dinitrotoluene	<0.012
3-Methylphenol + 4-Methylphenol	<0.05	4-Nitrophenol	<0.075
Nitrobenzene	<0.0025	Diethyl phthalate	<0.025
Isophorone	<0.0025	4-Chlorophenyl phenyl ether	<0.0025
2-Nitrophenol	<0.025	N-Nitrosodiphenylamine	<0.0025
2,4-Dimethylphenol	<0.025	4-Nitroaniline	<0.25
Benzoic acid	<0.12	4,6-Dinitro-2-methylphenol	<0.075
Bis(2-chloroethoxy)methane	<0.0025	4-Bromophenyl phenyl ether	<0.0025
2,4-Dichlorophenol	<0.025	Hexachlorobenzene	<0.0025
1,2,4-Trichlorobenzene	<0.0025	Pentachlorophenol	<0.025
Hexachlorobutadiene	<0.0025	Carbazole	<0.025
4-Chloroaniline	<0.25	Di-n-butyl phthalate	<0.025
4-Chloro-3-methylphenol	<0.025	Benzyl butyl phthalate	<0.025
2-Methylnaphthalene	<0.0025	Bis(2-ethylhexyl) phthalate	<0.04
1-Methylnaphthalene	<0.0025	Di-n-octyl phthalate	<0.025

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	Krazan & Associates
Date Received:	Not Applicable	Project:	Port Gamble, PO 10415010, F&BI 509421
Date Extracted:	09/30/15	Lab ID:	05-2004 mb 1/0.25
Date Analyzed:	09/30/15	Data File:	093005.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	96	56	115
Phenol-d6	94	54	113
Nitrobenzene-d5	96	31	164
2-Fluorobiphenyl	97	47	133
2,4,6-Tribromophenol	98	35	141
Terphenyl-d14	104	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.025	Hexachlorocyclopentadiene	<0.0075
Bis(2-chloroethyl) ether	<0.0025	2,4,6-Trichlorophenol	<0.025
2-Chlorophenol	<0.025	2,4,5-Trichlorophenol	<0.025
1,3-Dichlorobenzene	<0.0025	2-Chloronaphthalene	<0.0025
1,4-Dichlorobenzene	<0.0025	2-Nitroaniline	<0.012
1,2-Dichlorobenzene	<0.0025	Dimethyl phthalate	<0.025
Benzyl alcohol	<0.025	2,6-Dinitrotoluene	<0.012
Bis(2-chloroisopropyl) ether	<0.0025	3-Nitroaniline	<0.25
2-Methylphenol	<0.025	2,4-Dinitrophenol	<0.075
Hexachloroethane	<0.0025	Dibenzofuran	<0.0025
N-Nitroso-di-n-propylamine	<0.0025	2,4-Dinitrotoluene	<0.012
3-Methylphenol + 4-Methylphenol	<0.05	4-Nitrophenol	<0.075
Nitrobenzene	<0.0025	Diethyl phthalate	<0.025
Isophorone	<0.0025	4-Chlorophenyl phenyl ether	<0.0025
2-Nitrophenol	<0.025	N-Nitrosodiphenylamine	<0.0025
2,4-Dimethylphenol	<0.025	4-Nitroaniline	<0.25
Benzoic acid	<0.12	4,6-Dinitro-2-methylphenol	<0.075
Bis(2-chloroethoxy)methane	<0.0025	4-Bromophenyl phenyl ether	<0.0025
2,4-Dichlorophenol	<0.025	Hexachlorobenzene	<0.0025
1,2,4-Trichlorobenzene	<0.0025	Pentachlorophenol	<0.025
Hexachlorobutadiene	<0.0025	Carbazole	<0.025
4-Chloroaniline	<0.25	Di-n-butyl phthalate	<0.025
4-Chloro-3-methylphenol	<0.025	Benzyl butyl phthalate	<0.025
2-Methylnaphthalene	<0.0025	Bis(2-ethylhexyl) phthalate	<0.04
1-Methylnaphthalene	<0.0025	Di-n-octyl phthalate	<0.025

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	ZP-SAND	Client:	Krazan & Associates
Date Received:	09/24/15	Project:	Port Gamble, PO 10415010, F&BI 509421
Date Extracted:	09/30/15	Lab ID:	509421-01 1/0.25
Date Analyzed:	09/30/15	Data File:	093015.D
Matrix:	Soil	Instrument:	GCMS10
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	80	38	162
Benzo(a)anthracene-d12	84	22	160

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.00050
Acenaphthylene	<0.00050
Acenaphthene	<0.00050
Fluorene	<0.00050
Phenanthrene	<0.00050
Anthracene	<0.00050
Fluoranthene	<0.00050
Pyrene	<0.00050
Benz(a)anthracene	<0.00050
Chrysene	<0.00050
Benzo(a)pyrene	<0.00050
Benzo(b)fluoranthene	<0.00050
Benzo(k)fluoranthene	<0.00050
Indeno(1,2,3-cd)pyrene	<0.00050
Dibenz(a,h)anthracene	<0.00050
Benzo(g,h,i)perylene	<0.00050

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Krazan & Associates
Date Received:	Not Applicable	Project:	Port Gamble, PO 10415010, F&BI 509421
Date Extracted:	09/30/15	Lab ID:	05-2005 mb 1/0.25
Date Analyzed:	09/30/15	Data File:	093013.D
Matrix:	Soil	Instrument:	GCMS10
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	89	38	162
Benzo(a)anthracene-d12	102	22	160

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.00050
Acenaphthylene	<0.00050
Acenaphthene	<0.00050
Fluorene	<0.00050
Phenanthrene	<0.00050
Anthracene	<0.00050
Fluoranthene	<0.00050
Pyrene	<0.00050
Benz(a)anthracene	<0.00050
Chrysene	<0.00050
Benzo(a)pyrene	<0.00050
Benzo(b)fluoranthene	<0.00050
Benzo(k)fluoranthene	<0.00050
Indeno(1,2,3-cd)pyrene	<0.00050
Dibenz(a,h)anthracene	<0.00050
Benzo(g,h,i)perylene	<0.00050

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	ZP-SAND	Client:	Krazan & Associates
Date Received:	09/24/15	Project:	Port Gamble, PO 10415010, F&BI 509421
Date Extracted:	09/30/15	Lab ID:	509421-01
Date Analyzed:	09/30/15	Data File:	09.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	54	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.004
Aroclor 1232	<0.004
Aroclor 1016	<0.004
Aroclor 1242	<0.004
Aroclor 1248	<0.004
Aroclor 1254	<0.004
Aroclor 1260	<0.004

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Krazan & Associates
Date Received:	Not Applicable	Project:	Port Gamble, PO 10415010, F&BI 509421
Date Extracted:	09/30/15	Lab ID:	05-2006 mb
Date Analyzed:	09/30/15	Data File:	08.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	69	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.004
Aroclor 1232	<0.004
Aroclor 1016	<0.004
Aroclor 1242	<0.004
Aroclor 1248	<0.004
Aroclor 1254	<0.004
Aroclor 1260	<0.004

Date of Report: 10/02/15
Date Received: 09/24/15
Project: Port Gamble, PO 10415010, F&BI 509421

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 6020A

Laboratory Code: 509421-01 x10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Antimony	mg/kg (ppm)	20	<10	111	114	75-125	3
Arsenic	mg/kg (ppm)	10	<10	110	112	75-125	2
Beryllium	mg/kg (ppm)	5	<10	94	92	75-125	2
Cadmium	mg/kg (ppm)	10	<10	108	113	75-125	5
Chromium	mg/kg (ppm)	50	17.6	103	102	75-125	1
Copper	mg/kg (ppm)	50	<50	107	110	75-125	3
Lead	mg/kg (ppm)	50	<10	107	107	75-125	0
Nickel	mg/kg (ppm)	25	36.9	114	112	75-125	2
Selenium	mg/kg (ppm)	5	<10	98	95	75-125	3
Silver	mg/kg (ppm)	10	<10	57 vo	84	75-125	38 vo
Thallium	mg/kg (ppm)	5	<10	102	102	75-125	0
Zinc	mg/kg (ppm)	50	<50	98	99	75-125	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Antimony	mg/kg (ppm)	20	117	80-120
Arsenic	mg/kg (ppm)	10	102	80-120
Beryllium	mg/kg (ppm)	5	89	80-120
Cadmium	mg/kg (ppm)	10	110	80-120
Chromium	mg/kg (ppm)	50	108	80-120
Copper	mg/kg (ppm)	50	107	80-120
Lead	mg/kg (ppm)	50	109	80-120
Nickel	mg/kg (ppm)	25	109	80-120
Selenium	mg/kg (ppm)	5	104	80-120
Silver	mg/kg (ppm)	10	92	80-120
Thallium	mg/kg (ppm)	5	112	80-120
Zinc	mg/kg (ppm)	50	96	80-120

Date of Report: 10/02/15
Date Received: 09/24/15
Project: Port Gamble, PO 10415010, F&BI 509421

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL MERCURY USING EPA METHOD 1631E

Laboratory Code: 509421-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Mercury	mg/kg (ppm)	0.125	<0.1	109	106	62-136	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	mg/kg (ppm)	0.125	107	68-125

Date of Report: 10/02/15
Date Received: 09/24/15
Project: Port Gamble, PO 10415010, F&BI 509421

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 509421-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	33	32	10-142	3
Chloromethane	mg/kg (ppm)	2.5	<0.5	65	60	10-126	8
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	69	64	10-138	8
Bromomethane	mg/kg (ppm)	2.5	<0.5	77	71	10-163	8
Chloroethane	mg/kg (ppm)	2.5	<0.5	77	74	10-176	4
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	78	76	10-176	3
Acetone	mg/kg (ppm)	12.5	<0.5	87	87	10-163	0
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	85	83	10-160	2
Hexane	mg/kg (ppm)	2.5	<0.25	77	72	10-137	7
Methylene chloride	mg/kg (ppm)	2.5	<0.5	98	94	10-156	4
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	94	90	21-145	4
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	89	87	14-137	2
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	94	91	19-140	3
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	96	93	10-158	3
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	93	91	25-135	2
Chloroform	mg/kg (ppm)	2.5	<0.05	94	91	21-145	3
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	99	98	19-147	1
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	94	93	12-160	1
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	96	92	10-156	4
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	95	91	17-140	4
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	99	97	9-164	2
Benzene	mg/kg (ppm)	2.5	<0.03	90	89	29-129	1
Trichloroethene	mg/kg (ppm)	2.5	<0.02	92	90	21-139	2
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	95	94	30-135	1
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	102	99	23-155	3
Dibromomethane	mg/kg (ppm)	2.5	<0.05	98	96	23-145	2
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	99	100	24-155	1
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	103	102	28-144	1
Toluene	mg/kg (ppm)	2.5	<0.05	96	93	35-130	3
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	107	108	26-149	1
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	97	96	10-205	1
2-Hexanone	mg/kg (ppm)	12.5	<0.5	100	98	15-166	2
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	97	96	31-137	1
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	95	93	20-133	2
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	110	109	28-150	1
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	99	98	28-142	1
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	93	91	32-129	2
Ethylbenzene	mg/kg (ppm)	2.5	<0.05	93	90	32-137	3
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	98	94	31-143	4
m,p-Xylene	mg/kg (ppm)	5	<0.1	93	91	34-136	2
o-Xylene	mg/kg (ppm)	2.5	<0.05	95	93	33-134	2
Styrene	mg/kg (ppm)	2.5	<0.05	99	97	35-137	2
Isopropylbenzene	mg/kg (ppm)	2.5	<0.05	96	92	31-142	4
Bromoform	mg/kg (ppm)	2.5	<0.05	105	102	21-156	3
n-Propylbenzene	mg/kg (ppm)	2.5	<0.05	96	94	23-146	2
Bromobenzene	mg/kg (ppm)	2.5	<0.05	95	93	34-130	2
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	95	93	18-149	2
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	101	97	28-140	4
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05	92	91	25-144	1
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	94	92	31-134	2
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	94	92	31-136	2
tert-Butylbenzene	mg/kg (ppm)	2.5	<0.05	97	95	30-137	2
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	95	92	10-182	3
sec-Butylbenzene	mg/kg (ppm)	2.5	<0.05	96	95	23-145	1
p-Isopropyltoluene	mg/kg (ppm)	2.5	<0.05	96	94	21-149	2
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	94	92	30-131	2
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	93	91	29-129	2
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	96	95	31-132	1
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	105	100	11-161	5
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	97	94	22-142	3
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	97	95	10-142	2
Naphthalene	mg/kg (ppm)	2.5	<0.05	96	95	14-157	1
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	96	95	20-144	1

Date of Report: 10/02/15
Date Received: 09/24/15
Project: Port Gamble, PO 10415010, F&BI 509421

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2.5	56	10-146
Chloromethane	mg/kg (ppm)	2.5	77	27-133
Vinyl chloride	mg/kg (ppm)	2.5	83	22-139
Bromomethane	mg/kg (ppm)	2.5	91	38-114
Chloroethane	mg/kg (ppm)	2.5	90	10-163
Trichlorofluoromethane	mg/kg (ppm)	2.5	92	10-196
Acetone	mg/kg (ppm)	12.5	101	52-141
1,1-Dichloroethene	mg/kg (ppm)	2.5	96	47-128
Hexane	mg/kg (ppm)	2.5	92	43-142
Methylene chloride	mg/kg (ppm)	2.5	103	42-132
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	100	60-123
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	100	67-127
1,1-Dichloroethane	mg/kg (ppm)	2.5	102	68-115
2,2-Dichloropropane	mg/kg (ppm)	2.5	111	52-170
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	102	72-113
Chloroform	mg/kg (ppm)	2.5	102	66-120
2-Butanone (MEK)	mg/kg (ppm)	12.5	109	57-123
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	102	56-135
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	103	62-131
1,1-Dichloropropene	mg/kg (ppm)	2.5	103	69-128
Carbon tetrachloride	mg/kg (ppm)	2.5	109	60-139
Benzene	mg/kg (ppm)	2.5	97	68-114
Trichloroethene	mg/kg (ppm)	2.5	101	64-117
1,2-Dichloropropane	mg/kg (ppm)	2.5	105	72-127
Bromodichloromethane	mg/kg (ppm)	2.5	113	72-130
Dibromomethane	mg/kg (ppm)	2.5	108	70-120
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	110	45-145
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	114	75-136
Toluene	mg/kg (ppm)	2.5	104	66-126
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	120	72-132
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	108	75-113
2-Hexanone	mg/kg (ppm)	12.5	110	33-152
1,3-Dichloropropane	mg/kg (ppm)	2.5	105	72-130
Tetrachloroethene	mg/kg (ppm)	2.5	104	72-114
Dibromochloromethane	mg/kg (ppm)	2.5	125	74-125
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	109	74-132
Chlorobenzene	mg/kg (ppm)	2.5	100	76-111
Ethylbenzene	mg/kg (ppm)	2.5	100	64-123
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	109	69-135
m,p-Xylene	mg/kg (ppm)	5	102	78-122
o-Xylene	mg/kg (ppm)	2.5	101	77-124
Styrene	mg/kg (ppm)	2.5	108	74-126
Isopropylbenzene	mg/kg (ppm)	2.5	102	76-127
Bromoform	mg/kg (ppm)	2.5	122	56-132
n-Propylbenzene	mg/kg (ppm)	2.5	104	74-124
Bromobenzene	mg/kg (ppm)	2.5	102	72-122
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	104	76-126
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	110	56-143
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	102	61-137
2-Chlorotoluene	mg/kg (ppm)	2.5	101	74-121
4-Chlorotoluene	mg/kg (ppm)	2.5	102	75-122
tert-Butylbenzene	mg/kg (ppm)	2.5	105	73-130
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	103	76-125
sec-Butylbenzene	mg/kg (ppm)	2.5	105	71-130
p-Isopropyltoluene	mg/kg (ppm)	2.5	103	70-132
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	102	75-121
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	100	74-117
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	103	76-121
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	121	58-138
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	104	64-135
Hexachlorobutadiene	mg/kg (ppm)	2.5	104	50-153
Naphthalene	mg/kg (ppm)	2.5	106	63-140
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	104	63-138

Date of Report: 10/02/15
Date Received: 09/24/15
Project: Port Gamble, PO 10415010, F&BI 509421

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270D

Laboratory Code: 509421-01 1/0.25 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Phenol	mg/kg (ppm)	0.08	<0.025	98	50-150
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.08	<0.0025	88	50-150
2-Chlorophenol	mg/kg (ppm)	0.08	<0.025	92	44-133
1,3-Dichlorobenzene	mg/kg (ppm)	0.08	<0.0025	87	50-150
1,4-Dichlorobenzene	mg/kg (ppm)	0.08	<0.0025	86	50-150
1,2-Dichlorobenzene	mg/kg (ppm)	0.08	<0.0025	87	50-150
Benzyl alcohol	mg/kg (ppm)	0.08	<0.025	93	50-150
Bis(2-chloroisopropyl) ether	mg/kg (ppm)	0.08	<0.0025	86	50-150
2-Methylphenol	mg/kg (ppm)	0.08	<0.025	88	42-143
Hexachloroethane	mg/kg (ppm)	0.08	<0.0025	91	31-132
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.08	<0.0025	90	50-150
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.08	<0.05	91	10-250
Nitrobenzene	mg/kg (ppm)	0.08	<0.0025	90	50-150
Isophorone	mg/kg (ppm)	0.08	<0.0025	91	50-150
2-Nitrophenol	mg/kg (ppm)	0.08	<0.025	100	29-152
2,4-Dimethylphenol	mg/kg (ppm)	0.08	<0.025	63	16-163
Benzoic acid	mg/kg (ppm)	0.12	<0.12	129	10-250
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.08	<0.0025	92	50-150
2,4-Dichlorophenol	mg/kg (ppm)	0.08	<0.025	97	39-145
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.08	<0.0025	89	50-150
Hexachlorobutadiene	mg/kg (ppm)	0.08	<0.0025	90	50-150
4-Chloroaniline	mg/kg (ppm)	0.17	<0.25	62	23-110
4-Chloro-3-methylphenol	mg/kg (ppm)	0.08	<0.025	98	50-150
2-Methylnaphthalene	mg/kg (ppm)	0.08	<0.0025	91	50-150
1-Methylnaphthalene	mg/kg (ppm)	0.08	<0.0025	91	50-150
Hexachlorocyclopentadiene	mg/kg (ppm)	0.08	<0.0075	108	10-151
2,4,6-Trichlorophenol	mg/kg (ppm)	0.08	<0.025	103	38-149
2,4,5-Trichlorophenol	mg/kg (ppm)	0.08	<0.025	101	50-150
2-Chloronaphthalene	mg/kg (ppm)	0.08	<0.0025	92	50-150
2-Nitroaniline	mg/kg (ppm)	0.08	<0.012	96	50-150
Dimethyl phthalate	mg/kg (ppm)	0.08	<0.025	86	50-150
2,6-Dinitrotoluene	mg/kg (ppm)	0.08	<0.012	96	50-150
3-Nitroaniline	mg/kg (ppm)	0.17	<0.25	71	23-119
2,4-Dinitrophenol	mg/kg (ppm)	0.08	<0.075	98	10-162
Dibenzofuran	mg/kg (ppm)	0.08	<0.0025	93	47-149
2,4-Dinitrotoluene	mg/kg (ppm)	0.08	<0.012	96	50-150
4-Nitrophenol	mg/kg (ppm)	0.08	<0.075	94	10-179
Diethyl phthalate	mg/kg (ppm)	0.08	<0.025	92	50-150
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.08	<0.0025	93	50-150
N-Nitrosodiphenylamine	mg/kg (ppm)	0.08	<0.0025	86	50-150
4-Nitroaniline	mg/kg (ppm)	0.17	<0.25	70	32-135
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.08	<0.075	101	10-170
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.08	<0.0025	99	50-150
Hexachlorobenzene	mg/kg (ppm)	0.08	<0.0025	94	50-150
Pentachlorophenol	mg/kg (ppm)	0.08	<0.025	108	12-160
Carbazole	mg/kg (ppm)	0.08	<0.025	84	50-150
Di-n-butyl phthalate	mg/kg (ppm)	0.08	<0.025	92	50-150
Benzyl butyl phthalate	mg/kg (ppm)	0.08	<0.025	101	50-150
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.08	<0.04	101	10-250
Di-n-octyl phthalate	mg/kg (ppm)	0.08	<0.025	119	54-161

Date of Report: 10/02/15
Date Received: 09/24/15
Project: Port Gamble, PO 10415010, F&BI 509421

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270D

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Phenol	mg/kg (ppm)	0.08	91	102	51-119	11
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.08	87	96	60-112	10
2-Chlorophenol	mg/kg (ppm)	0.08	88	100	59-114	13
1,3-Dichlorobenzene	mg/kg (ppm)	0.08	84	95	62-113	12
1,4-Dichlorobenzene	mg/kg (ppm)	0.08	84	95	61-114	12
1,2-Dichlorobenzene	mg/kg (ppm)	0.08	85	95	61-113	11
Benzyl alcohol	mg/kg (ppm)	0.08	92	105	50-119	13
Bis(2-chloroisopropyl) ether	mg/kg (ppm)	0.08	84	93	59-113	10
2-Methylphenol	mg/kg (ppm)	0.08	88	99	58-115	12
Hexachloroethane	mg/kg (ppm)	0.08	89	100	63-114	12
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.08	87	98	62-114	12
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.08	88	100	54-120	13
Nitrobenzene	mg/kg (ppm)	0.08	89	96	59-114	8
Isophorone	mg/kg (ppm)	0.08	88	98	61-113	11
2-Nitrophenol	mg/kg (ppm)	0.08	94	107	59-114	13
2,4-Dimethylphenol	mg/kg (ppm)	0.08	84	91	54-107	8
Benzoic acid	mg/kg (ppm)	0.12	114	133	43-150	15
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.08	90	98	60-114	9
2,4-Dichlorophenol	mg/kg (ppm)	0.08	93	104	57-118	11
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.08	87	96	56-112	10
Hexachlorobutadiene	mg/kg (ppm)	0.08	89	97	60-116	9
4-Chloroaniline	mg/kg (ppm)	0.17	50	36	10-126	33 vo
4-Chloro-3-methylphenol	mg/kg (ppm)	0.08	93	105	59-115	12
2-Methylnaphthalene	mg/kg (ppm)	0.08	88	97	60-115	10
1-Methylnaphthalene	mg/kg (ppm)	0.08	87	98	70-130	12
Hexachlorocyclopentadiene	mg/kg (ppm)	0.08	94	105	41-107	11
2,4,6-Trichlorophenol	mg/kg (ppm)	0.08	99	110	47-119	11
2,4,5-Trichlorophenol	mg/kg (ppm)	0.08	95	107	61-121	12
2-Chloronaphthalene	mg/kg (ppm)	0.08	89	98	58-114	10
2-Nitroaniline	mg/kg (ppm)	0.08	93	103	55-119	10
Dimethyl phthalate	mg/kg (ppm)	0.08	84	92	58-116	9
2,6-Dinitrotoluene	mg/kg (ppm)	0.08	93	103	57-119	10
3-Nitroaniline	mg/kg (ppm)	0.17	67	76	10-143	13
2,4-Dinitrophenol	mg/kg (ppm)	0.08	98	110	40-122	12
Dibenzofuran	mg/kg (ppm)	0.08	90	99	56-115	10
2,4-Dinitrotoluene	mg/kg (ppm)	0.08	94	105	53-126	11
4-Nitrophenol	mg/kg (ppm)	0.08	93	104	40-124	11
Diethyl phthalate	mg/kg (ppm)	0.08	92	100	57-116	8
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.08	90	99	54-119	10
N-Nitrosodiphenylamine	mg/kg (ppm)	0.08	86	93	54-113	8
4-Nitroaniline	mg/kg (ppm)	0.17	69	78	47-109	12
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.08	100	112	55-147	11
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.08	97	105	56-116	8
Hexachlorobenzene	mg/kg (ppm)	0.08	94	101	57-115	7
Pentachlorophenol	mg/kg (ppm)	0.08	105	117	45-123	11
Carbazole	mg/kg (ppm)	0.08	82	97	57-116	17
Di-n-butyl phthalate	mg/kg (ppm)	0.08	92	98	56-118	6
Benzyl butyl phthalate	mg/kg (ppm)	0.08	97	107	56-122	10
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.08	95	107	56-155	12
Di-n-octyl phthalate	mg/kg (ppm)	0.08	106	119	58-120	12

Date of Report: 10/02/15
Date Received: 09/24/15
Project: Port Gamble, PO 10415010, F&BI 509421

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: 509421-01 1/0.25 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.008	<0.00050	79	50-150
Acenaphthylene	mg/kg (ppm)	0.008	<0.00050	88	50-150
Acenaphthene	mg/kg (ppm)	0.008	<0.00050	84	50-150
Fluorene	mg/kg (ppm)	0.008	<0.00050	90	50-150
Phenanthrene	mg/kg (ppm)	0.008	<0.00050	89	50-150
Anthracene	mg/kg (ppm)	0.008	<0.00050	81	50-150
Fluoranthene	mg/kg (ppm)	0.008	<0.00050	91	36-157
Pyrene	mg/kg (ppm)	0.008	<0.00050	93	34-154
Benz(a)anthracene	mg/kg (ppm)	0.008	<0.00050	90	46-149
Chrysene	mg/kg (ppm)	0.008	<0.00050	92	50-150
Benzo(b)fluoranthene	mg/kg (ppm)	0.008	<0.00050	85	50-150
Benzo(k)fluoranthene	mg/kg (ppm)	0.008	<0.00050	89	44-148
Benzo(a)pyrene	mg/kg (ppm)	0.008	<0.00050	78	46-144
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.008	<0.00050	84	50-150
Dibenz(a,h)anthracene	mg/kg (ppm)	0.008	<0.00050	88	50-150
Benzo(g,h,i)perylene	mg/kg (ppm)	0.008	<0.00050	90	50-150

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.008	77	84	70-130	9
Acenaphthylene	mg/kg (ppm)	0.008	88	94	70-130	7
Acenaphthene	mg/kg (ppm)	0.008	85	90	70-130	6
Fluorene	mg/kg (ppm)	0.008	91	95	70-130	4
Phenanthrene	mg/kg (ppm)	0.008	92	99	70-130	7
Anthracene	mg/kg (ppm)	0.008	84	91	70-130	8
Fluoranthene	mg/kg (ppm)	0.008	99	103	70-130	4
Pyrene	mg/kg (ppm)	0.008	98	111	66-124	12
Benz(a)anthracene	mg/kg (ppm)	0.008	93	93	70-130	0
Chrysene	mg/kg (ppm)	0.008	96	101	70-130	5
Benzo(b)fluoranthene	mg/kg (ppm)	0.008	87	95	57-127	9
Benzo(k)fluoranthene	mg/kg (ppm)	0.008	90	98	70-130	9
Benzo(a)pyrene	mg/kg (ppm)	0.008	79	85	61-112	7
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.008	93	93	48-135	0
Dibenz(a,h)anthracene	mg/kg (ppm)	0.008	95	99	51-136	4
Benzo(g,h,i)perylene	mg/kg (ppm)	0.008	100	103	51-127	3

Date of Report: 10/02/15
Date Received: 09/24/15
Project: Port Gamble, PO 10415010, F&BI 509421

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR POLYCHLORINATED BIPHENYLS AS AROCLOR 1016/1260 BY EPA METHOD 8082A

Laboratory Code: 509523-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Control Limits
Aroclor 1016	mg/kg (ppm)	0.17	<0.004	54	50-150
Aroclor 1260	mg/kg (ppm)	0.17	<0.004	60	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.17	66	83	55-130	23 vo
Aroclor 1260	mg/kg (ppm)	0.17	68	88	58-133	26 vo

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

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Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 509421
Lab ID: 1509330

October 02, 2015

Attention Michael Erdahl:

Fremont Analytical, Inc. received 1 sample(s) on 9/24/2015 for the analyses presented in the following report.

Organochlorine Pesticides by EPA Method 8081
Sample Moisture (Percent Moisture)
Total Organic Carbon by EPA Method 9060

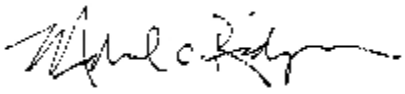
This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,



Mike Ridgeway
President

Date: *10/02/2015*

CLIENT: Friedman & Bruya
Project: 509421
Lab Order: 1509330

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1509330-001	ZP-Sand	09/23/2015 12:00 AM	09/24/2015 11:03 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **1509330**
Date: **10/2/2015**

CLIENT: Friedman & Bruya
Project: 509421

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below LOQ
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

WO#: **1509330**
Date Reported: **10/2/2015**

Client: Friedman & Bruya
Collection Date: 9/23/2015
Project: 509421
Lab ID: 1509330-001
Matrix: Soil
Client Sample ID: **ZP-Sand**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Organochlorine Pesticides by EPA Method 8081				Batch ID: 11962		Analyst: MD
Toxaphene	ND	0.0913		mg/Kg-dry	1	9/25/2015 10:07:00 PM
Alpha BHC	ND	0.00913		mg/Kg-dry	1	9/25/2015 10:07:00 PM
Beta BHC	ND	0.00913		mg/Kg-dry	1	9/25/2015 10:07:00 PM
Gamma BHC (Lindane)	ND	0.00913		mg/Kg-dry	1	9/25/2015 10:07:00 PM
Delta BHC	ND	0.00913		mg/Kg-dry	1	9/25/2015 10:07:00 PM
Heptachlor	ND	0.00913		mg/Kg-dry	1	9/25/2015 10:07:00 PM
Aldrin	ND	0.00913		mg/Kg-dry	1	9/25/2015 10:07:00 PM
Heptachlor epoxide	ND	0.00913		mg/Kg-dry	1	9/25/2015 10:07:00 PM
gamma-Chlordane	ND	0.00913		mg/Kg-dry	1	9/25/2015 10:07:00 PM
Endosulfan I	ND	0.00913		mg/Kg-dry	1	9/25/2015 10:07:00 PM
alpha-Chlordane	ND	0.00913		mg/Kg-dry	1	9/25/2015 10:07:00 PM
Dieldrin	ND	0.00913		mg/Kg-dry	1	9/25/2015 10:07:00 PM
4,4´-DDE	ND	0.0183		mg/Kg-dry	1	9/25/2015 10:07:00 PM
Endrin	ND	0.0183		mg/Kg-dry	1	9/25/2015 10:07:00 PM
Endosulfan II	ND	0.0183		mg/Kg-dry	1	9/25/2015 10:07:00 PM
4,4´-DDD	ND	0.0183		mg/Kg-dry	1	9/25/2015 10:07:00 PM
Endrin aldehyde	ND	0.0183		mg/Kg-dry	1	9/25/2015 10:07:00 PM
Endosulfan sulfate	ND	0.0183		mg/Kg-dry	1	9/25/2015 10:07:00 PM
4,4´-DDT	ND	0.0183		mg/Kg-dry	1	9/25/2015 10:07:00 PM
Endrin ketone	ND	0.0183		mg/Kg-dry	1	9/25/2015 10:07:00 PM
Methoxychlor	ND	0.0457		mg/Kg-dry	1	9/25/2015 10:07:00 PM
Surr: Decachlorobiphenyl	87.7	26.5-158		%REC	1	9/25/2015 10:07:00 PM
Surr: Tetrachloro-m-xylene	67.0	11-150		%REC	1	9/25/2015 10:07:00 PM
Sample Moisture (Percent Moisture)				Batch ID: R25189		Analyst: SB
Percent Moisture	4.46	0.500		wt%	1	9/29/2015 4:04:42 PM
Total Organic Carbon by EPA Method 9060				Batch ID: 11991		Analyst: KT
Total Organic Carbon	ND	0.100		%-dry	1	9/29/2015 1:12:02 PM

Work Order: 1509330
CLIENT: Friedman & Bruya
Project: 509421

QC SUMMARY REPORT

Total Organic Carbon by EPA Method 9060

Sample ID **MB-11991**	SampType: **MBLK**			Units: **%-dry**		Prep Date: **9/29/2015**			RunNo: **25185**	
Client ID: **MBLKS**	Batch ID: **11991**					Analysis Date: **9/29/2015**			SeqNo: **474873**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.100									

Sample ID **LCS-11991**	SampType: **LCS**			Units: **%-dry**		Prep Date: **9/29/2015**			RunNo: **25185**	
Client ID: **LCSS**	Batch ID: **11991**					Analysis Date: **9/29/2015**			SeqNo: **474874**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	0.586	0.100	0.6510	0	90.0	41.1	157				

Sample ID **1509330-001ADUP**	SampType: **DUP**			Units: **%-dry**		Prep Date: **9/29/2015**			RunNo: **25185**	
Client ID: **ZP-Sand**	Batch ID: **11991**					Analysis Date: **9/29/2015**			SeqNo: **474876**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.100						0		30	

Sample ID **1509330-001AMS**	SampType: **MS**			Units: **%-dry**		Prep Date: **9/29/2015**			RunNo: **25185**	
Client ID: **ZP-Sand**	Batch ID: **11991**					Analysis Date: **9/29/2015**			SeqNo: **474877**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	1.05	0.100	1.000	0.02315	103	50.2	118				

Sample ID **1509330-001AMSD**	SampType: **MSD**			Units: **%-dry**		Prep Date: **9/29/2015**			RunNo: **25185**	
Client ID: **ZP-Sand**	Batch ID: **11991**					Analysis Date: **9/29/2015**			SeqNo: **474878**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	1.03	0.100	1.000	0.02315	101	50.2	118	1.050	1.73	20	

Work Order: 1509330
CLIENT: Friedman & Bruya
Project: 509421

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **MB-11962** SampType: **MBLK** Units: **mg/Kg** Prep Date: **9/25/2015** RunNo: **25268**
Client ID: **MBLKS** Batch ID: **11962** Analysis Date: **9/25/2015** SeqNo: **476442**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toxaphene	ND	0.100									
Alpha BHC	ND	0.0100									
Beta BHC	ND	0.0100									
Gamma BHC (Lindane)	ND	0.0100									
Delta BHC	ND	0.0100									
Heptachlor	ND	0.0100									
Aldrin	ND	0.0100									
Heptachlor epoxide	ND	0.0100									
gamma-Chlordane	ND	0.0100									
Endosulfan I	ND	0.0100									
alpha-Chlordane	ND	0.0100									
Dieldrin	ND	0.0100									
4,4´-DDE	ND	0.0200									
Endrin	ND	0.0200									
Endosulfan II	ND	0.0200									
4,4´-DDD	ND	0.0200									
Endrin aldehyde	ND	0.0200									
Endosulfan sulfate	ND	0.0200									
4,4´-DDT	ND	0.0200									
Endrin ketone	ND	0.0200									
Methoxychlor	ND	0.0500									
Surr: Decachlorobiphenyl	0.0615		0.1000		61.5	26.5	158				
Surr: Tetrachloro-m-xylene	0.0327		0.05000		65.4	11	150				

Sample ID **LCS-11962** SampType: **LCS** Units: **µg/Kg** Prep Date: **9/25/2015** RunNo: **25268**
Client ID: **LCSS** Batch ID: **11962** Analysis Date: **9/25/2015** SeqNo: **476441**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alpha BHC	0.175	0.0100	0.2000	0	87.3	54.2	139				
Beta BHC	0.183	0.0100	0.2000	0	91.6	56.5	142				
Gamma BHC (Lindane)	0.180	0.0100	0.2000	0	90.2	55.5	142				

Work Order: 1509330
CLIENT: Friedman & Bruya
Project: 509421

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **LCS-11962** SampType: **LCS** Units: **µg/Kg** Prep Date: **9/25/2015** RunNo: **25268**
Client ID: **LCSS** Batch ID: **11962** Analysis Date: **9/25/2015** SeqNo: **476441**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Delta BHC	0.173	0.0100	0.2000	0	86.4	47.4	157				
Heptachlor	0.197	0.0100	0.2000	0	98.4	54	141				
Aldrin	0.179	0.0100	0.2000	0	89.5	43.7	147				
Heptachlor epoxide	0.191	0.0100	0.2000	0	95.4	56.2	137				
gamma-Chlordane	0.194	0.0100	0.2000	0	96.8	58.5	136				
Endosulfan I	0.195	0.0100	0.2000	0	97.4	60	132				
alpha-Chlordane	0.196	0.0100	0.2000	0	98.2	46.1	140				
Dieldrin	0.191	0.0100	0.2000	0	95.3	61.2	133				
4,4´-DDE	0.191	0.0200	0.2000	0	95.6	55.4	142				
Endrin	0.201	0.0200	0.2000	0	100	56.5	143				
Endosulfan II	0.223	0.0200	0.2000	0	112	62	143				
4,4´-DDD	0.220	0.0200	0.2000	0	110	53.3	145				
Endrin aldehyde	0.186	0.0200	0.2000	0	93.2	39.5	153				
Endosulfan sulfate	0.219	0.0200	0.2000	0	109	53.8	148				
4,4´-DDT	0.215	0.0200	0.2000	0	108	48.2	152				
Endrin ketone	0.228	0.0200	0.2000	0	114	28.5	162				
Methoxychlor	0.250	0.0500	0.2000	0	125	34.6	159				
Surr: Decachlorobiphenyl	0.0757		0.1000		75.7	26.5	158				
Surr: Tetrachloro-m-xylene	0.0395		0.05000		79.0	11	150				

Sample ID **1509311-007ADUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **9/25/2015** RunNo: **25268**
Client ID: **BATCH** Batch ID: **11962** Analysis Date: **9/25/2015** SeqNo: **476428**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toxaphene	ND	0.114						0		30	
Alpha BHC	ND	0.0114						0		30	
Beta BHC	ND	0.0114						0		30	
Gamma BHC (Lindane)	ND	0.0114						0		30	
Delta BHC	ND	0.0114						0		30	
Heptachlor	ND	0.0114						0		30	
Aldrin	ND	0.0114						0		30	

Work Order: 1509330
CLIENT: Friedman & Bruya
Project: 509421

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **1509311-007ADUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **9/25/2015** RunNo: **25268**
Client ID: **BATCH** Batch ID: **11962** Analysis Date: **9/25/2015** SeqNo: **476428**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Heptachlor epoxide	ND	0.0114						0		30	
gamma-Chlordane	ND	0.0114						0		30	
Endosulfan I	ND	0.0114						0		30	
alpha-Chlordane	ND	0.0114						0		30	
Dieldrin	ND	0.0114						0		30	
4,4´-DDE	ND	0.0228						0		30	
Endrin	ND	0.0228						0		30	
Endosulfan II	ND	0.0228						0		30	
4,4´-DDD	ND	0.0228						0		30	
Endrin aldehyde	ND	0.0228						0		30	
Endosulfan sulfate	ND	0.0228						0		30	
4,4´-DDT	ND	0.0228						0		30	
Endrin ketone	ND	0.0228						0		30	
Methoxychlor	ND	0.0570						0		30	
Surr: Decachlorobiphenyl	0.0661		0.1139		58.0	26.5	158		0		
Surr: Tetrachloro-m-xylene	0.0332		0.05697		58.3	11	150		0		

Sample ID **1509311-008AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **9/25/2015** RunNo: **25268**
Client ID: **BATCH** Batch ID: **11962** Analysis Date: **9/25/2015** SeqNo: **476430**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alpha BHC	0.173	0.0113	0.2257	0	76.6	49.1	158				
Beta BHC	0.184	0.0113	0.2257	0	81.3	50.9	160				
Gamma BHC (Lindane)	0.181	0.0113	0.2257	0	80.2	55.3	157				
Delta BHC	0.176	0.0113	0.2257	0	77.9	55.8	160				
Heptachlor	0.195	0.0113	0.2257	0	86.3	59.1	150				
Aldrin	0.178	0.0113	0.2257	0	78.8	46.4	145				
Heptachlor epoxide	0.189	0.0113	0.2257	0	83.6	48.5	151				
gamma-Chlordane	0.190	0.0113	0.2257	0	84.1	50.9	143				
Endosulfan I	0.187	0.0113	0.2257	0	83.0	46.4	149				
alpha-Chlordane	0.194	0.0113	0.2257	0	86.0	46.3	153				

Work Order: 1509330
CLIENT: Friedman & Bruya
Project: 509421

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **1509311-008AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **9/25/2015** RunNo: **25268**
Client ID: **BATCH** Batch ID: **11962** Analysis Date: **9/25/2015** SeqNo: **476430**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dieldrin	0.186	0.0113	0.2257	0	82.6	51	147				
4,4´-DDE	0.190	0.0226	0.2257	0	84.1	39.9	162				
Endrin	0.198	0.0226	0.2257	0	87.8	51.3	151				
Endosulfan II	0.223	0.0226	0.2257	0	99.0	51	152				
4,4´-DDD	0.208	0.0226	0.2257	0	92.0	45.8	160				
Endrin aldehyde	0.189	0.0226	0.2257	0	83.6	38.3	156				
Endosulfan sulfate	0.222	0.0226	0.2257	0	98.4	53.2	154				
4,4´-DDT	0.201	0.0226	0.2257	0	89.0	45.7	168				
Endrin ketone	0.223	0.0226	0.2257	0	98.9	68.3	144				
Methoxychlor	0.243	0.0564	0.2257	0	108	43.4	178				
Surr: Decachlorobiphenyl	0.0652		0.1129		57.8	26.5	158				
Surr: Tetrachloro-m-xylene	0.0327		0.05643		58.0	11	150				

Sample ID **CCV-PEST-B-11962** SampType: **CCV** Units: **mg/L** Prep Date: **9/25/2015** RunNo: **25268**
Client ID: **CCV** Batch ID: **11962** Analysis Date: **9/25/2015** SeqNo: **476439**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toxaphene	1,170	0.100	1,000	0	117	50	150				
Surr: Decachlorobiphenyl	268		200.0		134	50	150				
Surr: Tetrachloro-m-xylene	166		200.0		82.8	50	150				

Date: *10/2/2015*

Work Order: 1509330
CLIENT: Friedman & Bruya
Project: 509421

QC SUMMARY REPORT

Sample Moisture (Percent Moisture)

Sample ID	1509276-018ADUP	SampType:	DUP	Units:	wt%	Prep Date:	9/29/2015	RunNo:	25189
Client ID:	BATCH	Batch ID:	R25189			Analysis Date:	9/29/2015	SeqNo:	474938

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	13.2	0.500						10.34	24.3	20	R

Sample ID	1509401-001ADUP	SampType:	DUP	Units:	wt%	Prep Date:	9/29/2015	RunNo:	25189
Client ID:	BATCH	Batch ID:	R25189			Analysis Date:	9/29/2015	SeqNo:	474956

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	14.6	0.500						16.55	12.7	20	

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**1509330**
Logged by:	**Clare Griggs**	Date Received:	**9/24/2015 11:03:00 AM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Client		

Log In

3.	Coolers are present?	Yes ☐	No ☑	NA ☐
		No cooler present.		
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C *	Yes ☐	No ☑	NA ☐
		Please refer to item information.		
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample	13.0

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY 1509330

Page # 1 of 1

Send Report To Michael Erdahl
Company Friedman and Bruya, Inc.
Address 3012 16th Ave W
City, State, ZIP Seattle, WA 98119
Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont
PROJECT NAME/NO. 509421
PO # D-669
REMARKS Please Email Results

TURNAROUND TIME
☐ Standard (2 Weeks)
☒ RUSH 5-day
Rush charges authorized by: ME

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins and Furans by 8290	EPH	VPH	Nitrate	Sulfate	Alkalinity	Chlorinated Pesticides	TOC			Notes
ZP-Sand		9/23/15		Soil	1							X	X			

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman & Bruya	9/24/15	10:30 AM
Received by:		Clark Gilbert		9/24/15	11:03 am
Relinquished by:					
Received by:					

509421

SAMPLE CHAIN OF CUSTODY

ME 09/24/15 BT1/US1

Report To KRAZAN

Company STEVEN PADILLA

Address

City, State, ZIP

Phone 425-485-5519 Email STEVENPADILLA@

SAMPLERS (signature)

PROJECT NAME: PORT GAMBLE

PO #: 10415010

REMARKS

INVOICE TO

Page # 1 of 1

TURNAROUND TIME
- ☐ Standard (10 Business Days)
- ☐ RUSH 5 DAY
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs	Cl. Pesticides	Dioxins/Furans	TOC	PP Metals	PCBs	Notes
ZP-SAND	01 A-H	9/23/15		SAND	8				X	X	X	X	X	X	X	X	

Samples received at 4 °C

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	STEVEN PADILLA	KRAZAN	9/24/15	9:35
Received by:	Michael Erdahl	FGBinc	↓	↓
Relinquished by:				
Received by:				

Samples received at °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

September 30, 2015

FAL Project ID: 9315

Mr. Michael Erdahl
Friedman and Bruya, Inc.
3012 16th Ave. W
Seattle, WA 98119

Dear Mr. Erdahl,

Enclosed are the results for Frontier Analytical Laboratory project **9315**. This corresponds to your project number **509421** and purchase order number **D-656**. One soil sample was received at Frontier Analytical Laboratory on 9/25/2015. This sample was extracted and analyzed by EPA Method 1613 for tetra through octa chlorinated dibenzo dioxins and furans. The Toxic Equivalency (TEQ) for your sample has been calculated using the 2005 World Health Organization's (WHO's) toxic equivalency factors (TEFs). Freidman and Bruya, Inc. requested a **RUSH** turnaround time of **FIVE** business days for project **9315**.

The following report consists of an Analytical Data section and a Sample Receipt section. The Analytical Data section contains our project-sample tracking log and the analytical results. The Sample Receipt section contains your chain of custody, our sample login form and a sample photo. The enclosed results are specifically for the sample referenced in this report only. These results meet all National Environmental Laboratory Accreditation Program (NELAP) requirements and shall not be reproduced except in full. Frontier Analytical Laboratory's State of Oregon NELAP certificate number is **4041**, our State of California ELAP certificate number is **2934** and our State of Washington certificate number is **C844**. This report has been emailed to you as a portable document file (PDF). A hardcopy will not be sent to you unless specifically requested.

If you have any questions regarding project **9315**, please feel free to contact me at (916) 934-0900. Thank you for choosing Frontier Analytical Laboratory for your analytical testing needs.

Sincerely,

Thomas C. Crabtree

Thomas C. Crabtree
Director

Frontier Analytical Laboratory

Sample Tracking Log

FAL Project ID: **9315**

Received on: **09/25/2015** Project Due: **10/05/2015** Storage: **R3**

FAL Sample ID	Dup	Client Project ID	Client Sample ID	Requested Method	Matrix	Sampling Date	Sampling Time	Hold Time Due Date
9315-001-SA	0	509421	ZP-Sand	EPA 1613 D/F	Soil	09/23/2015	NP	09/22/2016

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 9315-001-MB
Client ID: Method Blank
Matrix: Soil
Batch No: X3457

Date Extracted: 09-25-2015
Date Received: NA
Amount: 5.00 g

ICal: PCDDFAL3-9-22-15
GC Column: DB5
Units: pg/g

Acquired: 09-28-2015
2005 WHO TEQ: 0.00
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.0651		-	0.0184				
1,2,3,7,8-PeCDD	ND	0.145		-	0.0275				
1,2,3,4,7,8-HxCDD	ND	0.199		-	0.0314				
1,2,3,6,7,8-HxCDD	ND	0.226		-	0.0335	Total TCDD	ND	0.0651	
1,2,3,7,8,9-HxCDD	ND	0.194		-	0.0296	Total PeCDD	ND	0.145	
1,2,3,4,6,7,8-HpCDD	ND	0.302		-	0.0492	Total HxCDD	ND	0.226	
OCDD	ND	0.386		-	0.136	Total HpCDD	ND	0.302	
2,3,7,8-TCDF	ND	0.0932		-	0.0211				
1,2,3,7,8-PeCDF	ND	0.102		-	0.0235				
2,3,4,7,8-PeCDF	ND	0.101		-	0.0247				
1,2,3,4,7,8-HxCDF	ND	0.0825		-	0.0251				
1,2,3,6,7,8-HxCDF	ND	0.0808		-	0.0235				
2,3,4,6,7,8-HxCDF	ND	0.0916		-	0.0271				
1,2,3,7,8,9-HxCDF	ND	0.104		-	0.0320	Total TCDF	ND	0.0932	
1,2,3,4,6,7,8-HpCDF	ND	0.0977		-	0.0280	Total PeCDF	ND	0.102	
1,2,3,4,7,8,9-HpCDF	ND	0.110		-	0.0359	Total HxCDF	ND	0.104	
OCDF	ND	0.211		-	0.0531	Total HpCDF	ND	0.110	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	97.0	25.0 - 164	
13C-1,2,3,7,8-PeCDD	99.0	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	95.1	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	93.2	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	95.1	23.0 - 140	
13C-OCDD	76.6	17.0 - 157	
13C-2,3,7,8-TCDF	104	24.0 - 169	
13C-1,2,3,7,8-PeCDF	97.0	24.0 - 185	
13C-2,3,4,7,8-PeCDF	101	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	97.9	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	97.3	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	92.7	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	92.3	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	88.2	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	106	26.0 - 138	
13C-OCDF	78.3	17.0 - 157	

Cleanup Surrogate		
37Cl-2,3,7,8-TCDD	99.4	35.0 - 197

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: _____
Date: 9/29/2015

Reviewed By: _____
Date: 9/29/2015

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EPA Method 1613
PCDD/F

FAL ID: 9315-001-OPR
Client ID: OPR
Matrix: Soil
Batch No: X3457

Date Extracted: 09-25-2015
Date Received: NA
Amount: 5.00 g

ICal: PCDDFAL3-9-22-15
GC Column: DB5
Units: ng/ml

Acquired: 09-28-2015
2005 WHO TEQ: NA

Compound	Conc	QC Limits	Qual
2,3,7,8-TCDD	10.2	6.70 - 15.8	
1,2,3,7,8-PeCDD	50.6	35.0 - 71.0	
1,2,3,4,7,8-HxCDD	50.1	35.0 - 82.0	
1,2,3,6,7,8-HxCDD	52.1	38.0 - 67.0	
1,2,3,7,8,9-HxCDD	49.0	32.0 - 81.0	
1,2,3,4,6,7,8-HpCDD	50.7	35.0 - 70.0	
OCDD	103	78.0 - 144	
2,3,7,8-TCDF	10.2	7.50 - 15.8	
1,2,3,7,8-PeCDF	52.5	40.0 - 67.0	
2,3,4,7,8-PeCDF	52.7	34.0 - 80.0	
1,2,3,4,7,8-HxCDF	47.3	36.0 - 67.0	
1,2,3,6,7,8-HxCDF	49.7	42.0 - 65.0	
2,3,4,6,7,8-HxCDF	49.3	35.0 - 78.0	
1,2,3,7,8,9-HxCDF	49.8	39.0 - 65.0	
1,2,3,4,6,7,8-HpCDF	52.7	41.0 - 61.0	
1,2,3,4,7,8,9-HpCDF	50.1	39.0 - 69.0	
OCDF	105	63.0 - 170	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	95.9	20.0 - 175	
13C-1,2,3,7,8-PeCDD	97.3	21.0 - 227	
13C-1,2,3,4,7,8-HxCDD	97.2	21.0 - 193	
13C-1,2,3,6,7,8-HxCDD	93.8	25.0 - 163	
13C-1,2,3,4,6,7,8-HpCDD	93.3	26.0 - 166	
13C-OCDD	78.1	13.0 - 198	
13C-2,3,7,8-TCDF	103	22.0 - 152	
13C-1,2,3,7,8-PeCDF	95.6	21.0 - 192	
13C-2,3,4,7,8-PeCDF	98.8	13.0 - 328	
13C-1,2,3,4,7,8-HxCDF	99.7	19.0 - 202	
13C-1,2,3,6,7,8-HxCDF	99.8	21.0 - 159	
13C-2,3,4,6,7,8-HxCDF	95.9	22.0 - 176	
13C-1,2,3,7,8,9-HxCDF	94.2	17.0 - 205	
13C-1,2,3,4,6,7,8-HpCDF	86.3	21.0 - 158	
13C-1,2,3,4,7,8,9-HpCDF	107	20.0 - 186	
13C-OCDF	79.3	13.0 - 198	

Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	98.8	31.0 - 191	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: _____

Date: 9/29/2015

Reviewed By: _____

Date: 9/29/2015

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 9315-001-SA
Client ID: ZP-Sand
Matrix: Soil
Batch No: X3457

Date Extracted: 09-25-2015
Date Received: 09-25-2015
Amount: 5.51 g
% Solids: 95.40

ICal: PCDDFAL3-9-22-15
GC Column: DB5
Units: pg/g

Acquired: 09-28-2015
2005 WHO TEQ: 0.00
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.132		-	0.0184				
1,2,3,7,8-PeCDD	ND	0.183		-	0.0275				
1,2,3,4,7,8-HxCDD	ND	0.309		-	0.0314				
1,2,3,6,7,8-HxCDD	ND	0.347		-	0.0335	Total TCDD	ND	0.132	
1,2,3,7,8,9-HxCDD	ND	0.299		-	0.0296	Total PeCDD	ND	0.183	
1,2,3,4,6,7,8-HpCDD	ND	0.623		-	0.0492	Total HxCDD	ND	0.347	
OCDD	ND	1.39		-	0.136	Total HpCDD	ND	0.623	
2,3,7,8-TCDF	ND	0.112		-	0.0211				
1,2,3,7,8-PeCDF	ND	0.237		-	0.0235				
2,3,4,7,8-PeCDF	ND	0.251		-	0.0247				
1,2,3,4,7,8-HxCDF	ND	0.206		-	0.0251				
1,2,3,6,7,8-HxCDF	ND	0.209		-	0.0235				
2,3,4,6,7,8-HxCDF	ND	0.263		-	0.0271				
1,2,3,7,8,9-HxCDF	ND	0.352		-	0.0320	Total TCDF	ND	0.112	
1,2,3,4,6,7,8-HpCDF	ND	0.340		-	0.0280	Total PeCDF	ND	0.251	
1,2,3,4,7,8,9-HpCDF	ND	0.480		-	0.0359	Total HxCDF	ND	0.352	
OCDF	ND	0.772		-	0.0531	Total HpCDF	ND	0.480	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	75.9	25.0 - 164	
13C-1,2,3,7,8-PeCDD	69.6	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	92.1	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	86.5	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	67.9	23.0 - 140	
13C-OCDD	40.3	17.0 - 157	
13C-2,3,7,8-TCDF	80.2	24.0 - 169	
13C-1,2,3,7,8-PeCDF	70.7	24.0 - 185	
13C-2,3,4,7,8-PeCDF	67.8	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	93.2	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	88.1	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	74.0	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	65.2	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	73.6	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	66.2	26.0 - 138	
13C-OCDF	41.3	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	90.5	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: _____
Date: 9/29/2015

Reviewed By: _____
Date: 9/29/2015

5172 Hillsdale Circle * El Dorado Hills, CA 95762 * Tel (916) 934-0900 * Fax (916) 934-0999 * www.frontieranalytical.com

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

9315
40c

Page # 1 of 1

Send Report To Michael Erdahl
Company Friedman and Bruya, Inc.
Address 3012 16th Ave W
City, State, ZIP Seattle, WA 98119
Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Frontier.

PROJECT NAME/NO.	PO #
509421	D-656

REMARKS
Please Email Results

TURNAROUND TIME
☐ Standard (2 Weeks)
☒ RUSH 5-day
Rush charges authorized by: ME

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins and Furans by 8290 1613	EPH	VPH	Nitrate	Sulfate	Alkalinity					Notes
ZP-Sand		9/23/15		So:1	1	X										

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman & Bruya	9/24/15	10:30 AM
Received by:	Kathy Zipp	Kathy Zipp	Frontier Analytical	9/25/15	10:00
Relinquished by:					
Received by:					

Frontier Analytical Laboratory

Sample Login Form

FAL Project ID: **9315**

Client:	Friedman & Bruya, Inc.
Client Project ID:	509421
Date Received:	09/25/2015
Time Received:	10:00 am
Received By:	KZ
Logged In By:	KZ
# of Samples Received:	1
Duplicates:	0
Storage Location:	R3

Method of Delivery:	Fed-Ex
Tracking Number:	804312999525
Shipping Container Received Intact	Yes
Custody seals(s) present?	No
Custody seals(s) intact?	No
Sample Arrival Temperature (C)	4
Cooling Method	Blue Ice
Chain Of Custody Present?	Yes
Return Shipping Container To Client	Yes
Test aqueous sample for residual Chlorine	No
Sodium Thiosulfate Added	No
Adequate Sample Volume	Yes
Appropriate Sample Container	No
pH Range of Aqueous Sample	N/A

Anomalies or additional comments:

Please note that the sample was received in a clear glass jar. NELAC requires samples be received in an amber glass bottle or jar. Although this anomaly will not affect your results, we are required by NELAC to make a note of it. We will proceed with analysis unless directed otherwise by you.

5172 Hillsdale Circle * El Dorado Hills, CA 95762 * Tel (916) 934-0900 * Fax (916) 934-0999 * www.frontieranalytical.com

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

9315
4oc

Page # 1 of 1

Send Report To: Michael Erdahl
Company: Friedman and Bruya, Inc.
Address: 3012 16th Ave W
City, State, ZIP: Seattle, WA 98119
Phone #: (206) 285-8282 Fax #: (206) 283-5044

SUBCONTRACTER: Frontier
PROJECT NAME/NO.: 509421
PO #: D-656
REMARKS: Please Email Results

TURNAROUND TIME
☐ Standard (2 Weeks)
☒ RUSH 5-day
Rush charges authorized by: ME

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins and Furans by 8290	EPH	VPH	Nitrate	Sulfate	Alkalinity	Notes
ZP-Sand		9/23/15		So:1	1	X						

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	COMPANY	DATE	TIME
Relinquished by:	Friedman & Bruya	9/24/15	10:30 AM
Received by: Kathy Zoe	Frontier Analytical	9/25/15	10:00
Relinquished by:			
Received by:			

509421
ZP
SAND

Frontier Analytical Laboratory
9315-001-SA
Client ID: ZP-Sand
Storage: R3
(01 of 01)

2015/09/25

5172 Hillsdale Circle * El Dorado Hills, CA 95762 * Tel (916) 934-0900 * Fax (916) 934-0999 * www.frontieranalytical.com

The State of Washington Department of Ecology

Friedman & Bruya, Inc.
Seattle, WA

has complied with provisions set forth in Chapter 173-50 WAC and is hereby recognized by the Department of Ecology as an ACCREDITED LABORATORY for the analytical parameters listed on the accompanying Scope of Accreditation. This certificate is effective January 10, 2015 and shall expire January 9, 2016.

Witnessed under my hand on January 6, 2015

Alan D. Rue
Lab Accreditation Unit Supervisor

Laboratory ID
C578

WASHINGTON STATE DEPARTMENT OF ECOLOGY

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

SCOPE OF ACCREDITATION

Friedman & Bruya, Inc.

Seattle, WA

is accredited for the analytes listed below using the methods indicated. Full accreditation is granted unless stated otherwise in a note. Accreditation for U.S. Environmental Protection Agency (EPA) "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846) is for the latest version of the method. SM refers to EPA approved editions of "Standard Methods for the Examination of Water and Wastewater." ASTM is the American Society for Testing and Materials. Other references are described in notes.

Matrix/Analyte	Method	Notes
Non-Potable Water		
n-Hexane Extractable Material (O&G)	EPA 1664A (SGT-HEM)	
Turbidity	SM 2130 B-01	
Solids, Total Suspended	SM 2540 D-97	2
Mercury	EPA 1631 E-02	1
Antimony	EPA 200.8_5.4_1994	1
Arsenic	EPA 200.8_5.4_1994	1
Barium	EPA 200.8_5.4_1994	1
Beryllium	EPA 200.8_5.4_1994	1
Cadmium	EPA 200.8_5.4_1994	1
Chromium	EPA 200.8_5.4_1994	1
Cobalt	EPA 200.8_5.4_1994	1
Copper	EPA 200.8_5.4_1994	1
Iron	EPA 200.8_5.4_1994	1
Lead	EPA 200.8_5.4_1994	1
Manganese	EPA 200.8_5.4_1994	1
Mercury	EPA 200.8_5.4_1994	1,4
Molybdenum	EPA 200.8_5.4_1994	1
Nickel	EPA 200.8_5.4_1994	1
Selenium	EPA 200.8_5.4_1994	1
Silver	EPA 200.8_5.4_1994	1
Thallium	EPA 200.8_5.4_1994	1
Vanadium	EPA 200.8_5.4_1994	1

Matrix/Analyte	Method	Notes
Zinc	EPA 200.8_5.4_1994	1
Ethane	EPA RSK-175	1
Ethene	EPA RSK-175	1
Methane	EPA RSK-175	1
Solid and Chemical Materials		
pH	EPA 9040C_2002	
Mercury	EPA 1631 E-02	1
Antimony	EPA 200.8_5.4_1994	1
Arsenic	EPA 200.8_5.4_1994	1
Barium	EPA 200.8_5.4_1994	1
Beryllium	EPA 200.8_5.4_1994	1
Cadmium	EPA 200.8_5.4_1994	1
Chromium	EPA 200.8_5.4_1994	1
Cobalt	EPA 200.8_5.4_1994	1
Copper	EPA 200.8_5.4_1994	1
Lead	EPA 200.8_5.4_1994	1
Manganese	EPA 200.8_5.4_1994	1
Mercury	EPA 200.8_5.4_1994	1
Molybdenum	EPA 200.8_5.4_1994	1
Nickel	EPA 200.8_5.4_1994	1
Selenium	EPA 200.8_5.4_1994	1
Silver	EPA 200.8_5.4_1994	1
Thallium	EPA 200.8_5.4_1994	1
Vanadium	EPA 200.8_5.4_1994	1
Zinc	EPA 200.8_5.4_1994	1
Antimony	EPA 6020A_(2/07)	
Arsenic	EPA 6020A_(2/07)	
Barium	EPA 6020A_(2/07)	
Beryllium	EPA 6020A_(2/07)	
Cadmium	EPA 6020A_(2/07)	
Chromium	EPA 6020A_(2/07)	
Cobalt	EPA 6020A_(2/07)	
Copper	EPA 6020A_(2/07)	
Iron	EPA 6020A_(2/07)	
Lead	EPA 6020A_(2/07)	

Matrix/Analyte	Method	Notes
Manganese	EPA 6020A_(2/07)	
Molybdenum	EPA 6020A_(2/07)	
Nickel	EPA 6020A_(2/07)	
Selenium	EPA 6020A_(2/07)	
Silver	EPA 6020A_(2/07)	2
Thallium	EPA 6020A_(2/07)	
Vanadium	EPA 6020A_(2/07)	
Zinc	EPA 6020A_(2/07)	
Aroclor-1016 (PCB-1016)	EPA 8082A_(2/07)	1
Aroclor-1221 (PCB-1221)	EPA 8082A_(2/07)	1
Aroclor-1232 (PCB-1232)	EPA 8082A_(2/07)	1
Aroclor-1242 (PCB-1242)	EPA 8082A_(2/07)	1
Aroclor-1248 (PCB-1248)	EPA 8082A_(2/07)	1
Aroclor-1254 (PCB-1254)	EPA 8082A_(2/07)	1
Aroclor-1260 (PCB-1260)	EPA 8082A_(2/07)	1
Total Pet Hydrocarbons - Diesel	WDOE NWTPH-Dx_(1997)	1
Total Pet Hydrocarbons - Gasoline	WDOE NWTPH-Gx_(1997)	1
1,1,1,2-Tetrachloroethane	EPA 8260C_(8/06)	1
1,1,1-Trichloro-2,2,2-trifluoroethane	EPA 8260C_(8/06)	1
1,1,1-Trichloro-2-propanone	EPA 8260C_(8/06)	1
1,1,1-Trichloroethane	EPA 8260C_(8/06)	1
1,1,2,2-Tetrachloroethane	EPA 8260C_(8/06)	1
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	EPA 8260C_(8/06)	1
1,1,2-Trichloroethane	EPA 8260C_(8/06)	1
1,1,2-Trichlorofluoroethane	EPA 8260C_(8/06)	1
1,1-Dichloro-1-fluoroethane	EPA 8260C_(8/06)	1
1,1-Dichloroethane	EPA 8260C_(8/06)	1
1,1-Dichloroethylene	EPA 8260C_(8/06)	1
1,1-Dichloropropene	EPA 8260C_(8/06)	1
1,2,3,4-Diepoxybutane	EPA 8260C_(8/06)	1
1,2,3-Trichlorobenzene	EPA 8260C_(8/06)	1
1,2,3-Trichloropropane	EPA 8260C_(8/06)	1
1,2,3-Trimethylbenzene	EPA 8260C_(8/06)	1
1,2,4-Trichlorobenzene	EPA 8260C_(8/06)	1

Matrix/Analyte	Method	Notes
1,2,4-Trimethylbenzene	EPA 8260C_(8/06)	1
1,2-Dibromo-3-chloropropane (DBCP)	EPA 8260C_(8/06)	1
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8260C_(8/06)	1
1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)	EPA 8260C_(8/06)	1
1,2-Dichloro-1,1,2-trifluoroethane	EPA 8260C_(8/06)	1
1,2-Dichlorobenzene	EPA 8260C_(8/06)	1
1,2-Dichloroethane (Ethylene dichloride)	EPA 8260C_(8/06)	1
1,2-Dichloropropane	EPA 8260C_(8/06)	1
1,2-Dimethoxyethane	EPA 8260C_(8/06)	1
1,3,5-Trimethylbenzene	EPA 8260C_(8/06)	1
1,3-Butanediol	EPA 8260C_(8/06)	1
1,3-Dichloro-2-propanol	EPA 8260C_(8/06)	1
1,3-Dichlorobenzene	EPA 8260C_(8/06)	1
1,3-Dichloropropane	EPA 8260C_(8/06)	1
1,3-Dichloropropene	EPA 8260C_(8/06)	1
1,4-Butanediol	EPA 8260C_(8/06)	1
1,4-Dichloro-2-butene	EPA 8260C_(8/06)	1
1,4-Dichlorobenzene	EPA 8260C_(8/06)	1
1,4-Difluorobenzene	EPA 8260C_(8/06)	1
1,4-Dioxane (1,4- Diethyleneoxide)	EPA 8260C_(8/06)	3
1-Butene	EPA 8260C_(8/06)	1
1-Chloro-1,2,2-trifluoroethane (Freon 133)	EPA 8260C_(8/06)	1
1-Chlorobutane	EPA 8260C_(8/06)	1
1-Chlorohexane	EPA 8260C_(8/06)	1
1-Heptene	EPA 8260C_(8/06)	1
1-Hexene	EPA 8260C_(8/06)	1
1-Methyl-2-n-propylbenzene	EPA 8260C_(8/06)	1
1-Propene	EPA 8260C_(8/06)	1
2,2,4-Trimethylpentane	EPA 8260C_(8/06)	1
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	EPA 8260C_(8/06)	1
2,2-Dichloropropane	EPA 8260C_(8/06)	1
2,2-Dimethylbutane	EPA 8260C_(8/06)	1
2,2'-Oxybis(1-chloropropane)	EPA 8260C_(8/06)	1
2,3,4-Trimethylpentane	EPA 8260C_(8/06)	1
2,3-Dichloropropene	EPA 8260C_(8/06)	1
2,3-Dimethylbutane	EPA 8260C_(8/06)	1

Matrix/Analyte	Method	Notes
2,3-Dimethylpentane	EPA 8260C_(8/06)	1
2,4-Dimethylpentane	EPA 8260C_(8/06)	1
2-Bromofluorobenzene	EPA 8260C_(8/06)	1
2-Butanone (Methyl ethyl ketone, MEK)	EPA 8260C_(8/06)	1
2-Chloro-2-methybutane (tert-Amyl chloride)	EPA 8260C_(8/06)	1
2-Chloroethanol	EPA 8260C_(8/06)	1
2-Chloroethyl vinyl ether	EPA 8260C_(8/06)	1
2-Chlorotoluene	EPA 8260C_(8/06)	1
2-Ethylhexanol (2-Ethyl-1-hexanol)	EPA 8260C_(8/06)	1
2-Ethyltoluene	EPA 8260C_(8/06)	1
2-Hexanone	EPA 8260C_(8/06)	1
2-Hexene	EPA 8260C_(8/06)	1
2-Hydroxypropionitrile	EPA 8260C_(8/06)	1
2-Methoxyethanol (Methyl cellosolve)	EPA 8260C_(8/06)	1
2-Methyl-1,3-dioxolane	EPA 8260C_(8/06)	1
2-Methyl-2-Butene	EPA 8260C_(8/06)	1
2-Methylaniline (o-Toluidine)	EPA 8260C_(8/06)	1
2-Methylbutadiene (Isoprene)	EPA 8260C_(8/06)	1
2-Methylbutane (Isopentane)	EPA 8260C_(8/06)	1
2-Methylheptane	EPA 8260C_(8/06)	1
2-Methylhexane	EPA 8260C_(8/06)	1
2-Methylpentane (Isohexane)	EPA 8260C_(8/06)	1
2-methylpropane (Isobutane)	EPA 8260C_(8/06)	1
2-Nitropropane	EPA 8260C_(8/06)	1
2-Pentanone	EPA 8260C_(8/06)	1
2-Picoline (2-Methylpyridine)	EPA 8260C_(8/06)	1
3-Bromofluorobenzene	EPA 8260C_(8/06)	1
3-Butene-1-ol	EPA 8260C_(8/06)	1
3-Chloropropionitrile	EPA 8260C_(8/06)	1
3-Ethyltoluene	EPA 8260C_(8/06)	1
3-Methyl-1-Butene	EPA 8260C_(8/06)	1
3-Methylheptane	EPA 8260C_(8/06)	1
3-Methylhexane	EPA 8260C_(8/06)	1
3-Methylpentane	EPA 8260C_(8/06)	1
4-Bromofluorobenzene	EPA 8260C_(8/06)	1
4-Chlorotoluene	EPA 8260C_(8/06)	1

Matrix/Analyte	Method	Notes
4-Ethyltoluene	EPA 8260C_(8/06)	1
4-Isopropyltoluene (p-Cymene)	EPA 8260C_(8/06)	1
4-Methyl-1-Pentene	EPA 8260C_(8/06)	1
4-Methyl-2-pentanone (MIBK)	EPA 8260C_(8/06)	1
4-Methylaniline (p-Toluidine)	EPA 8260C_(8/06)	1
Acetamide	EPA 8260C_(8/06)	1
Acetone	EPA 8260C_(8/06)	1
Acetonitrile	EPA 8260C_(8/06)	1
Acetylene	EPA 8260C_(8/06)	1
Acrolein (Propenal)	EPA 8260C_(8/06)	1
Acrylamide	EPA 8260C_(8/06)	1
Acrylic acid	EPA 8260C_(8/06)	1
Acrylonitrile	EPA 8260C_(8/06)	1
Adsorbable Organic Halides (AOX)	EPA 8260C_(8/06)	1
Allyl alcohol	EPA 8260C_(8/06)	1
Allyl chloride (3-Chloropropene)	EPA 8260C_(8/06)	1
alpha-Methylstyrene	EPA 8260C_(8/06)	1
Benzene	EPA 8260C_(8/06)	1
beta-Propiolactone	EPA 8260C_(8/06)	1
bis(2-Chloroethyl) sulfide	EPA 8260C_(8/06)	1
bis(Chloromethyl)ether	EPA 8260C_(8/06)	1
Bromoacetone	EPA 8260C_(8/06)	1
Bromobenzene	EPA 8260C_(8/06)	1
Bromochloromethane	EPA 8260C_(8/06)	1
Bromodichloromethane	EPA 8260C_(8/06)	1
Bromoethane (Ethyl Bromide)	EPA 8260C_(8/06)	1
Bromoethene	EPA 8260C_(8/06)	1
Bromoform	EPA 8260C_(8/06)	1
Butyl acetate	EPA 8260C_(8/06)	1
Carbon disulfide	EPA 8260C_(8/06)	1
Carbon tetrachloride	EPA 8260C_(8/06)	1
Chloral hydrate	EPA 8260C_(8/06)	1
Chloroacetonitrile	EPA 8260C_(8/06)	1
Chlorobenzene	EPA 8260C_(8/06)	1
Chlorodibromomethane	EPA 8260C_(8/06)	1
Chlorodifluoromethane (Freon-22)	EPA 8260C_(8/06)	1

Matrix/Analyte	Method	Notes
Chloroethane (Ethyl chloride)	EPA 8260C_(8/06)	1
Chloroform	EPA 8260C_(8/06)	1
Chloromethyl methyl ether	EPA 8260C_(8/06)	1
Chloroprene (2-Chloro-1,3-butadiene)	EPA 8260C_(8/06)	1
cis & trans-1,2-Dichloroethene	EPA 8260C_(8/06)	1
cis-1,2-Dichloroethylene	EPA 8260C_(8/06)	1
cis-1,3-Dichloropropene	EPA 8260C_(8/06)	1
cis-1,4-Dichloro-2-butene	EPA 8260C_(8/06)	1
cis-2-Butene	EPA 8260C_(8/06)	1
cis-2-Hexene	EPA 8260C_(8/06)	1
cis-2-pentene	EPA 8260C_(8/06)	1
Cycloate	EPA 8260C_(8/06)	1
Cyclohexane	EPA 8260C_(8/06)	1
Cyclohexanol	EPA 8260C_(8/06)	1
Cyclohexanone	EPA 8260C_(8/06)	1
Cyclopentane	EPA 8260C_(8/06)	1
Cyclopentene	EPA 8260C_(8/06)	1
Decanal	EPA 8260C_(8/06)	1
Dibromochloropropane	EPA 8260C_(8/06)	1
Dibromofluoromethane	EPA 8260C_(8/06)	1
Dibromomethane	EPA 8260C_(8/06)	1
Dichlorodifluoromethane (Freon-12)	EPA 8260C_(8/06)	1
Dichlorofluoromethane (Freon 21)	EPA 8260C_(8/06)	1
Dichlorotetrafluoroethane	EPA 8260C_(8/06)	1
Dicyclopentadiene	EPA 8260C_(8/06)	1
Diethyl ether	EPA 8260C_(8/06)	1
Diethylamine	EPA 8260C_(8/06)	1
Diethylene glycol	EPA 8260C_(8/06)	1
Dimethyl disulfide	EPA 8260C_(8/06)	1
Dimethyl sulfoxide	EPA 8260C_(8/06)	1
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	EPA 8260C_(8/06)	1
Ethane	EPA 8260C_(8/06)	1
Ethanol	EPA 8260C_(8/06)	1
Ethene	EPA 8260C_(8/06)	1
Ethyl acetate	EPA 8260C_(8/06)	1
Ethyl acrylate	EPA 8260C_(8/06)	1

Matrix/Analyte	Method	Notes
Ethyl methacrylate	EPA 8260C_(8/06)	1
Ethyl tert-Butyl alcohol	EPA 8260C_(8/06)	1
Ethylbenzene	EPA 8260C_(8/06)	1
Ethylene glycol	EPA 8260C_(8/06)	1
Ethylene oxide	EPA 8260C_(8/06)	1
Ethylene thiourea	EPA 8260C_(8/06)	1
Ethyleneimine	EPA 8260C_(8/06)	1
Ethyl-t-butylether (ETBE)	EPA 8260C_(8/06)	1
Fluorobenzene	EPA 8260C_(8/06)	1
Fluoromethane (Freon 41)	EPA 8260C_(8/06)	1
Heptanal	EPA 8260C_(8/06)	1
Hexachlorobutadiene	EPA 8260C_(8/06)	1
Hexachloroethane	EPA 8260C_(8/06)	1
Iodomethane (Methyl iodide)	EPA 8260C_(8/06)	1
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 8260C_(8/06)	1
Isopropyl acetate	EPA 8260C_(8/06)	1
Isopropyl alcohol (2-Propanol, Isopropanol)	EPA 8260C_(8/06)	1
Isopropylbenzene	EPA 8260C_(8/06)	1
m+p-xylene	EPA 8260C_(8/06)	1
Malononitrile	EPA 8260C_(8/06)	1
Methacrylonitrile	EPA 8260C_(8/06)	1
Methane	EPA 8260C_(8/06)	1
Methanol	EPA 8260C_(8/06)	1
Methyl acetate	EPA 8260C_(8/06)	1
Methyl acrylate	EPA 8260C_(8/06)	1
Methyl bromide (Bromomethane)	EPA 8260C_(8/06)	1
Methyl chloride (Chloromethane)	EPA 8260C_(8/06)	1
Methyl formate	EPA 8260C_(8/06)	1
Methyl methacrylate	EPA 8260C_(8/06)	1
Methyl tert-butyl ether (MTBE)	EPA 8260C_(8/06)	1
Methylcyclohexane	EPA 8260C_(8/06)	1
Methylcyclopentane	EPA 8260C_(8/06)	1
Methylene chloride (Dichloromethane)	EPA 8260C_(8/06)	1
m-Xylene	EPA 8260C_(8/06)	1
n, n-Dimethylformamide	EPA 8260C_(8/06)	1
n-Amyl acetate	EPA 8260C_(8/06)	1

Matrix/Analyte	Method	Notes
n-Amyl alcohol	EPA 8260C_(8/06)	1
Naphthalene	EPA 8260C_(8/06)	1
n-Butane	EPA 8260C_(8/06)	1
n-Butyl alcohol (1-Butanol, n-Butanol)	EPA 8260C_(8/06)	1
n-Butylbenzene	EPA 8260C_(8/06)	1
n-Butylcyclopentane	EPA 8260C_(8/06)	1
n-Heptane	EPA 8260C_(8/06)	1
n-Hexane	EPA 8260C_(8/06)	1
Nitrobenzene	EPA 8260C_(8/06)	1
n-Nitroso-di-n-butylamine	EPA 8260C_(8/06)	1
n-Nonane	EPA 8260C_(8/06)	1
n-Octane	EPA 8260C_(8/06)	1
n-Pentane	EPA 8260C_(8/06)	1
n-Propane	EPA 8260C_(8/06)	1
n-Propanol (1-Propanol)	EPA 8260C_(8/06)	1
n-Propylamine	EPA 8260C_(8/06)	1
n-Propylbenzene	EPA 8260C_(8/06)	1
o-Xylene	EPA 8260C_(8/06)	1
p-Diethylbenzene	EPA 8260C_(8/06)	1
Pentachloroethane	EPA 8260C_(8/06)	1
Pentafluorobenzene	EPA 8260C_(8/06)	1
Propargyl alcohol	EPA 8260C_(8/06)	1
Propionitrile (Ethyl cyanide)	EPA 8260C_(8/06)	1
Propyne	EPA 8260C_(8/06)	1
Purgeable Organic Halides	EPA 8260C_(8/06)	1
p-Xylene	EPA 8260C_(8/06)	1
Pyridine	EPA 8260C_(8/06)	1
Sec-Amyl Alcohol (2-Pentanol)	EPA 8260C_(8/06)	1
sec-Butylbenzene	EPA 8260C_(8/06)	1
S-Methyl thioacetate (S-Methyl etanethioate)	EPA 8260C_(8/06)	1
Styrene	EPA 8260C_(8/06)	1
tert-Amyl alcohol (TAA)	EPA 8260C_(8/06)	1
tert-Amyl ethyl ether (TAEE)	EPA 8260C_(8/06)	1
tert-amylmethylether (TAME)	EPA 8260C_(8/06)	1
tert-Butyl alcohol	EPA 8260C_(8/06)	1
tert-Butylbenzene	EPA 8260C_(8/06)	1

Matrix/Analyte	Method	Notes
Tetrachloroethylene (Perchloroethylene)	EPA 8260C_(8/06)	1
Tetrahydrofuran (THF)	EPA 8260C_(8/06)	1
Toluene	EPA 8260C_(8/06)	1
Total Trihalomethanes	EPA 8260C_(8/06)	1
Total Volatile Petroleum Hydrocarbons (VPH)	EPA 8260C_(8/06)	1
trans-1,2-Dichloroethylene	EPA 8260C_(8/06)	1
trans-1,3-Dichloropropylene	EPA 8260C_(8/06)	1
trans-1,4-Dichloro-2-butene	EPA 8260C_(8/06)	1
trans-2-Butene	EPA 8260C_(8/06)	1
trans-2-Hexene	EPA 8260C_(8/06)	1
trans-2-pentene	EPA 8260C_(8/06)	1
Trichloroethene (Trichloroethylene)	EPA 8260C_(8/06)	1
Trichlorofluoromethane (Freon 11)	EPA 8260C_(8/06)	1
Triethylamine	EPA 8260C_(8/06)	1
Trifluoromethane (Freon 23)	EPA 8260C_(8/06)	1
Vinyl acetate	EPA 8260C_(8/06)	1
Vinyl bromide	EPA 8260C_(8/06)	1
Vinyl chloride	EPA 8260C_(8/06)	1
Xylene (total)	EPA 8260C_(8/06)	1
1,2,4,5-Tetrachlorobenzene	EPA 8270D_(2/07)	1
1,2,4-Trichlorobenzene	EPA 8270D_(2/07)	1
1,2-Dibromo-3-chloropropane (DBCP)	EPA 8270D_(2/07)	1
1,2-Dichlorobenzene	EPA 8270D_(2/07)	1
1,2-Dinitrobenzene	EPA 8270D_(2/07)	1
1,2-Diphenylhydrazine	EPA 8270D_(2/07)	1
1,3,5-Trinitrobenzene (1,3,5-TNB)	EPA 8270D_(2/07)	1
1,3-Dichlorobenzene	EPA 8270D_(2/07)	1
1,3-Dinitrobenzene (1,3-DNB)	EPA 8270D_(2/07)	1
1,4-Dichlorobenzene	EPA 8270D_(2/07)	1
1,4-Dinitrobenzene	EPA 8270D_(2/07)	1
1,4-Naphthoquinone	EPA 8270D_(2/07)	1
1,4-Phenylenediamine	EPA 8270D_(2/07)	1
1-Acetyl-2-thiourea	EPA 8270D_(2/07)	1
1-Chloronaphthalene	EPA 8270D_(2/07)	1
1-Methylnaphthalene	EPA 8270D_(2/07)	1,3
1-Naphthylamine	EPA 8270D_(2/07)	1

Matrix/Analyte	Method	Notes
2,3,4,6-Tetrachlorophenol	EPA 8270D_(2/07)	1
2,4,5-Trichlorophenol	EPA 8270D_(2/07)	1
2,4,5-Trimethylaniline	EPA 8270D_(2/07)	1
2,4,6-Trichlorophenol	EPA 8270D_(2/07)	1
2,4-Diaminotoluene	EPA 8270D_(2/07)	1
2,4-Dichlorophenol	EPA 8270D_(2/07)	1
2,4-Dimethylphenol	EPA 8270D_(2/07)	1
2,4-Dinitrophenol	EPA 8270D_(2/07)	1
2,4-Dinitrotoluene (2,4-DNT)	EPA 8270D_(2/07)	1
2,6-Dichlorophenol	EPA 8270D_(2/07)	1
2,6-Dinitrotoluene (2,6-DNT)	EPA 8270D_(2/07)	1
2-Acetylaminofluorene	EPA 8270D_(2/07)	1
2-Aminoanthraquinone	EPA 8270D_(2/07)	1
2-Chloronaphthalene	EPA 8270D_(2/07)	1
2-Chlorophenol	EPA 8270D_(2/07)	1
2-Cyclohexyl-4,6-dinitrophenol	EPA 8270D_(2/07)	1
2-Methylaniline (o-Toluidine)	EPA 8270D_(2/07)	1
2-Methylnaphthalene	EPA 8270D_(2/07)	1, 3
2-Methylphenol (o-Cresol)	EPA 8270D_(2/07)	1
2-Naphthylamine	EPA 8270D_(2/07)	1
2-Nitroaniline	EPA 8270D_(2/07)	1
2-Nitrophenol	EPA 8270D_(2/07)	1
2-Picoline (2-Methylpyridine)	EPA 8270D_(2/07)	1
3-(Chloromethyl) pyridine hydrochloride	EPA 8270D_(2/07)	1
3,3'-Dichlorobenzidine	EPA 8270D_(2/07)	1
3,3'-Dimethoxybenzidine	EPA 8270D_(2/07)	1
3,3'-Dimethylbenzidine	EPA 8270D_(2/07)	1
3-Amino-9-ethylcarbazole	EPA 8270D_(2/07)	1
3-Methylcholanthrene	EPA 8270D_(2/07)	1
3-Methylphenol (m-Cresol)	EPA 8270D_(2/07)	1
3-Nitroaniline	EPA 8270D_(2/07)	1
4,4'-DDD	EPA 8270D_(2/07)	1
4,4'-DDE	EPA 8270D_(2/07)	1
4,4'-DDT	EPA 8270D_(2/07)	1
4,4'-Methylenebis(2-chloroaniline)	EPA 8270D_(2/07)	1
4,4'-Methylenebis(n, n-dimethylaniline)	EPA 8270D_(2/07)	1

Matrix/Analyte	Method	Notes
4,4'-Oxydianiline	EPA 8270D_(2/07)	1
4,6-Dinitro-2-methylphenol	EPA 8270D_(2/07)	1
4-Aminobiphenyl	EPA 8270D_(2/07)	1
4-Bromophenyl phenyl ether (BDE-3)	EPA 8270D_(2/07)	1
4-Chloro-1,2-phenylenediamine	EPA 8270D_(2/07)	1
4-Chloro-1,3-phenylenediamine	EPA 8270D_(2/07)	1
4-Chloro-3-methylphenol	EPA 8270D_(2/07)	1
4-Chloroaniline	EPA 8270D_(2/07)	1
4-Chlorophenol	EPA 8270D_(2/07)	1
4-Chlorophenyl phenylether	EPA 8270D_(2/07)	1
4-Dimethyl aminoazobenzene	EPA 8270D_(2/07)	1
4-Methylphenol (p-Cresol)	EPA 8270D_(2/07)	1
4-Nitroaniline	EPA 8270D_(2/07)	1
4-Nitrobiphenyl	EPA 8270D_(2/07)	1
4-Nitrophenol	EPA 8270D_(2/07)	1
5,5-Diphenylhydantoin	EPA 8270D_(2/07)	1
5-Chloro-2-methylaniline	EPA 8270D_(2/07)	1
5-Nitroacenaphthene	EPA 8270D_(2/07)	1
5-Nitro-o-anisidine	EPA 8270D_(2/07)	1
5-Nitro-o-toluidine	EPA 8270D_(2/07)	1
7,12-Dimethylbenz(a) anthracene	EPA 8270D_(2/07)	1
a,a-Dimethylphenethylamine	EPA 8270D_(2/07)	1
Acenaphthene	EPA 8270D_(2/07)	1,3
Acenaphthylene	EPA 8270D_(2/07)	1,3
Acetophenone	EPA 8270D_(2/07)	1
Aldrin	EPA 8270D_(2/07)	1
alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 8270D_(2/07)	1
alpha-Terpineol	EPA 8270D_(2/07)	1
Aminoazobenzene	EPA 8270D_(2/07)	1
Anilazine	EPA 8270D_(2/07)	1
Aniline	EPA 8270D_(2/07)	1
Anthracene	EPA 8270D_(2/07)	1,3
Aramite	EPA 8270D_(2/07)	1
Aroclor-1016 (PCB-1016)	EPA 8270D_(2/07)	1
Aroclor-1221 (PCB-1221)	EPA 8270D_(2/07)	1
Aroclor-1232 (PCB-1232)	EPA 8270D_(2/07)	1

Matrix/Analyte	Method	Notes
Aroclor-1242 (PCB-1242)	EPA 8270D_(2/07)	1
Aroclor-1248 (PCB-1248)	EPA 8270D_(2/07)	1
Aroclor-1254 (PCB-1254)	EPA 8270D_(2/07)	1
Aroclor-1260 (PCB-1260)	EPA 8270D_(2/07)	1
Atrazine	EPA 8270D_(2/07)	1
Azinphos-methyl (Guthion)	EPA 8270D_(2/07)	1
Barban	EPA 8270D_(2/07)	1
Benzidine	EPA 8270D_(2/07)	1
Benzo(a)anthracene	EPA 8270D_(2/07)	1,3
Benzo(a)pyrene	EPA 8270D_(2/07)	1,3
Benzo(g,h,i)perylene	EPA 8270D_(2/07)	1,3
Benzo(k)fluoranthene	EPA 8270D_(2/07)	1,3
Benzo[b]fluoranthene	EPA 8270D_(2/07)	1,3
Benzoic acid	EPA 8270D_(2/07)	1
Benzyl alcohol	EPA 8270D_(2/07)	1
beta-BHC (beta-Hexachlorocyclohexane)	EPA 8270D_(2/07)	1
Biphenyl	EPA 8270D_(2/07)	1
bis(2-Chloroethoxy)methane	EPA 8270D_(2/07)	1
bis(2-Chloroethyl) ether	EPA 8270D_(2/07)	1
bis(2-Chloroisopropyl) ether	EPA 8270D_(2/07)	1
Bromoxynil octanate	EPA 8270D_(2/07)	1
Butyl benzyl phthalate	EPA 8270D_(2/07)	1
Captafol	EPA 8270D_(2/07)	1
Captan	EPA 8270D_(2/07)	1
Carbaryl (Sevin)	EPA 8270D_(2/07)	1
Carbazole	EPA 8270D_(2/07)	1
Carbofuran (Furaden)	EPA 8270D_(2/07)	1
Carbophenothion	EPA 8270D_(2/07)	1
Chlordane (tech.)	EPA 8270D_(2/07)	1
Chlorfenvinphos	EPA 8270D_(2/07)	1
Chlorobenzilate	EPA 8270D_(2/07)	1
Chlorpyrifos	EPA 8270D_(2/07)	1
Chrysene	EPA 8270D_(2/07)	1,3
Coumaphos	EPA 8270D_(2/07)	1
Crotoxyphos	EPA 8270D_(2/07)	1
delta-BHC	EPA 8270D_(2/07)	1

Matrix/Analyte	Method	Notes
Demeton	EPA 8270D_(2/07)	1
Demeton-o	EPA 8270D_(2/07)	1
Demeton-s	EPA 8270D_(2/07)	1
Di(2-ethylhexyl)adipate	EPA 8270D_(2/07)	1
Di(2-ethylhexyl)phthalate	EPA 8270D_(2/07)	1
Diallate	EPA 8270D_(2/07)	1
Dibenz(a,h) acridine	EPA 8270D_(2/07)	1
Dibenz(a,h) anthracene	EPA 8270D_(2/07)	1,3
Dibenz(a,j) acridine	EPA 8270D_(2/07)	1
Dibenzo(a,e) pyrene	EPA 8270D_(2/07)	1
Dibenzofuran	EPA 8270D_(2/07)	1
Dibenzothiophene	EPA 8270D_(2/07)	1
Dichlone	EPA 8270D_(2/07)	1
Dichlorovos (DDVP, Dichlorvos)	EPA 8270D_(2/07)	1
Dicrotophos	EPA 8270D_(2/07)	1
Dieldrin	EPA 8270D_(2/07)	1
Diethyl phthalate	EPA 8270D_(2/07)	1
Diethyl sulfate	EPA 8270D_(2/07)	1
Diethylstilbestrol	EPA 8270D_(2/07)	1
Dihydrosafrole	EPA 8270D_(2/07)	1
Dimethoate	EPA 8270D_(2/07)	1
Dimethyl phthalate	EPA 8270D_(2/07)	1
Di-n-butyl phthalate	EPA 8270D_(2/07)	1
Dinocap	EPA 8270D_(2/07)	1
Di-n-octyl phthalate	EPA 8270D_(2/07)	1
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8270D_(2/07)	1
Diphenylamine	EPA 8270D_(2/07)	1
Disulfoton	EPA 8270D_(2/07)	1
Endosulfan I	EPA 8270D_(2/07)	1
Endosulfan II	EPA 8270D_(2/07)	1
Endosulfan sulfate	EPA 8270D_(2/07)	1
Endrin	EPA 8270D_(2/07)	1
Endrin aldehyde	EPA 8270D_(2/07)	1
Endrin ketone	EPA 8270D_(2/07)	1
EPN	EPA 8270D_(2/07)	1
Ethion	EPA 8270D_(2/07)	1

Matrix/Analyte	Method	Notes
Ethyl carbamate (Urethane)	EPA 8270D_(2/07)	1
Ethyl methanesulfonate	EPA 8270D_(2/07)	1
Famphur	EPA 8270D_(2/07)	1
Fensulfothion	EPA 8270D_(2/07)	1
Fenthion	EPA 8270D_(2/07)	1
Fluchloralin	EPA 8270D_(2/07)	1
Fluoranthene	EPA 8270D_(2/07)	1,3
Fluorene	EPA 8270D_(2/07)	1,3
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 8270D_(2/07)	1
Heptachlor	EPA 8270D_(2/07)	1
Heptachlor epoxide	EPA 8270D_(2/07)	1
Hexachlorobenzene	EPA 8270D_(2/07)	1
Hexachlorobutadiene	EPA 8270D_(2/07)	1
Hexachlorocyclopentadiene	EPA 8270D_(2/07)	1
Hexachloroethane	EPA 8270D_(2/07)	1
Hexachlorophene	EPA 8270D_(2/07)	1
Hexachloropropene	EPA 8270D_(2/07)	1
Hexamethylphosphoramide (HMPA)	EPA 8270D_(2/07)	1
Hydroquinone	EPA 8270D_(2/07)	1
Indeno(1,2,3-cd) pyrene	EPA 8270D_(2/07)	1,3
Isodrin	EPA 8270D_(2/07)	1
Isophorone	EPA 8270D_(2/07)	1
Isosafrole	EPA 8270D_(2/07)	1
Kepone	EPA 8270D_(2/07)	1
Leptophos	EPA 8270D_(2/07)	1
Malathion	EPA 8270D_(2/07)	1
Maleic anhydride	EPA 8270D_(2/07)	1
Mestranol	EPA 8270D_(2/07)	1
Methamphetamine	EPA 8270D_(2/07)	
Methapyrilene	EPA 8270D_(2/07)	1
Methoxychlor	EPA 8270D_(2/07)	1
Methyl methanesulfonate	EPA 8270D_(2/07)	1
Methyl parathion (Parathion, methyl)	EPA 8270D_(2/07)	1
Mevinphos	EPA 8270D_(2/07)	1
Mexacarbate	EPA 8270D_(2/07)	1
Mirex	EPA 8270D_(2/07)	1

Matrix/Analyte	Method	Notes
Monocrotophos	EPA 8270D_(2/07)	1
Naled	EPA 8270D_(2/07)	1
Naphthalene	EPA 8270D_(2/07)	1,3
n-Hexadecane	EPA 8270D_(2/07)	1
Nicotine	EPA 8270D_(2/07)	1
Nitrobenzene	EPA 8270D_(2/07)	1
Nitrofen	EPA 8270D_(2/07)	1
Nitroquinoline-1-oxide	EPA 8270D_(2/07)	1
n-Nitrosodiethylamine	EPA 8270D_(2/07)	1
n-Nitrosodimethylamine	EPA 8270D_(2/07)	1
n-Nitroso-di-n-butylamine	EPA 8270D_(2/07)	1
N-Nitroso-di-n-propylamine	EPA 8270D_(2/07)	1
n-Nitrosodiphenylamine	EPA 8270D_(2/07)	1
n-Nitrosomethylethalamine	EPA 8270D_(2/07)	1
n-Nitrosomorpholine	EPA 8270D_(2/07)	1
n-Nitrosopiperidine	EPA 8270D_(2/07)	1
n-Nitrosopyrrolidine	EPA 8270D_(2/07)	1
n-Tetradecane	EPA 8270D_(2/07)	1
o,o,o-Triethyl phosphorothioate	EPA 8270D_(2/07)	1
o-Anisidine	EPA 8270D_(2/07)	1
Octamethyl pyrophosphoramide	EPA 8270D_(2/07)	1
Parathion	EPA 8270D_(2/07)	1
p-Benzoquinone	EPA 8270D_(2/07)	1
p-Cresidine	EPA 8270D_(2/07)	1
Pentachlorobenzene	EPA 8270D_(2/07)	1
Pentachloronitrobenzene	EPA 8270D_(2/07)	1
Pentachlorophenol	EPA 8270D_(2/07)	1
Phenacetin	EPA 8270D_(2/07)	1
Phenanthrene	EPA 8270D_(2/07)	1,3
Phenobarbital	EPA 8270D_(2/07)	1
Phenol	EPA 8270D_(2/07)	1
Phorate	EPA 8270D_(2/07)	1
Phosalone	EPA 8270D_(2/07)	1
Phosmet (Imidan)	EPA 8270D_(2/07)	1
Phosphamidon	EPA 8270D_(2/07)	1
Phthalic anhydride	EPA 8270D_(2/07)	1

Matrix/Analyte	Method	Notes
Piperonyl sulfoxide	EPA 8270D_(2/07)	1
Pronamide (Kerb)	EPA 8270D_(2/07)	1
Propylthiouracil	EPA 8270D_(2/07)	1
Pyrene	EPA 8270D_(2/07)	1,3
Pyridine	EPA 8270D_(2/07)	1
Resorcinol	EPA 8270D_(2/07)	1
Safrole	EPA 8270D_(2/07)	1
Strychnine	EPA 8270D_(2/07)	1
Sulfallate	EPA 8270D_(2/07)	1
Terbufos	EPA 8270D_(2/07)	1
Tetrachlorvinphos (Stirophos, Gardona)	EPA 8270D_(2/07)	1
Tetraethyl dithiopyrophosphate	EPA 8270D_(2/07)	1
Tetraethyl pyrophosphate (TEPP)	EPA 8270D_(2/07)	1
Thionazin (Zinophos)	EPA 8270D_(2/07)	1
Thiophenol (Benzenethiol)	EPA 8270D_(2/07)	1
Toluene diisocyanate	EPA 8270D_(2/07)	1
Toxaphene (Chlorinated camphene)	EPA 8270D_(2/07)	1
Trifluralin (Treflan)	EPA 8270D_(2/07)	1
Trimethyl phosphate	EPA 8270D_(2/07)	1
Tri-p-tolyl phosphate	EPA 8270D_(2/07)	1
tris-(2,3-Dibromopropyl) phosphate (tris-BP)	EPA 8270D_(2/07)	1

Accredited Parameter Note Detail

(1) Accreditation based in part on recognition of Oregon NELAP accreditation. (2) Provisional accreditation pending the submittal of recent, acceptable proficiency testing (PT) study results. (3) Accreditation inlcudes selective ion monitoring (SIM). (4) Method not approved for NPDES testing.

01/06/2015

Authentication Signature
Alan D. Rue, Lab Accreditation Unit Supervisor

Date

Parameters Not Accredited

Friedman & Bruya, Inc.

Seattle, WA

Analyte	Method	Notes	Matrix
1,1,1,2-Tetrachloroethane	EPA 524.2_4.1_1995	a	D
1,1,1-Trichloroethane	EPA 524.2_4.1_1995	a	D
1,1,2,2-Tetrachloroethane	EPA 524.2_4.1_1995	a	D
1,1,2-Trichloroethane	EPA 524.2_4.1_1995	a	D
1,1-Dichloroethane	EPA 524.2_4.1_1995	a	D
1,1-Dichloroethylene	EPA 524.2_4.1_1995	a	D
1,1-Dichloropropene	EPA 524.2_4.1_1995	a	D
1,2,3-Trichlorobenzene	EPA 524.2_4.1_1995	a	D
1,2,4-Trichlorobenzene	EPA 524.2_4.1_1995	a	D
1,2,4-Trimethylbenzene	EPA 524.2_4.1_1995	a	D
1,2-Dichlorobenzene	EPA 524.2_4.1_1995	a	D
1,2-Dichloroethane (Ethylene dichloride)	EPA 524.2_4.1_1995	a	D
1,2-Dichloropropane	EPA 524.2_4.1_1995	a	D
1,3,5-Trimethylbenzene	EPA 524.2_4.1_1995	a	D
1,3-Dichloropropane	EPA 524.2_4.1_1995	a	D
1,4-Dichlorobenzene	EPA 524.2_4.1_1995	a	D
2,2-Dichloropropane	EPA 524.2_4.1_1995	a	D
4-Isopropyltoluene (p-Cymene)	EPA 524.2_4.1_1995	a	D
Acrolein (Propenal)	EPA 524.2_4.1_1995	a	D
Benzene	EPA 524.2_4.1_1995	a	D
Bromobenzene	EPA 524.2_4.1_1995	a	D
Bromochloromethane	EPA 524.2_4.1_1995	a	D
Bromodichloromethane	EPA 524.2_4.1_1995	a	D
Bromoform	EPA 524.2_4.1_1995	a	D
Carbon tetrachloride	EPA 524.2_4.1_1995	a	D
Chlorobenzene	EPA 524.2_4.1_1995	a	D
Chlorodibromomethane	EPA 524.2_4.1_1995	a	D
Chloroethane (Ethyl chloride)	EPA 524.2_4.1_1995	a	D
Chloroform	EPA 524.2_4.1_1995	a	D
cis-1,2-Dichloroethylene	EPA 524.2_4.1_1995	a	D
cis-1,3-Dichloropropene	EPA 524.2_4.1_1995	a	D
Dibromomethane	EPA 524.2_4.1_1995	a	D
Dichlorodifluoromethane (Freon-12)	EPA 524.2_4.1_1995	a	D
Dichloromethane (DCM, Methylene chloride)	EPA 524.2_4.1_1995	a	D
Ethylbenzene	EPA 524.2_4.1_1995	a	D
Hexachlorobutadiene	EPA 524.2_4.1_1995	a	D
Hexachloroethane	EPA 524.2_4.1_1995	a	D
Isopropylbenzene	EPA 524.2_4.1_1995	a	D
Methyl bromide (Bromomethane)	EPA 524.2_4.1_1995	a	D
Methyl chloride (Chloromethane)	EPA 524.2_4.1_1995	a	D
m-Xylene	EPA 524.2_4.1_1995	a	D

Analyte	Method	Notes	Matrix
Naphthalene	EPA 524.2_4.1_1995	a	D
n-Butylbenzene	EPA 524.2_4.1_1995	a	D
o-Xylene	EPA 524.2_4.1_1995	a	D
p-Xylene	EPA 524.2_4.1_1995	a	D
sec-Butylbenzene	EPA 524.2_4.1_1995	a	D
Styrene	EPA 524.2_4.1_1995	a	D
tert-Butylbenzene	EPA 524.2_4.1_1995	a	D
Tetrachloroethylene (Perchloroethylene)	EPA 524.2_4.1_1995	a	D
Toluene	EPA 524.2_4.1_1995	a	D
Total Trihalomethanes	EPA 524.2_4.1_1995	a	D
trans-1,2-Dichloroethylene	EPA 524.2_4.1_1995	a	D
Trichloroethene (Trichloroethylene)	EPA 524.2_4.1_1995	a	D
Trichlorofluoromethane (Freon 11)	EPA 524.2_4.1_1995	a	D
Vinyl chloride	EPA 524.2_4.1_1995	a	D
Xylene (total)	EPA 524.2_4.1_1995	a	D
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8011-94	a	S
Benzene	EPA 8021B_2_(12/96)	a	S
Ethylbenzene	EPA 8021B_2_(12/96)	a	S
m-Xylene	EPA 8021B_2_(12/96)	a	S
o-Xylene	EPA 8021B_2_(12/96)	a	S
p-Xylene	EPA 8021B_2_(12/96)	a	S
Toluene	EPA 8021B_2_(12/96)	a	S
Xylene (total)	EPA 8021B_2_(12/96)	a	S
pH	EPA 9045D_2002	b	S

Denied Parameter Accreditation Footnotes

(a) Not on Third Party Scope of Accreditation. (b) Denied pending receipt of acceptable PT results (WAC 173-50-140).

Matrix Definitions - D = Drinking Water; N = Non-potable Water; S = Solid and Chemical Material; A = Air and Emissions.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 488 • Manchester, WA 98353-0488 • (360) 871-8840

September 02, 2015

Mr. Dan Vickers
Frontier Analytical Laboratory
5172 Hillsdale Circle
El Dorado Hills,CA 95762

Dear Mr. Vickers:

Thank you for your application for renewal in the Environmental Laboratory Accreditation Program. Enclosed is a new Certificate of Accreditation covering the one-year period beginning September 4, 2015 and a current Scope of Accreditation.

Congratulations on your excellent work! Based on PT Study results submitted since your last renewal, full accreditation is warranted for all applicable parameters.

Accreditation is based in part on recognition of the Labs ORELAP accreditation.

As a reminder, continued participation in the Ecology Lab Accreditation Program requires the lab to:

- Submit a renewal application and fees annually.
- Report significant changes in facility, personnel, analytical methods, equipment, the lab's quality assurance (QA) manual or QA procedures as they occur.
- Participate in proficiency testing studies semi-annually, with the following exception: **For each parameter where all PT results were satisfactory, you are required to submit only one PT result over this next year, and in subsequent years, as long as the results are satisfactory.**
- Submit copies of current third-party Scopes of Accreditation when they are available.

If you have any questions concerning the accreditation of your lab, please contact Kamilee Ginder at (360) 871-8841, fax (360) 871-8849, or by e-mail at kamilee.ginder@ecy.wa.gov.

Sincerely,

Alan D. Rue
Lab Accreditation Unit Supervisor

AR:KG:kg
Enclosures

The State of Washington Department of Ecology

Frontier Analytical Laboratory
El Dorado Hills, CA

has complied with provisions set forth in Chapter 173-50 WAC and is hereby recognized by the Department of Ecology as an ACCREDITED LABORATORY for the analytical parameters listed on the accompanying Scope of Accreditation. This certificate is effective September 4, 2015 and shall expire September 3, 2016.

Witnessed under my hand on September 2, 2015

Alan D. Rue
Lab Accreditation Unit Supervisor

Laboratory ID
C844

WASHINGTON STATE DEPARTMENT OF ECOLOGY

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

SCOPE OF ACCREDITATION

Frontier Analytical Laboratory

El Dorado Hills, CA

is accredited for the analytes listed below using the methods indicated. Full accreditation is granted unless stated otherwise in a note. Accreditation for U.S. Environmental Protection Agency (EPA) "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846) is for the latest version of the method. SM refers to EPA approved editions of "Standard Methods for the Examination of Water and Wastewater." ASTM is the American Society for Testing and Materials. Other references are described in notes.

Matrix/Analyte	Method	Notes
Drinking Water		
2,3,7,8-TCDD	EPA 1613_1994	1
Non-Potable Water		
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	EPA 1613_1994	1
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	EPA 1613_1994	1
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7	EPA 1613_1994	1
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4	EPA 1613_1994	1
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8	EPA 1613_1994	1
1,2,3,4,7,8-Hxcdd	EPA 1613_1994	1
1,2,3,4,7,8-Hxcdf	EPA 1613_1994	1
1,2,3,6,7,8-Hxcdd	EPA 1613_1994	1
1,2,3,6,7,8-Hxcdf	EPA 1613_1994	1
1,2,3,7,8,9-Hxcdd	EPA 1613_1994	1
1,2,3,7,8,9-Hxcdf	EPA 1613_1994	1
1,2,3,7,8-Pecdd	EPA 1613_1994	1
1,2,3,7,8-Pecdf	EPA 1613_1994	1
2,3,4,6,7,8-Hxcdf	EPA 1613_1994	1
2,3,4,7,8-Pecdf	EPA 1613_1994	1
2,3,7,8-TCDD	EPA 1613_1994	1
2,3,7,8-TCDF	EPA 1613_1994	1
Hpcdd, total	EPA 1613_1994	1
Hpcdf, total	EPA 1613_1994	1

Matrix/Analyte	Method	Notes
Hxcdd, total	EPA 1613_1994	1
Hxcdf, total	EPA 1613_1994	1
Pecdd, total	EPA 1613_1994	1
Pecdf, total	EPA 1613_1994	1
TCDD, total	EPA 1613_1994	1
TCDF, total	EPA 1613_1994	1
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ-206)	EPA 1668C_2010	1
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ-194)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ-207)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ-195)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ-196)	EPA 1668C_2010	1
2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ-170)	EPA 1668C_2010	1
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ-197)	EPA 1668C_2010	1
2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ-171)	EPA 1668C_2010	1
2,2',3,3',4,4'-Hexachlorobiphenyl (BZ-128)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ-208)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ-198)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ-199)	EPA 1668C_2010	1
2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ-172)	EPA 1668C_2010	1
2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ-200)	EPA 1668C_2010	1
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ-201)	EPA 1668C_2010	1
2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ-173)	EPA 1668C_2010	1
2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ-174)	EPA 1668C_2010	1
2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ-175)	EPA 1668C_2010	1
2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ-177)	EPA 1668C_2010	1
2,2',3,3',4,5-Hexachlorobiphenyl (BZ-129)	EPA 1668C_2010	1
2,2',3,3',4,5'-Hexachlorobiphenyl (BZ-130)	EPA 1668C_2010	1
2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ-176)	EPA 1668C_2010	1
2,2',3,3',4,6-Hexachlorobiphenyl (BZ-131)	EPA 1668C_2010	1
2,2',3,3',4,6'-Hexachlorobiphenyl (BZ-132)	EPA 1668C_2010	1
2,2',3,3',4-Pentachlorobiphenyl (BZ-82)	EPA 1668C_2010	1
2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ-202)	EPA 1668C_2010	1
2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ-178)	EPA 1668C_2010	1
2,2',3,3',5,5'-Hexachlorobiphenyl (BZ-133)	EPA 1668C_2010	1
2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ-179)	EPA 1668C_2010	1
2,2',3,3',5,6-Hexachlorobiphenyl (BZ-134)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
2,2',3,3',5,6'-Hexachlorobiphenyl (BZ-135)	EPA 1668C_2010	1
2,2',3,3',5-Pentachlorobiphenyl (BZ-83)	EPA 1668C_2010	1
2,2',3,3',6,6'-Hexachlorobiphenyl (BZ-136)	EPA 1668C_2010	1
2,2',3,3',6-Pentachlorobiphenyl (BZ-84)	EPA 1668C_2010	1
2,2',3,3'-Tetrachlorobiphenyl (BZ-40)	EPA 1668C_2010	1
2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ-203)	EPA 1668C_2010	1
2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ-180)	EPA 1668C_2010	1
2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ-204)	EPA 1668C_2010	1
2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ-181)	EPA 1668C_2010	1
2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ-182)	EPA 1668C_2010	1
2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ-183)	EPA 1668C_2010	1
2,2',3,4,4',5-Hexachlorobiphenyl (BZ-137)	EPA 1668C_2010	1
2,2',3,4,4',5'-Hexachlorobiphenyl (BZ-138)	EPA 1668C_2010	1
2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ-184)	EPA 1668C_2010	1
2,2',3,4,4',6-Hexachlorobiphenyl (BZ-139)	EPA 1668C_2010	1
2,2',3,4,4',6'-Hexachlorobiphenyl (BZ-140)	EPA 1668C_2010	1
2,2',3,4,4'-Pentachlorobiphenyl (BZ-85)	EPA 1668C_2010	1
2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ-185)	EPA 1668C_2010	1
2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ-187)	EPA 1668C_2010	1
2,2',3,4,5,5'-Hexachlorobiphenyl (BZ-141)	EPA 1668C_2010	1
2,2',3,4',5,5'-Hexachlorobiphenyl (BZ-146)	EPA 1668C_2010	1
2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ-186)	EPA 1668C_2010	1
2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ-188)	EPA 1668C_2010	1
2,2',3,4,5,6-Hexachlorobiphenyl (BZ-142)	EPA 1668C_2010	1
2,2',3,4,5,6'-Hexachlorobiphenyl (BZ-143)	EPA 1668C_2010	1
2,2',3,4,5',6-Hexachlorobiphenyl (BZ-144)	EPA 1668C_2010	1
2,2',3,4',5,6-Hexachlorobiphenyl (BZ-147)	EPA 1668C_2010	1
2,2',3,4',5,6'-Hexachlorobiphenyl (BZ-148)	EPA 1668C_2010	1
2,2',3,4',5',6-Hexachlorobiphenyl (BZ-149)	EPA 1668C_2010	1
2,2',3,4,5-Pentachlorobiphenyl (BZ-86)	EPA 1668C_2010	1
2,2',3,4,5'-Pentachlorobiphenyl (BZ-87)	EPA 1668C_2010	1
2,2',3,4',5-Pentachlorobiphenyl (BZ-90)	EPA 1668C_2010	1
2,2',3,4',5'-Pentachlorobiphenyl (BZ-97)	EPA 1668C_2010	1
2,2',3,4,6,6'-Hexachlorobiphenyl (BZ-145)	EPA 1668C_2010	1
2,2',3,4',6,6'-Hexachlorobiphenyl (BZ-150)	EPA 1668C_2010	1
2,2',3,4,6-Pentachlorobiphenyl (BZ-88)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
2,2',3,4,6'-Pentachlorobiphenyl (BZ-89)	EPA 1668C_2010	1
2,2',3,4',6-Pentachlorobiphenyl (BZ-91)	EPA 1668C_2010	1
2,2',3,4',6'-Pentachlorobiphenyl (BZ-98)	EPA 1668C_2010	1
2,2',3,4-Tetrachlorobiphenyl (BZ-41)	EPA 1668C_2010	1
2,2',3,4'-Tetrachlorobiphenyl (BZ-42)	EPA 1668C_2010	1
2,2',3,5,5',6-Hexachlorobiphenyl (BZ-151)	EPA 1668C_2010	1
2,2',3,5,5'-Pentachlorobiphenyl (BZ-92)	EPA 1668C_2010	1
2,2',3,5,6,6'-Hexachlorobiphenyl (BZ-152)	EPA 1668C_2010	1
2,2',3,5,6-Pentachlorobiphenyl (BZ-93)	EPA 1668C_2010	1
2,2',3,5,6'-Pentachlorobiphenyl (BZ-94)	EPA 1668C_2010	1
2,2',3,5',6-Pentachlorobiphenyl (BZ-95)	EPA 1668C_2010	1
2,2',3,5-Tetrachlorobiphenyl (BZ-43)	EPA 1668C_2010	1
2,2',3,5'-Tetrachlorobiphenyl (BZ-44)	EPA 1668C_2010	1
2,2',3,6,6'-Pentachlorobiphenyl (BZ-96)	EPA 1668C_2010	1
2,2',3,6-Tetrachlorobiphenyl (BZ-45)	EPA 1668C_2010	1
2,2',3,6'-Tetrachlorobiphenyl (BZ-46)	EPA 1668C_2010	1
2,2',3-Trichlorobiphenyl (BZ-16)	EPA 1668C_2010	1
2,2',4,4',5,5'-Hexachlorobiphenyl (BZ-153)	EPA 1668C_2010	1
2,2',4,4',5,6'-Hexachlorobiphenyl (BZ-154)	EPA 1668C_2010	1
2,2',4,4',5-Pentachlorobiphenyl (BZ-99)	EPA 1668C_2010	1
2,2',4,4',6,6'-Hexachlorobiphenyl (BZ-155)	EPA 1668C_2010	1
2,2',4,4',6-Pentachlorobiphenyl (BZ-100)	EPA 1668C_2010	1
2,2',4,4'-Tetrachlorobiphenyl (BZ-47)	EPA 1668C_2010	1
2,2',4,5,5'-Pentachlorobiphenyl (BZ-101)	EPA 1668C_2010	1
2,2',4,5,6'-Pentachlorobiphenyl (BZ-102)	EPA 1668C_2010	1
2,2',4,5',6-Pentachlorobiphenyl (BZ-103)	EPA 1668C_2010	1
2,2',4,5-Tetrachlorobiphenyl (BZ-48)	EPA 1668C_2010	1
2,2',4,5'-Tetrachlorobiphenyl (BZ-49)	EPA 1668C_2010	1
2,2',4,6,6'-Pentachlorobiphenyl (BZ-104)	EPA 1668C_2010	1
2,2',4,6-Tetrachlorobiphenyl (BZ-50)	EPA 1668C_2010	1
2,2',4,6'-Tetrachlorobiphenyl (BZ-51)	EPA 1668C_2010	1
2,2',4-Trichlorobiphenyl (BZ-17)	EPA 1668C_2010	1
2,2',5,5'-Tetrachlorobiphenyl (BZ-52)	EPA 1668C_2010	1
2,2',5,6'-Tetrachlorobiphenyl (BZ-53)	EPA 1668C_2010	1
2,2',5-Trichlorobiphenyl (BZ-18)	EPA 1668C_2010	1
2,2',6,6'-Tetrachlorobiphenyl (BZ-54)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
2,2',6-Trichlorobiphenyl (BZ-19)	EPA 1668C_2010	1
2,2'-Dichlorobiphenyl (BZ-4)	EPA 1668C_2010	1
2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ-205)	EPA 1668C_2010	1
2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ-189)	EPA 1668C_2010	1
2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ-190)	EPA 1668C_2010	1
2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ-191)	EPA 1668C_2010	1
2,3,3',4,4',5-Hexachlorobiphenyl (BZ-156)	EPA 1668C_2010	1
2,3,3',4,4',5'-Hexachlorobiphenyl (BZ-157)	EPA 1668C_2010	1
2,3,3',4,4',6-Hexachlorobiphenyl (BZ-158)	EPA 1668C_2010	1
2,3,3',4,4'-Pentachlorobiphenyl (BZ-105)	EPA 1668C_2010	1
2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ-192)	EPA 1668C_2010	1
2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ-193)	EPA 1668C_2010	1
2,3,3',4,5,5'-Hexachlorobiphenyl (BZ-159)	EPA 1668C_2010	1
2,3,3',4',5,5'-Hexachlorobiphenyl (BZ-162)	EPA 1668C_2010	1
2,3,3',4,5,6-Hexachlorobiphenyl (BZ-160)	EPA 1668C_2010	1
2,3,3',4',5,6-Hexachlorobiphenyl (BZ-163)	EPA 1668C_2010	1
2,3,3',4',5',6-Hexachlorobiphenyl (BZ-164)	EPA 1668C_2010	1
2,3,3',4,5',6-Hexachlorobiphenyl (BZ-161)	EPA 1668C_2010	1
2,3,3',4,5-Pentachlorobiphenyl (BZ-106)	EPA 1668C_2010	1
2,3,3',4',5-Pentachlorobiphenyl (BZ-107)	EPA 1668C_2010	1
2,3,3',4,5'-Pentachlorobiphenyl (BZ-108)	EPA 1668C_2010	1
2,3,3',4',5'-Pentachlorobiphenyl (BZ-122)	EPA 1668C_2010	1
2,3,3',4,6-Pentachlorobiphenyl (BZ-109)	EPA 1668C_2010	1
2,3,3',4',6-Pentachlorobiphenyl (BZ-110)	EPA 1668C_2010	1
2,3,3',4-Tetrachlorobiphenyl (BZ-55)	EPA 1668C_2010	1
2,3,3',4'-Tetrachlorobiphenyl (BZ-56)	EPA 1668C_2010	1
2,3,3',5,5',6-Hexachlorobiphenyl (BZ-165)	EPA 1668C_2010	1
2,3,3',5,5'-Pentachlorobiphenyl (BZ-111)	EPA 1668C_2010	1
2,3,3',5,6-Pentachlorobiphenyl (BZ-112)	EPA 1668C_2010	1
2,3,3',5',6-Pentachlorobiphenyl (BZ-113)	EPA 1668C_2010	1
2,3,3',5-Tetrachlorobiphenyl (BZ-57)	EPA 1668C_2010	1
2,3,3',5'-Tetrachlorobiphenyl (BZ-58)	EPA 1668C_2010	1
2,3,3',6-Tetrachlorobiphenyl (BZ-59)	EPA 1668C_2010	1
2,3,3'-Trichlorobiphenyl (BZ-20)	EPA 1668C_2010	1
2,3',4,4',5,5'-Hexachlorobiphenyl (BZ-167)	EPA 1668C_2010	1
2,3,4,4',5,6-Hexachlorobiphenyl (BZ-166)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
2,3',4,4',5',6-Hexachlorobiphenyl (BZ-168)	EPA 1668C_2010	1
2,3,4,4',5-Pentachlorobiphenyl (BZ-114)	EPA 1668C_2010	1
2,3',4,4',5-Pentachlorobiphenyl (BZ-118)	EPA 1668C_2010	1
2,3',4,4',5'-Pentachlorobiphenyl (BZ-123)	EPA 1668C_2010	1
2,3,4,4',6-Pentachlorobiphenyl (BZ-115)	EPA 1668C_2010	1
2,3',4,4',6-Pentachlorobiphenyl (BZ-119)	EPA 1668C_2010	1
2,3,4,4'-Tetrachlorobiphenyl (BZ-60)	EPA 1668C_2010	1
2,3',4,4'-Tetrachlorobiphenyl (BZ-66)	EPA 1668C_2010	1
2,3',4,5,5'-Pentachlorobiphenyl (BZ-120)	EPA 1668C_2010	1
2,3',4',5,5'-Pentachlorobiphenyl (BZ-124)	EPA 1668C_2010	1
2,3,4,5,6-Pentachlorobiphenyl (BZ-116)	EPA 1668C_2010	1
2,3,4',5,6-Pentachlorobiphenyl (BZ-117)	EPA 1668C_2010	1
2,3',4,5',6-Pentachlorobiphenyl (BZ-121)	EPA 1668C_2010	1
2,3',4',5',6-Pentachlorobiphenyl (BZ-125)	EPA 1668C_2010	1
2,3,4,5-Tetrachlorobiphenyl (BZ-61)	EPA 1668C_2010	1
2,3,4',5-Tetrachlorobiphenyl (BZ-63)	EPA 1668C_2010	1
2,3',4,5'-Tetrachlorobiphenyl (BZ-68)	EPA 1668C_2010	1
2,3',4',5-Tetrachlorobiphenyl (BZ-70)	EPA 1668C_2010	1
2,3',4',5'-Tetrachlorobiphenyl (BZ-76)	EPA 1668C_2010	1
2,3',4,5-Tetrachlorobiphenyl (BZ-67)	EPA 1668C_2010	1
2,3,4,6-Tetrachlorobiphenyl (BZ-62)	EPA 1668C_2010	1
2,3,4',6-Tetrachlorobiphenyl (BZ-64)	EPA 1668C_2010	1
2,3',4,6-Tetrachlorobiphenyl (BZ-69)	EPA 1668C_2010	1
2,3',4',6-Tetrachlorobiphenyl (BZ-71)	EPA 1668C_2010	1
2,3,4-Trichlorobiphenyl (BZ-21)	EPA 1668C_2010	1
2,3,4'-Trichlorobiphenyl (BZ-22)	EPA 1668C_2010	1
2,3',4-Trichlorobiphenyl (BZ-25)	EPA 1668C_2010	1
2,3',4'-Trichlorobiphenyl (BZ-33)	EPA 1668C_2010	1
2,3',5,5'-Tetrachlorobiphenyl (BZ-72)	EPA 1668C_2010	1
2,3,5,6-Tetrachlorobiphenyl (BZ-65)	EPA 1668C_2010	1
2,3',5',6-Tetrachlorobiphenyl (BZ-73)	EPA 1668C_2010	1
2,3,5-Trichlorobiphenyl (BZ-23)	EPA 1668C_2010	1
2,3',5-Trichlorobiphenyl (BZ-26)	EPA 1668C_2010	1
2,3',5'-Trichlorobiphenyl (BZ-34)	EPA 1668C_2010	1
2,3,6-Trichlorobiphenyl (BZ-24)	EPA 1668C_2010	1
2,3',6-Trichlorobiphenyl (BZ-27)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
2,3-Dichlorobiphenyl (BZ-5)	EPA 1668C_2010	1
2,3'-Dichlorobiphenyl (BZ-6)	EPA 1668C_2010	1
2,4,4',5-Tetrachlorobiphenyl (BZ-74)	EPA 1668C_2010	1
2,4,4',6-Tetrachlorobiphenyl (BZ-75)	EPA 1668C_2010	1
2,4,4'-Trichlorobiphenyl (BZ-28)	EPA 1668C_2010	1
2,4,5-Trichlorobiphenyl (BZ-29)	EPA 1668C_2010	1
2,4',5-Trichlorobiphenyl (BZ-31)	EPA 1668C_2010	1
2,4,6-Trichlorobiphenyl (BZ-30)	EPA 1668C_2010	1
2,4',6-Trichlorobiphenyl (BZ-32)	EPA 1668C_2010	1
2,4-Dichlorobiphenyl (BZ-7)	EPA 1668C_2010	1
2,4'-Dichlorobiphenyl (BZ-8)	EPA 1668C_2010	1
2,5-Dichlorobiphenyl (BZ-9)	EPA 1668C_2010	1
2,6-Dichlorobiphenyl (BZ-10)	EPA 1668C_2010	1
2-Chlorobiphenyl (BZ-1)	EPA 1668C_2010	1
3,3',4,4',5,5'-Hexachlorobiphenyl (BZ-169)	EPA 1668C_2010	1
3,3',4,4',5-Pentachlorobiphenyl (BZ-126)	EPA 1668C_2010	1
3,3',4,4'-Tetrachlorobiphenyl (BZ-77)	EPA 1668C_2010	1
3,3',4,5,5'-Pentachlorobiphenyl (BZ-127)	EPA 1668C_2010	1
3,3',4,5-Tetrachlorobiphenyl (BZ-78)	EPA 1668C_2010	1
3,3',4,5'-Tetrachlorobiphenyl (BZ-79)	EPA 1668C_2010	1
3,3',4-Trichlorobiphenyl (BZ-35)	EPA 1668C_2010	1
3,3',5,5'-Tetrachlorobiphenyl (BZ-80)	EPA 1668C_2010	1
3,3',5-Trichlorobiphenyl (BZ-36)	EPA 1668C_2010	1
3,3'-Dichlorobiphenyl (BZ-11)	EPA 1668C_2010	1
3,4,4',5-Tetrachlorobiphenyl (BZ-81)	EPA 1668C_2010	1
3,4,4'-Trichlorobiphenyl (BZ-37)	EPA 1668C_2010	1
3,4,5-Trichlorobiphenyl (BZ-38)	EPA 1668C_2010	1
3,4',5-Trichlorobiphenyl (BZ-39)	EPA 1668C_2010	1
3,4-Dichlorobiphenyl (BZ-12)	EPA 1668C_2010	1
3,4'-Dichlorobiphenyl (BZ-13)	EPA 1668C_2010	1
3,5-Dichlorobiphenyl (BZ-14)	EPA 1668C_2010	1
3-Chlorobiphenyl (BZ-2)	EPA 1668C_2010	1
4,4'-Dichlorobiphenyl (BZ-15)	EPA 1668C_2010	1
4-Chlorobiphenyl (BZ-3)	EPA 1668C_2010	1
Decachlorobiphenyl (BZ-209)	EPA 1668C_2010	1
Total Dichlorobiphenyls	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
Total Heptachlorobiphenyls	EPA 1668C_2010	1
Total Hexachlorobiphenyls	EPA 1668C_2010	1
Total Monochlorobiphenyls	EPA 1668C_2010	1
Total Nonachlorobiphenyls	EPA 1668C_2010	1
Total Octachlorobiphenyls	EPA 1668C_2010	1
Total Pentachlorobiphenyls	EPA 1668C_2010	1
Total Tetrachlorobiphenyls	EPA 1668C_2010	1
Total Trichlorobiphenyls	EPA 1668C_2010	1
Solid and Chemical Materials		
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ-206)	EPA 1668C_2010	1
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (BZ-194)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl (BZ-207)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ-195)	EPA 1668C_2010	1
2,2',3,3',4,4',5,6'-Octachlorobiphenyl (BZ-196)	EPA 1668C_2010	1
2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ-170)	EPA 1668C_2010	1
2,2',3,3',4,4',6,6'-Octachlorobiphenyl (BZ-197)	EPA 1668C_2010	1
2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ-171)	EPA 1668C_2010	1
2,2',3,3',4,4'-Hexachlorobiphenyl (BZ-128)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (BZ-208)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6-Octachlorobiphenyl (BZ-198)	EPA 1668C_2010	1
2,2',3,3',4,5,5',6'-Octachlorobiphenyl (BZ-199)	EPA 1668C_2010	1
2,2',3,3',4,5,5'-Heptachlorobiphenyl (BZ-172)	EPA 1668C_2010	1
2,2',3,3',4,5,6,6'-Octachlorobiphenyl (BZ-200)	EPA 1668C_2010	1
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ-201)	EPA 1668C_2010	1
2,2',3,3',4,5,6-Heptachlorobiphenyl (BZ-173)	EPA 1668C_2010	1
2,2',3,3',4,5,6'-Heptachlorobiphenyl (BZ-174)	EPA 1668C_2010	1
2,2',3,3',4,5',6-Heptachlorobiphenyl (BZ-175)	EPA 1668C_2010	1
2,2',3,3',4,5',6'-Heptachlorobiphenyl (BZ-177)	EPA 1668C_2010	1
2,2',3,3',4,5-Hexachlorobiphenyl (BZ-129)	EPA 1668C_2010	1
2,2',3,3',4,5'-Hexachlorobiphenyl (BZ-130)	EPA 1668C_2010	1
2,2',3,3',4,6,6'-Heptachlorobiphenyl (BZ-176)	EPA 1668C_2010	1
2,2',3,3',4,6-Hexachlorobiphenyl (BZ-131)	EPA 1668C_2010	1
2,2',3,3',4,6'-Hexachlorobiphenyl (BZ-132)	EPA 1668C_2010	1
2,2',3,3',4-Pentachlorobiphenyl (BZ-82)	EPA 1668C_2010	1
2,2',3,3',5,5',6,6'-Octachlorobiphenyl (BZ-202)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
2,2',3,3',5,5',6-Heptachlorobiphenyl (BZ-178)	EPA 1668C_2010	1
2,2',3,3',5,5'-Hexachlorobiphenyl (BZ-133)	EPA 1668C_2010	1
2,2',3,3',5,6,6'-Heptachlorobiphenyl (BZ-179)	EPA 1668C_2010	1
2,2',3,3',5,6-Hexachlorobiphenyl (BZ-134)	EPA 1668C_2010	1
2,2',3,3',5,6'-Hexachlorobiphenyl (BZ-135)	EPA 1668C_2010	1
2,2',3,3',5-Pentachlorobiphenyl (BZ-83)	EPA 1668C_2010	1
2,2',3,3',6,6'-Hexachlorobiphenyl (BZ-136)	EPA 1668C_2010	1
2,2',3,3',6-Pentachlorobiphenyl (BZ-84)	EPA 1668C_2010	1
2,2',3,3'-Tetrachlorobiphenyl (BZ-40)	EPA 1668C_2010	1
2,2',3,4,4',5,5',6-Octachlorobiphenyl (BZ-203)	EPA 1668C_2010	1
2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ-180)	EPA 1668C_2010	1
2,2',3,4,4',5,6,6'-Octachlorobiphenyl (BZ-204)	EPA 1668C_2010	1
2,2',3,4,4',5,6-Heptachlorobiphenyl (BZ-181)	EPA 1668C_2010	1
2,2',3,4,4',5,6'-Heptachlorobiphenyl (BZ-182)	EPA 1668C_2010	1
2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ-183)	EPA 1668C_2010	1
2,2',3,4,4',5-Hexachlorobiphenyl (BZ-137)	EPA 1668C_2010	1
2,2',3,4,4',5'-Hexachlorobiphenyl (BZ-138)	EPA 1668C_2010	1
2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ-184)	EPA 1668C_2010	1
2,2',3,4,4',6-Hexachlorobiphenyl (BZ-139)	EPA 1668C_2010	1
2,2',3,4,4',6'-Hexachlorobiphenyl (BZ-140)	EPA 1668C_2010	1
2,2',3,4,4'-Pentachlorobiphenyl (BZ-85)	EPA 1668C_2010	1
2,2',3,4,5,5',6-Heptachlorobiphenyl (BZ-185)	EPA 1668C_2010	1
2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ-187)	EPA 1668C_2010	1
2,2',3,4,5,5'-Hexachlorobiphenyl (BZ-141)	EPA 1668C_2010	1
2,2',3,4',5,5'-Hexachlorobiphenyl (BZ-146)	EPA 1668C_2010	1
2,2',3,4,5,6,6'-Heptachlorobiphenyl (BZ-186)	EPA 1668C_2010	1
2,2',3,4',5,6,6'-Heptachlorobiphenyl (BZ-188)	EPA 1668C_2010	1
2,2',3,4,5,6-Hexachlorobiphenyl (BZ-142)	EPA 1668C_2010	1
2,2',3,4,5,6'-Hexachlorobiphenyl (BZ-143)	EPA 1668C_2010	1
2,2',3,4,5',6-Hexachlorobiphenyl (BZ-144)	EPA 1668C_2010	1
2,2',3,4',5,6-Hexachlorobiphenyl (BZ-147)	EPA 1668C_2010	1
2,2',3,4',5,6'-Hexachlorobiphenyl (BZ-148)	EPA 1668C_2010	1
2,2',3,4',5',6-Hexachlorobiphenyl (BZ-149)	EPA 1668C_2010	1
2,2',3,4,5-Pentachlorobiphenyl (BZ-86)	EPA 1668C_2010	1
2,2',3,4,5'-Pentachlorobiphenyl (BZ-87)	EPA 1668C_2010	1
2,2',3,4',5-Pentachlorobiphenyl (BZ-90)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
2,2',3,4',5'-Pentachlorobiphenyl (BZ-97)	EPA 1668C_2010	1
2,2',3,4,6,6'-Hexachlorobiphenyl (BZ-145)	EPA 1668C_2010	1
2,2',3,4',6,6'-Hexachlorobiphenyl (BZ-150)	EPA 1668C_2010	1
2,2',3,4,6-Pentachlorobiphenyl (BZ-88)	EPA 1668C_2010	1
2,2',3,4,6'-Pentachlorobiphenyl (BZ-89)	EPA 1668C_2010	1
2,2',3,4',6-Pentachlorobiphenyl (BZ-91)	EPA 1668C_2010	1
2,2',3,4',6'-Pentachlorobiphenyl (BZ-98)	EPA 1668C_2010	1
2,2',3,4-Tetrachlorobiphenyl (BZ-41)	EPA 1668C_2010	1
2,2',3,4'-Tetrachlorobiphenyl (BZ-42)	EPA 1668C_2010	1
2,2',3,5,5',6-Hexachlorobiphenyl (BZ-151)	EPA 1668C_2010	1
2,2',3,5,5'-Pentachlorobiphenyl (BZ-92)	EPA 1668C_2010	1
2,2',3,5,6,6'-Hexachlorobiphenyl (BZ-152)	EPA 1668C_2010	1
2,2',3,5,6-Pentachlorobiphenyl (BZ-93)	EPA 1668C_2010	1
2,2',3,5,6'-Pentachlorobiphenyl (BZ-94)	EPA 1668C_2010	1
2,2',3,5',6-Pentachlorobiphenyl (BZ-95)	EPA 1668C_2010	1
2,2',3,5-Tetrachlorobiphenyl (BZ-43)	EPA 1668C_2010	1
2,2',3,5'-Tetrachlorobiphenyl (BZ-44)	EPA 1668C_2010	1
2,2',3,6,6'-Pentachlorobiphenyl (BZ-96)	EPA 1668C_2010	1
2,2',3,6-Tetrachlorobiphenyl (BZ-45)	EPA 1668C_2010	1
2,2',3,6'-Tetrachlorobiphenyl (BZ-46)	EPA 1668C_2010	1
2,2',3-Trichlorobiphenyl (BZ-16)	EPA 1668C_2010	1
2,2',4,4',5,5'-Hexachlorobiphenyl (BZ-153)	EPA 1668C_2010	1
2,2',4,4',5,6'-Hexachlorobiphenyl (BZ-154)	EPA 1668C_2010	1
2,2',4,4',5-Pentachlorobiphenyl (BZ-99)	EPA 1668C_2010	1
2,2',4,4',6,6'-Hexachlorobiphenyl (BZ-155)	EPA 1668C_2010	1
2,2',4,4',6-Pentachlorobiphenyl (BZ-100)	EPA 1668C_2010	1
2,2',4,4'-Tetrachlorobiphenyl (BZ-47)	EPA 1668C_2010	1
2,2',4,5,5'-Pentachlorobiphenyl (BZ-101)	EPA 1668C_2010	1
2,2',4,5,6'-Pentachlorobiphenyl (BZ-102)	EPA 1668C_2010	1
2,2',4,5',6-Pentachlorobiphenyl (BZ-103)	EPA 1668C_2010	1
2,2',4,5-Tetrachlorobiphenyl (BZ-48)	EPA 1668C_2010	1
2,2',4,5'-Tetrachlorobiphenyl (BZ-49)	EPA 1668C_2010	1
2,2',4,6,6'-Pentachlorobiphenyl (BZ-104)	EPA 1668C_2010	1
2,2',4,6-Tetrachlorobiphenyl (BZ-50)	EPA 1668C_2010	1
2,2',4,6'-Tetrachlorobiphenyl (BZ-51)	EPA 1668C_2010	1
2,2',4-Trichlorobiphenyl (BZ-17)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
2,2',5,5'-Tetrachlorobiphenyl (BZ-52)	EPA 1668C_2010	1
2,2',5,6'-Tetrachlorobiphenyl (BZ-53)	EPA 1668C_2010	1
2,2',5-Trichlorobiphenyl (BZ-18)	EPA 1668C_2010	1
2,2',6,6'-Tetrachlorobiphenyl (BZ-54)	EPA 1668C_2010	1
2,2',6-Trichlorobiphenyl (BZ-19)	EPA 1668C_2010	1
2,2'-Dichlorobiphenyl (BZ-4)	EPA 1668C_2010	1
2,3,3',4,4',5,5',6-Octachlorobiphenyl (BZ-205)	EPA 1668C_2010	1
2,3,3',4,4',5,5'-Heptachlorobiphenyl (BZ-189)	EPA 1668C_2010	1
2,3,3',4,4',5,6-Heptachlorobiphenyl (BZ-190)	EPA 1668C_2010	1
2,3,3',4,4',5',6-Heptachlorobiphenyl (BZ-191)	EPA 1668C_2010	1
2,3,3',4,4',5-Hexachlorobiphenyl (BZ-156)	EPA 1668C_2010	1
2,3,3',4,4',5'-Hexachlorobiphenyl (BZ-157)	EPA 1668C_2010	1
2,3,3',4,4',6-Hexachlorobiphenyl (BZ-158)	EPA 1668C_2010	1
2,3,3',4,4'-Pentachlorobiphenyl (BZ-105)	EPA 1668C_2010	1
2,3,3',4,5,5',6-Heptachlorobiphenyl (BZ-192)	EPA 1668C_2010	1
2,3,3',4',5,5',6-Heptachlorobiphenyl (BZ-193)	EPA 1668C_2010	1
2,3,3',4,5,5'-Hexachlorobiphenyl (BZ-159)	EPA 1668C_2010	1
2,3,3',4',5,5'-Hexachlorobiphenyl (BZ-162)	EPA 1668C_2010	1
2,3,3',4,5,6-Hexachlorobiphenyl (BZ-160)	EPA 1668C_2010	1
2,3,3',4',5,6-Hexachlorobiphenyl (BZ-163)	EPA 1668C_2010	1
2,3,3',4',5',6-Hexachlorobiphenyl (BZ-164)	EPA 1668C_2010	1
2,3,3',4,5',6-Hexachlorobiphenyl (BZ-161)	EPA 1668C_2010	1
2,3,3',4,5-Pentachlorobiphenyl (BZ-106)	EPA 1668C_2010	1
2,3,3',4',5-Pentachlorobiphenyl (BZ-107)	EPA 1668C_2010	1
2,3,3',4,5'-Pentachlorobiphenyl (BZ-108)	EPA 1668C_2010	1
2,3,3',4',5'-Pentachlorobiphenyl (BZ-122)	EPA 1668C_2010	1
2,3,3',4,6-Pentachlorobiphenyl (BZ-109)	EPA 1668C_2010	1
2,3,3',4',6-Pentachlorobiphenyl (BZ-110)	EPA 1668C_2010	1
2,3,3',4-Tetrachlorobiphenyl (BZ-55)	EPA 1668C_2010	1
2,3,3',4'-Tetrachlorobiphenyl (BZ-56)	EPA 1668C_2010	1
2,3,3',5,5',6-Hexachlorobiphenyl (BZ-165)	EPA 1668C_2010	1
2,3,3',5,5'-Pentachlorobiphenyl (BZ-111)	EPA 1668C_2010	1
2,3,3',5,6-Pentachlorobiphenyl (BZ-112)	EPA 1668C_2010	1
2,3,3',5',6-Pentachlorobiphenyl (BZ-113)	EPA 1668C_2010	1
2,3,3',5-Tetrachlorobiphenyl (BZ-57)	EPA 1668C_2010	1
2,3,3',5'-Tetrachlorobiphenyl (BZ-58)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
2,3,3',6-Tetrachlorobiphenyl (BZ-59)	EPA 1668C_2010	1
2,3,3'-Trichlorobiphenyl (BZ-20)	EPA 1668C_2010	1
2,3',4,4',5,5'-Hexachlorobiphenyl (BZ-167)	EPA 1668C_2010	1
2,3,4,4',5,6-Hexachlorobiphenyl (BZ-166)	EPA 1668C_2010	1
2,3',4,4',5',6-Hexachlorobiphenyl (BZ-168)	EPA 1668C_2010	1
2,3,4,4',5-Pentachlorobiphenyl (BZ-114)	EPA 1668C_2010	1
2,3',4,4',5-Pentachlorobiphenyl (BZ-118)	EPA 1668C_2010	1
2,3',4,4',5'-Pentachlorobiphenyl (BZ-123)	EPA 1668C_2010	1
2,3,4,4',6-Pentachlorobiphenyl (BZ-115)	EPA 1668C_2010	1
2,3',4,4',6-Pentachlorobiphenyl (BZ-119)	EPA 1668C_2010	1
2,3,4,4'-Tetrachlorobiphenyl (BZ-60)	EPA 1668C_2010	1
2,3',4,4'-Tetrachlorobiphenyl (BZ-66)	EPA 1668C_2010	1
2,3',4,5,5'-Pentachlorobiphenyl (BZ-120)	EPA 1668C_2010	1
2,3',4',5,5'-Pentachlorobiphenyl (BZ-124)	EPA 1668C_2010	1
2,3,4,5,6-Pentachlorobiphenyl (BZ-116)	EPA 1668C_2010	1
2,3,4',5,6-Pentachlorobiphenyl (BZ-117)	EPA 1668C_2010	1
2,3',4,5',6-Pentachlorobiphenyl (BZ-121)	EPA 1668C_2010	1
2,3',4',5',6-Pentachlorobiphenyl (BZ-125)	EPA 1668C_2010	1
2,3,4,5-Tetrachlorobiphenyl (BZ-61)	EPA 1668C_2010	1
2,3,4',5-Tetrachlorobiphenyl (BZ-63)	EPA 1668C_2010	1
2,3',4,5'-Tetrachlorobiphenyl (BZ-68)	EPA 1668C_2010	1
2,3',4',5-Tetrachlorobiphenyl (BZ-70)	EPA 1668C_2010	1
2,3',4',5'-Tetrachlorobiphenyl (BZ-76)	EPA 1668C_2010	1
2,3',4,5-Tetrachlorobiphenyl (BZ-67)	EPA 1668C_2010	1
2,3,4,6-Tetrachlorobiphenyl (BZ-62)	EPA 1668C_2010	1
2,3,4',6-Tetrachlorobiphenyl (BZ-64)	EPA 1668C_2010	1
2,3',4,6-Tetrachlorobiphenyl (BZ-69)	EPA 1668C_2010	1
2,3',4',6-Tetrachlorobiphenyl (BZ-71)	EPA 1668C_2010	1
2,3,4-Trichlorobiphenyl (BZ-21)	EPA 1668C_2010	1
2,3,4'-Trichlorobiphenyl (BZ-22)	EPA 1668C_2010	1
2,3',4-Trichlorobiphenyl (BZ-25)	EPA 1668C_2010	1
2,3',4'-Trichlorobiphenyl (BZ-33)	EPA 1668C_2010	1
2,3',5,5'-Tetrachlorobiphenyl (BZ-72)	EPA 1668C_2010	1
2,3,5,6-Tetrachlorobiphenyl (BZ-65)	EPA 1668C_2010	1
2,3',5',6-Tetrachlorobiphenyl (BZ-73)	EPA 1668C_2010	1
2,3,5-Trichlorobiphenyl (BZ-23)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
2,3',5-Trichlorobiphenyl (BZ-26)	EPA 1668C_2010	1
2,3',5'-Trichlorobiphenyl (BZ-34)	EPA 1668C_2010	1
2,3,6-Trichlorobiphenyl (BZ-24)	EPA 1668C_2010	1
2,3',6-Trichlorobiphenyl (BZ-27)	EPA 1668C_2010	1
2,3-Dichlorobiphenyl (BZ-5)	EPA 1668C_2010	1
2,3'-Dichlorobiphenyl (BZ-6)	EPA 1668C_2010	1
2,4,4',5-Tetrachlorobiphenyl (BZ-74)	EPA 1668C_2010	1
2,4,4',6-Tetrachlorobiphenyl (BZ-75)	EPA 1668C_2010	1
2,4,4'-Trichlorobiphenyl (BZ-28)	EPA 1668C_2010	1
2,4,5-Trichlorobiphenyl (BZ-29)	EPA 1668C_2010	1
2,4',5-Trichlorobiphenyl (BZ-31)	EPA 1668C_2010	1
2,4,6-Trichlorobiphenyl (BZ-30)	EPA 1668C_2010	1
2,4',6-Trichlorobiphenyl (BZ-32)	EPA 1668C_2010	1
2,4-Dichlorobiphenyl (BZ-7)	EPA 1668C_2010	1
2,4'-Dichlorobiphenyl (BZ-8)	EPA 1668C_2010	1
2,5-Dichlorobiphenyl (BZ-9)	EPA 1668C_2010	1
2,6-Dichlorobiphenyl (BZ-10)	EPA 1668C_2010	1
2-Chlorobiphenyl (BZ-1)	EPA 1668C_2010	1
3,3',4,4',5,5'-Hexachlorobiphenyl (BZ-169)	EPA 1668C_2010	1
3,3',4,4',5-Pentachlorobiphenyl (BZ-126)	EPA 1668C_2010	1
3,3',4,4'-Tetrachlorobiphenyl (BZ-77)	EPA 1668C_2010	1
3,3',4,5,5'-Pentachlorobiphenyl (BZ-127)	EPA 1668C_2010	1
3,3',4,5-Tetrachlorobiphenyl (BZ-78)	EPA 1668C_2010	1
3,3',4,5'-Tetrachlorobiphenyl (BZ-79)	EPA 1668C_2010	1
3,3',4-Trichlorobiphenyl (BZ-35)	EPA 1668C_2010	1
3,3',5,5'-Tetrachlorobiphenyl (BZ-80)	EPA 1668C_2010	1
3,3',5-Trichlorobiphenyl (BZ-36)	EPA 1668C_2010	1
3,3'-Dichlorobiphenyl (BZ-11)	EPA 1668C_2010	1
3,4,4',5-Tetrachlorobiphenyl (BZ-81)	EPA 1668C_2010	1
3,4,4'-Trichlorobiphenyl (BZ-37)	EPA 1668C_2010	1
3,4,5-Trichlorobiphenyl (BZ-38)	EPA 1668C_2010	1
3,4',5-Trichlorobiphenyl (BZ-39)	EPA 1668C_2010	1
3,4-Dichlorobiphenyl (BZ-12)	EPA 1668C_2010	1
3,4'-Dichlorobiphenyl (BZ-13)	EPA 1668C_2010	1
3,5-Dichlorobiphenyl (BZ-14)	EPA 1668C_2010	1
3-Chlorobiphenyl (BZ-2)	EPA 1668C_2010	1

Matrix/Analyte	Method	Notes
4,4'-Dichlorobiphenyl (BZ-15)	EPA 1668C_2010	1
4-Chlorobiphenyl (BZ-3)	EPA 1668C_2010	1
Decachlorobiphenyl (BZ-209)	EPA 1668C_2010	1
Total Dichlorobiphenyls	EPA 1668C_2010	1
Total Heptachlorobiphenyls	EPA 1668C_2010	1
Total Hexachlorobiphenyls	EPA 1668C_2010	1
Total Monochlorobiphenyls	EPA 1668C_2010	1
Total Nonachlorobiphenyls	EPA 1668C_2010	1
Total Octachlorobiphenyls	EPA 1668C_2010	1
Total Pentachlorobiphenyls	EPA 1668C_2010	1
Total Tetrachlorobiphenyls	EPA 1668C_2010	1
Total Trichlorobiphenyls	EPA 1668C_2010	1
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	EPA 8280B_(1/98)	1
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	EPA 8280B_(1/98)	1
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7	EPA 8280B_(1/98)	1
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4	EPA 8280B_(1/98)	1
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8	EPA 8280B_(1/98)	1
1,2,3,4,7,8-Hxcdd	EPA 8280B_(1/98)	1
1,2,3,4,7,8-Hxcdf	EPA 8280B_(1/98)	1
1,2,3,6,7,8-Hxcdd	EPA 8280B_(1/98)	1
1,2,3,6,7,8-Hxcdf	EPA 8280B_(1/98)	1
1,2,3,7,8,9-Hxcdd	EPA 8280B_(1/98)	1
1,2,3,7,8,9-Hxcdf	EPA 8280B_(1/98)	1
1,2,3,7,8-Pecdd	EPA 8280B_(1/98)	1
1,2,3,7,8-Pecdf	EPA 8280B_(1/98)	1
2,3,4,6,7,8-Hxcdf	EPA 8280B_(1/98)	1
2,3,4,7,8-Pecdf	EPA 8280B_(1/98)	1
2,3,7,8-TCDD	EPA 8280B_(1/98)	1
2,3,7,8-TCDF	EPA 8280B_(1/98)	1
Hpcdd, total	EPA 8280B_(1/98)	1
Hpcdf, total	EPA 8280B_(1/98)	1
Hxcdd, total	EPA 8280B_(1/98)	1
Hxcdf, total	EPA 8280B_(1/98)	1
Pecdd, total	EPA 8280B_(1/98)	1
Pecdf, total	EPA 8280B_(1/98)	1
TCDD, total	EPA 8280B_(1/98)	1

Matrix/Analyte	Method	Notes
TCDF, total	EPA 8280B_(1/98)	1
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	EPA 8290A_(1/98)	1
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	EPA 8290A_(1/98)	1
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7	EPA 8290A_(1/98)	1
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4	EPA 8290A_(1/98)	1
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8	EPA 8290A_(1/98)	1
1,2,3,4,7,8-Hxcdd	EPA 8290A_(1/98)	1
1,2,3,4,7,8-Hxcdf	EPA 8290A_(1/98)	1
1,2,3,6,7,8-Hxcdd	EPA 8290A_(1/98)	1
1,2,3,6,7,8-Hxcdf	EPA 8290A_(1/98)	1
1,2,3,7,8,9-Hxcdd	EPA 8290A_(1/98)	1
1,2,3,7,8,9-Hxcdf	EPA 8290A_(1/98)	1
1,2,3,7,8-Pecdd	EPA 8290A_(1/98)	1
1,2,3,7,8-Pecdf	EPA 8290A_(1/98)	1
2,3,4,6,7,8-Hxcdf	EPA 8290A_(1/98)	1
2,3,4,7,8-Pecdf	EPA 8290A_(1/98)	1
2,3,7,8-TCDD	EPA 8290A_(1/98)	1
2,3,7,8-TCDF	EPA 8290A_(1/98)	1

Accredited Parameter Note Detail

(1) Accreditation based in part on recognition of Oregon ORELAP accreditation.

Authentication Signature
Alan D. Rue, Lab Accreditation Unit Supervisor

09/02/2015
Date

The State of Washington Department of Ecology

Fremont Analytical, Inc.
Seattle, WA

has complied with provisions set forth in Chapter 173-50 WAC and is hereby recognized by the Department of Ecology as an ACCREDITED LABORATORY for the analytical parameters listed on the accompanying Scope of Accreditation. This certificate is effective July 9, 2015 and shall expire July 8, 2016.

Witnessed under my hand on September 4, 2015

Alan D. Rue
Lab Accreditation Unit Supervisor

Laboratory ID
C910

WASHINGTON STATE DEPARTMENT OF ECOLOGY

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

SCOPE OF ACCREDITATION

Fremont Analytical, Inc.

Seattle, WA

is accredited for the analytes listed below using the methods indicated. Full accreditation is granted unless stated otherwise in a note. Accreditation for U.S. Environmental Protection Agency (EPA) "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846) is for the latest version of the method. SM refers to EPA approved editions of “Standard Methods for the Examination of Water and Wastewater.” ASTM is the American Society for Testing and Materials. Other references are described in notes.

Matrix/Analyte	Method	Notes
Air		
Carbon dioxide	EPA 3C	
Carbon monoxide	EPA 3C	
Hydrogen	EPA 3C	
Methane	EPA 3C	
Nitrogen	EPA 3C	
Oxygen	EPA 3C	
Carbon disulfide	ASTM D5504-08	
Carbonyl sulfide	ASTM D5504-08	
Dimethyl disulfide	ASTM D5504-08	
Dimethyl Sulfide	ASTM D5504-08	
Ethyl Mercaptan	ASTM D5504-08	
Hydrogen sulfide	ASTM D5504-08	
Isobutyl Mercaptan	ASTM D5504-08	
Isopropyl Mercaptan	ASTM D5504-08	
Methyl Mercaptan	ASTM D5504-08	
n-Butyl Mercaptan	ASTM D5504-08	
n-Propyl Mercaptan	ASTM D5504-08	
t-Butyl Mercaptan	ASTM D5504-08	
1,1,1-Trichloroethane	EPA TO-15 Rev. 2 (1999)	5
1,1,2,2-Tetrachloroethane	EPA TO-15 Rev. 2 (1999)	5
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	EPA TO-15 Rev. 2 (1999)	5
1,1,2-Trichloroethane	EPA TO-15 Rev. 2 (1999)	5

Matrix/Analyte	Method	Notes
1,1-Dichloroethane	EPA TO-15 Rev. 2 (1999)	5
1,1-Dichloroethylene	EPA TO-15 Rev. 2 (1999)	5
1,2,3-Trimethylbenzene	EPA TO-15 Rev. 2 (1999)	5
1,2,4-Trichlorobenzene	EPA TO-15 Rev. 2 (1999)	5
1,2,4-Trimethylbenzene	EPA TO-15 Rev. 2 (1999)	5
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA TO-15 Rev. 2 (1999)	5
1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)	EPA TO-15 Rev. 2 (1999)	5
1,2-Dichlorobenzene	EPA TO-15 Rev. 2 (1999)	5
1,2-Dichloroethane (Ethylene dichloride)	EPA TO-15 Rev. 2 (1999)	5
1,2-Dichloropropane	EPA TO-15 Rev. 2 (1999)	5
1,3,5-Trimethylbenzene	EPA TO-15 Rev. 2 (1999)	5
1,3-Butadiene	EPA TO-15 Rev. 2 (1999)	5
1,3-Dichlorobenzene	EPA TO-15 Rev. 2 (1999)	5
1,4-Dichlorobenzene	EPA TO-15 Rev. 2 (1999)	5
1,4-Dioxane (1,4- Diethyleneoxide)	EPA TO-15 Rev. 2 (1999)	5
1-Propene	EPA TO-15 Rev. 2 (1999)	5
2,3-Dimethylheptane	EPA TO-15 Rev. 2 (1999)	5
2,3-Dimethylpentane	EPA TO-15 Rev. 2 (1999)	5
2-Butanone (Methyl ethyl ketone, MEK)	EPA TO-15 Rev. 2 (1999)	5
2-Hexanone	EPA TO-15 Rev. 2 (1999)	5
2-Methylbutane (Isopentane)	EPA TO-15 Rev. 2 (1999)	5
2-Propanol	EPA TO-15 Rev. 2 (1999)	5
3-Ethyltoluene	EPA TO-15 Rev. 2 (1999)	5
4-Ethyltoluene	EPA TO-15 Rev. 2 (1999)	5
4-Isopropyltoluene (p-Cymene)	EPA TO-15 Rev. 2 (1999)	5
4-Methyl-2-pentanone (MIBK)	EPA TO-15 Rev. 2 (1999)	5
Acetone	EPA TO-15 Rev. 2 (1999)	5
Acrolein (Propenal)	EPA TO-15 Rev. 2 (1999)	5
APH Aliphatics C5-C8	EPA TO-15 Rev. 2 (1999)	5
APH Aliphatics C9-C10	EPA TO-15 Rev. 2 (1999)	5
APH Aromatics C9-C10	EPA TO-15 Rev. 2 (1999)	5
Benzene	EPA TO-15 Rev. 2 (1999)	5
Benzyl chloride	EPA TO-15 Rev. 2 (1999)	5
Bromochloromethane	EPA TO-15 Rev. 2 (1999)	5
Bromodichloromethane	EPA TO-15 Rev. 2 (1999)	5
Bromoform	EPA TO-15 Rev. 2 (1999)	5

Matrix/Analyte	Method	Notes
Carbon disulfide	EPA TO-15 Rev. 2 (1999)	5
Carbon tetrachloride	EPA TO-15 Rev. 2 (1999)	5
Chlorobenzene	EPA TO-15 Rev. 2 (1999)	5
Chlorodibromomethane	EPA TO-15 Rev. 2 (1999)	5
Chloroethane	EPA TO-15 Rev. 2 (1999)	5
Chloroform	EPA TO-15 Rev. 2 (1999)	5
cis-1,2-Dichloroethylene	EPA TO-15 Rev. 2 (1999)	5
cis-1,3-Dichloropropene	EPA TO-15 Rev. 2 (1999)	5
Cyclohexane	EPA TO-15 Rev. 2 (1999)	5
Dichlorodifluoromethane (Freon-12)	EPA TO-15 Rev. 2 (1999)	5
Ethane	EPA TO-15 Rev. 2 (1999)	5
Ethanol	EPA TO-15 Rev. 2 (1999)	5
Ethene	EPA TO-15 Rev. 2 (1999)	5
Ethyl acetate	EPA TO-15 Rev. 2 (1999)	5
Ethylbenzene	EPA TO-15 Rev. 2 (1999)	5
Ethyl-t-butylether (ETBE)	EPA TO-15 Rev. 2 (1999)	5
Formaldehyde	EPA TO-15 Rev. 2 (1999)	5
Gasoline range organics (GRO)	EPA TO-15 Rev. 2 (1999)	5
Hexachlorobutadiene	EPA TO-15 Rev. 2 (1999)	5
Hexamethylcyclotrisiloxane (D3)	EPA TO-15 Rev. 2 (1999)	5
Hexamethyldisiloxane	EPA TO-15 Rev. 2 (1999)	5
Hexane	EPA TO-15 Rev. 2 (1999)	5
Isopropylbenzene	EPA TO-15 Rev. 2 (1999)	5
m+p-xylene	EPA TO-15 Rev. 2 (1999)	5
Methyl bromide (Bromomethane)	EPA TO-15 Rev. 2 (1999)	5
Methyl chloride (Chloromethane)	EPA TO-15 Rev. 2 (1999)	5
Methyl methacrylate	EPA TO-15 Rev. 2 (1999)	5
Methyl tert-butyl ether (MTBE)	EPA TO-15 Rev. 2 (1999)	5
Methylene chloride (Dichloromethane)	EPA TO-15 Rev. 2 (1999)	5
Naphthalene	EPA TO-15 Rev. 2 (1999)	5
n-Butane	EPA TO-15 Rev. 2 (1999)	5
n-Butylcyclohexane	EPA TO-15 Rev. 2 (1999)	5
n-Decane	EPA TO-15 Rev. 2 (1999)	5
n-Dodecane	EPA TO-15 Rev. 2 (1999)	5
n-Heptane	EPA TO-15 Rev. 2 (1999)	5
n-Nonane	EPA TO-15 Rev. 2 (1999)	5

Matrix/Analyte	Method	Notes
n-Octane	EPA TO-15 Rev. 2 (1999)	5
n-Propane	EPA TO-15 Rev. 2 (1999)	5
n-Undecane	EPA TO-15 Rev. 2 (1999)	5
Octamethylcyclotetrasiloxane (D4)	EPA TO-15 Rev. 2 (1999)	5
Octamethyltrisiloxane-L3 (MDM)	EPA TO-15 Rev. 2 (1999)	5
o-Xylene	EPA TO-15 Rev. 2 (1999)	5
Pentamethyldisiloxane	EPA TO-15 Rev. 2 (1999)	5
Styrene	EPA TO-15 Rev. 2 (1999)	5
Tetrachloroethylene (Perchloroethylene)	EPA TO-15 Rev. 2 (1999)	5
Tetrahydrofuran (THF)	EPA TO-15 Rev. 2 (1999)	5
Toluene	EPA TO-15 Rev. 2 (1999)	5
trans-1,2-Dichloroethylene	EPA TO-15 Rev. 2 (1999)	5
trans-1,3-Dichloropropylene	EPA TO-15 Rev. 2 (1999)	5
Trichloroethene (Trichloroethylene)	EPA TO-15 Rev. 2 (1999)	5
Trichlorofluoromethane (Freon 11)	EPA TO-15 Rev. 2 (1999)	5
Vinyl acetate	EPA TO-15 Rev. 2 (1999)	5
Vinyl chloride	EPA TO-15 Rev. 2 (1999)	5
Drinking Water		
Turbidity	EPA 180.1_2_1993	
Bromide	EPA 300.0_2.1_1993	
Chloride	EPA 300.0_2.1_1993	
Fluoride	EPA 300.0_2.1_1993	
Nitrate	EPA 300.0_2.1_1993	
Nitrite	EPA 300.0_2.1_1993	
Sulfate	EPA 300.0_2.1_1993	
Solids, Total Dissolved	SM 2540 C-97	
Cyanide, Total	SM 4500-CN^- E-99	
Total organic carbon	SM 5310 B-00	
Total Organic Carbon	SM 5310 C-00	
Aluminum	EPA 200.8_5.4_1994	
Antimony	EPA 200.8_5.4_1994	3
Arsenic	EPA 200.8_5.4_1994	
Barium	EPA 200.8_5.4_1994	
Beryllium	EPA 200.8_5.4_1994	
Cadmium	EPA 200.8_5.4_1994	

Matrix/Analyte	Method	Notes
Chromium	EPA 200.8_5.4_1994	
Copper	EPA 200.8_5.4_1994	
Hardness, Total (as CaCO3)	EPA 200.8_5.4_1994	
Lead	EPA 200.8_5.4_1994	
Manganese	EPA 200.8_5.4_1994	
Mercury	EPA 200.8_5.4_1994	
Nickel	EPA 200.8_5.4_1994	
Selenium	EPA 200.8_5.4_1994	
Silver	EPA 200.8_5.4_1994	
Thallium	EPA 200.8_5.4_1994	
Zinc	EPA 200.8_5.4_1994	
Mercury	EPA 245.1_3_1994	
Total Coli/Ecoli - count	EPA 1604 (MI Medium)	4
Total Coli/Ecoli - detect	EPA 1604 (MI Medium)	4
Fecal coliform-count	SM 9222 D (m-FC)-97	4
Non-Potable Water		
n-Hexane Extractable Material (O&G)	EPA 1664A_1_1999	
Turbidity	EPA 180.1_2_1993	
Bromide	EPA 300.0_2.1_1993	
Chloride	EPA 300.0_2.1_1993	
Fluoride	EPA 300.0_2.1_1993	
Nitrate	EPA 300.0_2.1_1993	
Nitrate + Nitrite	EPA 300.0_2.1_1993	
Nitrite	EPA 300.0_2.1_1993	
Orthophosphate	EPA 300.0_2.1_1993	3
Sulfate	EPA 300.0_2.1_1993	
Phosphorus, total	EPA 365.3_1978	
Alkalinity	SM 2320 B-97	
Hardness (calc.)	SM 2340 B-97	
Specific Conductance	SM 2510 B-97	
Solids, Total	SM 2540 B-97	
Solids, Total Dissolved	SM 2540 C-97	
Solids, Total Suspended	SM 2540 D-97	
Cyanide, Total	SM 4500-CN^- E-99	
Ammonia	SM 4500-NH3 D-97	

Matrix/Analyte	Method	Notes
Sulfide	SM 4500-$S2^{-}$ F-00	
Chemical Oxygen Demand (COD)	SM 5220 D-97	
Dissolved Organic Carbon	SM 5310 B-00	
Total Organic Carbon	SM 5310 B-00	
Total Organic Carbon	SM 5310 C-00	
Mercury	EPA 1631 E-02	1,5
Aluminum	EPA 200.8_5.4_1994	
Antimony	EPA 200.8_5.4_1994	
Arsenic	EPA 200.8_5.4_1994	
Barium	EPA 200.8_5.4_1994	
Beryllium	EPA 200.8_5.4_1994	
Boron	EPA 200.8_5.4_1994	
Cadmium	EPA 200.8_5.4_1994	
Calcium	EPA 200.8_5.4_1994	
Chromium	EPA 200.8_5.4_1994	
Cobalt	EPA 200.8_5.4_1994	
Copper	EPA 200.8_5.4_1994	
Iron	EPA 200.8_5.4_1994	
Lead	EPA 200.8_5.4_1994	
Magnesium	EPA 200.8_5.4_1994	
Manganese	EPA 200.8_5.4_1994	
Mercury	EPA 200.8_5.4_1994	
Molybdenum	EPA 200.8_5.4_1994	
Nickel	EPA 200.8_5.4_1994	
Potassium	EPA 200.8_5.4_1994	
Selenium	EPA 200.8_5.4_1994	
Silver	EPA 200.8_5.4_1994	
Sodium	EPA 200.8_5.4_1994	
Strontium	EPA 200.8_5.4_1994	
Thallium	EPA 200.8_5.4_1994	
Tin	EPA 200.8_5.4_1994	
Titanium	EPA 200.8_5.4_1994	
Vanadium	EPA 200.8_5.4_1994	
Zinc	EPA 200.8_5.4_1994	
Mercury	EPA 245.1_3_1994	
Mercury	EPA 245.7_2005	

Matrix/Analyte	Method	Notes
Iron	SM 3500-Fe B-97	5
Aroclor-1016 (PCB-1016)	EPA 608	5
Aroclor-1221 (PCB-1221)	EPA 608	5
Aroclor-1232 (PCB-1232)	EPA 608	5
Aroclor-1242 (PCB-1242)	EPA 608	5
Aroclor-1248 (PCB-1248)	EPA 608	5
Aroclor-1254 (PCB-1254)	EPA 608	5
Aroclor-1260 (PCB-1260)	EPA 608	5
Aroclor-1262 (PCB-1262)	EPA 608	5
Aroclor-1268 (PCB-1268)	EPA 608	5
Ethane	EPA RSK-175	
Ethene	EPA RSK-175	
Methane	EPA RSK-175	
1,1,1,2-Tetrachloroethane	EPA 624	1,5
1,1,1-Trichloroethane	EPA 624	1,5
1,1,2,2-Tetrachloroethane	EPA 624	1,5
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	EPA 624	1,5
1,1,2-Trichloroethane	EPA 624	1,5
1,1-Dichloroethane	EPA 624	1,5
1,1-Dichloroethylene	EPA 624	1,5
1,1-Dichloropropene	EPA 624	1,5
1,2,3-Trichlorobenzene	EPA 624	1,5
1,2,3-Trichloropropane	EPA 624	1,5
1,2,3-Trimethylbenzene	EPA 624	1,5
1,2,4-Trichlorobenzene	EPA 624	1,5
1,2-Dibromo-3-chloropropane (DBCP)	EPA 624	1,5
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 624	1,5
1,2-Dichlorobenzene	EPA 624	1,5
1,2-Dichloroethane (Ethylene dichloride)	EPA 624	1,5
1,2-Dichloropropane	EPA 624	1,5
1,3,5-Trimethylbenzene	EPA 624	1,5
1,3-Dichlorobenzene	EPA 624	1,5
1,3-Dichloropropane	EPA 624	1,5
1,4-Dichlorobenzene	EPA 624	1,5
1,4-Dioxane (1,4- Diethyleneoxide)	EPA 624	1,5
2,2-Dichloropropane	EPA 624	1,5

Matrix/Analyte	Method	Notes
2-Butanone (Methyl ethyl ketone, MEK)	EPA 624	1,5
2-Chloroethyl vinyl ether	EPA 624	5
2-Chlorotoluene	EPA 624	1,5
2-Hexanone	EPA 624	1,5
2-Nitropropane	EPA 624	5
4-Chlorotoluene	EPA 624	1,5
4-Isopropyltoluene (p-Cymene)	EPA 624	1,5
4-Methyl-2-pentanone (MIBK)	EPA 624	1,5
Acetone	EPA 624	1,5
Acrylonitrile	EPA 624	5
Allyl chloride (3-Chloropropene)	EPA 624	1,5
Benzene	EPA 624	1,5
Bromobenzene	EPA 624	1,5
Bromochloromethane	EPA 624	1,5
Bromodichloromethane	EPA 624	1,5
Bromoethane (Ethyl Bromide)	EPA 624	5
Bromoform	EPA 624	1,5
Carbon disulfide	EPA 624	1,5
Carbon tetrachloride	EPA 624	1,5
Chlorobenzene	EPA 624	1,5
Chlorodibromomethane	EPA 624	1,5
Chloroethane (Ethyl chloride)	EPA 624	1,5
Chloroform	EPA 624	1,5
cis-1,2-Dichloroethylene	EPA 624	1,5
cis-1,3-Dichloropropene	EPA 624	1,5
Dibromomethane (Methylene bromide)	EPA 624	1,5
Dichlorodifluoromethane (Freon-12)	EPA 624	1,5
Diethyl ether	EPA 624	1,5
Ethyl acetate	EPA 624	1,5
Ethyl methacrylate	EPA 624	5
Ethylbenzene	EPA 624	1,5
Iodomethane (Methyl iodide)	EPA 624	1,5
Isopropylbenzene	EPA 624	1,5
m+p-xylene	EPA 624	1,5
Methacrylonitrile	EPA 624	5
Methyl acrylate	EPA 624	5

Matrix/Analyte	Method	Notes
Methyl bromide (Bromomethane)	EPA 624	1,5
Methyl chloride (Chloromethane)	EPA 624	1,5
Methyl methacrylate	EPA 624	5
Methyl tert-butyl ether (MTBE)	EPA 624	1,5
Methylene chloride (Dichloromethane)	EPA 624	1,5
n-Butylbenzene	EPA 624	1,5
n-Hexane	EPA 624	1,5
Nitrobenzene	EPA 624	1,5
n-Propylbenzene	EPA 624	1,5
o-Xylene	EPA 624	1,5
sec-Butylbenzene	EPA 624	1,5
Styrene	EPA 624	1,5
tert-amylmethylether (TAME)	EPA 624	5
tert-Butylbenzene	EPA 624	1,5
Tetrachloroethylene (Perchloroethylene)	EPA 624	1,5
Tetrahydrofuran (THF)	EPA 624	1,5
Toluene	EPA 624	1,5
trans-1,2-Dichloroethylene	EPA 624	1,5
trans-1,3-Dichloropropylene	EPA 624	1,5
trans-1,4-Dichloro-2-butene	EPA 624	1,5
Trichloroethene (Trichloroethylene)	EPA 624	1,5
Trichlorofluoromethane (Freon 11)	EPA 624	1,5
Vinyl acetate	EPA 624	1,5
Vinyl chloride	EPA 624	1,5
1,2,4-Trichlorobenzene	EPA 625	1,5
1,2-Dichlorobenzene	EPA 625	1,5
1,2-Dinitrobenzene	EPA 625	5
1,3-Dichlorobenzene	EPA 625	1,5
1,3-Dinitrobenzene (1,3-DNB)	EPA 625	5
1,4-Dichlorobenzene	EPA 625	1,5
1,4-Dinitrobenzene	EPA 625	5
1-Methylnaphthalene	EPA 625	1,5
2,3,4,6-Tetrachlorophenol	EPA 625	5
2,3,5,6-Tetrachlorophenol	EPA 625	5
2,4,5-Trichlorophenol	EPA 625	1,5
2,4,6-Trichlorophenol	EPA 625	1,5

Matrix/Analyte	Method	Notes
2,4-Dichlorophenol	EPA 625	1,5
2,4-Dimethylphenol	EPA 625	1,5
2,4-Dinitrophenol	EPA 625	5
2,4-Dinitrotoluene (2,4-DNT)	EPA 625	1,5
2,6-Dinitrotoluene (2,6-DNT)	EPA 625	1,5
2-Chloronaphthalene	EPA 625	1,5
2-Methylphenol (o-Cresol)	EPA 625	1,5
2-Nitroaniline	EPA 625	1,5
2-Nitrophenol	EPA 625	1,5
3-Methylphenol (m-Cresol)	EPA 625	1,5
3-Nitroaniline	EPA 625	5
4-Bromophenyl phenyl ether (BDE-3)	EPA 625	1,5
4-Chloro-3-methylphenol	EPA 625	1,5
4-Chloroaniline	EPA 625	1,5
4-Chlorophenyl phenylether	EPA 625	1,5
4-Methylphenol (p-Cresol)	EPA 625	1,5
4-Nitroaniline	EPA 625	5
4-Nitrophenol	EPA 625	1,5
Acenaphthene	EPA 625	1,5
Acenaphthylene	EPA 625	1,5
Aniline	EPA 625	5
Anthracene	EPA 625	1,5
Azobenzene	EPA 625	5
Benzo(a)anthracene	EPA 625	1,5
Benzo(a)pyrene	EPA 625	1,5
Benzo(g,h,i)perylene	EPA 625	1,5
Benzo(k)fluoranthene	EPA 625	1,5
Benzo[b]fluoranthene	EPA 625	1,5
Benzoic acid	EPA 625	5
Benzyl alcohol	EPA 625	1,5
bis(2-Chloroethoxy)methane	EPA 625	1,5
bis(2-Chloroethyl) ether	EPA 625	1,5
bis(2-Chloroisopropyl) ether	EPA 625	1,5
Butyl benzyl phthalate	EPA 625	1,5
Carbazole	EPA 625	1,5
Chrysene	EPA 625	1,5

Matrix/Analyte	Method	Notes
Di(2-ethylhexyl)adipate	EPA 625	1
Dibenz(a,h) anthracene	EPA 625	1,5
Dibenzofuran	EPA 625	1,5
Diethyl phthalate	EPA 625	1,5
Dimethyl phthalate	EPA 625	1,5
Di-n-butyl phthalate	EPA 625	1,5
Di-n-octyl phthalate	EPA 625	1,5
Diphenylamine	EPA 625	1,5
Fluoranthene	EPA 625	1,5
Fluorene	EPA 625	1,5
Hexachlorobenzene	EPA 625	1,5
Hexachlorobutadiene	EPA 625	1,5
Hexachlorocyclopentadiene	EPA 625	1,5
Hexachloroethane	EPA 625	1,5
Indeno(1,2,3-cd) pyrene	EPA 625	1,5
Isophorone	EPA 625	1,5
Naphthalene	EPA 625	1,5
Nitrobenzene	EPA 625	1,5
N-Nitrosodiethylamine	EPA 625	5
N-Nitrosodimethylamine	EPA 625	5
N-Nitroso-di-n-propylamine	EPA 625	1
N-Nitrosodiphenylamine	EPA 625	5
Pentachlorophenol	EPA 625	1,5
Phenanthrene	EPA 625	1,5
Phenol	EPA 625	1,5
Pyrene	EPA 625	1,5
Pyridine	EPA 625	5
Total Coli/Ecoli - count	EPA 1604 (MI Medium)	2,4
Fecal coliform-count	SM 9222 D (m-FC)-97	4
Solid and Chemical Materials		
Chromium, Hexavalent	EPA 7196A_1_1992	
pH	EPA 9045C_3_1995	
Total Organic Carbon	EPA 9060A_1_2004	
Aluminum	EPA 6020A_(2/07)	
Antimony	EPA 6020A_(2/07)	

Matrix/Analyte	Method	Notes
Arsenic	EPA 6020A_(2/07)	
Barium	EPA 6020A_(2/07)	
Beryllium	EPA 6020A_(2/07)	
Boron	EPA 6020A_(2/07)	3
Cadmium	EPA 6020A_(2/07)	
Calcium	EPA 6020A_(2/07)	3
Chromium	EPA 6020A_(2/07)	
Cobalt	EPA 6020A_(2/07)	
Copper	EPA 6020A_(2/07)	
Iron	EPA 6020A_(2/07)	
Lead	EPA 6020A_(2/07)	
Magnesium	EPA 6020A_(2/07)	
Mercury	EPA 6020A_(2/07)	
Molybdenum	EPA 6020A_(2/07)	
Nickel	EPA 6020A_(2/07)	
Potassium	EPA 6020A_(2/07)	
Selenium	EPA 6020A_(2/07)	
Silver	EPA 6020A_(2/07)	
Sodium	EPA 6020A_(2/07)	
Strontium	EPA 6020A_(2/07)	
Thallium	EPA 6020A_(2/07)	
Tin	EPA 6020A_(2/07)	
Titanium	EPA 6020A_(2/07)	3
Vanadium	EPA 6020A_(2/07)	
Zinc	EPA 6020A_(2/07)	
Mercury, Liquid Waste	EPA 7470A_1_1994	
Mercury, Solid Waste	EPA 7471B_(1/98)	
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8011-94	5,6
Dibromochloropropane	EPA 8011-94	5,6
Ethylene glycol	EPA 8015B_2_1996	
Propylene glycol	EPA 8015B_2_1996	
Benzene	EPA 8021B_2_(12/96)	
Ethylbenzene	EPA 8021B_2_(12/96)	
m+p-xylene	EPA 8021B_2_(12/96)	
o-Xylene	EPA 8021B_2_(12/96)	
Toluene	EPA 8021B_2_(12/96)	

Matrix/Analyte	Method	Notes
Xylene (total)	EPA 8021B_2_(12/96)	
4,4'-DDD	EPA 8081B_(2/07)	
4,4'-DDE	EPA 8081B_(2/07)	
4,4'-DDT	EPA 8081B_(2/07)	
Aldrin	EPA 8081B_(2/07)	
alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 8081B_(2/07)	
alpha-Chlordane	EPA 8081B_(2/07)	
beta-BHC (beta-Hexachlorocyclohexane)	EPA 8081B_(2/07)	
Chlordane (tech.)	EPA 8081B_(2/07)	
delta-BHC	EPA 8081B_(2/07)	
Dieldrin	EPA 8081B_(2/07)	
Endosulfan I	EPA 8081B_(2/07)	
Endosulfan II	EPA 8081B_(2/07)	
Endosulfan sulfate	EPA 8081B_(2/07)	
Endrin	EPA 8081B_(2/07)	
Endrin aldehyde	EPA 8081B_(2/07)	
Endrin ketone	EPA 8081B_(2/07)	
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 8081B_(2/07)	
gamma-Chlordane	EPA 8081B_(2/07)	
Heptachlor	EPA 8081B_(2/07)	
Heptachlor epoxide	EPA 8081B_(2/07)	
Methoxychlor	EPA 8081B_(2/07)	
Aroclor-1016 (PCB-1016)	EPA 8082A_(2/07)	
Aroclor-1221 (PCB-1221)	EPA 8082A_(2/07)	
Aroclor-1232 (PCB-1232)	EPA 8082A_(2/07)	
Aroclor-1242 (PCB-1242)	EPA 8082A_(2/07)	
Aroclor-1248 (PCB-1248)	EPA 8082A_(2/07)	
Aroclor-1254 (PCB-1254)	EPA 8082A_(2/07)	
Aroclor-1260 (PCB-1260)	EPA 8082A_(2/07)	
2,4,5-T	EPA 8151A_(1/98)	
2,4-D	EPA 8151A_(1/98)	
2,4-DB	EPA 8151A_(1/98)	
Dalapon	EPA 8151A_(1/98)	
Dicamba	EPA 8151A_(1/98)	
Dichloroprop (Dichlorprop)	EPA 8151A_(1/98)	
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8151A_(1/98)	

Matrix/Analyte	Method	Notes
MCPA	EPA 8151A_(1/98)	
MCPP	EPA 8151A_(1/98)	
Silvex (2,4,5-TP)	EPA 8151A_(1/98)	
C8-C10 Aliphatic EPH	WDOE EPH_(1997)	
C8-C10 Aromatic EPH	WDOE EPH_(1997)	
>C10-C12 Aliphatic EPH	WDOE EPH_(1997)	
>C10-C12 Aromatic EPH	WDOE EPH_(1997)	
>C12-C16 Aliphatic EPH	WDOE EPH_(1997)	
>C12-C16 Aromatic EPH	WDOE EPH_(1997)	
>C16-C21 Aliphatic EPH	WDOE EPH_(1997)	
>C16-C21 Aromatic EPH	WDOE EPH_(1997)	
>C21-C34 Alpihatic EPH	WDOE EPH_(1997)	
>C21-C34 Aromatic EPH	WDOE EPH_(1997)	
Diesel range organics (DRO)	WDOE NWTPH-Dx_(1997)	
Gasoline range organics (GRO)	WDOE NWTPH-Gx_(1997)	
C8-C10 Aromatic VPH	WDOE VPH_(1997)	
C5-C6 Aliphatic VPH	WDOE VPH_(1997)	
>C10-C12 Aliphatic VPH	WDOE VPH_(1997)	
>C10-C12 Aromatic VPH	WDOE VPH_(1997)	
>C12-C13 Aromatic VPH	WDOE VPH_(1997)	
>C6-C8 Aliphatic VPH	WDOE VPH_(1997)	
>C8-C10 Aliphatic VPH	WDOE VPH_(1997)	
1,1,1,2-Tetrachloroethane	EPA 8260C_(8/06)	
1,1,1-Trichloroethane	EPA 8260C_(8/06)	
1,1,2,2-Tetrachloroethane	EPA 8260C_(8/06)	
1,1,2-Trichloroethane	EPA 8260C_(8/06)	
1,1-Dichloroethane	EPA 8260C_(8/06)	
1,1-Dichloroethylene	EPA 8260C_(8/06)	
1,1-Dichloropropene	EPA 8260C_(8/06)	
1,2,3-Trichlorobenzene	EPA 8260C_(8/06)	
1,2,3-Trichloropropane	EPA 8260C_(8/06)	
1,2,4-Trichlorobenzene	EPA 8260C_(8/06)	
1,2,4-Trimethylbenzene	EPA 8260C_(8/06)	
1,2-Dibromo-3-chloropropane (DBCP)	EPA 8260C_(8/06)	

Matrix/Analyte	Method	Notes
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8260C_(8/06)	
1,2-Dichlorobenzene	EPA 8260C_(8/06)	
1,2-Dichloroethane (Ethylene dichloride)	EPA 8260C_(8/06)	
1,2-Dichloropropane	EPA 8260C_(8/06)	
1,3,5-Trimethylbenzene	EPA 8260C_(8/06)	
1,3-Dichlorobenzene	EPA 8260C_(8/06)	
1,3-Dichloropropane	EPA 8260C_(8/06)	
1,4-Dichlorobenzene	EPA 8260C_(8/06)	
2,2-Dichloropropane	EPA 8260C_(8/06)	
2-Chlorotoluene	EPA 8260C_(8/06)	
4-Chlorotoluene	EPA 8260C_(8/06)	
4-Isopropyltoluene (p-Cymene)	EPA 8260C_(8/06)	
Benzene	EPA 8260C_(8/06)	
Bromobenzene	EPA 8260C_(8/06)	
Bromochloromethane	EPA 8260C_(8/06)	
Bromodichloromethane	EPA 8260C_(8/06)	
Bromoform	EPA 8260C_(8/06)	
Carbon tetrachloride	EPA 8260C_(8/06)	
Chlorobenzene	EPA 8260C_(8/06)	
Chlorodibromomethane	EPA 8260C_(8/06)	
Chloroethane (Ethyl chloride)	EPA 8260C_(8/06)	
Chloroform	EPA 8260C_(8/06)	
cis-1,2-Dichloroethylene	EPA 8260C_(8/06)	
cis-1,3-Dichloropropene	EPA 8260C_(8/06)	
Dibromomethane	EPA 8260C_(8/06)	
Dichlorofluoromethane (Freon 21)	EPA 8260C_(8/06)	
Ethylbenzene	EPA 8260C_(8/06)	
Hexachlorobutadiene	EPA 8260C_(8/06)	
Isopropylbenzene	EPA 8260C_(8/06)	
Methyl bromide (Bromomethane)	EPA 8260C_(8/06)	
Methyl chloride (Chloromethane)	EPA 8260C_(8/06)	
Methylene chloride (Dichloromethane)	EPA 8260C_(8/06)	
Naphthalene	EPA 8260C_(8/06)	
n-Butylbenzene	EPA 8260C_(8/06)	
n-Propylbenzene	EPA 8260C_(8/06)	
sec-Butylbenzene	EPA 8260C_(8/06)	

Matrix/Analyte	Method	Notes
Styrene	EPA 8260C_(8/06)	
tert-Butylbenzene	EPA 8260C_(8/06)	
Tetrachloroethylene (Perchloroethylene)	EPA 8260C_(8/06)	
Toluene	EPA 8260C_(8/06)	
trans-1,2-Dichloroethylene	EPA 8260C_(8/06)	
trans-1,3-Dichloropropylene	EPA 8260C_(8/06)	
Trichloroethene (Trichloroethylene)	EPA 8260C_(8/06)	
Trichlorofluoromethane (Freon 11)	EPA 8260C_(8/06)	
Vinyl chloride	EPA 8260C_(8/06)	
Xylene (total)	EPA 8260C_(8/06)	
1,2,4,5-Tetrachlorobenzene	EPA 8270D_(2/07)	
1,2,4-Trichlorobenzene	EPA 8270D_(2/07)	
1,2-Dibromo-3-chloropropane (DBCP)	EPA 8270D_(2/07)	
1,2-Dichlorobenzene	EPA 8270D_(2/07)	
1,2-Dinitrobenzene	EPA 8270D_(2/07)	
1,2-Diphenylhydrazine	EPA 8270D_(2/07)	
1,3,5-Trinitrobenzene (1,3,5-TNB)	EPA 8270D_(2/07)	
1,3-Dichlorobenzene	EPA 8270D_(2/07)	
1,3-Dinitrobenzene (1,3-DNB)	EPA 8270D_(2/07)	
1,4-Dichlorobenzene	EPA 8270D_(2/07)	
1,4-Dinitrobenzene	EPA 8270D_(2/07)	
1-Chloronaphthalene	EPA 8270D_(2/07)	
1-Naphthylamine	EPA 8270D_(2/07)	
2,3,4,6-Tetrachlorophenol	EPA 8270D_(2/07)	
2,4,5-Trichlorophenol	EPA 8270D_(2/07)	
2,4,5-Trimethylaniline	EPA 8270D_(2/07)	
2,4,6-Trichlorophenol	EPA 8270D_(2/07)	
2,4-Diaminotoluene	EPA 8270D_(2/07)	
2,4-Dichlorophenol	EPA 8270D_(2/07)	
2,4-Dimethylphenol	EPA 8270D_(2/07)	
2,4-Dinitrophenol	EPA 8270D_(2/07)	
2,4-Dinitrotoluene (2,4-DNT)	EPA 8270D_(2/07)	
2,6-Dichlorophenol	EPA 8270D_(2/07)	
2,6-Dinitrotoluene (2,6-DNT)	EPA 8270D_(2/07)	
2-Aminoanthraquinone	EPA 8270D_(2/07)	
2-Chloronaphthalene	EPA 8270D_(2/07)	

Matrix/Analyte	Method	Notes
2-Chlorophenol	EPA 8270D_(2/07)	
2-Cyclohexyl-4,6-dinitrophenol	EPA 8270D_(2/07)	
2-Methylnaphthalene	EPA 8270D_(2/07)	
2-Methylphenol (o-Cresol)	EPA 8270D_(2/07)	
2-Naphthylamine	EPA 8270D_(2/07)	
2-Nitroaniline	EPA 8270D_(2/07)	
2-Nitrophenol	EPA 8270D_(2/07)	
3-(Chloromethyl) pyridine hydrochloride	EPA 8270D_(2/07)	
3,3'-Dichlorobenzidine	EPA 8270D_(2/07)	
3-Methylcholanthrene	EPA 8270D_(2/07)	
3-Methylphenol (m-Cresol)	EPA 8270D_(2/07)	
3-Nitroaniline	EPA 8270D_(2/07)	
4,4'-DDD	EPA 8270D_(2/07)	
4,4'-DDE	EPA 8270D_(2/07)	
4,4'-DDT	EPA 8270D_(2/07)	
4,4'-Methylenebis(2-chloroaniline)	EPA 8270D_(2/07)	
4,6-Dinitro-2-methylphenol	EPA 8270D_(2/07)	
4-Bromophenyl phenyl ether (BDE-3)	EPA 8270D_(2/07)	
4-Chloro-1,2-phenylenediamine	EPA 8270D_(2/07)	
4-Chloro-1,3-phenylenediamine	EPA 8270D_(2/07)	
4-Chloro-3-methylphenol	EPA 8270D_(2/07)	
4-Chloroaniline	EPA 8270D_(2/07)	
4-Chlorophenol	EPA 8270D_(2/07)	
4-Chlorophenyl phenylether	EPA 8270D_(2/07)	
4-Dimethyl aminoazobenzene	EPA 8270D_(2/07)	
4-Methylphenol (p-Cresol)	EPA 8270D_(2/07)	
4-Nitroaniline	EPA 8270D_(2/07)	
4-Nitrobiphenyl	EPA 8270D_(2/07)	
4-Nitrophenol	EPA 8270D_(2/07)	
5-Chloro-2-methylaniline	EPA 8270D_(2/07)	
a,a-Dimethylphenethylamine	EPA 8270D_(2/07)	
Acenaphthene	EPA 8270D_(2/07)	
Acenaphthylene	EPA 8270D_(2/07)	
Acetophenone	EPA 8270D_(2/07)	
Aldrin	EPA 8270D_(2/07)	
alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 8270D_(2/07)	

Matrix/Analyte	Method	Notes
Aminoazobenzene	EPA 8270D_(2/07)	
Anilazine	EPA 8270D_(2/07)	
Aniline	EPA 8270D_(2/07)	
Anthracene	EPA 8270D_(2/07)	
Aramite	EPA 8270D_(2/07)	
Atrazine	EPA 8270D_(2/07)	
Azinphos-methyl (Guthion)	EPA 8270D_(2/07)	
Barban	EPA 8270D_(2/07)	
Benzidine	EPA 8270D_(2/07)	
Benzo(a)anthracene	EPA 8270D_(2/07)	
Benzo(a)pyrene	EPA 8270D_(2/07)	
Benzo(g,h,i)perylene	EPA 8270D_(2/07)	
Benzo(k)fluoranthene	EPA 8270D_(2/07)	
Benzo[b]fluoranthene	EPA 8270D_(2/07)	
Benzoic acid	EPA 8270D_(2/07)	
Benzyl alcohol	EPA 8270D_(2/07)	
beta-BHC (beta-Hexachlorocyclohexane)	EPA 8270D_(2/07)	
Biphenyl	EPA 8270D_(2/07)	
bis(2-Chloroethoxy)methane	EPA 8270D_(2/07)	
bis(2-Chloroethyl) ether	EPA 8270D_(2/07)	
bis(2-Chloroisopropyl) ether	EPA 8270D_(2/07)	
Bromoxynil octanate	EPA 8270D_(2/07)	
Butyl benzyl phthalate	EPA 8270D_(2/07)	
Captafol	EPA 8270D_(2/07)	
Captan	EPA 8270D_(2/07)	
Carbaryl (Sevin)	EPA 8270D_(2/07)	
Carbazole	EPA 8270D_(2/07)	
Carbofuran (Furaden)	EPA 8270D_(2/07)	
Carbophenothion	EPA 8270D_(2/07)	
Chlordane (tech.)	EPA 8270D_(2/07)	
Chlorfenvinphos	EPA 8270D_(2/07)	
Chlorpyrifos	EPA 8270D_(2/07)	
Chrysene	EPA 8270D_(2/07)	
Coumaphos	EPA 8270D_(2/07)	
Crotoxyphos	EPA 8270D_(2/07)	
delta-BHC	EPA 8270D_(2/07)	

Matrix/Analyte	Method	Notes
Demeton	EPA 8270D_(2/07)	
Demeton-o	EPA 8270D_(2/07)	
Demeton-s	EPA 8270D_(2/07)	
Di(2-ethylhexyl)adipate	EPA 8270D_(2/07)	
Di(2-ethylhexyl)phthalate	EPA 8270D_(2/07)	
Diallate	EPA 8270D_(2/07)	
Dibenz(a,h) acridine	EPA 8270D_(2/07)	
Dibenz(a,h) anthracene	EPA 8270D_(2/07)	
Dibenz(a,j) acridine	EPA 8270D_(2/07)	
Dibenzo(a,e) pyrene	EPA 8270D_(2/07)	
Dibenzofuran	EPA 8270D_(2/07)	
Dibenzothiophene	EPA 8270D_(2/07)	
Dichlorovos (DDVP, Dichlorvos)	EPA 8270D_(2/07)	
Dicrotophos	EPA 8270D_(2/07)	
Dieldrin	EPA 8270D_(2/07)	
Diethyl phthalate	EPA 8270D_(2/07)	
Diethyl sulfate	EPA 8270D_(2/07)	
Dimethoate	EPA 8270D_(2/07)	
Dimethyl phthalate	EPA 8270D_(2/07)	
Di-n-butyl phthalate	EPA 8270D_(2/07)	
Dinocap	EPA 8270D_(2/07)	
Di-n-octyl phthalate	EPA 8270D_(2/07)	
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8270D_(2/07)	
Diphenylamine	EPA 8270D_(2/07)	
Disulfoton	EPA 8270D_(2/07)	
Endosulfan I	EPA 8270D_(2/07)	
Endosulfan II	EPA 8270D_(2/07)	
Endosulfan sulfate	EPA 8270D_(2/07)	
Endrin	EPA 8270D_(2/07)	
Endrin aldehyde	EPA 8270D_(2/07)	
Endrin ketone	EPA 8270D_(2/07)	
EPN	EPA 8270D_(2/07)	
Ethion	EPA 8270D_(2/07)	
Ethyl carbamate (Urethane)	EPA 8270D_(2/07)	
Ethyl methanesulfonate	EPA 8270D_(2/07)	
Famphur	EPA 8270D_(2/07)	

Matrix/Analyte	Method	Notes
Fensulfothion	EPA 8270D_(2/07)	
Fenthion	EPA 8270D_(2/07)	
Fluchloralin	EPA 8270D_(2/07)	
Fluoranthene	EPA 8270D_(2/07)	
Fluorene	EPA 8270D_(2/07)	
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 8270D_(2/07)	
Heptachlor	EPA 8270D_(2/07)	
Heptachlor epoxide	EPA 8270D_(2/07)	
Hexachlorobenzene	EPA 8270D_(2/07)	
Hexachlorobutadiene	EPA 8270D_(2/07)	
Hexachlorocyclopentadiene	EPA 8270D_(2/07)	
Hexachloroethane	EPA 8270D_(2/07)	
Hexachlorophene	EPA 8270D_(2/07)	
Hexachloropropene	EPA 8270D_(2/07)	
Hexamethylphosphoramide (HMPA)	EPA 8270D_(2/07)	
Hydroquinone	EPA 8270D_(2/07)	
Indeno(1,2,3-cd) pyrene	EPA 8270D_(2/07)	
Isodrin	EPA 8270D_(2/07)	
Isophorone	EPA 8270D_(2/07)	
Malathion	EPA 8270D_(2/07)	
Maleic anhydride	EPA 8270D_(2/07)	
Methoxychlor	EPA 8270D_(2/07)	
Methyl parathion (Parathion, methyl)	EPA 8270D_(2/07)	
Mevinphos	EPA 8270D_(2/07)	
Mirex	EPA 8270D_(2/07)	
Monocrotophos	EPA 8270D_(2/07)	
Naled	EPA 8270D_(2/07)	
Naphthalene	EPA 8270D_(2/07)	
n-Hexadecane	EPA 8270D_(2/07)	
Nicotine	EPA 8270D_(2/07)	
Nitrobenzene	EPA 8270D_(2/07)	
Nitroquinoline-1-oxide	EPA 8270D_(2/07)	
n-Nitrosodiethylamine	EPA 8270D_(2/07)	
n-Nitrosodimethylamine	EPA 8270D_(2/07)	
n-Nitroso-di-n-butylamine	EPA 8270D_(2/07)	
N-Nitroso-di-n-propylamine	EPA 8270D_(2/07)	

Matrix/Analyte	Method	Notes
n-Nitrosodiphenylamine	EPA 8270D_(2/07)	
n-Nitrosomethylethalamine	EPA 8270D_(2/07)	
n-Nitrosomorpholine	EPA 8270D_(2/07)	
n-Nitrosopiperidine	EPA 8270D_(2/07)	
n-Nitrosopyrrolidine	EPA 8270D_(2/07)	
n-Tetradecane	EPA 8270D_(2/07)	
o,o,o-Triethyl phosphorothioate	EPA 8270D_(2/07)	
Octamethyl pyrophosphoramide	EPA 8270D_(2/07)	
Parathion	EPA 8270D_(2/07)	
p-Benzoquinone	EPA 8270D_(2/07)	
p-Cresidine	EPA 8270D_(2/07)	
Pentachlorobenzene	EPA 8270D_(2/07)	
Pentachloronitrobenzene	EPA 8270D_(2/07)	
Pentachlorophenol	EPA 8270D_(2/07)	
Phenacetin	EPA 8270D_(2/07)	
Phenanthrene	EPA 8270D_(2/07)	
Phenobarbital	EPA 8270D_(2/07)	
Phenol	EPA 8270D_(2/07)	
Phorate	EPA 8270D_(2/07)	
Pyrene	EPA 8270D_(2/07)	
Pyridine	EPA 8270D_(2/07)	
Resorcinol	EPA 8270D_(2/07)	
Safrole	EPA 8270D_(2/07)	
Strychnine	EPA 8270D_(2/07)	
Sulfallate	EPA 8270D_(2/07)	
Terbufos	EPA 8270D_(2/07)	
Tetrachlorvinphos (Stirophos, Gardona)	EPA 8270D_(2/07)	
Tetraethyl dithiopyrophosphate	EPA 8270D_(2/07)	
Tetraethyl pyrophosphate (TEPP)	EPA 8270D_(2/07)	
Thionazin (Zinophos)	EPA 8270D_(2/07)	
Thiophenol (Benzenethiol)	EPA 8270D_(2/07)	
Toxaphene (Chlorinated camphene)	EPA 8270D_(2/07)	
Trifluralin (Treflan)	EPA 8270D_(2/07)	
Trimethyl phosphate	EPA 8270D_(2/07)	
1-Methylnaphthalene	EPA 8270D_(2/07) SIM	
2-Methylnaphthalene	EPA 8270D_(2/07) SIM	

Matrix/Analyte	Method	Notes
Acenaphthene	EPA 8270D_(2/07) SIM	
Acenaphthylene	EPA 8270D_(2/07) SIM	
Anthracene	EPA 8270D_(2/07) SIM	
Azinphos-methyl (Guthion)	EPA 8270D_(2/07) SIM	
Benzo(a)anthracene	EPA 8270D_(2/07) SIM	
Benzo(a)pyrene	EPA 8270D_(2/07) SIM	
Benzo(g,h,i)perylene	EPA 8270D_(2/07) SIM	
Benzo(k)fluoranthene	EPA 8270D_(2/07) SIM	
Benzo[b]fluoranthene	EPA 8270D_(2/07) SIM	
Bolstar (Sulprofos)	EPA 8270D_(2/07) SIM	
Chlorpyrifos	EPA 8270D_(2/07) SIM	
Chrysene	EPA 8270D_(2/07) SIM	
Coumaphos	EPA 8270D_(2/07) SIM	
Demeton	EPA 8270D_(2/07) SIM	
Diazinon	EPA 8270D_(2/07) SIM	
Dibenz(a,h) anthracene	EPA 8270D_(2/07) SIM	
Dichlorvos	EPA 8270D_(2/07) SIM	
Dimethoate	EPA 8270D_(2/07) SIM	
Disulfoton	EPA 8270D_(2/07) SIM	
EPN	EPA 8270D_(2/07) SIM	
Ethoprop	EPA 8270D_(2/07) SIM	
Fensulfothion	EPA 8270D_(2/07) SIM	
Fenthion	EPA 8270D_(2/07) SIM	
Fluoranthene	EPA 8270D_(2/07) SIM	
Fluorene	EPA 8270D_(2/07) SIM	
Indeno(1,2,3-cd) pyrene	EPA 8270D_(2/07) SIM	
Malathion	EPA 8270D_(2/07) SIM	
Merphos	EPA 8270D_(2/07) SIM	
Methyl parathion (Parathion, methyl)	EPA 8270D_(2/07) SIM	
Mevinphos	EPA 8270D_(2/07) SIM	
Monocrotophos	EPA 8270D_(2/07) SIM	
Naled	EPA 8270D_(2/07) SIM	
Naphthalene	EPA 8270D_(2/07) SIM	
Parathion, ethyl	EPA 8270D_(2/07) SIM	
Pentachlorophenol	EPA 8270D_(2/07) SIM	
Phenanthrene	EPA 8270D_(2/07) SIM	

Matrix/Analyte	Method	Notes
Phorate	EPA 8270D_(2/07) SIM	
Pyrene	EPA 8270D_(2/07) SIM	
Ronnel	EPA 8270D_(2/07) SIM	
Sulfotepp	EPA 8270D_(2/07) SIM	
Tetrachlorvinphos (Stirophos, Gardona)	EPA 8270D_(2/07) SIM	
Tetraethyl pyrophosphate (TEPP)	EPA 8270D_(2/07) SIM	
Tokuthion (Prothiophos)	EPA 8270D_(2/07) SIM	
Trichloronate	EPA 8270D_(2/07) SIM	
Particle Size Distribution	ASTM D 422	
Ignitability	ASTM D93-02	
Ignitability	EPA 1010A - 2004	

Accredited Parameter Note Detail

(1) Accreditation based in part on recognition of Laboratory Accreditation Bureau DoD accreditation. (2) Method is not approved for NPDES testing under 40 CFR 136.3.(3) Provisional accreditation pending submittal of acceptable Proficiency Testing (PT) results (WAC 173-50-110).(4) Provisional accreditation pending submittal of acceptable corrective action report.(5) Accreditation based in part on recognition of Oregon NELAP accreditation. (6) Limited to water, not drinking water or NPDES.

09/04/2015

Authentication Signature
Alan D. Rue, Lab Accreditation Unit Supervisor

Date

October 13, 2015 KA Project No. 104-15010

Mr. Jesse Galligan Tel: (253)279-6809
Orion Marine Group E-Mail: jgalligan@orionmarinegroup.com

Port Gamble Capping and Material Placement Project
Port Gamble Bay, Washington

RE: Letter Report for:
Limited Soil Sampling and Analysis (Armor 1 & 3)
Port Gamble Source Acceptance
Port Gamble Bay

Dear Mr. Galligan:

Krazan and Associates is providing this Letter Report in reference to limited sampling of capping material (armor 1 & 3) located at the New Shine Gravel Pit near Hood Canal, Washington. Sample collection was conducted by Krazan representative Mr. Steven Padilla on September 17, 2015. This sampling was performed in accordance with federal, state and local regulatory requirements, and was limited to areas defined by the client.

1.0 Analytical Results

1.1 Soil Analytical Results

The material sampled did not exceed Table 352026-1 for capping material sediment quality standards contained in Division 35, Section 352026 of the Waterway and Marine Construction specification for the Port Gamble Cleanup Project. Compounds requested to be tested by Orion Construction did not indicate levels above corresponding capping material sediment quality standards. The laboratory analytical report is provided in Appendix A.

2.0 Sampling Methodology

The sampling location was defined by the client as a discreet sample taken of the capping material (armor 1&3) located at the New Shine Gravel Pit near Hood Canal, Washington. The samples were collected by carefully collecting one sample of each reprented material in a zip-lock plastic bag from a specified material piles located at the New Shine Gravel pit. Sample containers were then placed in an iced cooler for transportation to the laboratory. The samples were delivered to the laboratory on September 17, 2015. Data pertinent to the sample (e.g., date, sample number, material description, and material category) was recorded on a field data sheet.

2.1 Laboratory Analysis

Two (2) discrete samples were collected in zip-lock container bags as part of the sample project. The samples were collected in zip-lock bags due to the particle size of the materials. The sample containers were delivered to Friedman and Bruya (F&B) Laboratories in Seattle, Washington, under chain-of-custody protocol for analysis. F&B Laboratories is a Washington State accredited laboratory. In addition to in-house testing, F&B Laboratories supplied samples to Frontier Laboratories (Furan and Dioxin testing) and Fremont Laboratories (Chlorinated Pesticides and TOC testing). Analytical data reports, laboratory certifications, and chain-of-custody forms are provided in Appendix A.

3.0 Laboratory Sample Results

Table 1 and 2 include the sample number, sample location, sample description, and percent of contaminant.

Table 1 – Summary of Analytical Data – Metals (mg/kg)

Sample Number	Sample Location	Sample Material	% Moisture	Zinc	Nickel	Thallium	Copper	Antimony	Arsenic	Selenium	Chromium	Cadmium	Beryllium	Silver	Lead	Mercury
Armor 1(A1) Armor 3(A3)	New Shine Gravel Pit Hood Canal WA	Gravel	(A1)-3% (A3)-7%	A1-17.2 A3-28.1	A1-15.7 A3-28.3	A1- <1 A3- <1	A1-41.2 A3-82.1	A1- <1 A3- <1	A1- <1 A3- <1	A1- <1 A3- <1	A1-6.83 A3-5.63	A1- <1 A3- <1	A1- <1 A3- <1	A1- <1 A3- <1	A1- <1 A3- <1	A1- <1 A3- <1
Table 352026-1 Standards	NA	Soil	NA	410	NR	NR	390	NR	57	NR	260	3.0	NR	6.1	450	0.41

Notes:
NR = Not Requested

Table 2 – Summary of Analytical Data

Sample Number	Sample Location	Sample Material	PCB	LPAH	HPAH	Chlorinate Hydrocarbons	Phthalates	Phenols	Misc. Extractables	Dioxins / Furans
Armor 1(A1) Armor 3(A3)	New Shine Gravel Pit Hood Canal WA	Gravel	A1-<4 A3-<4 ppb	LTDL (see attached)	LTDL (see attached)	LTDL (see attached)	LTDL (see attached)	LTDL (see attached)	LTDL (see attached)	ND
Table 352026-1 Standards	NA	Capping Material	130 ppb	See Table	See Table	See Table	See Table	See Table	See Table	5 ng/kg

Notes:
ND = None Detected; NA = Not Applicable; LTDL = Less Than Detection Limit

4.0 Conclusions

The materials sampled did not exceed Table 352026-1 for capping material sediment quality standards contained in Division 35, Section 352026 of the Waterway and Marine Construction specification for the Port Gamble Cleanup Project. Compounds requested to be tested by Orion Construction did not indicate levels above corresponding capping material sediment quality standards. The laboratory analytical report is provided in Appendix A.

LIMITATIONS

This survey has been limited in scope to those areas defined by the client. This investigation is undertaken with the risk that visual observations and random sampling alone would not reveal the presence, full nature, and extent of Contaminants of Concern (COC). Krazan makes no representation as to the COC content of materials not sampled or that were inaccessible to our inspector. The sample locations are approximate, and are based on field notes and diagrams of sample locations. The opinions presented herein apply to the site condition existing at the time of the investigation. Opinions and recommendations provided herein may not apply to future conditions that may exist at the site.

The findings presented in this report were based on field observations and sampling as defined by the client. Therefore, the data obtained are clear and accurate only to the degree implied by the sources and methods used. The information presented herein is based on professional interpretation using presently

accepted methods with a degree of conservatism deemed proper as of the report date. We do not warrant that future technical developments cannot supersede such data.

This report is provided for the exclusive use of the client noted on the cover page and is subject to the terms and conditions in the applicable contract between the client and Krazan. The client is the only party to whom Krazan has explained the risks involved and has been involved in the shaping of the scope of services needed to satisfactorily manage those risks, if any, from the client's point of view. Any third party use of this report, including use by the Client's lender, prospective purchaser, or lessee will be subject to the terms and conditions governing the contractual work between the Client and Krazan. The unauthorized use of, reliance on, or release of the information contained in this report, without the expressed written consent of Krazan, is strictly prohibited and will be without risk or liability to Krazan.

Laboratory analysis was conducted by a laboratory accredited under the guidance of the EPA. The results of the analyses are accurate only to the degree of care exercised by the independent laboratories and the representative nature of the samples obtained.

Krazan appreciates the opportunity to provide you with this information and trusts that you will find it useful. If you have any questions or if we may be of further assistance, please do not hesitate to contact our office at (425) 485-5519.

Respectfully submitted,
KRAZAN & ASSOCIATES, INC.

R. Steven Padilla
NW Environmental Department Manager
Krazan & Associates

Appendix A

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

October 5, 2015

Steven Padilla, Project Manager
Krazan & Associates
4303 198th Street SW
Lynnwood, WA 98036

Dear Mr. Padilla:

Included is the amended report from the testing of material submitted on September 17, 2015 from the Port Gamble Bay, PO 10415010, F&BI 509306 project. Per your request, percent moisture was added to the report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
KRZ1001R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

October 1, 2015

Steven Padilla, Project Manager
Krazan & Associates
4303 198th Street SW
Lynnwood, WA 98036

Dear Mr. Padilla:

Included are the results from the testing of material submitted on September 17, 2015 from the Port Gamble Bay, PO 10415010, F&BI 509306 project. There are 31 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
KRZ1001R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 17, 2015 by Friedman & Bruya, Inc. from the Krazan & Associates Port Gamble Bay, PO 10415010, F&BI 509306 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Krazan & Associates
509306 -01	Habitat Substrate
509306 -02	Filter Material
509306 -03	Type 1 Armor
509306 -04	Type 3 Armor

Per your request, the analytical testing on samples Habitat Substrates and Filter Material were canceled when possible.

The samples were sent to Fremont Analytical for chlorinated pesticides and total organic carbon analyses. In addition, the samples were sent to Frontier for dioxin and furan analysis. The report from Fremont Analytical is enclosed. The report generated by Frontier will be forwarded to your office upon receipt.

The 6020A silver matrix spike and the associated relative percent difference failed the acceptance criteria. The laboratory control sample passed the acceptance criteria, therefore the results were likely due to matrix effect.

The 8270D calibration standard failed the acceptance criteria for hexachlorocyclopentadiene. The data were flagged accordingly.

All other quality control requirements were acceptable.

Date of Report: 10/01/15
Date Received: 09/17/15
Project: Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted: NA
Date Analyzed: 09/22/15

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES FOR PERCENT MOISTURE USING ASTM D2216-98

Sample ID Laboratory ID	% Moisture
Type 1 Armor 509306-03	3
Type 3 Armor 509306-04	7

Analysis For Total Metals By EPA Method 6020A

Client ID:	Type 1 Armor	Client:	Krazan & Associates
Date Received:	09/17/15	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/23/15	Lab ID:	509306-03
Date Analyzed:	09/24/15	Data File:	509306-03.028
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Lithium	107	70	130
Germanium	108	70	130
Indium	90	70	130
Holmium	94	70	130

Analyte:	Concentration mg/kg (ppm)
Antimony	<1
Arsenic	<1
Beryllium	<1
Cadmium	<1
Chromium	6.83
Copper	41.2
Lead	<1
Nickel	15.7
Selenium	<1
Thallium	<1
Zinc	17.2

Analysis For Total Metals By EPA Method 6020A

Client ID:	Type 3 Armor	Client:	Krazan & Associates
Date Received:	09/17/15	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/23/15	Lab ID:	509306-04
Date Analyzed:	09/24/15	Data File:	509306-04.027
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Lithium	104	70	130
Germanium	115	70	130
Indium	89	70	130
Holmium	93	70	130

Analyte:	Concentration mg/kg (ppm)
Antimony	<1
Arsenic	<1
Beryllium	<1
Cadmium	<1
Chromium	5.63
Copper	82.1
Lead	<1
Nickel	28.3
Selenium	<1
Thallium	<1
Zinc	28.1

Analysis For Total Metals By EPA Method 6020A

Client ID:	Method Blank	Client:	Krazan & Associates
Date Received:	Not Applicable	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/23/15	Lab ID:	I5-543 mb
Date Analyzed:	09/24/15	Data File:	I5-543 mb.023
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Lithium	114	70	130
Germanium	98	70	130
Indium	97	70	130
Holmium	101	70	130

Analyte:	Concentration mg/kg (ppm)
Antimony	<1
Arsenic	<1
Beryllium	<1
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Nickel	<1
Selenium	<1
Thallium	<1
Zinc	<5

Analysis For Total Metals By EPA Method 6020A

Client ID:	Type 1 Armor	Client:	Krazan & Associates
Date Received:	09/17/15	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/30/15	Lab ID:	509306-03
Date Analyzed:	09/30/15	Data File:	509306-03.039
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	89	70	130

Analyte:	Concentration mg/kg (ppm) Dry Weight
Silver	<1

Analysis For Total Metals By EPA Method 6020A

Client ID:	Type 3 Armor	Client:	Krazan & Associates
Date Received:	09/17/15	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/30/15	Lab ID:	509306-04
Date Analyzed:	09/30/15	Data File:	509306-04.040
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	85	70	130

Analyte:	Concentration mg/kg (ppm) Dry Weight
Silver	<1

Analysis For Total Metals By EPA Method 6020A

Client ID:	Method Blank	Client:	Krazan & Associates
Date Received:	Not Applicable	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/30/15	Lab ID:	I5-558 mb2
Date Analyzed:	09/30/15	Data File:	I5-558 mb2.035
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	93	70	130

Analyte:	Concentration mg/kg (ppm) Dry Weight
Silver	<1

Date of Report: 10/01/15
Date Received: 09/17/15
Project: Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted: 09/23/15
Date Analyzed: 09/24/15

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL MERCURY
USING EPA METHOD 1631E

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Total Mercury
Type 1 Armor 509306-03	<0.1
Type 3 Armor 509306-04	<0.1
Method Blank	<0.1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Type 1 Armor	Client:	Krazan & Associates
Date Received:	09/17/15	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/18/15	Lab ID:	509306-03
Date Analyzed:	09/18/15	Data File:	091828.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	62	142
Toluene-d8	101	55	145
4-Bromofluorobenzene	95	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Type 3 Armor	Client:	Krazan & Associates
Date Received:	09/17/15	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/18/15	Lab ID:	509306-04
Date Analyzed:	09/18/15	Data File:	091829.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	62	142
Toluene-d8	101	55	145
4-Bromofluorobenzene	94	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Krazan & Associates
Date Received:	Not Applicable	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/18/15	Lab ID:	05-1899 mb2
Date Analyzed:	09/18/15	Data File:	091818.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	62	142
Toluene-d8	103	55	145
4-Bromofluorobenzene	94	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Type 1 Armor	Client:	Krazan & Associates
Date Received:	09/17/15	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/21/15	Lab ID:	509306-03 1/0.25
Date Analyzed:	09/22/15	Data File:	092210.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	88	31	163
Benzo(a)anthracene-d12	88	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.0005
Acenaphthylene	<0.0005
Acenaphthene	<0.0005
Fluorene	<0.0005
Phenanthrene	<0.0005
Anthracene	<0.0005
Fluoranthene	<0.0005
Pyrene	<0.0005
Benz(a)anthracene	<0.0005
Chrysene	<0.0005
Benzo(a)pyrene	<0.0005
Benzo(b)fluoranthene	<0.0005
Benzo(k)fluoranthene	<0.0005
Indeno(1,2,3-cd)pyrene	<0.0005
Dibenz(a,h)anthracene	<0.0005
Benzo(g,h,i)perylene	<0.0005

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Type 3 Armor	Client:	Krazan & Associates
Date Received:	09/17/15	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/21/15	Lab ID:	509306-04 1/0.25
Date Analyzed:	09/22/15	Data File:	092211.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	86	31	163
Benzo(a)anthracene-d12	105	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.0005
Acenaphthylene	<0.0005
Acenaphthene	<0.0005
Fluorene	<0.0005
Phenanthrene	<0.0005
Anthracene	<0.0005
Fluoranthene	<0.0005
Pyrene	<0.0005
Benz(a)anthracene	<0.0005
Chrysene	<0.0005
Benzo(a)pyrene	<0.0005
Benzo(b)fluoranthene	<0.0005
Benzo(k)fluoranthene	<0.0005
Indeno(1,2,3-cd)pyrene	<0.0005
Dibenz(a,h)anthracene	<0.0005
Benzo(g,h,i)perylene	<0.0005

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Krazan & Associates
Date Received:	Not Applicable	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/21/15	Lab ID:	05-1921 mb 1/0.25
Date Analyzed:	09/22/15	Data File:	092206.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	86	31	163
Benzo(a)anthracene-d12	88	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.0005
Acenaphthylene	<0.0005
Acenaphthene	<0.0005
Fluorene	<0.0005
Phenanthrene	<0.0005
Anthracene	<0.0005
Fluoranthene	<0.0005
Pyrene	<0.0005
Benz(a)anthracene	<0.0005
Chrysene	<0.0005
Benzo(a)pyrene	<0.0005
Benzo(b)fluoranthene	<0.0005
Benzo(k)fluoranthene	<0.0005
Indeno(1,2,3-cd)pyrene	<0.0005
Dibenz(a,h)anthracene	<0.0005
Benzo(g,h,i)perylene	<0.0005

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Type 1 Armor	Client:	Krazan & Associates
Date Received:	09/17/15	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/21/15	Lab ID:	509306-03 1/0.25
Date Analyzed:	09/22/15	Data File:	092211.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	78	56	115
Phenol-d6	77	54	113
Nitrobenzene-d5	78	31	164
2-Fluorobiphenyl	83	47	133
2,4,6-Tribromophenol	91	35	141
Terphenyl-d14	89	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.025	Hexachlorocyclopentadiene	<0.0075 ca
Bis(2-chloroethyl) ether	<0.0025	2,4,6-Trichlorophenol	<0.025
2-Chlorophenol	<0.025	2,4,5-Trichlorophenol	<0.025
1,3-Dichlorobenzene	<0.0025	2-Chloronaphthalene	<0.0025
1,4-Dichlorobenzene	<0.0025	2-Nitroaniline	<0.012
1,2-Dichlorobenzene	<0.0025	Dimethyl phthalate	<0.025
Benzyl alcohol	<0.025	2,6-Dinitrotoluene	<0.012
Bis(2-chloroisopropyl) ether	<0.0025	3-Nitroaniline	<0.25
2-Methylphenol	<0.025	2,4-Dinitrophenol	<0.075
Hexachloroethane	<0.0025	Dibenzofuran	<0.0025
N-Nitroso-di-n-propylamine	<0.0025	2,4-Dinitrotoluene	<0.012
3-Methylphenol + 4-Methylphenol	<0.05	4-Nitrophenol	<0.075
Nitrobenzene	<0.0025	Diethyl phthalate	<0.025
Isophorone	<0.0025	4-Chlorophenyl phenyl ether	<0.0025
2-Nitrophenol	<0.025	N-Nitrosodiphenylamine	<0.0025
2,4-Dimethylphenol	<0.025	4-Nitroaniline	<0.25
Benzoic acid	<0.12	4,6-Dinitro-2-methylphenol	<0.075
Bis(2-chloroethoxy)methane	<0.0025	4-Bromophenyl phenyl ether	<0.0025
2,4-Dichlorophenol	<0.025	Hexachlorobenzene	<0.0025
1,2,4-Trichlorobenzene	<0.0025	Pentachlorophenol	<0.025
Hexachlorobutadiene	<0.0025	Carbazole	<0.025
4-Chloroaniline	<0.25	Di-n-butyl phthalate	<0.025
4-Chloro-3-methylphenol	<0.025	Benzyl butyl phthalate	<0.025
2-Methylnaphthalene	<0.0025	Bis(2-ethylhexyl) phthalate	<0.04
1-Methylnaphthalene	<0.0025	Di-n-octyl phthalate	<0.025

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Type 3 Armor	Client:	Krazan & Associates
Date Received:	09/17/15	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/21/15	Lab ID:	509306-04 1/0.25
Date Analyzed:	09/22/15	Data File:	092212.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	63	56	115
Phenol-d6	73	54	113
Nitrobenzene-d5	72	31	164
2-Fluorobiphenyl	77	47	133
2,4,6-Tribromophenol	88	35	141
Terphenyl-d14	90	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.025	Hexachlorocyclopentadiene	<0.0075 ca
Bis(2-chloroethyl) ether	<0.0025	2,4,6-Trichlorophenol	<0.025
2-Chlorophenol	<0.025	2,4,5-Trichlorophenol	<0.025
1,3-Dichlorobenzene	<0.0025	2-Chloronaphthalene	<0.0025
1,4-Dichlorobenzene	<0.0025	2-Nitroaniline	<0.012
1,2-Dichlorobenzene	<0.0025	Dimethyl phthalate	<0.025
Benzyl alcohol	<0.025	2,6-Dinitrotoluene	<0.012
Bis(2-chloroisopropyl) ether	<0.0025	3-Nitroaniline	<0.25
2-Methylphenol	<0.025	2,4-Dinitrophenol	<0.075
Hexachloroethane	<0.0025	Dibenzofuran	<0.0025
N-Nitroso-di-n-propylamine	<0.0025	2,4-Dinitrotoluene	<0.012
3-Methylphenol + 4-Methylphenol	<0.05	4-Nitrophenol	<0.075
Nitrobenzene	<0.0025	Diethyl phthalate	<0.025
Isophorone	<0.0025	4-Chlorophenyl phenyl ether	<0.0025
2-Nitrophenol	<0.025	N-Nitrosodiphenylamine	<0.0025
2,4-Dimethylphenol	<0.025	4-Nitroaniline	<0.25
Benzoic acid	<0.12	4,6-Dinitro-2-methylphenol	<0.075
Bis(2-chloroethoxy)methane	<0.0025	4-Bromophenyl phenyl ether	<0.0025
2,4-Dichlorophenol	<0.025	Hexachlorobenzene	<0.0025
1,2,4-Trichlorobenzene	<0.0025	Pentachlorophenol	<0.025
Hexachlorobutadiene	<0.0025	Carbazole	<0.025
4-Chloroaniline	<0.25	Di-n-butyl phthalate	<0.025
4-Chloro-3-methylphenol	<0.025	Benzyl butyl phthalate	<0.025
2-Methylnaphthalene	<0.0025	Bis(2-ethylhexyl) phthalate	<0.04
1-Methylnaphthalene	<0.0025	Di-n-octyl phthalate	<0.025

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	Krazan & Associates
Date Received:	Not Applicable	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/21/15	Lab ID:	05-1920 mb 1/0.25
Date Analyzed:	09/22/15	Data File:	092205.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	88	56	115
Phenol-d6	87	54	113
Nitrobenzene-d5	90	31	164
2-Fluorobiphenyl	93	47	133
2,4,6-Tribromophenol	87	35	141
Terphenyl-d14	97	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.025	Hexachlorocyclopentadiene	<0.0075 ca
Bis(2-chloroethyl) ether	<0.0025	2,4,6-Trichlorophenol	<0.025
2-Chlorophenol	<0.025	2,4,5-Trichlorophenol	<0.025
1,3-Dichlorobenzene	<0.0025	2-Chloronaphthalene	<0.0025
1,4-Dichlorobenzene	<0.0025	2-Nitroaniline	<0.012
1,2-Dichlorobenzene	<0.0025	Dimethyl phthalate	<0.025
Benzyl alcohol	<0.025	2,6-Dinitrotoluene	<0.012
Bis(2-chloroisopropyl) ether	<0.0025	3-Nitroaniline	<0.25
2-Methylphenol	<0.025	2,4-Dinitrophenol	<0.075
Hexachloroethane	<0.0025	Dibenzofuran	<0.0025
N-Nitroso-di-n-propylamine	<0.0025	2,4-Dinitrotoluene	<0.012
3-Methylphenol + 4-Methylphenol	<0.05	4-Nitrophenol	<0.075
Nitrobenzene	<0.0025	Diethyl phthalate	<0.025
Isophorone	<0.0025	4-Chlorophenyl phenyl ether	<0.0025
2-Nitrophenol	<0.025	N-Nitrosodiphenylamine	<0.0025
2,4-Dimethylphenol	<0.025	4-Nitroaniline	<0.25
Benzoic acid	<0.12	4,6-Dinitro-2-methylphenol	<0.075
Bis(2-chloroethoxy)methane	<0.0025	4-Bromophenyl phenyl ether	<0.0025
2,4-Dichlorophenol	<0.025	Hexachlorobenzene	<0.0025
1,2,4-Trichlorobenzene	<0.0025	Pentachlorophenol	<0.025
Hexachlorobutadiene	<0.0025	Carbazole	<0.025
4-Chloroaniline	<0.25	Di-n-butyl phthalate	<0.025
4-Chloro-3-methylphenol	<0.025	Benzyl butyl phthalate	<0.025
2-Methylnaphthalene	<0.0025	Bis(2-ethylhexyl) phthalate	<0.04
1-Methylnaphthalene	<0.0025	Di-n-octyl phthalate	<0.025

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Type 1 Armor	Client:	Krazan & Associates
Date Received:	09/17/15	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/21/15	Lab ID:	509306-03
Date Analyzed:	09/22/15	Data File:	U:\09-22-15\092211.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	66	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.004
Aroclor 1232	<0.004
Aroclor 1016	<0.004
Aroclor 1242	<0.004
Aroclor 1248	<0.004
Aroclor 1254	<0.004
Aroclor 1260	<0.004

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Type 3 Armor	Client:	Krazan & Associates
Date Received:	09/17/15	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/21/15	Lab ID:	509306-04
Date Analyzed:	09/22/15	Data File:	12.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	64	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.004
Aroclor 1232	<0.004
Aroclor 1016	<0.004
Aroclor 1242	<0.004
Aroclor 1248	<0.004
Aroclor 1254	<0.004
Aroclor 1260	<0.004

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Krazan & Associates
Date Received:	Not Applicable	Project:	Port Gamble Bay, PO 10415010, F&BI 509306
Date Extracted:	09/21/15	Lab ID:	05-1933 mb
Date Analyzed:	09/22/15	Data File:	06.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	79	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.004
Aroclor 1232	<0.004
Aroclor 1016	<0.004
Aroclor 1242	<0.004
Aroclor 1248	<0.004
Aroclor 1254	<0.004
Aroclor 1260	<0.004

Date of Report: 10/01/15
Date Received: 09/17/15
Project: Port Gamble Bay, PO 10415010, F&BI 509306

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 6020A

Laboratory Code: 509306-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Antimony	mg/kg (ppm)	20	<1	95	95	75-125	0
Arsenic	mg/kg (ppm)	10	<1	90	90	75-125	0
Beryllium	mg/kg (ppm)	5	<1	85	85	75-125	0
Cadmium	mg/kg (ppm)	10	<1	97	97	75-125	0
Chromium	mg/kg (ppm)	50	6.62	79	77	75-125	3
Copper	mg/kg (ppm)	50	40.0	105	113	75-125	7
Lead	mg/kg (ppm)	50	<1	90	88	75-125	2
Nickel	mg/kg (ppm)	25	15.3	88	88	75-125	0
Selenium	mg/kg (ppm)	5	<1	83	78	75-125	6
Thallium	mg/kg (ppm)	5	<1	97	94	75-125	3
Zinc	mg/kg (ppm)	50	16.7	78	77	75-125	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Antimony	mg/kg (ppm)	20	115	80-120
Arsenic	mg/kg (ppm)	10	102	80-120
Beryllium	mg/kg (ppm)	5	95	80-120
Cadmium	mg/kg (ppm)	10	107	80-120
Chromium	mg/kg (ppm)	50	100	80-120
Copper	mg/kg (ppm)	50	106	80-120
Lead	mg/kg (ppm)	50	105	80-120
Nickel	mg/kg (ppm)	25	105	80-120
Selenium	mg/kg (ppm)	5	106	80-120
Thallium	mg/kg (ppm)	5	109	80-120
Zinc	mg/kg (ppm)	50	94	80-120

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 6020A

Laboratory Code: 509421-01 1/10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Silver	mg/kg (ppm)	10	<10	57 vo	84	75-125	38 vo

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Silver	mg/kg (ppm)	10	92	80-120

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL MERCURY USING EPA METHOD 1631E

Laboratory Code: 509306-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Mercury	mg/kg (ppm)	0.125	<0.1	97	96	62-136	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	mg/kg (ppm)	0.125	95	68-125

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 509222-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	26	10-142
Chloromethane	mg/kg (ppm)	2.5	<0.5	52	10-126
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	56	10-138
Bromomethane	mg/kg (ppm)	2.5	<0.5	61	10-163
Chloroethane	mg/kg (ppm)	2.5	<0.5	54	10-176
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	61	10-176
Acetone	mg/kg (ppm)	12.5	<0.5	72	10-163
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	70	10-160
Hexane	mg/kg (ppm)	2.5	<0.25	48	10-137
Methylene chloride	mg/kg (ppm)	2.5	0.52	69 b	10-156
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	79	21-145
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	72	14-137
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	70	19-140
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	82	10-158
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	78	25-135
Chloroform	mg/kg (ppm)	2.5	<0.05	72	21-145
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	80	19-147
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	67	12-160
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	76	10-156
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	73	17-140
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	75	9-164
Benzene	mg/kg (ppm)	2.5	<0.03	71	29-129
Trichloroethene	mg/kg (ppm)	2.5	<0.02	73	21-139
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	69	30-135
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	78	23-155
Dibromomethane	mg/kg (ppm)	2.5	<0.05	80	23-145
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	87	24-155
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	83	28-144
Toluene	mg/kg (ppm)	2.5	<0.05	67	35-130
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	79	26-149
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	71	10-205
2-Hexanone	mg/kg (ppm)	12.5	<0.5	72	15-166
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	70	31-137
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	66	20-133
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	72	28-150
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	76	28-142
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	66	32-129
Ethylbenzene	mg/kg (ppm)	2.5	0.061	65	32-137
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	78	31-143
m,p-Xylene	mg/kg (ppm)	5	0.24	68	34-136
o-Xylene	mg/kg (ppm)	2.5	0.10	67	33-134
Styrene	mg/kg (ppm)	2.5	<0.05	75	35-137
Isopropylbenzene	mg/kg (ppm)	2.5	0.11	67	31-142
Bromoform	mg/kg (ppm)	2.5	<0.05	76	21-156
n-Propylbenzene	mg/kg (ppm)	2.5	0.33	57	23-146
Bromobenzene	mg/kg (ppm)	2.5	<0.05	70	34-130
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	0.62	50 b	18-149
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	70	28-140
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05	69	25-144
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	65	31-134
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	66	31-136
tert-Butylbenzene	mg/kg (ppm)	2.5	<0.05	66	30-137
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	1.5	31 b	10-182
sec-Butylbenzene	mg/kg (ppm)	2.5	0.61	51 b	23-145
p-Isopropyltoluene	mg/kg (ppm)	2.5	0.65	53 b	21-149
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	66	30-131
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	65	29-129
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	68	31-132
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	74	11-161
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	71	22-142
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	83	10-142
Naphthalene	mg/kg (ppm)	2.5	0.95	41 b	14-157
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	68	20-144

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	39	44	10-146	12
Chloromethane	mg/kg (ppm)	2.5	60	65	27-133	8
Vinyl chloride	mg/kg (ppm)	2.5	70	76	22-139	8
Bromomethane	mg/kg (ppm)	2.5	84	94	38-114	11
Chloroethane	mg/kg (ppm)	2.5	84	95	10-163	12
Trichlorofluoromethane	mg/kg (ppm)	2.5	87	101	10-196	15
Acetone	mg/kg (ppm)	12.5	98	105	52-141	7
1,1-Dichloroethene	mg/kg (ppm)	2.5	93	103	47-128	10
Hexane	mg/kg (ppm)	2.5	74	84	43-142	13
Methylene chloride	mg/kg (ppm)	2.5	100	96	42-132	4
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	104	111	60-123	7
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	98	105	67-127	7
1,1-Dichloroethane	mg/kg (ppm)	2.5	93	99	68-115	6
2,2-Dichloropropane	mg/kg (ppm)	2.5	120	126	52-170	5
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	103	112	72-113	8
Chloroform	mg/kg (ppm)	2.5	96	103	66-120	7
2-Butanone (MEK)	mg/kg (ppm)	12.5	111	119	57-123	7
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	92	100	56-135	8
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	107	113	62-131	5
1,1-Dichloropropene	mg/kg (ppm)	2.5	100	109	69-128	9
Carbon tetrachloride	mg/kg (ppm)	2.5	106	116	60-139	9
Benzene	mg/kg (ppm)	2.5	96	103	68-114	7
Trichloroethene	mg/kg (ppm)	2.5	97	105	64-117	8
1,2-Dichloropropane	mg/kg (ppm)	2.5	91	100	72-127	9
Bromodichloromethane	mg/kg (ppm)	2.5	111	115	72-130	4
Dibromomethane	mg/kg (ppm)	2.5	106	114	70-120	7
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	113	119	45-145	5
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	112	119	75-136	6
Toluene	mg/kg (ppm)	2.5	91	97	66-126	6
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	104	110	72-132	6
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	91	97	75-113	6
2-Hexanone	mg/kg (ppm)	12.5	87	94	33-152	8
1,3-Dichloropropane	mg/kg (ppm)	2.5	93	99	72-130	6
Tetrachloroethene	mg/kg (ppm)	2.5	91	97	72-114	6
Dibromochloromethane	mg/kg (ppm)	2.5	102	105	74-125	3
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	102	110	74-132	8
Chlorobenzene	mg/kg (ppm)	2.5	90	96	76-111	6
Ethylbenzene	mg/kg (ppm)	2.5	91	98	64-123	7
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	108	112	69-135	4
m,p-Xylene	mg/kg (ppm)	5	98	105	78-122	7
o-Xylene	mg/kg (ppm)	2.5	96	101	77-124	5
Styrene	mg/kg (ppm)	2.5	100	106	74-126	6
Isopropylbenzene	mg/kg (ppm)	2.5	94	101	76-127	7
Bromoform	mg/kg (ppm)	2.5	110	110	56-132	0
n-Propylbenzene	mg/kg (ppm)	2.5	87	96	74-124	10
Bromobenzene	mg/kg (ppm)	2.5	94	101	72-122	7
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	88	96	76-126	9
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	90	98	56-143	9
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	88	96	61-137	9
2-Chlorotoluene	mg/kg (ppm)	2.5	85	93	74-121	9
4-Chlorotoluene	mg/kg (ppm)	2.5	89	96	75-122	8
tert-Butylbenzene	mg/kg (ppm)	2.5	90	100	73-130	11
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	89	97	76-125	9
sec-Butylbenzene	mg/kg (ppm)	2.5	88	96	71-130	9
p-Isopropyltoluene	mg/kg (ppm)	2.5	90	99	70-132	10
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	89	97	75-121	9
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	86	93	74-117	8
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	90	96	76-121	6
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	95	100	58-138	5
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	95	104	64-135	9
Hexachlorobutadiene	mg/kg (ppm)	2.5	92	104	50-153	12
Naphthalene	mg/kg (ppm)	2.5	81	90	63-140	11
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	89	98	63-138	10

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: 509306-01 1/0.25 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	<0.0005	80	44-129
Acenaphthylene	mg/kg (ppm)	0.17	<0.0005	84	52-121
Acenaphthene	mg/kg (ppm)	0.17	<0.0005	84	51-123
Fluorene	mg/kg (ppm)	0.17	<0.0005	88	37-137
Phenanthrene	mg/kg (ppm)	0.17	<0.0005	90	34-141
Anthracene	mg/kg (ppm)	0.17	<0.0005	81	32-124
Fluoranthene	mg/kg (ppm)	0.17	<0.0005	93	16-160
Pyrene	mg/kg (ppm)	0.17	<0.0005	99	10-180
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.0005	91	23-144
Chrysene	mg/kg (ppm)	0.17	<0.0005	92	32-149
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.0005	81	23-176
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.0005	83	42-139
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.0005	72	21-163
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.0005	85	23-170
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.0005	86	31-146
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	<0.0005	81	37-133

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	83	86	58-121	4
Acenaphthylene	mg/kg (ppm)	0.17	83	87	54-121	5
Acenaphthene	mg/kg (ppm)	0.17	86	88	54-123	2
Fluorene	mg/kg (ppm)	0.17	88	89	56-127	1
Phenanthrene	mg/kg (ppm)	0.17	89	92	55-122	3
Anthracene	mg/kg (ppm)	0.17	80	79	50-120	1
Fluoranthene	mg/kg (ppm)	0.17	91	92	54-129	1
Pyrene	mg/kg (ppm)	0.17	102	97	53-127	5
Benz(a)anthracene	mg/kg (ppm)	0.17	91	93	51-115	2
Chrysene	mg/kg (ppm)	0.17	93	96	55-129	3
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	88	90	56-123	2
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	91	92	54-131	1
Benzo(a)pyrene	mg/kg (ppm)	0.17	67	68	51-118	1
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	82	80	49-148	2
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	86	87	50-141	1
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	79	78	52-131	1

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270D

Laboratory Code: 509306-01 1/0.25 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Phenol	mg/kg (ppm)	0.33	<0.025	93	50-150
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.33	<0.0025	81	50-150
2-Chlorophenol	mg/kg (ppm)	0.33	<0.025	85	44-133
1,3-Dichlorobenzene	mg/kg (ppm)	0.33	<0.0025	73	50-150
1,4-Dichlorobenzene	mg/kg (ppm)	0.33	<0.0025	73	50-150
1,2-Dichlorobenzene	mg/kg (ppm)	0.33	<0.0025	75	50-150
Benzyl alcohol	mg/kg (ppm)	0.33	<0.025	89	50-150
Bis(2-chloroisopropyl) ether	mg/kg (ppm)	0.33	<0.0025	80	50-150
2-Methylphenol	mg/kg (ppm)	0.33	<0.025	86	42-143
Hexachloroethane	mg/kg (ppm)	0.33	<0.0025	77	31-132
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.33	<0.0025	85	50-150
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.33	<0.05	88	10-250
Nitrobenzene	mg/kg (ppm)	0.33	<0.0025	82	50-150
Isophorone	mg/kg (ppm)	0.33	<0.0025	87	50-150
2-Nitrophenol	mg/kg (ppm)	0.33	<0.025	92	29-152
2,4-Dimethylphenol	mg/kg (ppm)	0.33	<0.025	74	16-163
Benzoic acid	mg/kg (ppm)	0.5	<0.12	116	10-250
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.33	<0.0025	85	50-150
2,4-Dichlorophenol	mg/kg (ppm)	0.33	<0.025	92	39-145
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.33	<0.0025	80	50-150
Hexachlorobutadiene	mg/kg (ppm)	0.33	<0.0025	78	50-150
4-Chloroaniline	mg/kg (ppm)	0.66	<0.25	63	23-110
4-Chloro-3-methylphenol	mg/kg (ppm)	0.33	<0.025	96	50-150
2-Methylnaphthalene	mg/kg (ppm)	0.33	<0.0025	87	50-150
1-Methylnaphthalene	mg/kg (ppm)	0.33	<0.0025	87	50-150
Hexachlorocyclopentadiene	mg/kg (ppm)	0.33	<0.0075	89	10-151
2,4,6-Trichlorophenol	mg/kg (ppm)	0.33	<0.025	98	38-149
2,4,5-Trichlorophenol	mg/kg (ppm)	0.33	<0.025	96	50-150
2-Chloronaphthalene	mg/kg (ppm)	0.33	<0.0025	86	50-150
2-Nitroaniline	mg/kg (ppm)	0.33	<0.012	94	50-150
Dimethyl phthalate	mg/kg (ppm)	0.33	<0.025	85	50-150
2,6-Dinitrotoluene	mg/kg (ppm)	0.33	<0.012	93	50-150
3-Nitroaniline	mg/kg (ppm)	0.66	<0.25	72	23-119
2,4-Dinitrophenol	mg/kg (ppm)	0.33	<0.075	101	10-162
Dibenzofuran	mg/kg (ppm)	0.33	<0.0025	90	47-149
2,4-Dinitrotoluene	mg/kg (ppm)	0.33	<0.012	96	50-150
4-Nitrophenol	mg/kg (ppm)	0.33	<0.075	95	10-179
Diethyl phthalate	mg/kg (ppm)	0.33	<0.025	95	50-150
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.33	<0.0025	91	50-150
N-Nitrosodiphenylamine	mg/kg (ppm)	0.33	<0.0025	87	50-150
4-Nitroaniline	mg/kg (ppm)	0.66	<0.25	69	32-135
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.33	<0.075	103	10-170
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.33	<0.0025	95	50-150
Hexachlorobenzene	mg/kg (ppm)	0.33	<0.0025	92	50-150
Pentachlorophenol	mg/kg (ppm)	0.33	<0.025	108	12-160
Carbazole	mg/kg (ppm)	0.33	<0.025	89	50-150
Di-n-butyl phthalate	mg/kg (ppm)	0.33	<0.025	97	50-150
Benzyl butyl phthalate	mg/kg (ppm)	0.33	<0.025	102	50-150
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.33	<0.04	106	10-250
Di-n-octyl phthalate	mg/kg (ppm)	0.33	<0.025	124	54-161

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270D

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Phenol	mg/kg (ppm)	0.33	94	100	51-119	6
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.33	91	96	60-112	5
2-Chlorophenol	mg/kg (ppm)	0.33	92	97	59-114	5
1,3-Dichlorobenzene	mg/kg (ppm)	0.33	90	93	62-113	3
1,4-Dichlorobenzene	mg/kg (ppm)	0.33	89	92	61-114	3
1,2-Dichlorobenzene	mg/kg (ppm)	0.33	90	93	61-113	3
Benzyl alcohol	mg/kg (ppm)	0.33	95	102	50-119	7
Bis(2-chloroisopropyl) ether	mg/kg (ppm)	0.33	88	93	59-113	6
2-Methylphenol	mg/kg (ppm)	0.33	88	95	58-115	8
Hexachloroethane	mg/kg (ppm)	0.33	92	96	63-114	4
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.33	89	96	62-114	8
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.33	91	99	54-120	8
Nitrobenzene	mg/kg (ppm)	0.33	90	95	59-114	5
Isophorone	mg/kg (ppm)	0.33	91	98	61-113	7
2-Nitrophenol	mg/kg (ppm)	0.33	95	105	59-114	10
2,4-Dimethylphenol	mg/kg (ppm)	0.33	76	86	54-107	12
Benzoic acid	mg/kg (ppm)	0.5	110	135	43-150	20
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.33	91	96	60-114	5
2,4-Dichlorophenol	mg/kg (ppm)	0.33	94	103	57-118	9
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.33	90	94	56-112	4
Hexachlorobutadiene	mg/kg (ppm)	0.33	91	94	60-116	3
4-Chloroaniline	mg/kg (ppm)	0.66	48	45	10-126	6
4-Chloro-3-methylphenol	mg/kg (ppm)	0.33	94	104	59-115	10
2-Methylnaphthalene	mg/kg (ppm)	0.33	94	98	60-115	4
1-Methylnaphthalene	mg/kg (ppm)	0.33	94	99	70-130	5
Hexachlorocyclopentadiene	mg/kg (ppm)	0.33	75	91	41-107	19
2,4,6-Trichlorophenol	mg/kg (ppm)	0.33	96	109	47-119	13
2,4,5-Trichlorophenol	mg/kg (ppm)	0.33	93	102	61-121	9
2-Chloronaphthalene	mg/kg (ppm)	0.33	90	97	58-114	7
2-Nitroaniline	mg/kg (ppm)	0.33	94	103	55-119	9
Dimethyl phthalate	mg/kg (ppm)	0.33	87	87	58-116	0
2,6-Dinitrotoluene	mg/kg (ppm)	0.33	95	102	57-119	7
3-Nitroaniline	mg/kg (ppm)	0.66	70	78	10-143	11
2,4-Dinitrophenol	mg/kg (ppm)	0.33	93	109	40-122	16
Dibenzofuran	mg/kg (ppm)	0.33	93	100	56-115	7
2,4-Dinitrotoluene	mg/kg (ppm)	0.33	98	106	53-126	8
4-Nitrophenol	mg/kg (ppm)	0.33	91	104	40-124	13
Diethyl phthalate	mg/kg (ppm)	0.33	96	98	57-116	2
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.33	92	99	54-119	7
N-Nitrosodiphenylamine	mg/kg (ppm)	0.33	83	93	54-113	11
4-Nitroaniline	mg/kg (ppm)	0.66	71	81	47-109	13
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.33	96	112	55-147	15
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.33	95	107	56-116	12
Hexachlorobenzene	mg/kg (ppm)	0.33	94	104	57-115	10
Pentachlorophenol	mg/kg (ppm)	0.33	102	122	45-123	18
Carbazole	mg/kg (ppm)	0.33	86	92	57-116	7
Di-n-butyl phthalate	mg/kg (ppm)	0.33	96	104	56-118	8
Benzyl butyl phthalate	mg/kg (ppm)	0.33	98	108	56-122	10
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.33	102	112	56-155	9
Di-n-octyl phthalate	mg/kg (ppm)	0.33	100	116	58-120	15

Date of Report: 10/01/15
Date Received: 09/17/15
Project: Port Gamble Bay, PO 10415010, F&BI 509306

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR POLYCHLORINATED BIPHENYLS AS AROCLOR 1016/1260 BY EPA METHOD 8082A

Laboratory Code: 509306-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Control Limits
Aroclor 1016	mg/kg (ppm)	0.8	<0.004	67	50-150
Aroclor 1260	mg/kg (ppm)	0.8	<0.004	72	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	77	74	55-130	4
Aroclor 1260	mg/kg (ppm)	0.8	78	76	58-133	3

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

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info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 509306
Lab ID: 1509268

September 25, 2015

Attention Michael Erdahl:

Fremont Analytical, Inc. received 4 sample(s) on 9/18/2015 for the analyses presented in the following report.

Organochlorine Pesticides by EPA Method 8081
Sample Moisture (Percent Moisture)
Total Organic Carbon by EPA Method 9060

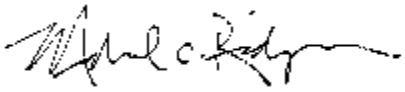
This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,



Mike Ridgeway
President

Date: *09/25/2015*

CLIENT: Friedman & Bruya
Project: 509306
Lab Order: 1509268

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1509268-001	Habitat Substrate	09/17/2015 12:00 AM	09/18/2015 1:50 PM
1509268-002	Filter Material	09/17/2015 12:00 AM	09/18/2015 1:50 PM
1509268-003	Type 1 Armor	09/17/2015 12:00 AM	09/18/2015 1:50 PM
1509268-004	Type 3 Armor	09/17/2015 12:00 AM	09/18/2015 1:50 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **1509268**
Date: **9/25/2015**

CLIENT: Friedman & Bruya
Project: 509306

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below LOQ
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

WO#: **1509268**

Date Reported: **9/25/2015**

Client: Friedman & Bruya
Collection Date: 9/17/2015
Project: 509306
Lab ID: 1509268-003
Matrix: Soil
Client Sample ID: **Type 1 Armor**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Organochlorine Pesticides by EPA Method 8081				Batch ID: 11932		Analyst: MD
Toxaphene	ND	0.102		mg/Kg-dry	1	9/24/2015 6:59:00 AM
Alpha BHC	ND	0.0102		mg/Kg-dry	1	9/24/2015 6:59:00 AM
Beta BHC	ND	0.0102		mg/Kg-dry	1	9/24/2015 6:59:00 AM
Gamma BHC (Lindane)	ND	0.0102		mg/Kg-dry	1	9/24/2015 6:59:00 AM
Delta BHC	ND	0.0102		mg/Kg-dry	1	9/24/2015 6:59:00 AM
Heptachlor	ND	0.0102		mg/Kg-dry	1	9/24/2015 6:59:00 AM
Aldrin	ND	0.0102		mg/Kg-dry	1	9/24/2015 6:59:00 AM
Heptachlor epoxide	ND	0.0102		mg/Kg-dry	1	9/24/2015 6:59:00 AM
gamma-Chlordane	ND	0.0102		mg/Kg-dry	1	9/24/2015 6:59:00 AM
Endosulfan I	ND	0.0102		mg/Kg-dry	1	9/24/2015 6:59:00 AM
alpha-Chlordane	ND	0.0102		mg/Kg-dry	1	9/24/2015 6:59:00 AM
Dieldrin	ND	0.0102		mg/Kg-dry	1	9/24/2015 6:59:00 AM
4,4´-DDE	ND	0.0203		mg/Kg-dry	1	9/24/2015 6:59:00 AM
Endrin	ND	0.0203		mg/Kg-dry	1	9/24/2015 6:59:00 AM
Endosulfan II	ND	0.0203		mg/Kg-dry	1	9/24/2015 6:59:00 AM
4,4´-DDD	ND	0.0203		mg/Kg-dry	1	9/24/2015 6:59:00 AM
Endrin aldehyde	ND	0.0203		mg/Kg-dry	1	9/24/2015 6:59:00 AM
Endosulfan sulfate	ND	0.0203		mg/Kg-dry	1	9/24/2015 6:59:00 AM
4,4´-DDT	ND	0.0203		mg/Kg-dry	1	9/24/2015 6:59:00 AM
Endrin ketone	ND	0.0203		mg/Kg-dry	1	9/24/2015 6:59:00 AM
Methoxychlor	ND	0.0508		mg/Kg-dry	1	9/24/2015 6:59:00 AM
Surr: Decachlorobiphenyl	83.2	26.5-158		%REC	1	9/24/2015 6:59:00 AM
Surr: Tetrachloro-m-xylene	63.4	11-150		%REC	1	9/24/2015 6:59:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R25030		Analyst: SL
Percent Moisture	2.82	0.500		wt%	1	9/22/2015 4:46:52 PM
Total Organic Carbon by EPA Method 9060				Batch ID: 11929		Analyst: KT
Total Organic Carbon	ND	0.0500		%-dry	1	9/23/2015 2:17:55 PM

NOTES:
Due to matrix, unable to fully homogenize sample.

Analytical Report

WO#: **1509268**
Date Reported: **9/25/2015**

Client: Friedman & Bruya
Collection Date: 9/17/2015
Project: 509306
Lab ID: 1509268-004
Matrix: Soil
Client Sample ID: **Type 3 Armor**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Organochlorine Pesticides by EPA Method 8081				Batch ID: 11932		Analyst: MD
Toxaphene	ND	0.104		mg/Kg-dry	1	9/24/2015 7:21:00 AM
Alpha BHC	ND	0.0104		mg/Kg-dry	1	9/24/2015 7:21:00 AM
Beta BHC	ND	0.0104		mg/Kg-dry	1	9/24/2015 7:21:00 AM
Gamma BHC (Lindane)	ND	0.0104		mg/Kg-dry	1	9/24/2015 7:21:00 AM
Delta BHC	ND	0.0104		mg/Kg-dry	1	9/24/2015 7:21:00 AM
Heptachlor	ND	0.0104		mg/Kg-dry	1	9/24/2015 7:21:00 AM
Aldrin	ND	0.0104		mg/Kg-dry	1	9/24/2015 7:21:00 AM
Heptachlor epoxide	ND	0.0104		mg/Kg-dry	1	9/24/2015 7:21:00 AM
gamma-Chlordane	ND	0.0104		mg/Kg-dry	1	9/24/2015 7:21:00 AM
Endosulfan I	ND	0.0104		mg/Kg-dry	1	9/24/2015 7:21:00 AM
alpha-Chlordane	ND	0.0104		mg/Kg-dry	1	9/24/2015 7:21:00 AM
Dieldrin	ND	0.0104		mg/Kg-dry	1	9/24/2015 7:21:00 AM
4,4´-DDE	ND	0.0208		mg/Kg-dry	1	9/24/2015 7:21:00 AM
Endrin	ND	0.0208		mg/Kg-dry	1	9/24/2015 7:21:00 AM
Endosulfan II	ND	0.0208		mg/Kg-dry	1	9/24/2015 7:21:00 AM
4,4´-DDD	ND	0.0208		mg/Kg-dry	1	9/24/2015 7:21:00 AM
Endrin aldehyde	ND	0.0208		mg/Kg-dry	1	9/24/2015 7:21:00 AM
Endosulfan sulfate	ND	0.0208		mg/Kg-dry	1	9/24/2015 7:21:00 AM
4,4´-DDT	ND	0.0208		mg/Kg-dry	1	9/24/2015 7:21:00 AM
Endrin ketone	ND	0.0208		mg/Kg-dry	1	9/24/2015 7:21:00 AM
Methoxychlor	ND	0.0520		mg/Kg-dry	1	9/24/2015 7:21:00 AM
Surr: Decachlorobiphenyl	93.1	26.5-158		%REC	1	9/24/2015 7:21:00 AM
Surr: Tetrachloro-m-xylene	63.3	11-150		%REC	1	9/24/2015 7:21:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R25030		Analyst: SL
Percent Moisture	6.12	0.500		wt%	1	9/22/2015 4:46:52 PM
Total Organic Carbon by EPA Method 9060				Batch ID: 11929		Analyst: KT
Total Organic Carbon	ND	0.0500		%-dry	1	9/23/2015 2:28:54 PM

NOTES:
Due to matrix, unable to fully homogenize sample.

Work Order: 1509268
CLIENT: Friedman & Bruya
Project: 509306

QC SUMMARY REPORT

Total Organic Carbon by EPA Method 9060

Sample ID: **MB-11929**	SampType: **MBLK**			Units: **%-dry**		Prep Date: **9/23/2015**			RunNo: **25051**	
Client ID: **MBLKS**	Batch ID: **11929**					Analysis Date: **9/23/2015**			SeqNo: **472125**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.0500									

Sample ID: **LCS-11929**	SampType: **LCS**			Units: **%-dry**		Prep Date: **9/23/2015**			RunNo: **25051**	
Client ID: **LCSS**	Batch ID: **11929**					Analysis Date: **9/23/2015**			SeqNo: **472126**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	0.584	0.0500	0.6510	0	89.7	41.1	157				

Sample ID: **1509236-001ADUP**	SampType: **DUP**			Units: **%-dry**		Prep Date: **9/23/2015**			RunNo: **25051**	
Client ID: **BATCH**	Batch ID: **11929**					Analysis Date: **9/23/2015**			SeqNo: **472128**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	0.250	0.0500						0.2490	0.361	30	

Sample ID: **1509236-001AMS**	SampType: **MS**			Units: **%-dry**		Prep Date: **9/23/2015**			RunNo: **25051**	
Client ID: **BATCH**	Batch ID: **11929**					Analysis Date: **9/23/2015**			SeqNo: **472129**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	1.20	0.0500	1.000	0.2490	94.9	50.2	118				

Sample ID: **1509236-001AMSD**	SampType: **MSD**			Units: **%-dry**		Prep Date: **9/23/2015**			RunNo: **25051**	
Client ID: **BATCH**	Batch ID: **11929**					Analysis Date: **9/23/2015**			SeqNo: **472130**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	1.17	0.0500	1.000	0.2490	92.3	50.2	118	1.198	2.19	20	

Work Order: 1509268
CLIENT: Friedman & Bruya
Project: 509306

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID: **TOXIPHENE**	SampType: **CCV**	Units: **mg/L**	Prep Date: **9/24/2015**	RunNo: **25086**
Client ID: **CCV**	Batch ID: **R25086**		Analysis Date: **9/24/2015**	SeqNo: **472770**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toxaphene	1,150	0.100	1,000	0	115	50	150				

Sample ID: **MB-11932**	SampType: **MBLK**	Units: **mg/Kg**	Prep Date: **9/23/2015**	RunNo: **25086**
Client ID: **MBLKS**	Batch ID: **11932**		Analysis Date: **9/24/2015**	SeqNo: **472761**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toxaphene	ND	0.100									
Alpha BHC	ND	0.0100									
Beta BHC	ND	0.0100									
Gamma BHC (Lindane)	ND	0.0100									
Delta BHC	ND	0.0100									
Heptachlor	ND	0.0100									
Aldrin	ND	0.0100									
Heptachlor epoxide	ND	0.0100									
gamma-Chlordane	ND	0.0100									
Endosulfan I	ND	0.0100									
alpha-Chlordane	ND	0.0100									
Dieldrin	ND	0.0100									
4,4´-DDE	ND	0.0200									
Endrin	ND	0.0200									
Endosulfan II	ND	0.0200									
4,4´-DDD	ND	0.0200									
Endrin aldehyde	ND	0.0200									
Endosulfan sulfate	ND	0.0200									
4,4´-DDT	ND	0.0200									
Endrin ketone	ND	0.0200									
Methoxychlor	ND	0.0500									
Surr: Decachlorobiphenyl	0.0299		0.05000		59.7	26.5	158				
Surr: Tetrachloro-m-xylene	0.0299		0.05000		59.9	11	150				

Work Order: 1509268
CLIENT: Friedman & Bruya
Project: 509306

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID: **LCS-11932** SampType: **LCS** Units: **µg/Kg** Prep Date: **9/23/2015** RunNo: **25086**
Client ID: **LCSS** Batch ID: **11932** Analysis Date: **9/24/2015** SeqNo: **472759**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alpha BHC	0.163	0.0100	0.2000	0	81.5	54.2	139				
Beta BHC	0.160	0.0100	0.2000	0	80.2	56.5	142				
Gamma BHC (Lindane)	0.165	0.0100	0.2000	0	82.7	55.5	142				
Delta BHC	0.162	0.0100	0.2000	0	81.2	47.4	157				
Heptachlor	0.174	0.0100	0.2000	0	87.0	54	141				
Aldrin	0.169	0.0100	0.2000	0	84.4	43.7	147				
Heptachlor epoxide	0.172	0.0100	0.2000	0	85.8	56.2	137				
gamma-Chlordane	0.182	0.0100	0.2000	0	91.2	58.5	136				
Endosulfan I	0.173	0.0100	0.2000	0	86.4	60	132				
alpha-Chlordane	0.207	0.0100	0.2000	0	104	46.1	140				
Dieldrin	0.172	0.0100	0.2000	0	86.0	61.2	133				
4,4´-DDE	0.214	0.0200	0.2000	0	107	55.4	142				
Endrin	0.174	0.0200	0.2000	0	86.8	56.5	143				
Endosulfan II	0.181	0.0200	0.2000	0	90.5	62	143				
4,4´-DDD	0.163	0.0200	0.2000	0	81.3	53.3	145				
Endrin aldehyde	0.173	0.0200	0.2000	0	86.7	39.5	153				
Endosulfan sulfate	0.183	0.0200	0.2000	0	91.4	53.8	148				
4,4´-DDT	0.165	0.0200	0.2000	0	82.6	48.2	152				
Endrin ketone	0.170	0.0200	0.2000	0	84.9	28.5	162				
Methoxychlor	0.162	0.0500	0.2000	0	81.1	34.6	159				
Surr: Decachlorobiphenyl	0.0330		0.05000		65.9	26.5	158				
Surr: Tetrachloro-m-xylene	0.0331		0.05000		66.2	11	150				

Sample ID: **1509267-001ADUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **9/23/2015** RunNo: **25086**
Client ID: **BATCH** Batch ID: **11932** Analysis Date: **9/24/2015** SeqNo: **472709**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toxaphene	ND	0.104						0		30	
Alpha BHC	ND	0.0104						0		30	
Beta BHC	ND	0.0104						0		30	
Gamma BHC (Lindane)	ND	0.0104						0		30	

Work Order: 1509268
CLIENT: Friedman & Bruya
Project: 509306

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID: **1509267-001ADUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **9/23/2015** RunNo: **25086**
Client ID: **BATCH** Batch ID: **11932** Analysis Date: **9/24/2015** SeqNo: **472709**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Delta BHC	ND	0.0104						0		30	
Heptachlor	ND	0.0104						0		30	
Aldrin	ND	0.0104						0		30	
Heptachlor epoxide	ND	0.0104						0		30	
gamma-Chlordane	ND	0.0104						0		30	
Endosulfan I	ND	0.0104						0		30	
alpha-Chlordane	ND	0.0104						0		30	
Dieldrin	ND	0.0104						0		30	
4,4´-DDE	ND	0.0208						0		30	
Endrin	ND	0.0208						0		30	
Endosulfan II	ND	0.0208						0		30	
4,4´-DDD	ND	0.0208						0		30	
Endrin aldehyde	ND	0.0208						0		30	
Endosulfan sulfate	ND	0.0208						0		30	
4,4´-DDT	ND	0.0208						0		30	
Endrin ketone	ND	0.0208						0		30	
Methoxychlor	ND	0.0519						0		30	
Surr: Decachlorobiphenyl	0.0398		0.05194		76.6	26.5	158		0		
Surr: Tetrachloro-m-xylene	0.0329		0.05194		63.4	11	150		0		

Sample ID: **1509268-003AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **9/23/2015** RunNo: **25086**
Client ID: **Type 1 Armor** Batch ID: **11932** Analysis Date: **9/24/2015** SeqNo: **472711**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alpha BHC	0.160	0.0101	0.2026	0	79.2	49.1	158				
Beta BHC	0.160	0.0101	0.2026	0	78.8	50.9	160				
Gamma BHC (Lindane)	0.163	0.0101	0.2026	0	80.5	55.3	157				
Delta BHC	0.161	0.0101	0.2026	0	79.3	55.8	160				
Heptachlor	0.172	0.0101	0.2026	0	84.8	59.1	150				
Aldrin	0.167	0.0101	0.2026	0	82.4	46.4	145				
Heptachlor epoxide	0.172	0.0101	0.2026	0	84.7	48.5	151				

Work Order: 1509268
CLIENT: Friedman & Bruya
Project: 509306

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID: **1509268-003AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **9/23/2015** RunNo: **25086**
Client ID: **Type 1 Armor** Batch ID: **11932** Analysis Date: **9/24/2015** SeqNo: **472711**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
gamma-Chlordane	0.187	0.0101	0.2026	0	92.1	50.9	143				
Endosulfan I	0.179	0.0101	0.2026	0	88.3	46.4	149				
alpha-Chlordane	0.119	0.0101	0.2026	0	58.7	46.3	153				
Dieldrin	0.177	0.0101	0.2026	0	87.2	51	147				
4,4´-DDE	0.222	0.0203	0.2026	0	110	39.9	162				
Endrin	0.180	0.0203	0.2026	0	88.8	51.3	151				
Endosulfan II	0.193	0.0203	0.2026	0	95.1	51	152				
4,4´-DDD	0.188	0.0203	0.2026	0	92.7	45.8	160				
Endrin aldehyde	0.185	0.0203	0.2026	0	91.2	38.3	156				
Endosulfan sulfate	0.196	0.0203	0.2026	0	96.7	53.2	154				
4,4´-DDT	0.197	0.0203	0.2026	0	97.1	45.7	168				
Endrin ketone	0.191	0.0203	0.2026	0	94.5	68.3	144				
Methoxychlor	0.213	0.0506	0.2026	0	105	43.4	178				
Surr: Decachlorobiphenyl	0.0436		0.05064		86.2	26.5	158				
Surr: Tetrachloro-m-xylene	0.0311		0.05064		61.4	11	150				

Work Order: 1509268
CLIENT: Friedman & Bruya
Project: 509306

QC SUMMARY REPORT

Sample Moisture (Percent Moisture)

Sample ID: **1509245-001ADUP**	SampType: **DUP**			Units: **wt%**			Prep Date: **9/22/2015**		RunNo: **25030**	
Client ID: **BATCH**	Batch ID: **R25030**						Analysis Date: **9/22/2015**		SeqNo: **471459**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	14.1	0.500						15.28	8.37	20	

Sample ID: **1509245-002ADUP**	SampType: **DUP**			Units: **wt%**			Prep Date: **9/22/2015**		RunNo: **25030**	
Client ID: **BATCH**	Batch ID: **R25030**						Analysis Date: **9/22/2015**		SeqNo: **471461**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	12.4	0.500						12.73	2.43	20	

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**1509268**
Logged by:	**Erica Silva**	Date Received:	**9/18/2015 1:50:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes	☑	No ☐	Not Present	☐
2.	How was the sample delivered?	FedEx				

Log In

3.	Coolers are present?	Yes	☐	No ☑	NA	☐
		No cooler present				
4.	Shipping container/cooler in good condition?	Yes	☑	No ☐		
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes	☐	No ☑	Not Required	☐
6.	Was an attempt made to cool the samples?	Yes	☑	No ☐	NA	☐
7.	Were all items received at a temperature of >0°C to 10.0°C *	Yes	☑	No ☐	NA	☐
8.	Sample(s) in proper container(s)?	Yes	☑	No ☐		
9.	Sufficient sample volume for indicated test(s)?	Yes	☑	No ☐		
10.	Are samples properly preserved?	Yes	☑	No ☐		
11.	Was preservative added to bottles?	Yes	☐	No ☑	NA	☐
12.	Is there headspace in the VOA vials?	Yes	☐	No ☐	NA	☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes	☑	No ☐		
14.	Does paperwork match bottle labels?	Yes	☑	No ☐		
15.	Are matrices correctly identified on Chain of Custody?	Yes	☑	No ☐		
16.	Is it clear what analyses were requested?	Yes	☑	No ☐		
17.	Were all holding times able to be met?	Yes	☑	No ☐		

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes	☐	No ☐	NA	☑

Person Notified:		Date:	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

19. Additional remarks:

Samples -001 and -002 placed on hold per client request.

Item Information

Item #	Temp ºC
Sample	7.5

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont

PROJECT NAME/NO.	PO #
509306	D-657

REMARKS

Please Email Results

TURNAROUND TIME

☒ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins and Furans by 8290	EPH	VPH	Nitrate	Sulfate	Alkalinity	TOC	Chlorinated Pesticides			Notes
Habitat Substrate		9/17/15		Soil								X	X			
Filter Material		↓		gravel								X	X			
Type 1 Armor				rock								X	X			
Type 3 Armor				rock								X	X			

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman & Bruya	9/18/15	1000 am
Received by:	Samantha Beerman	Samantha Beerman	FBI	09/18/15	1:50 pm
Relinquished by:					
Received by:					

509306

SAMPLE CHAIN OF CUSTODY

ME 09-17-15 BI4 / USI

Report To STEVEN PADILLA
Company KRAZAN
Address
City, State, ZIP LYNNWOOD
Phone 425-485-5519 Email STEVENPADILLA@KRAZAN.COM

SAMPLERS (*signature*)

PROJECT NAME: PORT GAMBLE BAY
PO #: 104/5010

REMARKS
INVOICE TO: KRAZAN

Page # _____ of _____

TURNAROUND TIME
- ☑ Standard (10 Business Days)
- ☐ RUSH _____
- Rush charges authorized by: _____

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other _____

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	HFS	Cl Pest.	D/F	TOC	PP MGT	PAH by SIM	PCB	Notes
HABITAT SUBSTRATE	01 A-H	9/17/15		SOIL	8				✓	✓		✓	✓	✓	✓	✓	✓	Hold-01 & -02 per SP 9/24/15 MC
FILTER MATERIAL	02 T	↓		GRAVEL	8				✓	✓		✓	✓	✓	✓	✓	✓	
TYPE 1 ARMOR	03			ROCK	1 BAG				✓	✓		✓	✓	✓	✓	✓	✓	
TYPE 3 ARMOR	04			ROCK	1 BAG				✓	✓		✓	✓	✓	✓	✓	✓	

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	STEVEN PADILLA	KRAZAN	9/17/15	2:50 PM
Received by:	ERIC CORE	F+S	9/18/15	1150
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

Samples received at 4 °C

October 6, 2015

FAL Project ID: 9306

Mr. Michael Erdahl
Friedman and Bruya, Inc.
3012 16th Ave. W
Seattle, WA 98119

Dear Mr. Erdahl,

Enclosed are the results for Frontier Analytical Laboratory project **9306**. This corresponds to your project number **509306** and purchase order number **D-656**. Four soil samples were received at Frontier Analytical Laboratory on 9/22/2015. Per your email dated 9/23/15, samples 9306-001-SA (Friedman & Bruya Sample ID: Habitat Substrate) and 9306-002-SA (Friedman & Bruya Sample ID: Filter Material) were placed on hold. The remaining two samples were extracted and analyzed by EPA Method 1613 for tetra through octa chlorinated dibenzo dioxins and furans. The Toxic Equivalency (TEQ) for your sample has been calculated using the 2005 World Health Organization's (WHO's) toxic equivalency factors (TEFs). Freidman and Bruya, Inc. requested a turnaround time of ten business days for project **9306**.

The following report consists of an Analytical Data section and a Sample Receipt section. The Analytical Data section contains our project-sample tracking log and the analytical results. The Sample Receipt section contains your chain of custody, your email dated 9/23/2015, our sample login form and a sample photo. The enclosed results are specifically for the samples referenced in this report only. These results meet all National Environmental Laboratory Accreditation Program (NELAP) requirements and shall not be reproduced except in full. Frontier Analytical Laboratory's State of Oregon NELAP certificate number is **4041**, our State of California ELAP certificate number is **2934** and our State of Washington certificate number is **C844**. This report has been emailed to you as a portable document format (PDF) file. A hardcopy will not be sent to you unless specifically requested.

If you have any questions regarding project **9306**, please feel free to contact me at (916) 934-0900. Thank you for choosing Frontier Analytical Laboratory for your analytical testing needs.

Sincerely,

Thomas C. Crabtree

Thomas C. Crabtree
Director

Frontier Analytical Laboratory

Sample Tracking Log

FAL Project ID: **9306**

Received on: **09/22/2015** Project Due: **10/07/2015** Storage: **R3**

FAL Sample ID	Dup	Client Project ID	Client Sample ID	Requested Method	Matrix	Sampling Date	Sampling Time	Hold Time Due Date
9306-001-SA	0	509306	Habitat Substrate	EPA 1613 D/F	Soil	09/17/2015	NP	09/16/2016
9306-002-SA	0	509306	Filter Material	EPA 1613 D/F	Solid	09/17/2015	NP	09/16/2016
9306-003-SA	0	509306	Type 1 Armor	EPA 1613 D/F	Solid	09/17/2015	NP	09/16/2016
9306-004-SA	0	509306	Type 3 Armor	EPA 1613 D/F	Solid	09/17/2015	NP	09/16/2016

FAL Sample ID	Notes
9306-001-SA	'Use sampling date from COC per client request. Hold per Mike's email dated 9-23-15 kz
9306-002-SA	Hold per Mike's email dated 9-23-15 kz
9306-003-SA	'Use sampling date from COC per client request.'
9306-004-SA	'Use sampling date from COC per client request.'

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EPA Method 1613
PCDD/F

FAL ID: 9306-001-MB
Client ID: Method Blank
Matrix: Solid
Batch No: X3457

Date Extracted: 09-25-2015
Date Received: NA
Amount: 5.00 g

ICal: PCDDFAL3-9-22-15
GC Column: DB5
Units: pg/g

Acquired: 09-28-2015
2005 WHO TEQ: 0.00
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.0651		-	0.0184				
1,2,3,7,8-PeCDD	ND	0.145		-	0.0275				
1,2,3,4,7,8-HxCDD	ND	0.199		-	0.0314				
1,2,3,6,7,8-HxCDD	ND	0.226		-	0.0335	Total TCDD	ND	0.0651	
1,2,3,7,8,9-HxCDD	ND	0.194		-	0.0296	Total PeCDD	ND	0.145	
1,2,3,4,6,7,8-HpCDD	ND	0.302		-	0.0492	Total HxCDD	ND	0.226	
OCDD	ND	0.386		-	0.136	Total HpCDD	ND	0.302	
2,3,7,8-TCDF	ND	0.0932		-	0.0211				
1,2,3,7,8-PeCDF	ND	0.102		-	0.0235				
2,3,4,7,8-PeCDF	ND	0.101		-	0.0247				
1,2,3,4,7,8-HxCDF	ND	0.0825		-	0.0251				
1,2,3,6,7,8-HxCDF	ND	0.0808		-	0.0235				
2,3,4,6,7,8-HxCDF	ND	0.0916		-	0.0271				
1,2,3,7,8,9-HxCDF	ND	0.104		-	0.0320	Total TCDF	ND	0.0932	
1,2,3,4,6,7,8-HpCDF	ND	0.0977		-	0.0280	Total PeCDF	ND	0.102	
1,2,3,4,7,8,9-HpCDF	ND	0.110		-	0.0359	Total HxCDF	ND	0.104	
OCDF	ND	0.211		-	0.0531	Total HpCDF	ND	0.110	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	97.0	25.0 - 164	
13C-1,2,3,7,8-PeCDD	99.0	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	95.1	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	93.2	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	95.1	23.0 - 140	
13C-OCDD	76.6	17.0 - 157	
13C-2,3,7,8-TCDF	104	24.0 - 169	
13C-1,2,3,7,8-PeCDF	97.0	24.0 - 185	
13C-2,3,4,7,8-PeCDF	101	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	97.9	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	97.3	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	92.7	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	92.3	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	88.2	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	106	26.0 - 138	
13C-OCDF	78.3	17.0 - 157	

Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	99.4	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: _____

Date: 9/29/2015

Reviewed By: _____

Date: 9/29/2015

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EPA Method 1613
PCDD/F

FAL ID: 9306-001-OPR
Client ID: OPR
Matrix: Solid
Batch No: X3457

Date Extracted: 09-25-2015
Date Received: NA
Amount: 5.00 g

ICal: PCDDFAL3-9-22-15
GC Column: DB5
Units: ng/ml

Acquired: 09-28-2015
2005 WHO TEQ: NA

Compound	Conc	QC Limits	Qual
2,3,7,8-TCDD	10.2	6.70 - 15.8	
1,2,3,7,8-PeCDD	50.6	35.0 - 71.0	
1,2,3,4,7,8-HxCDD	50.1	35.0 - 82.0	
1,2,3,6,7,8-HxCDD	52.1	38.0 - 67.0	
1,2,3,7,8,9-HxCDD	49.0	32.0 - 81.0	
1,2,3,4,6,7,8-HpCDD	50.7	35.0 - 70.0	
OCDD	103	78.0 - 144	
2,3,7,8-TCDF	10.2	7.50 - 15.8	
1,2,3,7,8-PeCDF	52.5	40.0 - 67.0	
2,3,4,7,8-PeCDF	52.7	34.0 - 80.0	
1,2,3,4,7,8-HxCDF	47.3	36.0 - 67.0	
1,2,3,6,7,8-HxCDF	49.7	42.0 - 65.0	
2,3,4,6,7,8-HxCDF	49.3	35.0 - 78.0	
1,2,3,7,8,9-HxCDF	49.8	39.0 - 65.0	
1,2,3,4,6,7,8-HpCDF	52.7	41.0 - 61.0	
1,2,3,4,7,8,9-HpCDF	50.1	39.0 - 69.0	
OCDF	105	63.0 - 170	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	95.9	20.0 - 175	
13C-1,2,3,7,8-PeCDD	97.3	21.0 - 227	
13C-1,2,3,4,7,8-HxCDD	97.2	21.0 - 193	
13C-1,2,3,6,7,8-HxCDD	93.8	25.0 - 163	
13C-1,2,3,4,6,7,8-HpCDD	93.3	26.0 - 166	
13C-OCDD	78.1	13.0 - 198	
13C-2,3,7,8-TCDF	103	22.0 - 152	
13C-1,2,3,7,8-PeCDF	95.6	21.0 - 192	
13C-2,3,4,7,8-PeCDF	98.8	13.0 - 328	
13C-1,2,3,4,7,8-HxCDF	99.7	19.0 - 202	
13C-1,2,3,6,7,8-HxCDF	99.8	21.0 - 159	
13C-2,3,4,6,7,8-HxCDF	95.9	22.0 - 176	
13C-1,2,3,7,8,9-HxCDF	94.2	17.0 - 205	
13C-1,2,3,4,6,7,8-HpCDF	86.3	21.0 - 158	
13C-1,2,3,4,7,8,9-HpCDF	107	20.0 - 186	
13C-OCDF	79.3	13.0 - 198	

Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	98.8	31.0 - 191	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: _____

Date: 9/29/2015

Reviewed By: _____

Date: 9/29/2015

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 9306-003-SA
Client ID: Type 1 Armor
Matrix: Solid
Batch No: X3457

Date Extracted: 09-25-2015
Date Received: 09-22-2015
Amount: 5.02 g
% Solids: 96.40

ICal: PCDDFAL3-9-22-15
GC Column: DB5
Units: pg/g

Acquired: 09-28-2015
2005 WHO TEQ: 0.00
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.129		-	0.0184				
1,2,3,7,8-PeCDD	ND	0.142		-	0.0275				
1,2,3,4,7,8-HxCDD	ND	0.234		-	0.0314				
1,2,3,6,7,8-HxCDD	ND	0.263		-	0.0335	Total TCDD	ND	0.129	
1,2,3,7,8,9-HxCDD	ND	0.226		-	0.0296	Total PeCDD	ND	0.142	
1,2,3,4,6,7,8-HpCDD	ND	0.467		-	0.0492	Total HxCDD	ND	0.263	
OCDD	ND	0.895		-	0.136	Total HpCDD	ND	0.467	
2,3,7,8-TCDF	ND	0.179		-	0.0211				
1,2,3,7,8-PeCDF	ND	0.181		-	0.0235				
2,3,4,7,8-PeCDF	ND	0.177		-	0.0247				
1,2,3,4,7,8-HxCDF	ND	0.168		-	0.0251				
1,2,3,6,7,8-HxCDF	ND	0.165		-	0.0235				
2,3,4,6,7,8-HxCDF	ND	0.192		-	0.0271				
1,2,3,7,8,9-HxCDF	ND	0.213		-	0.0320	Total TCDF	ND	0.179	
1,2,3,4,6,7,8-HpCDF	ND	0.153		-	0.0280	Total PeCDF	ND	0.181	
1,2,3,4,7,8,9-HpCDF	ND	0.173		-	0.0359	Total HxCDF	ND	0.213	
OCDF	ND	0.272		-	0.0531	Total HpCDF	ND	0.173	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	88.2	25.0 - 164	
13C-1,2,3,7,8-PeCDD	89.0	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	92.5	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	89.7	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	91.5	23.0 - 140	
13C-OCDD	74.3	17.0 - 157	
13C-2,3,7,8-TCDF	98.1	24.0 - 169	
13C-1,2,3,7,8-PeCDF	91.8	24.0 - 185	
13C-2,3,4,7,8-PeCDF	93.6	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	96.3	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	93.8	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	89.8	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	91.7	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	84.3	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	99.9	26.0 - 138	
13C-OCDF	72.3	17.0 - 157	

Cleanup Surrogate		
37Cl-2,3,7,8-TCDD	93.0	35.0 - 197

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: _____

Date: 9/29/2015

Reviewed By: _____

Date: 9/29/2015

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 9306-004-SA
Client ID: Type 3 Armor
Matrix: Solid
Batch No: X3457

Date Extracted: 09-25-2015
Date Received: 09-22-2015
Amount: 5.06 g
% Solids: 94.01

ICal: PCDDFAL3-9-22-15
GC Column: DB5
Units: pg/g

Acquired: 09-28-2015
2005 WHO TEQ: 0.00
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.113		-	0.0184				
1,2,3,7,8-PeCDD	ND	0.217		-	0.0275				
1,2,3,4,7,8-HxCDD	ND	0.270		-	0.0314				
1,2,3,6,7,8-HxCDD	ND	0.298		-	0.0335	Total TCDD	ND	0.113	
1,2,3,7,8,9-HxCDD	ND	0.259		-	0.0296	Total PeCDD	ND	0.217	
1,2,3,4,6,7,8-HpCDD	ND	0.418		-	0.0492	Total HxCDD	ND	0.298	
OCDD	ND	0.630		-	0.136	Total HpCDD	ND	0.418	
2,3,7,8-TCDF	ND	0.101		-	0.0211				
1,2,3,7,8-PeCDF	ND	0.152		-	0.0235				
2,3,4,7,8-PeCDF	ND	0.147		-	0.0247				
1,2,3,4,7,8-HxCDF	ND	0.0932		-	0.0251				
1,2,3,6,7,8-HxCDF	ND	0.0956		-	0.0235				
2,3,4,6,7,8-HxCDF	ND	0.108		-	0.0271				
1,2,3,7,8,9-HxCDF	ND	0.117		-	0.0320	Total TCDF	ND	0.101	
1,2,3,4,6,7,8-HpCDF	ND	0.106		-	0.0280	Total PeCDF	ND	0.152	
1,2,3,4,7,8,9-HpCDF	ND	0.121		-	0.0359	Total HxCDF	ND	0.117	
OCDF	ND	0.242		-	0.0531	Total HpCDF	ND	0.121	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	92.3	25.0 - 164	
13C-1,2,3,7,8-PeCDD	89.8	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	92.2	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	86.2	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	88.6	23.0 - 140	
13C-OCDD	72.7	17.0 - 157	
13C-2,3,7,8-TCDF	102	24.0 - 169	
13C-1,2,3,7,8-PeCDF	95.3	24.0 - 185	
13C-2,3,4,7,8-PeCDF	98.9	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	93.1	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	90.3	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	88.1	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	92.1	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	83.3	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	98.3	26.0 - 138	
13C-OCDF	71.4	17.0 - 157	

Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	95.4	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: _____

Date: 9/29/2015

Reviewed By: _____

Date: 9/29/2015

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SUBCONTRACT SAMPLE CHAIN OF CUSTODY

93306
205

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Frontier

PROJECT NAME/NO. 509306

PO # D-656

REMARKS

Please Email Results

TURNAROUND TIME

☒ Standard (2 Weeks) ✓

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

	Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins and Furans by 8290	EPH	VPH	Nitrate	Sulfate	Alkalinity	Dioxins/Furans 1613			HOLD 9/23/15	Notes
☆	Habitat Substrate		9/17/15		Soil								X			X	9/22/15
	Filter Material		↓		gravel								X			X	
	Type 1 Armor				rock								X				
	Type 3 Armor				rock								X				
☆	Use Sampling date from COC per mike to Kathy 9/22/15																
	9/23/15 Hold Samples 1 & 2 per mike's email. KZ 9/23/15																

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman & Bruya	9/18/15	1000 am
Received by: Kathy Zipp	Kathy Zipp	Frontier Analytical	9/22/15 @ 955	
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

Frontier Analytical Laboratory

Sample Login Form

FAL Project ID: **9306**

Client:	Friedman & Bruya, Inc.
Client Project ID:	509306
Date Received:	09/22/2015
Time Received:	09:55 am
Received By:	KZ
Logged In By:	KZ
# of Samples Received:	4
Duplicates:	0
Storage Location:	R3

Method of Delivery:	Fed-Ex
Tracking Number:	804312999124
Shipping Container Received Intact	Yes
Custody seals(s) present?	No
Custody seals(s) intact?	No
Sample Arrival Temperature (C)	2
Cooling Method	Blue Ice
Chain Of Custody Present?	Yes
Return Shipping Container To Client	Yes
Test aqueous sample for residual Chlorine	No
Sodium Thiosulfate Added	No
Adequate Sample Volume	Yes
Appropriate Sample Container	Yes
pH Range of Aqueous Sample	N/A

Anomalies or additional comments:

Please note that the samples were received in clear glass jars. NELAC requires samples be received in amber glass bottles or jars. Although this anomaly will not affect your results, we are required by NELAC to make a note of it. We will proceed with analysis unless directed otherwise by you.

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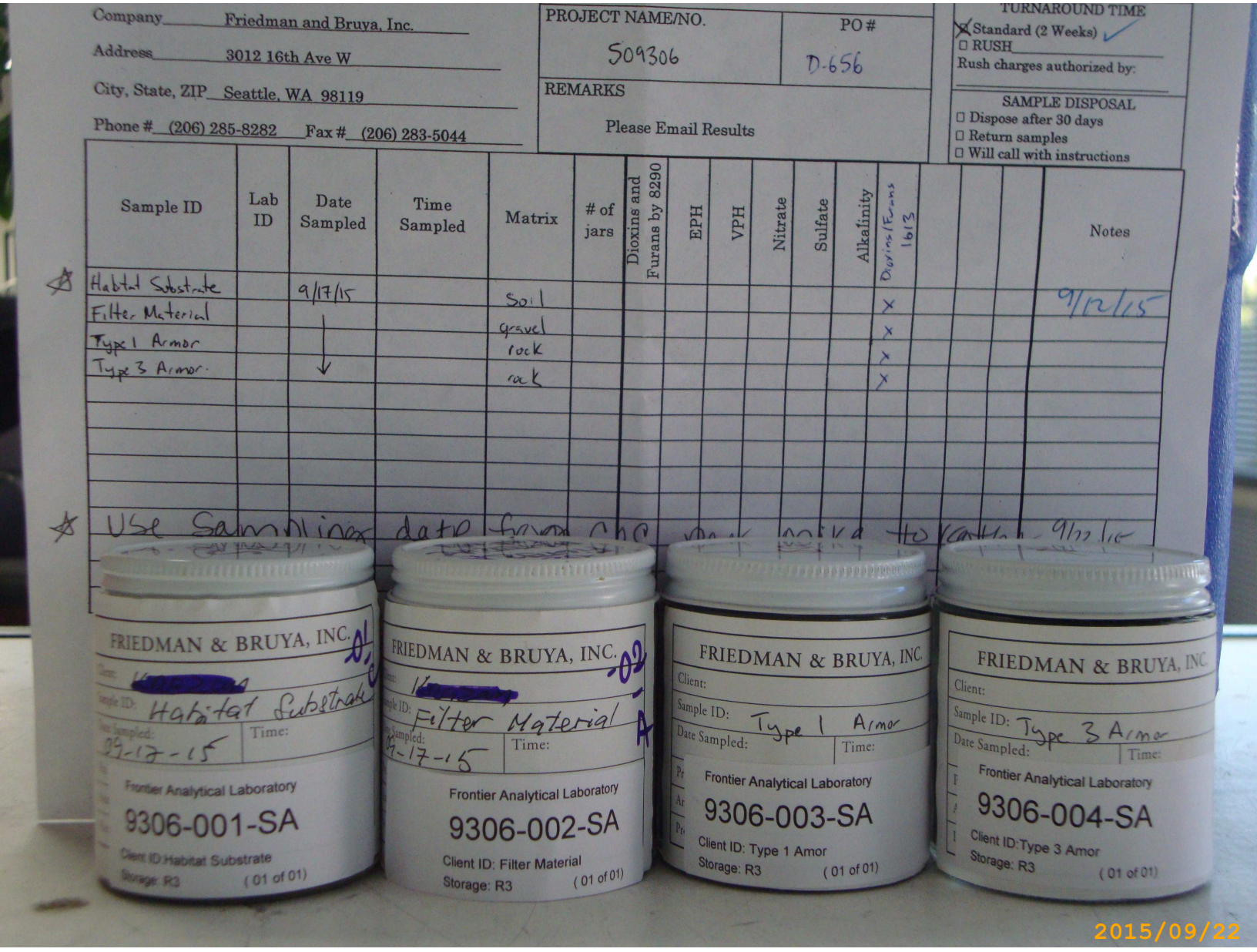

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PYRAMID MATERIALS
P.O.Box 3337 Renton, Wa. 98056
www.pyramidmaterials.com

November 6th 2015

To whom it may concern:

The materials that we intend to supply to Orion Marine Group for the Habitat Substrate gravel will come from the same gravel source that the Pea Gravel "Filter Material" is from @ 8857 Dickey Rd NW Silverdale. This material has already passed the analytical testing to be qualified for use on the Port Gamble Cleanup Project. Please reference the approved project submittal #0030 for the approved filter material.

Thank You,

Jim Haskins
Pyramid Materials
Sales Manager
425-495-7424
jhaskins@pyramidmaterials.com

October 19, 2015 KA Project No. 104-15010

Mr. Jesse Galligan Tel: (253)279-6809
Orion Marine Group E-Mail: jgalligan@orionmarinegroup.com

Port Gamble Capping and Material Placement Project
Port Gamble Bay, Washington

RE: Letter Report for:
Limited Soil Sampling and Analysis
Port Gamble Source Acceptance (Pyramid Filter Material)
Port Gamble Bay

Dear Mr. Galligan:

Krazan and Associates is providing this Letter Report in reference to limited sampling of capping material (Pyramid Filter Material) located at the Dickey Gravel Pit, in Silverdale, WA. Sample collection was conducted by Krazan representative Mr. Steven Padilla on September 29, 2015. This sampling was performed in accordance with federal, state and local regulatory requirements, and was limited to areas defined by the client.

1.0 Analytical Results

1.1 Soil Analytical Results

The material sampled did not exceed Table 352026-1 for capping material sediment quality standards contained in Division 35, Section 352026 of the Waterway and Marine Construction specification for the Port Gamble Cleanup Project. Compounds requested to be tested by Orion Construction did not indicate levels above corresponding capping material sediment quality standards. The laboratory analytical report is provided in Appendix A.

2.0 Sampling Methodology

The sampling location was defined by the client as a discreet sample taken of the capping material (Pyramid Filter Material) located at the Dickey Pit in Silverdale, Washington. The sample was collected by carefully collecting one sample of the indicated filter material in a zip-lock plastic bag from a specified material pile located at the Dickey pit. Sample containers were then placed in an iced cooler for transportation to the laboratory. The samples were delivered to the laboratory on September 29, 2015. Data pertinent to the sample (e.g., date, sample number, material description, and material category) was recorded on a field data sheet.

2.1 Laboratory Analysis

One (1) discrete sample was collected in a zip-lock container bag as part of the sample project. The sample was collected in a zip-lock bag to make sure the lab had enough sample to perform the required analysis. The sample containers were delivered to Friedman and Bruya (F&B) Laboratories in Seattle, Washington, under chain-of-custody protocol for analysis. F&B Laboratories is a Washington State accredited laboratory. In addition to in-house testing, F&B Laboratories supplied samples to Frontier Laboratories (Furan and Dioxin testing) and Fremont Laboratories (Chlorinated Pesticides and TOC testing). Analytical data reports, laboratory certifications, and chain-of-custody forms are provided in Appendix A.

3.0 Laboratory Sample Results

Table 1 and 2 include the sample number, sample location, sample description, and percent of contaminant.

Table 1 – Summary of Analytical Data – Metals (mg/kg)

Sample Number	Sample Location	Sample Material	% Moisture	Zinc	Nickel	Thallium	Copper	Antimony	Arsenic	Selenium	Chromium	Cadmium	Beryllium	Silver	Lead	Mercury
ZP-Sand	Zimmer Gravel Pit Poulsbo WA	Sand	3%	5.46	8.35	<1	<5	<1	<1	<1	4.08	<1	<1	<1	1.04	<0.1
WDOE Waste Characterization Levels	NA	Soil	NA	410	NR	NR	390	NR	57	NR	260	3.0	NR	6.1	450	0.41

Notes:
NR = Not Requested

Table 2 – Summary of Analytical Data

Sample Number	Sample Location	Sample Material	PCB	LPAH	HPAH	Chlorinate Hydrocarbons	Phthalates	Phenols	Misc. Extractables	Dioxins / Furans
ZP-Sand	Zimmer Gravel Pit Poulsbo WA	Sand	<4 ppb	LTDL (see attached)	LTDL (see attached)	LTDL (see attached)	LTDL (see attached)	LTDL (see attached)	LTDL (see attached)	ND
Table 352026-1 Standards	NA	Capping Material	130 ppb	See Table	See Table	See Table	See Table	See Table	See Table	5 ng/kg

Notes:
ND = None Detected; NA = Not Applicable; LTDL = Less Than Detection Limit

4.0 Conclusions

The material sampled did not exceed Table 352026-1 for capping material sediment quality standards contained in Division 35, Section 352026 of the Waterway and Marine Construction specification for the Port Gamble Cleanup Project (Appendix B). Compounds requested to be tested by Orion Construction did not indicate levels above corresponding capping material sediment quality standards. The laboratory analytical report is provided in Appendix A.

LIMITATIONS

This survey has been limited in scope to those areas defined by the client. This investigation is undertaken with the risk that visual observations and random sampling alone would not reveal the presence, full nature, and extent of Contaminants of Concern (COC). Krazan makes no representation as to the COC content of materials not sampled or that were inaccessible to our inspector. The sample locations are approximate, and are based on field notes and diagrams of sample locations. The opinions presented herein apply to the site condition existing at the time of the investigation. Opinions and recommendations provided herein may not apply to future conditions that may exist at the site.

The findings presented in this report were based on field observations and sampling as defined by the client. Therefore, the data obtained are clear and accurate only to the degree implied by the sources and methods used. The information presented herein is based on professional interpretation using presently

accepted methods with a degree of conservatism deemed proper as of the report date. We do not warrant that future technical developments cannot supersede such data.

This report is provided for the exclusive use of the client noted on the cover page and is subject to the terms and conditions in the applicable contract between the client and Krazan. The client is the only party to whom Krazan has explained the risks involved and has been involved in the shaping of the scope of services needed to satisfactorily manage those risks, if any, from the client's point of view. Any third party use of this report, including use by the Client's lender, prospective purchaser, or lessee will be subject to the terms and conditions governing the contractual work between the Client and Krazan. The unauthorized use of, reliance on, or release of the information contained in this report, without the expressed written consent of Krazan, is strictly prohibited and will be without risk or liability to Krazan.

Laboratory analysis was conducted by a laboratory accredited under the guidance of the EPA. The results of the analyses are accurate only to the degree of care exercised by the independent laboratories and the representative nature of the samples obtained.

Krazan appreciates the opportunity to provide you with this information and trusts that you will find it useful. If you have any questions or if we may be of further assistance, please do not hesitate to contact our office at (425) 485-5519.

Respectfully submitted,
KRAZAN & ASSOCIATES, INC.

R. Steven Padilla
NW Environmental Department Manager
Krazan & Associates

Appendix A

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

October 13, 2015

Steven Padilla, Project Manager
Krazan & Associates
4303 198th Street SW
Lynnwood, WA 98036

Dear Mr. Padilla:

Included are the results from the testing of material submitted on September 29, 2015 from the Port Gamble Bay, 10415010 PO, F&BI 5095233 project. There are 21 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
KRZ1013R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on September 29, 2015 by Friedman & Bruya, Inc. from the Krazan & Associates Port Gamble Bay, 10415010 PO, F&BI 509523 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Krazan & Associates
509523 -01	Pyramid Filter Material

The sample was sent to Fremont Analytical for chlorinated pesticides and total organic carbon analyses. In addition, the sample was sent to Frontier for dioxin and furan analysis. The report from Fremont is enclosed. The report from Frontier will be forwarded to your offices when available.

The sample was not received in a 5035 sampling container. The 8260C data were flagged accordingly. In addition, several compounds in the 8260C matrix spike, laboratory control sample and laboratory control sample duplicate exceeded the acceptance criteria. The analytes were not detected in the sample, therefore the data were acceptable.

The 8270D 4-chloroaniline and the 8082A Aroclor 1016 and 1260 laboratory control sample and laboratory control sample duplicate relative percent difference did not pass the acceptance criteria. The compounds were not detected, therefore the data were acceptable.

All other quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 6020A

Client ID:	Pyramid Filter Material	Client:	Krazan & Associates
Date Received:	09/29/15	Project:	Port Gamble Bay, 10415010 PO, F&BI 509523
Date Extracted:	09/30/15	Lab ID:	509523-01
Date Analyzed:	09/30/15	Data File:	509523-01.031
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Lithium	122	70	130
Germanium	94	70	130
Indium	90	70	130
Holmium	93	70	130

Analyte:	Concentration mg/kg (ppm)
Antimony	<1
Arsenic	<1
Beryllium	<1
Cadmium	<1
Chromium	4.08
Copper	<5
Lead	1.04
Nickel	8.35
Selenium	<1
Silver	<1
Thallium	<1
Zinc	5.46

Analysis For Total Metals By EPA Method 6020A

Client ID:	Method Blank	Client:	Krazan & Associates
Date Received:	Not Applicable	Project:	Port Gamble Bay, 10415010 PO, F&BI 509523
Date Extracted:	09/30/15	Lab ID:	I5-559 mb
Date Analyzed:	09/30/15	Data File:	I5-559 mb.028
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Lithium	119	70	130
Germanium	91	70	130
Indium	91	70	130
Holmium	94	70	130

Analyte:	Concentration mg/kg (ppm)
Antimony	<1
Arsenic	<1
Beryllium	<1
Cadmium	<1
Chromium	<1
Copper	<5
Lead	<1
Nickel	<1
Selenium	<1
Silver	<1
Thallium	<1
Zinc	<5

Date of Report: 10/13/15
Date Received: 09/29/15
Project: Port Gamble Bay, 10415010 PO, F&BI 509523
Date Extracted: 09/30/15
Date Analyzed: 10/06/15

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL MERCURY
USING EPA METHOD 1631E

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Total Mercury
Pyramid Filter Material 509523-01	<0.1
Method Blank	<0.1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Pyramid Filter Material pc	Client:	Krazan & Associates
Date Received:	09/29/15	Project:	Port Gamble Bay, 10415010 PO, F&BI 509523
Date Extracted:	09/30/15	Lab ID:	509523-01
Date Analyzed:	09/30/15	Data File:	093016.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	89	113
Toluene-d8	100	64	137
4-Bromofluorobenzene	102	81	119

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Krazan & Associates
Date Received:	Not Applicable	Project:	Port Gamble Bay, 10415010 PO, F&BI 509523
Date Extracted:	09/30/15	Lab ID:	05-1959 mb2
Date Analyzed:	09/30/15	Data File:	093015.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	89	113
Toluene-d8	102	64	137
4-Bromofluorobenzene	103	81	119

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Pyramid Filter Material	Client:	Krazan & Associates
Date Received:	09/29/15	Project:	Port Gamble Bay, 10415010 PO, F&BI 509523
Date Extracted:	09/30/15	Lab ID:	509523-01 1/0.25
Date Analyzed:	09/30/15	Data File:	093008.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	78	56	115
Phenol-d6	78	54	113
Nitrobenzene-d5	79	31	164
2-Fluorobiphenyl	81	47	133
2,4,6-Tribromophenol	85	35	141
Terphenyl-d14	87	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.025	Hexachlorocyclopentadiene	<0.0075
Bis(2-chloroethyl) ether	<0.0025	2,4,6-Trichlorophenol	<0.025
2-Chlorophenol	<0.025	2,4,5-Trichlorophenol	<0.025
1,3-Dichlorobenzene	<0.0025	2-Chloronaphthalene	<0.0025
1,4-Dichlorobenzene	<0.0025	2-Nitroaniline	<0.012
1,2-Dichlorobenzene	<0.0025	Dimethyl phthalate	<0.025
Benzyl alcohol	<0.025	2,6-Dinitrotoluene	<0.012
Bis(2-chloroisopropyl) ether	<0.0025	3-Nitroaniline	<0.25
2-Methylphenol	<0.025	2,4-Dinitrophenol	<0.075
Hexachloroethane	<0.0025	Dibenzofuran	<0.0025
N-Nitroso-di-n-propylamine	<0.0025	2,4-Dinitrotoluene	<0.012
3-Methylphenol + 4-Methylphenol	<0.05	4-Nitrophenol	<0.075
Nitrobenzene	<0.0025	Diethyl phthalate	<0.025
Isophorone	<0.0025	4-Chlorophenyl phenyl ether	<0.0025
2-Nitrophenol	<0.025	N-Nitrosodiphenylamine	<0.0025
2,4-Dimethylphenol	<0.025	4-Nitroaniline	<0.25
Benzoic acid	<0.12	4,6-Dinitro-2-methylphenol	<0.075
Bis(2-chloroethoxy)methane	<0.0025	4-Bromophenyl phenyl ether	<0.0025
2,4-Dichlorophenol	<0.025	Hexachlorobenzene	<0.0025
1,2,4-Trichlorobenzene	<0.0025	Pentachlorophenol	<0.025
Hexachlorobutadiene	<0.0025	Carbazole	<0.025
4-Chloroaniline	<0.25	Di-n-butyl phthalate	<0.025
4-Chloro-3-methylphenol	<0.025	Benzyl butyl phthalate	<0.025
2-Methylnaphthalene	<0.0025	Bis(2-ethylhexyl) phthalate	<0.04
1-Methylnaphthalene	<0.0025	Di-n-octyl phthalate	<0.025

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	Krazan & Associates
Date Received:	Not Applicable	Project:	Port Gamble Bay, 10415010 PO, F&BI 509523
Date Extracted:	09/30/15	Lab ID:	05-2004 mb 1/0.25
Date Analyzed:	09/30/15	Data File:	093005.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	96	56	115
Phenol-d6	94	54	113
Nitrobenzene-d5	96	31	164
2-Fluorobiphenyl	97	47	133
2,4,6-Tribromophenol	98	35	141
Terphenyl-d14	104	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.025	Hexachlorocyclopentadiene	<0.0075
Bis(2-chloroethyl) ether	<0.0025	2,4,6-Trichlorophenol	<0.025
2-Chlorophenol	<0.025	2,4,5-Trichlorophenol	<0.025
1,3-Dichlorobenzene	<0.0025	2-Chloronaphthalene	<0.0025
1,4-Dichlorobenzene	<0.0025	2-Nitroaniline	<0.012
1,2-Dichlorobenzene	<0.0025	Dimethyl phthalate	<0.025
Benzyl alcohol	<0.025	2,6-Dinitrotoluene	<0.012
Bis(2-chloroisopropyl) ether	<0.0025	3-Nitroaniline	<0.25
2-Methylphenol	<0.025	2,4-Dinitrophenol	<0.075
Hexachloroethane	<0.0025	Dibenzofuran	<0.0025
N-Nitroso-di-n-propylamine	<0.0025	2,4-Dinitrotoluene	<0.012
3-Methylphenol + 4-Methylphenol	<0.05	4-Nitrophenol	<0.075
Nitrobenzene	<0.0025	Diethyl phthalate	<0.025
Isophorone	<0.0025	4-Chlorophenyl phenyl ether	<0.0025
2-Nitrophenol	<0.025	N-Nitrosodiphenylamine	<0.0025
2,4-Dimethylphenol	<0.025	4-Nitroaniline	<0.25
Benzoic acid	<0.12	4,6-Dinitro-2-methylphenol	<0.075
Bis(2-chloroethoxy)methane	<0.0025	4-Bromophenyl phenyl ether	<0.0025
2,4-Dichlorophenol	<0.025	Hexachlorobenzene	<0.0025
1,2,4-Trichlorobenzene	<0.0025	Pentachlorophenol	<0.025
Hexachlorobutadiene	<0.0025	Carbazole	<0.025
4-Chloroaniline	<0.25	Di-n-butyl phthalate	<0.025
4-Chloro-3-methylphenol	<0.025	Benzyl butyl phthalate	<0.025
2-Methylnaphthalene	<0.0025	Bis(2-ethylhexyl) phthalate	<0.04
1-Methylnaphthalene	<0.0025	Di-n-octyl phthalate	<0.025

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Pyramid Filter Material	Client:	Krazan & Associates
Date Received:	09/29/15	Project:	Port Gamble Bay, 10415010 PO, F&BI 509523
Date Extracted:	09/30/15	Lab ID:	509523-01 1/0.25
Date Analyzed:	09/30/15	Data File:	093017.D
Matrix:	Soil	Instrument:	GCMS10
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	83	38	162
Benzo(a)anthracene-d12	90	22	160

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.00050
Acenaphthylene	<0.00050
Acenaphthene	<0.00050
Fluorene	<0.00050
Phenanthrene	<0.00050
Anthracene	<0.00050
Fluoranthene	<0.00050
Pyrene	<0.00050
Benz(a)anthracene	<0.00050
Chrysene	<0.00050
Benzo(a)pyrene	<0.00050
Benzo(b)fluoranthene	<0.00050
Benzo(k)fluoranthene	<0.00050
Indeno(1,2,3-cd)pyrene	<0.00050
Dibenz(a,h)anthracene	<0.00050
Benzo(g,h,i)perylene	<0.00050

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Krazan & Associates
Date Received:	Not Applicable	Project:	Port Gamble Bay, 10415010 PO, F&BI 509523
Date Extracted:	09/30/15	Lab ID:	05-2005 mb 1/0.25
Date Analyzed:	09/30/15	Data File:	093013.D
Matrix:	Soil	Instrument:	GCMS10
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	89	38	162
Benzo(a)anthracene-d12	102	22	160

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.00050
Acenaphthylene	<0.00050
Acenaphthene	<0.00050
Fluorene	<0.00050
Phenanthrene	<0.00050
Anthracene	<0.00050
Fluoranthene	<0.00050
Pyrene	<0.00050
Benz(a)anthracene	<0.00050
Chrysene	<0.00050
Benzo(a)pyrene	<0.00050
Benzo(b)fluoranthene	<0.00050
Benzo(k)fluoranthene	<0.00050
Indeno(1,2,3-cd)pyrene	<0.00050
Dibenz(a,h)anthracene	<0.00050
Benzo(g,h,i)perylene	<0.00050

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Pyramid Filter Material	Client:	Krazan & Associates
Date Received:	09/29/15	Project:	Port Gamble Bay, 10415010 PO, F&BI 509523
Date Extracted:	09/30/15	Lab ID:	509523-01
Date Analyzed:	09/30/15	Data File:	10.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	49	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.004
Aroclor 1232	<0.004
Aroclor 1016	<0.004
Aroclor 1242	<0.004
Aroclor 1248	<0.004
Aroclor 1254	<0.004
Aroclor 1260	<0.004

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Krazan & Associates
Date Received:	Not Applicable	Project:	Port Gamble Bay, 10415010 PO, F&BI 509523
Date Extracted:	09/30/15	Lab ID:	05-2006 mb
Date Analyzed:	09/30/15	Data File:	08.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	69	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.004
Aroclor 1232	<0.004
Aroclor 1016	<0.004
Aroclor 1242	<0.004
Aroclor 1248	<0.004
Aroclor 1254	<0.004
Aroclor 1260	<0.004

Date of Report: 10/13/15
Date Received: 09/29/15
Project: Port Gamble Bay, 10415010 PO, F&BI 509523

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 6020A

Laboratory Code: 509523-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Antimony	mg/kg (ppm)	20	<1	117	118	75-125	1
Arsenic	mg/kg (ppm)	10	<1	99	105	75-125	6
Beryllium	mg/kg (ppm)	5	<1	92	92	75-125	0
Cadmium	mg/kg (ppm)	10	<1	110	111	75-125	1
Chromium	mg/kg (ppm)	50	4.08	100	122	75-125	20
Copper	mg/kg (ppm)	50	<5	101	109	75-125	8
Lead	mg/kg (ppm)	50	1.04	108	108	75-125	0
Nickel	mg/kg (ppm)	25	8.35	97 b	146 b	75-125	40 b
Selenium	mg/kg (ppm)	5	<1	102	103	75-125	1
Silver	mg/kg (ppm)	10	<1	106	112	75-125	6
Thallium	mg/kg (ppm)	5	<1	114	113	75-125	1
Zinc	mg/kg (ppm)	50	5.46	92	93	75-125	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Antimony	mg/kg (ppm)	20	113	80-120
Arsenic	mg/kg (ppm)	10	98	80-120
Beryllium	mg/kg (ppm)	5	90	80-120
Cadmium	mg/kg (ppm)	10	107	80-120
Chromium	mg/kg (ppm)	50	102	80-120
Copper	mg/kg (ppm)	50	104	80-120
Lead	mg/kg (ppm)	50	106	80-120
Nickel	mg/kg (ppm)	25	104	80-120
Selenium	mg/kg (ppm)	5	97	80-120
Silver	mg/kg (ppm)	10	101	80-120
Thallium	mg/kg (ppm)	5	112	80-120
Zinc	mg/kg (ppm)	50	93	80-120

Date of Report: 10/13/15
Date Received: 09/29/15
Project: Port Gamble Bay, 10415010 PO, F&BI 509523

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL MERCURY USING EPA METHOD 1631E

Laboratory Code: 509523-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Mercury	mg/kg (ppm)	0.125	<0.1	81	85	62-136	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	mg/kg (ppm)	0.125	83	68-125

Date of Report: 10/13/15
Date Received: 09/29/15
Project: Port Gamble Bay, 10415010 PO, F&BI 509523

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 509476-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	11	10-56
Chloromethane	mg/kg (ppm)	2.5	<0.5	33	10-90
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	34	10-91
Bromomethane	mg/kg (ppm)	2.5	<0.5	63	10-110
Chloroethane	mg/kg (ppm)	2.5	<0.5	46	10-101
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	40	10-95
Acetone	mg/kg (ppm)	12.5	<0.5	76	11-141
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	51	11-103
Hexane	mg/kg (ppm)	2.5	31	271 b	10-95
Methylene chloride	mg/kg (ppm)	2.5	<0.5	69	14-128
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	77	17-134
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	59	13-112
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	65	23-115
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	53	18-117
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	69	25-120
Chloroform	mg/kg (ppm)	2.5	<0.05	73	29-117
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	76	20-133
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	76	22-124
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	62	27-112
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	64	26-107
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	71	22-115
Benzene	mg/kg (ppm)	2.5	1.2	74 b	26-114
Trichloroethene	mg/kg (ppm)	2.5	<0.02	69	30-112
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	74	31-119
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	93	31-131
Dibromomethane	mg/kg (ppm)	2.5	<0.05	80	27-124
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	93	16-147
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	76	28-137
Toluene	mg/kg (ppm)	2.5	0.18	70	34-112
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	71	30-136
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	99	32-126
2-Hexanone	mg/kg (ppm)	12.5	<0.5	88	17-147
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	77	29-125
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	55	25-114
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	80	32-143
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	81	32-126
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	68	37-113
Ethylbenzene	mg/kg (ppm)	2.5	31	291 b	34-115
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	84	35-126
m,p-Xylene	mg/kg (ppm)	5	140	505 b	25-125
o-Xylene	mg/kg (ppm)	2.5	19	220 b	27-126
Styrene	mg/kg (ppm)	2.5	<0.05	95	39-121
Isopropylbenzene	mg/kg (ppm)	2.5	16	189 b	34-123
Bromoform	mg/kg (ppm)	2.5	<0.05	80	18-155
n-Propylbenzene	mg/kg (ppm)	2.5	54	282 b	31-120
Bromobenzene	mg/kg (ppm)	2.5	<0.05	71	40-115
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	84	0 b	24-130
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	94	27-148
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05	82	33-123
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	1025 vo	39-110
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	377 vo	39-111
tert-Butylbenzene	mg/kg (ppm)	2.5	0.044	67	36-116
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	130	1571 b	35-116
sec-Butylbenzene	mg/kg (ppm)	2.5	8.0	116 b	33-118
p-Isopropyltoluene	mg/kg (ppm)	2.5	4.0	85 b	32-119
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	66	38-111
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	65	39-109
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	67	40-111
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	225 vo	37-122
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	70	31-121
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	73	24-128
Naphthalene	mg/kg (ppm)	2.5	28	277 b	24-139
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	74	35-117

Date of Report: 10/13/15
Date Received: 09/29/15
Project: Port Gamble Bay, 10415010 PO, F&BI 509523

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	35	31	10-76	12
Chloromethane	mg/kg (ppm)	2.5	58	57	34-98	2
Vinyl chloride	mg/kg (ppm)	2.5	73	70	42-107	4
Bromomethane	mg/kg (ppm)	2.5	97	93	46-113	4
Chloroethane	mg/kg (ppm)	2.5	78	80	47-115	3
Trichlorofluoromethane	mg/kg (ppm)	2.5	94	91	53-112	3
Acetone	mg/kg (ppm)	12.5	127	115	39-147	10
1,1-Dichloroethene	mg/kg (ppm)	2.5	91	89	65-110	2
Hexane	mg/kg (ppm)	2.5	83	81	55-107	2
Methylene chloride	mg/kg (ppm)	2.5	101	101	50-127	0
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	107	107	72-122	0
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	94	93	71-113	1
1,1-Dichloroethane	mg/kg (ppm)	2.5	97	97	74-109	0
2,2-Dichloropropane	mg/kg (ppm)	2.5	103	102	64-151	1
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	101	99	73-110	2
Chloroform	mg/kg (ppm)	2.5	95	94	76-110	1
2-Butanone (MEK)	mg/kg (ppm)	12.5	106	108	60-121	2
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	100	100	73-111	0
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	105	104	72-116	1
1,1-Dichloropropene	mg/kg (ppm)	2.5	102	101	72-112	1
Carbon tetrachloride	mg/kg (ppm)	2.5	127 vo	121	67-123	5
Benzene	mg/kg (ppm)	2.5	100	98	72-106	2
Trichloroethene	mg/kg (ppm)	2.5	97	97	72-107	0
1,2-Dichloropropane	mg/kg (ppm)	2.5	103	99	74-115	4
Bromodichloromethane	mg/kg (ppm)	2.5	110	107	75-126	3
Dibromomethane	mg/kg (ppm)	2.5	107	110	76-116	3
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	119	119	80-128	0
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	113	106	71-138	6
Toluene	mg/kg (ppm)	2.5	99	99	74-111	0
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	109	106	77-135	3
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	100	99	77-116	1
2-Hexanone	mg/kg (ppm)	12.5	113	112	70-129	1
1,3-Dichloropropane	mg/kg (ppm)	2.5	110	110	75-115	0
Tetrachloroethene	mg/kg (ppm)	2.5	92	91	73-111	1
Dibromochloromethane	mg/kg (ppm)	2.5	119	116	64-152	3
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	117	117	77-117	0
Chlorobenzene	mg/kg (ppm)	2.5	96	94	76-109	2
Ethylbenzene	mg/kg (ppm)	2.5	104	102	75-112	2
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	124	123	76-125	1
m,p-Xylene	mg/kg (ppm)	5	103	103	77-115	0
o-Xylene	mg/kg (ppm)	2.5	104	106	76-115	2
Styrene	mg/kg (ppm)	2.5	107	105	76-119	2
Isopropylbenzene	mg/kg (ppm)	2.5	105	105	76-120	0
Bromoform	mg/kg (ppm)	2.5	125	122	50-174	2
n-Propylbenzene	mg/kg (ppm)	2.5	106	105	77-115	1
Bromobenzene	mg/kg (ppm)	2.5	102	102	76-112	0
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	106	105	77-121	1
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	110	109	74-121	1
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	111	113	74-116	2
2-Chlorotoluene	mg/kg (ppm)	2.5	104	103	75-113	1
4-Chlorotoluene	mg/kg (ppm)	2.5	105	103	77-115	2
tert-Butylbenzene	mg/kg (ppm)	2.5	107	106	77-123	1
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	103	103	77-119	0
sec-Butylbenzene	mg/kg (ppm)	2.5	107	106	78-120	1
p-Isopropyltoluene	mg/kg (ppm)	2.5	105	105	77-120	0
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	97	96	76-112	1
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	92	93	74-109	1
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	96	96	75-114	0
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	126 vo	127 vo	68-122	1
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	100	101	75-122	1
Hexachlorobutadiene	mg/kg (ppm)	2.5	105	103	74-130	2
Naphthalene	mg/kg (ppm)	2.5	109	111	73-122	2
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	103	103	75-117	0

Date of Report: 10/13/15
Date Received: 09/29/15
Project: Port Gamble Bay, 10415010 PO, F&BI 509523

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270D

Laboratory Code: 509421-01 1/0.25 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Phenol	mg/kg (ppm)	0.08	<0.025	98	50-150
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.08	<0.0025	88	50-150
2-Chlorophenol	mg/kg (ppm)	0.08	<0.025	92	44-133
1,3-Dichlorobenzene	mg/kg (ppm)	0.08	<0.0025	87	50-150
1,4-Dichlorobenzene	mg/kg (ppm)	0.08	<0.0025	86	50-150
1,2-Dichlorobenzene	mg/kg (ppm)	0.08	<0.0025	87	50-150
Benzyl alcohol	mg/kg (ppm)	0.08	<0.025	93	50-150
Bis(2-chloroisopropyl) ether	mg/kg (ppm)	0.08	<0.0025	86	50-150
2-Methylphenol	mg/kg (ppm)	0.08	<0.025	88	42-143
Hexachloroethane	mg/kg (ppm)	0.08	<0.0025	91	31-132
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.08	<0.0025	90	50-150
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.08	<0.05	91	10-250
Nitrobenzene	mg/kg (ppm)	0.08	<0.0025	90	50-150
Isophorone	mg/kg (ppm)	0.08	<0.0025	91	50-150
2-Nitrophenol	mg/kg (ppm)	0.08	<0.025	100	29-152
2,4-Dimethylphenol	mg/kg (ppm)	0.08	<0.025	63	16-163
Benzoic acid	mg/kg (ppm)	0.12	<0.12	129	10-250
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.08	<0.0025	92	50-150
2,4-Dichlorophenol	mg/kg (ppm)	0.08	<0.025	97	39-145
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.08	<0.0025	89	50-150
Hexachlorobutadiene	mg/kg (ppm)	0.08	<0.0025	90	50-150
4-Chloroaniline	mg/kg (ppm)	0.17	<0.25	62	23-110
4-Chloro-3-methylphenol	mg/kg (ppm)	0.08	<0.025	98	50-150
2-Methylnaphthalene	mg/kg (ppm)	0.08	<0.0025	91	50-150
1-Methylnaphthalene	mg/kg (ppm)	0.08	<0.0025	91	50-150
Hexachlorocyclopentadiene	mg/kg (ppm)	0.08	<0.0075	108	10-151
2,4,6-Trichlorophenol	mg/kg (ppm)	0.08	<0.025	103	38-149
2,4,5-Trichlorophenol	mg/kg (ppm)	0.08	<0.025	101	50-150
2-Chloronaphthalene	mg/kg (ppm)	0.08	<0.0025	92	50-150
2-Nitroaniline	mg/kg (ppm)	0.08	<0.012	96	50-150
Dimethyl phthalate	mg/kg (ppm)	0.08	<0.025	86	50-150
2,6-Dinitrotoluene	mg/kg (ppm)	0.08	<0.012	96	50-150
3-Nitroaniline	mg/kg (ppm)	0.17	<0.25	71	23-119
2,4-Dinitrophenol	mg/kg (ppm)	0.08	<0.075	98	10-162
Dibenzofuran	mg/kg (ppm)	0.08	<0.0025	93	47-149
2,4-Dinitrotoluene	mg/kg (ppm)	0.08	<0.012	96	50-150
4-Nitrophenol	mg/kg (ppm)	0.08	<0.075	94	10-179
Diethyl phthalate	mg/kg (ppm)	0.08	<0.025	92	50-150
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.08	<0.0025	93	50-150
N-Nitrosodiphenylamine	mg/kg (ppm)	0.08	<0.0025	86	50-150
4-Nitroaniline	mg/kg (ppm)	0.17	<0.25	70	32-135
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.08	<0.075	101	10-170
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.08	<0.0025	99	50-150
Hexachlorobenzene	mg/kg (ppm)	0.08	<0.0025	94	50-150
Pentachlorophenol	mg/kg (ppm)	0.08	<0.025	108	12-160
Carbazole	mg/kg (ppm)	0.08	<0.025	84	50-150
Di-n-butyl phthalate	mg/kg (ppm)	0.08	<0.025	92	50-150
Benzyl butyl phthalate	mg/kg (ppm)	0.08	<0.025	101	50-150
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.08	<0.04	101	10-250
Di-n-octyl phthalate	mg/kg (ppm)	0.08	<0.025	119	54-161

Date of Report: 10/13/15
Date Received: 09/29/15
Project: Port Gamble Bay, 10415010 PO, F&BI 509523

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270D

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Phenol	mg/kg (ppm)	0.08	91	102	51-119	11
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.08	87	96	60-112	10
2-Chlorophenol	mg/kg (ppm)	0.08	88	100	59-114	13
1,3-Dichlorobenzene	mg/kg (ppm)	0.08	84	95	62-113	12
1,4-Dichlorobenzene	mg/kg (ppm)	0.08	84	95	61-114	12
1,2-Dichlorobenzene	mg/kg (ppm)	0.08	85	95	61-113	11
Benzyl alcohol	mg/kg (ppm)	0.08	92	105	50-119	13
Bis(2-chloroisopropyl) ether	mg/kg (ppm)	0.08	84	93	59-113	10
2-Methylphenol	mg/kg (ppm)	0.08	88	99	58-115	12
Hexachloroethane	mg/kg (ppm)	0.08	89	100	63-114	12
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.08	87	98	62-114	12
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.08	88	100	54-120	13
Nitrobenzene	mg/kg (ppm)	0.08	89	96	59-114	8
Isophorone	mg/kg (ppm)	0.08	88	98	61-113	11
2-Nitrophenol	mg/kg (ppm)	0.08	94	107	59-114	13
2,4-Dimethylphenol	mg/kg (ppm)	0.08	84	91	54-107	8
Benzoic acid	mg/kg (ppm)	0.12	114	133	43-150	15
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.08	90	98	60-114	9
2,4-Dichlorophenol	mg/kg (ppm)	0.08	93	104	57-118	11
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.08	87	96	56-112	10
Hexachlorobutadiene	mg/kg (ppm)	0.08	89	97	60-116	9
4-Chloroaniline	mg/kg (ppm)	0.17	50	36	10-126	33 vo
4-Chloro-3-methylphenol	mg/kg (ppm)	0.08	93	105	59-115	12
2-Methylnaphthalene	mg/kg (ppm)	0.08	88	97	60-115	10
1-Methylnaphthalene	mg/kg (ppm)	0.08	87	98	70-130	12
Hexachlorocyclopentadiene	mg/kg (ppm)	0.08	94	105	41-107	11
2,4,6-Trichlorophenol	mg/kg (ppm)	0.08	99	110	47-119	11
2,4,5-Trichlorophenol	mg/kg (ppm)	0.08	95	107	61-121	12
2-Chloronaphthalene	mg/kg (ppm)	0.08	89	98	58-114	10
2-Nitroaniline	mg/kg (ppm)	0.08	93	103	55-119	10
Dimethyl phthalate	mg/kg (ppm)	0.08	84	92	58-116	9
2,6-Dinitrotoluene	mg/kg (ppm)	0.08	93	103	57-119	10
3-Nitroaniline	mg/kg (ppm)	0.17	67	76	10-143	13
2,4-Dinitrophenol	mg/kg (ppm)	0.08	98	110	40-122	12
Dibenzofuran	mg/kg (ppm)	0.08	90	99	56-115	10
2,4-Dinitrotoluene	mg/kg (ppm)	0.08	94	105	53-126	11
4-Nitrophenol	mg/kg (ppm)	0.08	93	104	40-124	11
Diethyl phthalate	mg/kg (ppm)	0.08	92	100	57-116	8
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.08	90	99	54-119	10
N-Nitrosodiphenylamine	mg/kg (ppm)	0.08	86	93	54-113	8
4-Nitroaniline	mg/kg (ppm)	0.17	69	78	47-109	12
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.08	100	112	55-147	11
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.08	97	105	56-116	8
Hexachlorobenzene	mg/kg (ppm)	0.08	94	101	57-115	7
Pentachlorophenol	mg/kg (ppm)	0.08	105	117	45-123	11
Carbazole	mg/kg (ppm)	0.08	82	97	57-116	17
Di-n-butyl phthalate	mg/kg (ppm)	0.08	92	98	56-118	6
Benzyl butyl phthalate	mg/kg (ppm)	0.08	97	107	56-122	10
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.08	95	107	56-155	12
Di-n-octyl phthalate	mg/kg (ppm)	0.08	106	119	58-120	12

Date of Report: 10/13/15
Date Received: 09/29/15
Project: Port Gamble Bay, 10415010 PO, F&BI 509523

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: 509421-01 1/0.25 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.008	<0.00050	79	50-150
Acenaphthylene	mg/kg (ppm)	0.008	<0.00050	88	50-150
Acenaphthene	mg/kg (ppm)	0.008	<0.00050	84	50-150
Fluorene	mg/kg (ppm)	0.008	<0.00050	90	50-150
Phenanthrene	mg/kg (ppm)	0.008	<0.00050	89	50-150
Anthracene	mg/kg (ppm)	0.008	<0.00050	81	50-150
Fluoranthene	mg/kg (ppm)	0.008	<0.00050	91	36-157
Pyrene	mg/kg (ppm)	0.008	<0.00050	93	34-154
Benz(a)anthracene	mg/kg (ppm)	0.008	<0.00050	90	46-149
Chrysene	mg/kg (ppm)	0.008	<0.00050	92	50-150
Benzo(b)fluoranthene	mg/kg (ppm)	0.008	<0.00050	85	50-150
Benzo(k)fluoranthene	mg/kg (ppm)	0.008	<0.00050	89	44-148
Benzo(a)pyrene	mg/kg (ppm)	0.008	<0.00050	78	46-144
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.008	<0.00050	84	50-150
Dibenz(a,h)anthracene	mg/kg (ppm)	0.008	<0.00050	88	50-150
Benzo(g,h,i)perylene	mg/kg (ppm)	0.008	<0.00050	90	50-150

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.008	77	84	70-130	9
Acenaphthylene	mg/kg (ppm)	0.008	88	94	70-130	7
Acenaphthene	mg/kg (ppm)	0.008	85	90	70-130	6
Fluorene	mg/kg (ppm)	0.008	91	95	70-130	4
Phenanthrene	mg/kg (ppm)	0.008	92	99	70-130	7
Anthracene	mg/kg (ppm)	0.008	84	91	70-130	8
Fluoranthene	mg/kg (ppm)	0.008	99	103	70-130	4
Pyrene	mg/kg (ppm)	0.008	98	111	66-124	12
Benz(a)anthracene	mg/kg (ppm)	0.008	93	93	70-130	0
Chrysene	mg/kg (ppm)	0.008	96	101	70-130	5
Benzo(b)fluoranthene	mg/kg (ppm)	0.008	87	95	57-127	9
Benzo(k)fluoranthene	mg/kg (ppm)	0.008	90	98	70-130	9
Benzo(a)pyrene	mg/kg (ppm)	0.008	79	85	61-112	7
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.008	93	93	48-135	0
Dibenz(a,h)anthracene	mg/kg (ppm)	0.008	95	99	51-136	4
Benzo(g,h,i)perylene	mg/kg (ppm)	0.008	100	103	51-127	3

Date of Report: 10/13/15
Date Received: 09/29/15
Project: Port Gamble Bay, 10415010 PO, F&BI 509523

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR POLYCHLORINATED BIPHENYLS AS AROCLOR 1016/1260 BY EPA METHOD 8082A

Laboratory Code: 509523-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Control Limits
Aroclor 1016	mg/kg (ppm)	0.17	<0.004	54	50-150
Aroclor 1260	mg/kg (ppm)	0.17	<0.004	60	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.17	66	83	55-130	23 vo
Aroclor 1260	mg/kg (ppm)	0.17	68	88	58-133	26 vo

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

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Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 509523
Lab ID: 1509431

October 07, 2015

Attention Michael Erdahl:

Fremont Analytical, Inc. received 1 sample(s) on 9/30/2015 for the analyses presented in the following report.

Organochlorine Pesticides by EPA Method 8081
Sample Moisture (Percent Moisture)
Total Organic Carbon by EPA Method 9060

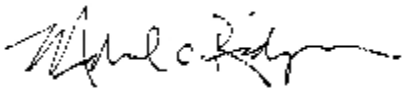
This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,



Mike Ridgeway
President

Date: *10/07/2015*

CLIENT: Friedman & Bruya
Project: 509523
Lab Order: 1509431

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1509431-001	Pyramid Filter Material - 1	09/29/2015 1:00 PM	09/30/2015 2:07 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **1509431**
Date: **10/7/2015**

CLIENT: Friedman & Bruya
Project: 509523

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below LOQ
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

WO#: **1509431**
Date Reported: **10/7/2015**

Client: Friedman & Bruya
Collection Date: 9/29/2015 1:00:00 PM
Project: 509523
Lab ID: 1509431-001
Matrix: Soil
Client Sample ID: **Pyramid Filter Material - 1**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Organochlorine Pesticides by EPA Method 8081				Batch ID: 12043		Analyst: MD
Toxaphene	ND	0.0891		mg/Kg-dry	1	10/6/2015 7:15:00 PM
Alpha BHC	ND	0.00891		mg/Kg-dry	1	10/6/2015 7:15:00 PM
Beta BHC	ND	0.00891		mg/Kg-dry	1	10/6/2015 7:15:00 PM
Gamma BHC (Lindane)	ND	0.00891		mg/Kg-dry	1	10/6/2015 7:15:00 PM
Delta BHC	ND	0.00891		mg/Kg-dry	1	10/6/2015 7:15:00 PM
Heptachlor	ND	0.00891		mg/Kg-dry	1	10/6/2015 7:15:00 PM
Aldrin	ND	0.00891		mg/Kg-dry	1	10/6/2015 7:15:00 PM
Heptachlor epoxide	ND	0.00891		mg/Kg-dry	1	10/6/2015 7:15:00 PM
gamma-Chlordane	ND	0.00891		mg/Kg-dry	1	10/6/2015 7:15:00 PM
Endosulfan I	ND	0.00891		mg/Kg-dry	1	10/6/2015 7:15:00 PM
alpha-Chlordane	ND	0.00891		mg/Kg-dry	1	10/6/2015 7:15:00 PM
Dieldrin	ND	0.00891		mg/Kg-dry	1	10/6/2015 7:15:00 PM
4,4´-DDE	ND	0.0178		mg/Kg-dry	1	10/6/2015 7:15:00 PM
Endrin	ND	0.0178		mg/Kg-dry	1	10/6/2015 7:15:00 PM
Endosulfan II	ND	0.0178		mg/Kg-dry	1	10/6/2015 7:15:00 PM
4,4´-DDD	ND	0.0178		mg/Kg-dry	1	10/6/2015 7:15:00 PM
Endrin aldehyde	ND	0.0178		mg/Kg-dry	1	10/6/2015 7:15:00 PM
Endosulfan sulfate	ND	0.0178		mg/Kg-dry	1	10/6/2015 7:15:00 PM
4,4´-DDT	ND	0.0178		mg/Kg-dry	1	10/6/2015 7:15:00 PM
Endrin ketone	ND	0.0178		mg/Kg-dry	1	10/6/2015 7:15:00 PM
Methoxychlor	ND	0.0446		mg/Kg-dry	1	10/6/2015 7:15:00 PM
Surr: Decachlorobiphenyl	125	26.5-158		%REC	1	10/6/2015 7:15:00 PM
Surr: Tetrachloro-m-xylene	127	11-150		%REC	1	10/6/2015 7:15:00 PM
Sample Moisture (Percent Moisture)				Batch ID: R25228		Analyst: CG
Percent Moisture	1.85	0.500		wt%	1	10/1/2015 8:40:20 AM
Total Organic Carbon by EPA Method 9060				Batch ID: 12050		Analyst: KT
Total Organic Carbon	ND	0.100		%-dry	1	10/6/2015 1:58:36 PM

Work Order: 1509431
CLIENT: Friedman & Bruya
Project: 509523

QC SUMMARY REPORT

Total Organic Carbon by EPA Method 9060

Sample ID **MB-12050**	SampType: **MBLK**			Units: **%-dry**		Prep Date: **10/6/2015**		RunNo: **25330**		
Client ID: **MBLKS**	Batch ID: **12050**					Analysis Date: **10/6/2015**		SeqNo: **477866**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.100									

Sample ID **LCS-12050**	SampType: **LCS**			Units: **%-dry**		Prep Date: **10/6/2015**		RunNo: **25330**		
Client ID: **LCSS**	Batch ID: **12050**					Analysis Date: **10/6/2015**		SeqNo: **477867**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	0.592	0.100	0.6510	0	91.0	41.1	157				

Sample ID **1509431-001ADUP**	SampType: **DUP**			Units: **%-dry**		Prep Date: **10/6/2015**		RunNo: **25330**		
Client ID: **Pyramid Filter Material**	Batch ID: **12050**					Analysis Date: **10/6/2015**		SeqNo: **477869**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.100						0		30	

Sample ID **1509431-001AMS**	SampType: **MS**			Units: **%-dry**		Prep Date: **10/6/2015**		RunNo: **25330**		
Client ID: **Pyramid Filter Material**	Batch ID: **12050**					Analysis Date: **10/6/2015**		SeqNo: **477870**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	0.979	0.100	1.000	0.02216	95.7	50.2	118				

Sample ID **1509431-001AMSD**	SampType: **MSD**			Units: **%-dry**		Prep Date: **10/6/2015**		RunNo: **25330**		
Client ID: **Pyramid Filter Material**	Batch ID: **12050**					Analysis Date: **10/6/2015**		SeqNo: **477871**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	0.986	0.100	1.000	0.02216	96.4	50.2	118	0.9787	0.784	20	

Work Order: 1509431
CLIENT: Friedman & Bruya
Project: 509523

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **MB-12043** SampType: **MBLK** Units: **mg/Kg** Prep Date: **10/5/2015** RunNo: **25362**
Client ID: **MBLKS** Batch ID: **12043** Analysis Date: **10/6/2015** SeqNo: **478485**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toxaphene	ND	0.100									
Alpha BHC	ND	0.0100									
Beta BHC	ND	0.0100									
Gamma BHC (Lindane)	ND	0.0100									
Delta BHC	ND	0.0100									
Heptachlor	ND	0.0100									
Aldrin	ND	0.0100									
Heptachlor epoxide	ND	0.0100									
gamma-Chlordane	ND	0.0100									
Endosulfan I	ND	0.0100									
alpha-Chlordane	ND	0.0100									
Dieldrin	ND	0.0100									
4,4´-DDE	ND	0.0200									
Endrin	ND	0.0200									
Endosulfan II	ND	0.0200									
4,4´-DDD	ND	0.0200									
Endrin aldehyde	ND	0.0200									
Endosulfan sulfate	ND	0.0200									
4,4´-DDT	ND	0.0200									
Endrin ketone	ND	0.0200									
Methoxychlor	ND	0.0500									
Surr: Decachlorobiphenyl	0.0565		0.05000		113	26.5	158				
Surr: Tetrachloro-m-xylene	0.0539		0.05000		108	11	150				

Sample ID **LCS-12043** SampType: **LCS** Units: **µg/Kg** Prep Date: **10/5/2015** RunNo: **25362**
Client ID: **LCSS** Batch ID: **12043** Analysis Date: **10/6/2015** SeqNo: **478486**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alpha BHC	0.221	0.0100	0.2000	0	111	54.2	139				
Beta BHC	0.216	0.0100	0.2000	0	108	56.5	142				
Gamma BHC (Lindane)	0.222	0.0100	0.2000	0	111	55.5	142				

Work Order: 1509431
CLIENT: Friedman & Bruya
Project: 509523

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **LCS-12043** SampType: **LCS** Units: **µg/Kg** Prep Date: **10/5/2015** RunNo: **25362**
Client ID: **LCSS** Batch ID: **12043** Analysis Date: **10/6/2015** SeqNo: **478486**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Delta BHC	0.221	0.0100	0.2000	0	110	47.4	157				
Heptachlor	0.220	0.0100	0.2000	0	110	54	141				
Aldrin	0.219	0.0100	0.2000	0	109	43.7	147				
Heptachlor epoxide	0.216	0.0100	0.2000	0	108	56.2	137				
gamma-Chlordane	0.218	0.0100	0.2000	0	109	58.5	136				
Endosulfan I	0.220	0.0100	0.2000	0	110	60	132				
alpha-Chlordane	0.214	0.0100	0.2000	0	107	46.1	140				
Dieldrin	0.217	0.0100	0.2000	0	109	61.2	133				
4,4´-DDE	0.211	0.0200	0.2000	0	106	55.4	142				
Endrin	0.217	0.0200	0.2000	0	109	56.5	143				
Endosulfan II	0.207	0.0200	0.2000	0	103	62	143				
4,4´-DDD	0.220	0.0200	0.2000	0	110	53.3	145				
Endrin aldehyde	0.207	0.0200	0.2000	0	103	39.5	153				
Endosulfan sulfate	0.207	0.0200	0.2000	0	103	53.8	148				
4,4´-DDT	0.220	0.0200	0.2000	0	110	48.2	152				
Endrin ketone	0.220	0.0200	0.2000	0	110	28.5	162				
Methoxychlor	0.212	0.0500	0.2000	0	106	34.6	159				
Surr: Decachlorobiphenyl	0.0603		0.05000		121	26.5	158				
Surr: Tetrachloro-m-xylene	0.0639		0.05000		128	11	150				

Sample ID **1509431-001ADUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **10/5/2015** RunNo: **25362**
Client ID: **Pyramid Filter Material** Batch ID: **12043** Analysis Date: **10/6/2015** SeqNo: **478488**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toxaphene	ND	0.0949						0		30	
Alpha BHC	ND	0.00949						0		30	
Beta BHC	ND	0.00949						0		30	
Gamma BHC (Lindane)	ND	0.00949						0		30	
Delta BHC	ND	0.00949						0		30	
Heptachlor	ND	0.00949						0		30	
Aldrin	ND	0.00949						0		30	

Work Order: 1509431
CLIENT: Friedman & Bruya
Project: 509523

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **1509431-001ADUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **10/5/2015** RunNo: **25362**
Client ID: **Pyramid Filter Material** Batch ID: **12043** Analysis Date: **10/6/2015** SeqNo: **478488**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Heptachlor epoxide	ND	0.00949						0		30	
gamma-Chlordane	ND	0.00949						0		30	
Endosulfan I	ND	0.00949						0		30	
alpha-Chlordane	ND	0.00949						0		30	
Dieldrin	ND	0.00949						0		30	
4,4´-DDE	ND	0.0190						0		30	
Endrin	ND	0.0190						0		30	
Endosulfan II	ND	0.0190						0		30	
4,4´-DDD	ND	0.0190						0		30	
Endrin aldehyde	ND	0.0190						0		30	
Endosulfan sulfate	ND	0.0190						0		30	
4,4´-DDT	ND	0.0190						0		30	
Endrin ketone	ND	0.0190						0		30	
Methoxychlor	ND	0.0474						0		30	
Surr: Decachlorobiphenyl	0.0548		0.04743		116	26.5	158		0		
Surr: Tetrachloro-m-xylene	0.0565		0.04743		119	11	150		0		

Sample ID **1509431-001AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **10/5/2015** RunNo: **25362**
Client ID: **Pyramid Filter Material** Batch ID: **12043** Analysis Date: **10/6/2015** SeqNo: **478489**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alpha BHC	0.230	0.00964	0.1928	0	119	49.1	158				
Beta BHC	0.229	0.00964	0.1928	0	119	50.9	160				
Gamma BHC (Lindane)	0.232	0.00964	0.1928	0	120	55.3	157				
Delta BHC	0.236	0.00964	0.1928	0	122	55.8	160				
Heptachlor	0.234	0.00964	0.1928	0	121	59.1	150				
Aldrin	0.233	0.00964	0.1928	0	121	46.4	145				
Heptachlor epoxide	0.235	0.00964	0.1928	0	122	48.5	151				
gamma-Chlordane	0.241	0.00964	0.1928	0	125	50.9	143				
Endosulfan I	0.245	0.00964	0.1928	0	127	46.4	149				
alpha-Chlordane	0.236	0.00964	0.1928	0	123	46.3	153				

Work Order: 1509431
CLIENT: Friedman & Bruya
Project: 509523

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **1509431-001AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **10/5/2015** RunNo: **25362**
Client ID: **Pyramid Filter Material** Batch ID: **12043** Analysis Date: **10/6/2015** SeqNo: **478489**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dieldrin	0.241	0.00964	0.1928	0	125	51	147				
4,4´-DDE	0.239	0.0193	0.1928	0	124	39.9	162				
Endrin	0.241	0.0193	0.1928	0	125	51.3	151				
Endosulfan II	0.234	0.0193	0.1928	0	122	51	152				
4,4´-DDD	0.257	0.0193	0.1928	0	133	45.8	160				
Endrin aldehyde	0.239	0.0193	0.1928	0	124	38.3	156				
Endosulfan sulfate	0.239	0.0193	0.1928	0	124	53.2	154				
4,4´-DDT	0.257	0.0193	0.1928	0	134	45.7	168				
Endrin ketone	0.256	0.0193	0.1928	0	133	68.3	144				
Methoxychlor	0.257	0.0482	0.1928	0	133	43.4	178				
Surr: Decachlorobiphenyl	0.0720		0.04819		149	26.5	158				
Surr: Tetrachloro-m-xylene	0.0634		0.04819		132	11	150				

Date: *10/7/2015*

Work Order: 1509431
CLIENT: Friedman & Bruya
Project: 509523

QC SUMMARY REPORT

Sample Moisture (Percent Moisture)

Sample ID **1509291-006ADUP** SampType: **DUP** Units: **wt%** Prep Date: **10/1/2015** RunNo: **25228**
Client ID: **BATCH** Batch ID: **R25228** Analysis Date: **10/1/2015** SeqNo: **475788**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	11.0	0.500						11.33	3.23	20	

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**1509431**
Logged by:	**Erica Silva**	Date Received:	**9/30/2015 2:07:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Client		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C *	Yes ☐	No ☑	NA ☐
		Please refer to Item Information		
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp °C
Cooler	10.9
Sample	12.4

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

1509431

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont

PROJECT NAME/NO. 509523

PO # D-669

REMARKS

Please Email Results

Page # 1 of 1

TURNAROUND TIME

☒ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins and Furans by 8290	EPH	VPH	Nitrate	Sulfate	Alkalinity	Chlorinated Pesticides	TOC			Notes
Pyramid Filter Material-1		9/29/15	1:00 PM	Soil	1							X	X			

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman & Bruya	9/30/15	0930
Received by:					
Relinquished by:		Elizabeth Webber-Bruya	FBI	9/30/15	1407
Received by:		Samantha Beerman	FAI	09/30/15	14:07

509523

SAMPLE CHAIN OF CUSTODY

ME 9/29/15 BI

Report To STEVEN PADILLA

Company KRAZAN

Address

City, State, ZIP LYNNWOOD

Phone 425-485-5519 Email STEVEN.PADILLA@KRAZAN.COM

SAMPLERS (signature)

PROJECT NAME: PORT GAMBLE BAY

PO #: 10415010

REMARKS

INVOICE TO: KRAZAN

Page # 1 of 1

TURNAROUND TIME
- ☑ Standard (10 Business Days)
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	HFS	Cl Rest	D/F	TOC	PP MetMs	PAH By SIM	PCB	Notes
PYRAMID FILTER MARINA-1	01 AD	9/29/15	1:00PM	PEA GRAVEL	4				✓	✓		✓	✓	✓	✓	✓	✓	
DUP-1																		
EB-1																		

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	STEVEN PADILLA	KRAZAN	9/29/15	3:23
Received by:	ERIC FOR	F&B	9/29/15	3:28
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

Samples received at 2.2 °C

October 14, 2015

FAL Project ID: 9321

Mr. Michael Erdahl
Friedman and Bruya, Inc.
3012 16th Ave. W
Seattle, WA 98119

Dear Mr. Erdahl,

Enclosed are the results for Frontier Analytical Laboratory project **9321**. This corresponds to your project number **509523** and purchase order number **D-656**. One soil sample was received at Frontier Analytical Laboratory on 10/1/2015. This sample was extracted and analyzed by EPA Method 1613 for tetra through octa chlorinated dibenzo dioxins and furans. The Toxic Equivalency (TEQ) for your sample has been calculated using the 2005 World Health Organization's (WHO's) toxic equivalency factors (TEFs). Freidman and Bruya, Inc. requested a turnaround time of ten business days for project **9321**.

The following report consists of an Analytical Data section and a Sample Receipt section. The Analytical Data section contains our project-sample tracking log and the analytical results. The Sample Receipt section contains your chain of custody, our sample login form and a sample photo. The enclosed results are specifically for the sample referenced in this report only. These results meet all National Environmental Laboratory Accreditation Program (NELAP) requirements and shall not be reproduced except in full. Frontier Analytical Laboratory's State of Oregon NELAP certificate number is **4041**, our State of California ELAP certificate number is **2934** and our State of Washington certificate number is **C844**. This report has been emailed to you as a portable document file (PDF). A hardcopy will not be sent to you unless specifically requested.

If you have any questions regarding project **9321**, please feel free to contact me at (916) 934-0900. Thank you for choosing Frontier Analytical Laboratory for your analytical testing needs.

Sincerely,

Thomas C. Crabtree

Thomas C. Crabtree
Director

Frontier Analytical Laboratory

Sample Tracking Log

FAL Project ID: **9321**

Received on: **10/01/2015** Project Due: **10/16/2015** Storage: **R3**

FAL Sample ID	Dup	Client Project ID	Client Sample ID	Requested Method	Matrix	Sampling Date	Sampling Time	Hold Time Due Date
9321-001-SA	0	509523	Pyramid Filter Material-1	EPA 1613 D/F	Soil	09/29/2015	01:00 pm	09/28/2016

FAL Sample ID	Notes
9321-001-SA	'Using sample ID from COC for our tracking purposes. '

5172 Hillsdale Circle * El Dorado Hills, CA 95762 * Tel (916) 934-0900 * Fax (916) 934-0999 * www.frontieranalytical.com

EPA Method 1613
PCDD/F

FAL ID: 9321-001-MB
Client ID: Method Blank
Matrix: Soil
Batch No: X3464

Date Extracted: 10-05-2015
Date Received: NA
Amount: 5.00 g

ICal: PCDDFAL4-9-9-15
GC Column: DB5
Units: pg/g

Acquired: 10-06-2015
2005 WHO TEQ: 0.00
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.0899		-	0.0143				
1,2,3,7,8-PeCDD	ND	0.132		-	0.0256				
1,2,3,4,7,8-HxCDD	ND	0.124		-	0.0300				
1,2,3,6,7,8-HxCDD	ND	0.131		-	0.0329	Total TCDD	ND	0.0899	
1,2,3,7,8,9-HxCDD	ND	0.117		-	0.0287	Total PeCDD	ND	0.132	
1,2,3,4,6,7,8-HpCDD	ND	0.229		-	0.0463	Total HxCDD	ND	0.131	
OCDD	ND	0.360		-	0.115	Total HpCDD	ND	0.229	
2,3,7,8-TCDF	ND	0.0480		-	0.0115				
1,2,3,7,8-PeCDF	ND	0.0776		-	0.0184				
2,3,4,7,8-PeCDF	ND	0.0862		-	0.0172				
1,2,3,4,7,8-HxCDF	ND	0.0815		-	0.0171				
1,2,3,6,7,8-HxCDF	ND	0.0793		-	0.0181				
2,3,4,6,7,8-HxCDF	ND	0.0903		-	0.0198				
1,2,3,7,8,9-HxCDF	ND	0.104		-	0.0240	Total TCDF	ND	0.0480	
1,2,3,4,6,7,8-HpCDF	ND	0.153		-	0.0263	Total PeCDF	ND	0.0862	
1,2,3,4,7,8,9-HpCDF	ND	0.154		-	0.0338	Total HxCDF	ND	0.104	
OCDF	ND	0.239		-	0.0565	Total HpCDF	ND	0.154	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	95.9	25.0 - 164	
13C-1,2,3,7,8-PeCDD	110	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	99.1	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	96.1	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	106	23.0 - 140	
13C-OCDD	101	17.0 - 157	
13C-2,3,7,8-TCDF	111	24.0 - 169	
13C-1,2,3,7,8-PeCDF	118	24.0 - 185	
13C-2,3,4,7,8-PeCDF	113	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	100	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	98.6	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	98.5	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	107	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	93.0	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	123	26.0 - 138	
13C-OCDF	103	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	86.3	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: _____

Date: 10/7/2015

Reviewed By: _____

Date: 10/7/2015

EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 9321-001-OPR
Client ID: OPR
Matrix: Soil
Batch No: X3464

Date Extracted: 10-05-2015
Date Received: NA
Amount: 5.00 g

ICal: PCDDFAL4-9-9-15
GC Column: DB5
Units: ng/ml

Acquired: 10-06-2015
2005 WHO TEQ: NA

Compound	Conc	QC Limits	Qual
2,3,7,8-TCDD	9.93	6.70 - 15.8	
1,2,3,7,8-PeCDD	52.4	35.0 - 71.0	
1,2,3,4,7,8-HxCDD	54.3	35.0 - 82.0	
1,2,3,6,7,8-HxCDD	53.5	38.0 - 67.0	
1,2,3,7,8,9-HxCDD	50.8	32.0 - 81.0	
1,2,3,4,6,7,8-HpCDD	53.8	35.0 - 70.0	
OCDD	107	78.0 - 144	
2,3,7,8-TCDF	9.41	7.50 - 15.8	
1,2,3,7,8-PeCDF	51.2	40.0 - 67.0	
2,3,4,7,8-PeCDF	53.7	34.0 - 80.0	
1,2,3,4,7,8-HxCDF	50.5	36.0 - 67.0	
1,2,3,6,7,8-HxCDF	54.9	42.0 - 65.0	
2,3,4,6,7,8-HxCDF	54.5	35.0 - 78.0	
1,2,3,7,8,9-HxCDF	54.2	39.0 - 65.0	
1,2,3,4,6,7,8-HpCDF	60.9	41.0 - 61.0	
1,2,3,4,7,8,9-HpCDF	55.8	39.0 - 69.0	
OCDF	113	63.0 - 170	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	101	20.0 - 175	
13C-1,2,3,7,8-PeCDD	108	21.0 - 227	
13C-1,2,3,4,7,8-HxCDD	98.3	21.0 - 193	
13C-1,2,3,6,7,8-HxCDD	94.9	25.0 - 163	
13C-1,2,3,4,6,7,8-HpCDD	101	26.0 - 166	
13C-OCDD	91.9	13.0 - 198	
13C-2,3,7,8-TCDF	111	22.0 - 152	
13C-1,2,3,7,8-PeCDF	112	21.0 - 192	
13C-2,3,4,7,8-PeCDF	110	13.0 - 328	
13C-1,2,3,4,7,8-HxCDF	99.3	19.0 - 202	
13C-1,2,3,6,7,8-HxCDF	96.8	21.0 - 159	
13C-2,3,4,6,7,8-HxCDF	94.4	22.0 - 176	
13C-1,2,3,7,8,9-HxCDF	104	17.0 - 205	
13C-1,2,3,4,6,7,8-HpCDF	88.4	21.0 - 158	
13C-1,2,3,4,7,8,9-HpCDF	120	20.0 - 186	
13C-OCDF	96.9	13.0 - 198	

Cleanup Surrogate		
37Cl-2,3,7,8-TCDD	99.1	31.0 - 191

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: _____
Date: 10/7/2015

Reviewed By: _____
Date: 10/7/2015

EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 9321-001-SA
Client ID: Pyramid Filter Material-1
Matrix: Soil
Batch No: X3464

Date Extracted: 10-05-2015
Date Received: 10-01-2015
Amount: 5.02 g
% Solids: 97.73

ICal: pcddfal3-9-22-15
GC Column: DB5
Units: pg/g

Acquired: 10-12-2015
2005 WHO TEQ: 0.00
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.127		-	0.0184				
1,2,3,7,8-PeCDD	ND	0.179		-	0.0275				
1,2,3,4,7,8-HxCDD	ND	0.346		-	0.0314				
1,2,3,6,7,8-HxCDD	ND	0.376		-	0.0335	Total TCDD	ND	0.127	
1,2,3,7,8,9-HxCDD	ND	0.330		-	0.0296	Total PeCDD	ND	0.382	
1,2,3,4,6,7,8-HpCDD	ND	0.335		-	0.0492	Total HxCDD	ND	0.376	
OCDD	ND	0.623		-	0.136	Total HpCDD	ND	0.335	
2,3,7,8-TCDF	ND	0.0843		-	0.0211				
1,2,3,7,8-PeCDF	ND	0.127		-	0.0235				
2,3,4,7,8-PeCDF	ND	0.127		-	0.0247				
1,2,3,4,7,8-HxCDF	ND	0.125		-	0.0251				
1,2,3,6,7,8-HxCDF	ND	0.127		-	0.0235				
2,3,4,6,7,8-HxCDF	ND	0.136		-	0.0271				
1,2,3,7,8,9-HxCDF	ND	0.172		-	0.0320	Total TCDF	ND	0.0843	
1,2,3,4,6,7,8-HpCDF	ND	0.116		-	0.0280	Total PeCDF	ND	0.127	
1,2,3,4,7,8,9-HpCDF	ND	0.135		-	0.0359	Total HxCDF	ND	0.172	
OCDF	ND	0.471		-	0.0531	Total HpCDF	ND	0.135	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	92.9	25.0 - 164	
13C-1,2,3,7,8-PeCDD	99.8	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	98.0	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	98.4	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	102	23.0 - 140	
13C-OCDD	88.1	17.0 - 157	
13C-2,3,7,8-TCDF	96.8	24.0 - 169	
13C-1,2,3,7,8-PeCDF	99.5	24.0 - 185	
13C-2,3,4,7,8-PeCDF	99.5	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	82.8	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	84.4	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	83.9	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	79.8	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	94.3	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	112	26.0 - 138	
13C-OCDF	76.0	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	89.7	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: _____
Date: 10/14/2015

Reviewed By: _____
Date: 10/14/2015

5172 Hillsdale Circle * El Dorado Hills, CA 95762 * Tel (916) 934-0900 * Fax (916) 934-0999 * www.frontieranalytical.com

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

9321
40C

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Frontier

PROJECT NAME/NO.	PO #
509523	D-656

REMARKS

Please Email Results

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- [ ] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins and Furans by 1613 ~~8290~~	EPH	VPH	Nitrate	Sulfate	Alkalinity					Notes
Pyramid Filter Material-1		9/29/15	1:00PM	Soil	1	X										

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Michael Erdahl	Friedman & Bruya	9/30/15	0930
Received by:	Kathy Zipp	Kathy Zipp	Frontier Analytical	10/1/15	950
Relinquished by:					
Received by:					

Frontier Analytical Laboratory

Sample Login Form

FAL Project ID: **9321**

Client:	Friedman & Bruya, Inc.
Client Project ID:	509523
Date Received:	10/01/2015
Time Received:	09:50 am
Received By:	KZ
Logged In By:	KZ
# of Samples Received:	1
Duplicates:	0
Storage Location:	R3

Method of Delivery:	Fed-Ex
Tracking Number:	NA804312999503
Shipping Container Received Intact	Yes
Custody seals(s) present?	No
Custody seals(s) intact?	No
Sample Arrival Temperature (C)	4
Cooling Method	Blue Ice
Chain Of Custody Present?	Yes
Return Shipping Container To Client	Yes
Test aqueous sample for residual Chlorine	No
Sodium Thiosulfate Added	No
Adequate Sample Volume	Yes
Appropriate Sample Container	No
pH Range of Aqueous Sample	N/A

Anomalies or additional comments:

Please note that the sample was received in a clear glass jar. NELAC requires samples be received in an amber glass bottle or jar. Although this anomaly will not affect your results, we are required by NELAC to make a note of it. We will proceed with analysis unless directed otherwise by you.

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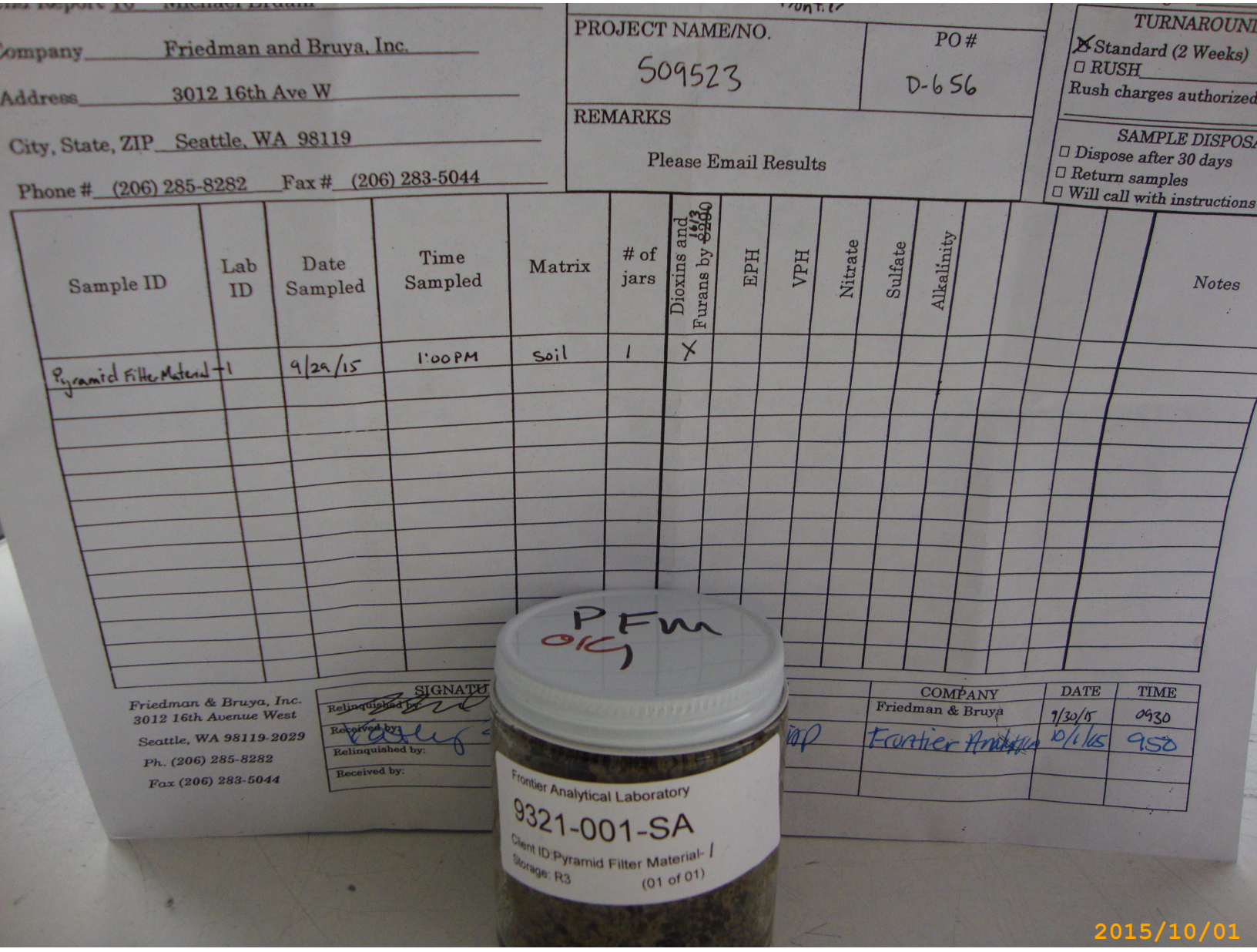

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Appendix B

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. The work consists of furnishing all transportation, labor, materials, equipment, and incidentals necessary to construct engineered sediment caps, the Eelgrass Mitigation Area, place residuals management cover (RMC) material over Subtidal Dredge areas, and Enhanced Monitored Natural Recovery (EMNR) material within site areas, as shown on the Drawings.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. ASTM D422 – (2007) Standard Test Method for Particle-Size Analysis of Soils

B. U.S. Environmental Protection Agency Publication SW846 – Test Methods for Evaluating Solid Waste, Physical/Chemical Methods

1. SW846 Method 6010/6020A/7471A Series for Priority Pollutant Metals

2. SW846 Method 8081A – Organochlorine Pesticides by Gas Chromatography (GC)

3. SW846 Method 8082A – Polychlorinated Biphenyls (PCBs) by GC

4. SW846 Method 8260 – Volatile Organic Compounds (VOCs)

5. SW846 Method 8270D – Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

C. U.S. Environmental Protection Agency Publication Method 1613- Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS

1. Method 1613B – Dioxins/Furans

D. Puget Sound Estuarine Protocols (PSEP) – Recommended Protocols for Measuring Conventional Sediment Variables in Puget Sound.

1. PSEP Protocol – Total Organic Carbon (TOC)

2. SM Method 5310B – TOC

1.03 DEFINITIONS

A. Cap Type: Specified areas require placement of engineered cap materials. The engineered capping design is separated into several cap types, as described below

and as shown on the Drawings. Each cap type has a different makeup for material types:

1. Intertidal Cap Type 1: This cap type consists of three layers—Filter material, Type 1 Armor, and Habitat Substrate material—and is designated for placement in the nearshore areas of the site as shown on the Drawings. Both cap materials are described in Part 2 of this section.

    a) Minimum Required Thickness for Filter material is 12 inches.

    b) Minimum Required Thickness for Type 1 Armor material is 6 inches.

    c) Minimum Required Thickness for Habitat Substrate material is 6 inches.

2. Intertidal Cap Type 2: This cap type consists of three layers—Filter material, Type 2 Armor material, and Habitat Substrate material—and is designated for placement in the nearshore areas of the site as shown on the Drawings. Cap materials are described in Part 2 of this section.

    a) Minimum Required Thickness for Filter material is 6 inches.

    b) Minimum Required Thickness for Type 2 Armor material is 1.5 feet.

    c) Habitat Substrate material thickness will be a nominal 6-inch thickness and will be placed to fill the interstitial spaces in Type 2 Armor material.

3. Intertidal Cap Type 3: This cap type consists of three layers—Filter material, Type 3 Armor, and Habitat Substrate material—and is designated for placement in the nearshore areas of the site as shown on the Drawings. Both cap materials are described in Part 2 of this section.

    a) Minimum Required Thickness for Filter material is 12 inches.

    b) Minimum Required Thickness for Type 3 Armor material is 6 inches.

    c) Minimum Required Thickness for Habitat Substrate material is 6 inches.

4. SMA-1 Subtidal Cap: This cap type consists of two layers – Filter material and Type 1 Armor material to be placed in areas shown on the Drawings. Both cap materials are described in Part 2 of this section.

a) Minimum Required Thickness for Filter material is 12 inches.

b) Minimum Required Thickness for Type 1 Armor material is 6 inches.

5. SMA-2 Subtidal Cap: This cap type consists of Sand material to be placed in areas shown on the Drawings. The cap material is described in Part 2 of this section.

a) Minimum Required Thickness for the SMA-2 Subtidal Cap is 4.0 feet.

6. Amended Sand Cap: This cap type consists of Amended Sand material to be placed over piles that are cut within intertidal areas. The cap material is described in Part 2 of this section.

a) Minimum Required Thickness for the Amended Sand Cap is 6 inches.

b) Place Amended Sand material over the top of the pile to a 1-foot radius from the edge of the pile using an Amended Sand blend consisting of 140 lbs of Sand (dry weight) or Alternate Sand blended with 140 lbs of organoclay.

B. Excessive Capping: Material placed outside of the capping limits and/or above the Overplacement Allowance is Excessive Capping.

C. Minimum Required Thickness: The Minimum Required Thickness is defined as the thickness that the Contractor shall place Sand material, Filter material, Armor material (Type 1, Type 2, and Type 3), RMC material, and EMNR material within areas as shown on the Drawings.

D. Overplacement Allowance: An additional increment above the Minimum Required Thickness to account for material placement tolerances. Material that is placed within the Overplacement Allowance will be paid as specified on the Drawings for the SMA-1 Subtidal Cap and SMA-2 Subtidal Cap. All other cap, RMC, and EMNR materials placed within the Overplacement Allowance will not be paid. Material placed above the Overplacement Allowance is considered Excessive Capping and will not be paid.

1.04 SUBMITTALS

A. Submit an Engineered Sediment Capping and Material Placement Plan as part of the Construction Work Plan in accordance with Section 013300 – Submittal Procedures.

B. Submit a Borrow Source Characterization Report in accordance with the requirements of this Specification and Section 013300 – Submittal Procedures.

C. Prepare and submit daily and weekly Construction Submittals in accordance with Section 013300 – Submittal Procedures, and Section 013200 – Construction Progress Documentation.

1.05 JOB CONDITIONS

A. The Contractor shall calculate its own estimate of the quantity of material to be used for the capping, RMC material, and EMNR material placement activities based on the Contractor's own calculation methods, the dredge and cap design as shown on the Drawings, and Contractor's means and methods for both dredging and capping operations in order to account for Contractor's equipment tolerances. Contractor shall account for its own estimated quantities in the Contractor's bid.

PART 2 – PRODUCTS

2.01 GENERAL

A. The Contractor shall provide all required capping, EMNR, and RMC materials for the project.

B. Imported material shall have chemical concentrations that meet the criteria presented in Table 352026-1, presented at the end of this section. Type 2 Armor material does not need to be tested for chemical criteria.

C. Material available from the Owner Sand Pit, Miles Sand and Gravel – Shine Facility, and Orcas Island Bay Head Marina maintenance dredging project are pre-approved sources for use as EMNR, Sand, and RMC materials. EMNR, Sand, and RMC materials shall be free of vegetation, debris, trees, or other deleterious materials.

D. The Owner Sand Pit is currently partially vegetated. It is the Contractor's responsibility to visit the Owner Sand Pit prior to bidding to generally ascertain vegetation to be removed for construction.

1. Prior to excavation of borrow material from this area, the Contractor shall clear and grub vegetation as directed by the Engineer. Vegetation shall be stockpiled at the Sand Pit.

2. The Owner Sand Pit material shall be screened to remove any remaining organic debris prior to hauling and placement.

E. The Contractor may elect to propose an alternate material source that meets the requirements described in this section.

2.02 BORROW SOURCE AND MATERIALS CHARACTERIZATION

A. The following activities shall be performed by the Contractor, as specified below, to ensure that imported materials are natural, native, virgin materials and free of contaminants, including debris or recycled materials, and meet construction Specifications:

1. Characterization of any Contractor-proposed sources of imported material shall be performed by the Contractor prior to any on-site placement. The characterization will include analysis of a borrow source sample, site inspection, and site characterization. The Contractor shall submit a Borrow Source Characterization Report summarizing all the information contained within this section.

2. Material Sources: Submit a list of the sources for all materials to be placed. Coordinate with the Engineer for pre-construction inspection of the cap material supplier sources.

3. The borrow source shall be inspected by the Contractor. During such inspection, the Contractor shall ensure that the materials to be delivered to the site meet the appropriate Specifications. The Contractor shall provide notification to the Engineer within 14 calendar days of such inspections. At the Engineer's discretion, the Engineer or another Owner's Representative may accompany the Contractor to witness such inspections. This witnessing shall in no way release the Contractor from complying with the Specifications and shall in no way be construed as approval of any particular source of material.

4. The Contractor shall provide the Engineer with a 5-gallon sample from each borrow source. Note, samples of Armor material are not required. Each sample should be composed from no less than five sub-samples taken throughout any one source. The Contractor shall ensure that the samples are representative of all materials to be imported. Samples shall be provided to the Engineer at least 1 month prior to the start of Capping activities.

5. Testing: The Contractor (or its material supplier) shall conduct physical and chemical testing to confirm that the materials meet the Specification requirements for use at the site. Materials must meet the gradation Specifications provided in this section and the chemical quality as shown on Table 352026-1, attached at the end of this Specification.

   a) The Contractor shall note that stringent, site-specific chemical acceptance criteria for dioxin/furans and carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) have been established for this work. It shall be the responsibility of the Contractor to ensure that

the proposed material suppliers can provide materials that meet the requirements of these Specifications.

b) The Owner reserves the right to request additional samples of materials in order to conduct its own testing for quality assurance purposes.

6. Testing Laboratory: Submit certificates for laboratories (certified by the Washington State Department of Ecology in Washington State) providing required testing to validate that the laboratory conforms to relevant paragraphs of ASTM D3740.

7. The Contractor shall test samples of all materials for chemical quality to be imported (except Type 2 Armor material) for the following:

a) In situ moisture content (ASTM method D2216).

b) Priority Pollutant Metals per U.S. Environmental Protection Agency SW846, the 6010/6020A/7471A method series.

c) VOCs per U.S. Environmental Protection Agency SW846, method 8260.

d) Semivolatile Organic Compounds per U.S. Environmental Protection Agency SW846, method 8270D.

e) PCBs per U.S. Environmental Protection Agency SW846, method 8082A.

f) Pesticides per U.S. Environmental Protection Agency SW846, method 8081A.

g) TOC per PSEP.

h) PAHs using Method 8270-SIM in Selected Ion Monitoring mode.

i) Dioxin/Furan per U.S. Environmental Protection Agency Method 1613B.

8. The Contractor shall test samples of all materials to be imported for grain size distribution (ASTM method D422-63).

9. The Contractor shall provide the results of such tests at least 14 calendar days before delivery of the materials to the site. The results shall be provided in report form, with the reports clearly identifying the following:

a) Source of samples.

b) Sampling dates.

c) Chain of custody.

d) Sampling locations.

e) Material Certification: Submit certification from material supplier that the materials meet Specification requirements for gradation and chemical testing.

2.03 ALTERNATE RMC MATERIAL

A. Material shall be clean, free-draining, granular material obtained from natural deposits. Individual particles shall be free from all objectionable coatings. The material shall contain no organic matter.

B. Alternate RMC material shall be graded so that the material is classified as SW, SP, SW-SM, SW-SC, SP-SM, SP-SC, SM, SC, or SC-SM in accordance with ASTM D2487.

2.04 ALTERNATE EMNR MATERIAL

A. Material shall be clean, free-draining, granular material obtained from natural deposits. Individual particles shall be free from all objectionable coatings. The material shall contain no organic matter.

B. Alternate EMNR material shall be graded between the limits specified for Alternate RMC material.

2.05 ALTERNATE SAND MATERIAL

A. Material shall be clean, free-draining, granular material obtained from natural deposits. Individual particles shall be free from all objectionable coatings. The material shall contain no organic matter.

B. Alternate Sand material shall be graded between the limits specified for Alternate RMC material.

2.06 AMENDED SAND MATERIAL

A. The Amended Sand material shall be Sand material or Alternate Sand material uniformly amended by blending organoclay at a minimum content of 50% organoclay by dry weight. Organoclay shall be virgin material meeting a minimum oil adsorption capacity of 0.5 lb/lb and a hydraulic conductivity of 1x10-3 cm/sec (CETCO PM-200, AquaBlok Aquate+Organoclay or equal). Product specification sheets for the selected organoclay must be submitted to the Owner for review and approval prior to ordering the material.

B. The Contractor shall provide a means of verification of the organoclay content, subject to approval by the Engineer. The Amended Sand material shall be blended prior to placement. The Amended Sand material shall be blended by proportioning Sand material and organoclay in the proper amounts and thoroughly mixed using mechanical means. The Amended Sand material shall be mixed until the mixture has a uniform texture and color.

2.07 FILTER MATERIAL

A. Material shall be clean, free-draining, granular material obtained from natural deposits. Individual particles shall be free from all objectionable coatings. The material shall contain no organic matter.

B. Filter material shall be graded between the limits specified below:

Sieve Size	Percent Passing (by weight)
1/2 inch	99% to 100%
3/8 inch	85% to 100%
U.S. No. 4	10% to 30%
U.S. No. 8	0% to 10%
U.S. No. 16	0% to 5

2.08 TYPE 1 ARMOR MATERIAL

A. Material shall be clean, free-draining, granular material obtained from natural deposits. Individual particles shall be free from all objectionable coatings. The material shall contain no organic matter, nor soft friable particles in quantities considered objectionable by the Engineer.

B. Type 1 Amor material shall be graded between the limits specified below:

Sieve Size	Percent Passing (by weight)
2 1/2 inches	95% to 100%
2 inches	70% to 100%
1 1/4 inches	40% to 90%
1 inch	3% to 30%
3/4 inch	15% maximum
U.S. No. 200	5% maximum

2.09 TYPE 2 ARMOR MATERIAL

A. Material shall be clean, free-draining, granular material obtained from natural deposits. Individual particles shall be free from all objectionable coatings. The material shall contain no organic matter, nor soft friable particles in quantities considered objectionable by the Engineer.

B. Type 2 Armor material shall be graded between the limits specified below:

Sieve Size	Percent Passing (by weight)
12 inches	100%
9 inch	45% to 58%
5 inch	10% to 33%
3 inch	0% to 23%

2.10 TYPE 3 ARMOR MATERIAL

A. Material shall be clean, free-draining, granular material obtained from natural deposits. Individual particles shall be free from all objectionable coatings. The material shall contain no organic matter, nor soft friable particles in quantities considered objectionable by the Engineer.

B. Type 3 Armor material shall be graded between the limits specified below:

Sieve Size	Percent Passing (by weight)
4 inches	100%
2 1/2 inches	20% to 60%
1 inch	0% to 22%

2.11 SUBTIDAL CAP ARMOR

A. Material shall be clean, free-draining, granular material obtained from natural deposits. Individual particles shall be free from all objectionable coatings. The material shall contain no organic matter, nor soft friable particles in quantities considered objectionable by the Engineer.

B. Subtidal Cap Armor material shall be graded between the limits as specified for Type 1 Armor material.

2.12 HABITAT SUBSTRATE

A. Material shall be clean, free-draining, granular material obtained from natural deposits. Individual particles shall be free from all objectionable coatings. The material shall contain no organic matter.

B. Habitat Substrate shall be graded between the limits specified below:

Sieve Size	Percent Passing (by weight)
2 inch	100%
1 ½ inch	80% to 95%
3/4 inch	50% to 90%
U.S. No. 4	30% to 50%
U.S. No. 200	0 to 5%

PART 3 – EXECUTION

3.01 ORDER OF WORK

A. Placement work will be performed from lower elevations to higher elevations to the extent practicable.

B. Intertidal excavation and intertidal capping will be performed in the dry during low tide cycles. Capping will be performed in the dry during the same tidal cycle as excavation.

C. RMC material placement in dredging areas will be performed following confirmation that the required dredge elevations have been achieved.

D. Amended Sand material will be placed evenly to a thickness of 6 inches over each cut pile location in areas within intertidal areas and within the site boundary as shown on the Drawings and as described in Section 024100 – Demolition and Pile Removal.

E. Habitat Substrate placement over the existing riprap armor will be performed following structure and pile removal as shown on the Drawings.

F. Once capping materials have been placed, the Contractor will complete bathymetric surveys detailed in Section 017123 – Surveying to confirm that required elevations and grades have been met. If low or thin spots are identified, the Contractor shall place additional material to the satisfaction of the Engineer to achieve the required grade or thickness.

3.02 EQUIPMENT

A. Equipment to be used for cap material placement shall place the materials in a manner that does not disturb the subgrade or previous lifts of capping material.

3.03 QUALITY CONTROL

A. The Contractor shall establish procedures for monitoring the rate of placement of the capping materials including use of a positioning system as described in Section 352023 – Dredging and Excavation. The methods should be capable of determining the area of cap material coverage on a daily basis.

B. The Contractor shall supply the Engineer with information pertaining to the previous day's material placement activities on a daily basis in the Daily Construction Report in accordance with Section 013300 – Submittal Procedures.

3.04 INSPECTION OF MATERIALS AT THE SITE

A. Truck or barge loads of imported materials shall be visually inspected by the Contractor upon delivery for the presence of foreign, recycled, or reprocessed material. The Engineer may, at any and all times, perform an independent inspection. Materials may be rejected if identified as substandard or if test results show it to be substandard.

B. The Owner reserves the right to reject any materials that do not meet the construction Specifications. In the event of rejections, it shall be the responsibility of the Contractor to remove all stockpiles of rejected material from the site.

3.05 SURVEYS AND PLACEMENT CONFIRMATION

A. Material Placement Acceptance Surveys: The Contractor shall conduct a survey verifying the thickness and/or elevation of each layer of material placement in accordance with Section 017123 – Surveying.

B. The Engineer must review and accept each layer as complete before the Contractor can place the next capping layer in accordance with Section 017123 – Surveying.

C. The Owner may collect cores through the cap material layers. Cores may be used to measure material layer thickness.

3.06 CONDUCT OF CAPPING

A. Layout of Work:

1. Establish an accurate method of horizontal and vertical control, as described in Section 017123 – Surveying before material placement activities begin.

2. Requirements for positioning equipment and methods as specified in Section 352023 – Dredging and Excavation are also applicable to material placement operations. The proposed method and maintenance of the horizontal control system shall be subject to the approval of the Engineer and if, at any time, the method fails to provide accurate location for the material placement operations, the Contractor may be required to suspend its operations until such time that accurate control is established.

3. Lay out the work from horizontal and vertical control points indicated on the Drawings and be responsible for all measurements taken from these points. Furnish, at the Contractor's own expense, all stakes, templates, platforms, equipment, range markers, transponder stations, and labor as

may be required to lay out the work from the control points shown on the Drawings.

4. Maintain all points established for the work until authorized to remove them. If such points are destroyed by the Contractor or disturbed through its negligence prior to an authorized removal, they shall be replaced by the Contractor at its own expense.

B. Material Placement

1. Furnish and place materials as shown on the Drawings and described in these Specifications. Any Capping material that is deposited other than in the area indicated on the Drawings, or as approved by the Engineer, will not be included in the measurement for payment, and the Contractor may be required to remove such misplaced material and deposit it where directed at its own expense.

2. After intertidal excavation in a Certification Unit has been completed and accepted by the Engineer as described in Section 352023 – Dredging and Excavation, place the initial 6-inch lift of cap material over the excavated surface ahead of the incoming tide.

3. Construct the full intertidal cap thickness no more than 2 days following the intertidal excavation for that area. If slumping or loss of sidewall stability is observed, the full intertidal cap thickness shall be constructed no more than one day following the intertidal excavation for that area. If slumping or loss of sidewall stability continues to be observed, the full intertidal cap thickness shall be constructed in the same tidal cycle as the intertidal excavation for that area.

4. In the event that weather or other conditions develop that can erode the initial 6-inch lift of cap material, the Contractor shall construct the full cap thickness before such conditions develop.

5. Place Habitat Substrate material after all Filter material and Armor material has been placed and accepted as complete by the Engineer.

6. Construct caps on slopes starting from the toe of the slope and working up the slope towards the top of slope to the extent practicable.

7. Place material in a manner to minimize disturbance and mixing of cap material subgrade.

8. Anchors and spuds shall not be set in areas previously capped.

9. Placement of materials in eelgrass beds is prohibited as shown on the Drawings.

10. For placement by bottom dump barge, the barge shall be opened gradually and in a controlled manner to minimize the potential for resuspending bottom sediment and excessive mixing of the cap material with the in situ bottom surface sediment. The Contractor may propose alternative mechanical placement methods to the Engineer such as placement using a clamshell bucket or hydraulic spraying of cap material off of a flat deck barge to form a material layer of uniform thickness. Placement of materials shall be accomplished such that material deposits form a uniform layer of required thickness over the designated area, and water quality criteria are not exceeded.

11. The Contractor shall not place material by rapidly dumping a barge load onto the placement area.

12. Contractor shall not place capping materials above the Overplacement Allowance Line, as shown on the Drawings.

13. The Contractor shall monitor the materials placement work throughout the course of work for depth, slopes, location, and tolerances, and shall be responsible for damages due to Overplacement or Capping outside the specified limits for capping placement.

14. The Contractor will not be allowed to drag equipment over capped areas to even out high spots.

15. Any material that is placed outside of the specified areas as shown on the Drawings, or other than as approved by the Engineer, will not be paid for, and the Contractor may be required to remove such misplaced material and deposit it where directed at its own expense.

3.07 EELGRASS MITIGATION AREA MATERIAL PLACEMENT

A. Place SMA-2 Subtidal Cap material to the lines and grades shown in the Drawings for the Eelgrass Mitigation Area only after placement, measurement, and approval of the SMA-2 Subtidal Cap beneath the Eelgrass Mitigation Area.

B. Avoid adjacent eelgrass during placement of Eelgrass Mitigation Area material in compliance with the buffers shown on the Drawings.

3.08 TRANSPORTING CAPPING MATERIAL FOR PLACEMENT

A. Haul barges shall be in good condition with no leaks in the hull. The barge shall be loaded with sufficient freeboard inside the barge so that no material spills over the side walls. Load lines shall be clearly shown on the barge, and loading shall not take the barge below the load lines.

B. The tug shall be of sufficient horsepower for moving the barge and maneuvering through the area, bridges, and marine traffic encountered between the borrow site and the placement site.

C. The Contractor shall provide the following information (as part of the Construction Work Plan) on each material barge that will be used in accordance with Section 013300 – Submittal Procedures.

1. Dimensions and capacity.

2. Barge displacement curve.

D. The Contractor shall collect certified tickets from the borrow source for each load of material brought to the site. The tickets shall be submitted to the Engineer as part of the Contractor's Weekly Construction Report.

3.09 WATER QUALITY MONITORING

A. The Contractor is responsible for meeting water quality criteria as defined in Appendix H – Water Quality Monitoring Plan in accordance with Section 015719 – Temporary Environmental Controls and applicable local, state, and federal standards.

Table 352026-1. Capping Material Sediment Quality Standards

Chemical	Container	Preservation	Maximum Holding Time (Days)	Required Reporting Limits	Maximum Level
Conventional Sediment Parameters					
Grain Size (%)	16 oz. glass	Cool, 4°C	180	1%	N/AP
Total Solids (%)	4 oz. glass	Cool, 4°C	14; 6 months stored frozen	0.1% (wet weight)	N/AP
Total Organic Carbon (%)	From total solids container	Cool, 4°C	14; 6 months stored frozen	1%	N/AP
Metals (mg/kg dw)	From total solids container	Cool, 4°C	180; 2 years stored frozen; 28 for Hg		
Arsenic				0.2	57
Cadmium				0.2	3
Chromium				0.5	260
Copper				0.5	390
Lead				1.0	450
Mercury				0.05	0.41
Silver				0.2	6.1
Zinc				4.0	410
PCBs (µ/kg dw)	4 oz. glass	Cool, 4°C	None		
Total PCBs				10	130
LPAH (µg/kg)	16 oz. glass	Cool, 4°C	14 days until extraction, 1 year stored frozen; 40 days until analysis		
Naphthalene				20	2100
Acenaphthylene				20	1300
Acenaphthene				20	500
Fluorene				20	540
Phenanthrene				20	1500
Anthracene				20	960
2-Methylnaphthalene				20	670
cPAH				5	16
Total LPAH					5200
HPAH (µg/kg)	Same container as LPAH	Cool, 4°C	14 days until extraction, 1 year stored frozen; 40 days until analysis		
Fluoranthene				20	1700
Pyrene				20	2600
Benzo(a)anthracene				20	1300
Chrysene				20	1400
Benzo(a)pyrene				20	1600
Indeno(1,2,3-Cd)Pyrene				20	600
Dibenzo(a,h)anthracene				20	230
Benzo(g,h,i)perylene				20	670
Total Benzofluoranthenes				20	3200
Total HPAH					12000

Chemical	Container	Preservation	Maximum Holding Time (Days)	Required Reporting Limits	Maximum Level
Chlorinated Hydrocarbons (µg/kg)	Same container as LPAH	Cool, 4°C	14 days until extraction, 1 year stored frozen; 40 days until analysis		
1,4-Dichlorobenzene				20	110
1,2-Dichlorobenzene				20	35
1,2,4-Trichlorobenzene				20	31
Hexachlorobenzene				20	22
Phthalates (µg/kg)	Same container as LPAH	Cool, 4°C	14 days until extraction, 1 year stored frozen; 40 days until analysis		
Dimethylphthalate					71
Diethylphthalate					200
Di-N-Butylphthalate					1400
Butylbenzylphthalate					63
Bis(2-Ethylhexyl)Phthalate					1300
Di-n-Octylphthalate					6200
Phenols (µg/kg)	Same container as LPAH	Cool, 4C	14 days until extraction, 1 year stored frozen; 40 days until analysis		
Phenol				20	420
2-Methylphenol				20	63
4-Methylphenol				20	670
2,4-Dimethylphenol				20	29
Pentachlorophenol				100	360
Misc Extractables (µg/kg)	Same container as LPAH	Cool, 4°C	14 days until extraction, 1 year stored frozen; 40 days until analysis		
Benzyl Alcohol				20	57
Benzoic Acid				200	650
Dibenzofuran				20	540
Hexachlorobutadiene				5	11
n-Nitroso-di-phenylamine				10	28
Dioxins and Furans (ng/kg)	4 oz. glass	Cool, 4°C	None	5	5 ng/kg TEQ (WHO 2005)

Notes:
N/AP = not applicable
mg/kg dw = milligrams/kilogram dry weight
µg/kg dw = micrograms/kilogram dry weight
ng/kg dw = nanograms/kilogram dry weight
cPAH = carcinogenic polycyclic aromatic hydrocarbons. cPAH calculated in accordance with WAC-173-340-708(e)
LPAH = low molecular weight polycyclic aromatic hydrocarbons
HPAH = high molecular weight polycyclic aromatic hydrocarbons
TEQ = toxicity equivalency factor
WHO 2005 = World Health Organization 2005 Human and Mammalian TEF from van den Berg, et al (2006)

END OF SECTION

Krazan Associates
1230 FIll Hill Rd. NW
Poulsbo, WA 98370
Phone: (360) 598-2126
Fax: (360) 598-2127

November 6, 2015

KA JOB No: **10615191**
LAB No: P34067
File No: 10615191
DES Project Number:

Orion Marine Group
1112 E. Alexander Ave
Tecoma, WA. 98364

Attention: Chad Smith

Project: Port Gamble Beach Replishment

The results of the requested laboratory tests are attached for your use.

This report includes the following test reports:

Test Description	Test Method	# of Tests
Max Density and Optimum Moisture Determination	ASTM D1557	1

Krazan & Associates appreciates the opportunity to be of service. Please contact our office if you have any questions regarding this report.

Respectfully submitted,
Krazan & Assocaites

Copies: jagalligan@orionmarinegroup.com

Tim Casey
Laboratory Manager

Krazan Associates
1230 FIll Hill Rd. NW
Poulsbo, WA 98370
Phone: (360) 598-2126
Fax: (360) 598-2127

Project:	Port Gamble Beach Replishment	KA JOB No:	**10615191**
Address:	4770 View Dr. NE	KA LAB No:	P34067
Client:	Orion Marine Group	File No:	10615191
Client Address:	1112 E. Alexander Ave	DES No:	
Client City,St:	Tecoma, WA. 98364	Permit No:	
Attention:		W.O. No:	
Phone:	253-279-6809	Govt. Contract No:	N/A
Supplier:	Dickey Pit		
Sampled By:	AC	KA Inspector:	Aaron Clyde
Date Sampled:	11/06/15	Date of Inspection:	11/06/15
Date Received:	11/06/15	Date Tested	11/6/15

Concrete & Masonry Aggregates

	Abrasion Resistance by L.A. Rattler - ASTM C131, C535
	Absorption, sand or gravel - ASTM C127, C128
	Clay Lumps & Friable Particles - ASTM C142,
	Cleanness Test -
	Crushed Particles, per primary size -
	Durability Index
	Lightweight Pieces, per size fraction - ASTM C123
	Mortar making Properties of Sand - ASTM C87
	Mortar Properties -
	Mortar Properties -
	Organic Impurities - ASTM C40
	Potential React. - Mortar Bar (Additional Mos.)
	Potential React. (Rapid Method) - C1260
	Potential React. Chemical Method - ASTM C289
	Potential React. Mortar Bar (to 3 months) - ASTM C227
	Sand Equivalent -
	Sieve Analysis with wash analysis -
	Sieve Analysis, per primary size - ASTM C136
	Specific Gravity , Coarse - ASTM C127
	Specific Gravity, Fine - ASTM C128
	Sulfate Soundness - ASTM C88
	Wash Analysis (minus #200) - ASTM C117
	Weight per cubic foot (unit weight) - ASTM C29

Miscellaneous

Aggregate Base, Subbase & Soil Laboratory Tests

	Abrasion Resistance by L.A. Rattler
	Acid Solubility
	California Bearing Ratio (CBR) @ 95% (3 points)
	California Bearing Ratio (CBR) with Expansion
	California Bearing Ratio (CBR) with expansion & elasticity
	Cem. Treated Base
	Cement treated base, by compression
	Cement treated base, stability
	Crushed Particles, per Primary Size
	Density of Sprayed Fireproofing
	Durability Index
	Expansion Index
	Lab Prep - Hourly
	Lime Content, additional tests using same control sample
	Lime content, including untreated control sample
	Liquid Limit
	Liquid Limit
	Maximum Density - Optimum Moisture Determination
	Moisture Density of Driven Ring Sample
	Moisture Determination
	Permeability, Constant Head
	Permeability, Falling Head
	Plastic Limit
	Plasticity Index (LL & PL)
	R' Value (HVEEM) (Treated material by quote)
	Roof Tile Absorption
	Roof Tile Strength
	Sand Equivalent
	Short Hydrometer Analysis (without specific gtravity)
1	Sieve Analysis (coarse & fine)
	Sieve Analysis (coarse or fine)
	Soil Resistivity (for estimated pipe life), includes pH
	Soluable Chloride (soils)
	Soluable Sulfate (soils)
	Specific Gravity, clay
	Specific Gravity, coarse
	Specific Gravity, fine (sand)
	Unconfined Compression on prepared specimens
	Wash Analysis (minus #200)
	Weight per cubic foot (loose)

Krazan Associates
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Fax: (360) 598-2127

Sieve & Wash Analysis Worksheet

○ ASTM C136 (Concrete) ◉ ASTM D422 (Soil) ○ CTM 202

Project:	Port Gamble Beach Replishment	KA JOB No:	**10615191**
Sample:	2" Minus Habitat Substrate	KA LAB No:	P34067
Tested By:	T. Casey	Date Tested:	11062015

Sample ID	A
Description	Gray GP/SP
Material	2" Minus Habitat Substrate
Sample Location	Dickey Pit
Date Sampled	6-Nov
Sampled By	AC
Date Tested	6-Nov
Tested By	Tim Casey
Fines (enter or estimate) PL: / LL:	○ silty ○ clay ey ◉ N.R.
Shape	○ Round; ○ Angular; ◉ N.R.
Hardness	○ Hard&Durable; ○ Weathered&Friable; ○ Soft ○ N.R.
Specific Gravity	2.65
Batch Weight	
% of Batch	

TEST RESULTS

Dry Sample Wt. **before** wash (gm)	**21540.0**	
Dry Sample Wt. **after** wash (gm)	**21540.0**	
Sieve Size	Wt. Retained	% Passing
LE FRACTION: 2.5" X #4 [% Passing = 100 - ((Wt.Retained / Sample Wt.) * 100)]		
63mm (2 1/2")	**0.0**	**100**
50mm (2")	**0.0**	**100**
37.5mm (1 1/2")	**1060.0**	**95**
25mm (1")	**3067.0**	**86**
19mm (3/4")	**4580.0**	**79**
12.5mm (1/2")	**7540.0**	**65**
9.5mm (3/8")	**9140.0**	**58**
4.75mm (#4)	**11220.0**	**48**
Fraction Passing #4 Dry Sample Wt (gm)	**512.5**	
ained / Sample Wt.) * 100) ; if Double stack of seives: % Passing = (% pass #4 / 100) * (100 - ((Wt.Retained / Sample Wt.) * 100))		
2.36mm (#8)	**67.8**	**42**
1.18mm (#16)	**138.3**	**35**
600um (#30)	**224.2**	**27**
300um (#50)	**395.2**	**11**
150um (#100)	**482.7**	**3**
75um (#200)	**492.6**	**2.0**
PAN	**493.6**	**0.0**

Remarks:

Krazan Associates
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Poulsbo, WA 98370
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Orion Marine Group
1112 E. Alexander Ave
Tecoma, WA. 98364

November 6, 2015
KA JOB No: **10615191**
KA LAB No: P34067
Building Permit No.: N/A

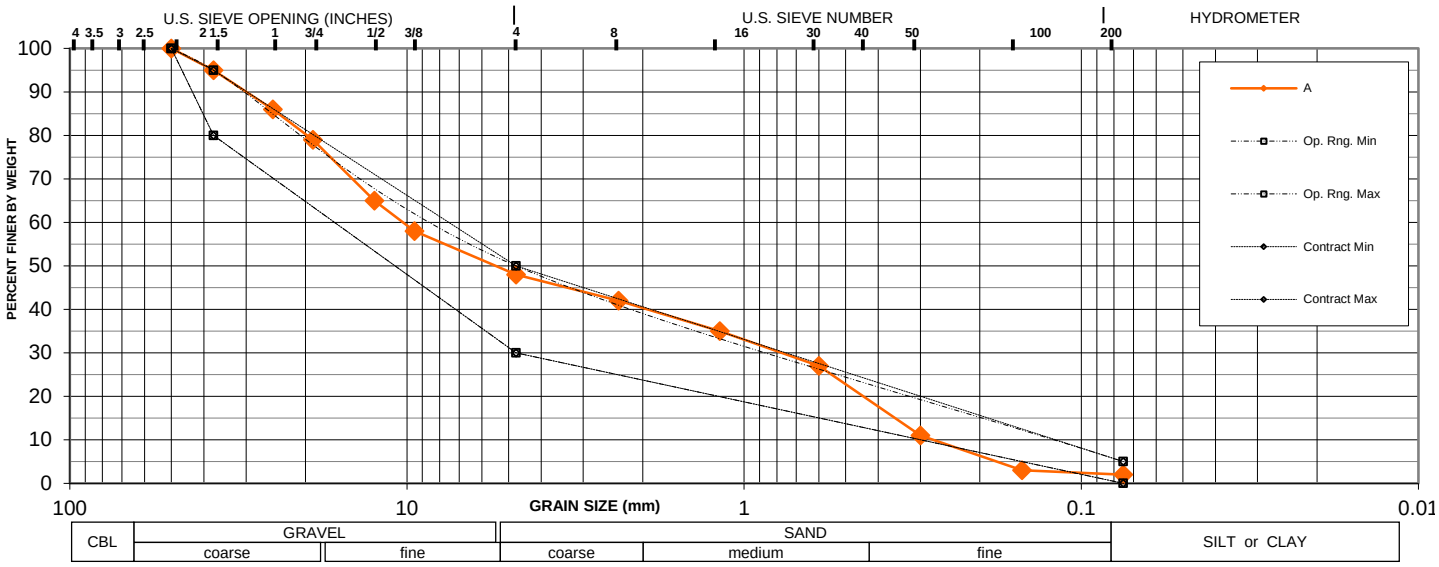
Project: **Port Gamble Beach Replishment**

REPORT OF SIEVE ANALYSIS TEST

ASTM C136

SAMPLE INFO:

	A
Description	Gray GP/SP
Material	2" Minus Habitat Substrate
Sample Location	Dickey Pit
Date Sampled	42314
Sampled By	AC
Date Tested	42314
Tested By	Tim Casey



Sample ID:	A	*PROJECT SPECIFICATIONS*			
Sieve Size	% Passing	Operating Range		Contract Compliance	
		Min.	Max.	Min.	Max.
63mm (2 1/2")	100				
50mm (2")	100	100	100	100	100
37.5mm (1 1/2")	95	80	95	80	95
25mm (1")	86				
19mm (3/4")	79				
12.5mm (1/2")	65				
9.5mm (3/8")	58				
4.75mm (#4)	48	30	50	30	50
2.36mm (#8)	42				
1.18mm (#16)	35				
600 um (#30)	27				
300 um (#50)	11				
150 um (#100)	3				
75 um (#200) wash	2.0	0.0	5.0	0.0	5.0

Fineness Modulus	5.1
Shape (sand & gravel)	N.R.
Hardness (sand & gravel)	N.R.
Specific Gravity	2.65
Coef. of Curvature (C_C)	0.2
Coef. of Uniformity (C_U)	37.3
% Gravel	52
% Sand	46
% Fines	2.0
USCS Class:	**GP**

Notes: *Result is bold outside Operating Range, shaded if outside Contract Compliance*

N.R.: Not Recorded; N/A: Not Available.

Reviewed By: _____

Sieve Analysis

Contract No.:
Project No.: 10615191
Project Name: Port Gamble Beach Replenishment
Mix Type: Type 1 Armor
Agg. Source: Shine Quarry
Plant Operator:

Sampler: Chazz Woo
Date Sampled: 10/13/2015
Time: 3:00 PM
Tester: T. Casey
Date Tested: 10/14/2015
Location:

Coarse and Fine Sieve Analysis

Total Weight of Sample: **40440.0**

Weight of Sample (Passing 4.75mm.): **40440.0**

Sieve Sizes	Percent Retained	Percent Passing	Garding	Specs.
2.5"(62.5mm)	0	100	**100**	95-100
2" (50.0mm)	28	72	**72**	70-100
1.25" (31.25 mm)	51	49	**49**	40-90
1" (25.0 mm)	93	7	**7**	3-30
3/4"(19.0mm)	100	0	**0**	0-15
#8 (2.36 mm)	100	0	**0**	
#16 (1.18 mm)	100	0	**0**	
#30 (600 µm)	100	0	**0**	
#50 (300 µm)	100	0	**0**	
#100 (150 µm)	100	0	**0**	
#200 (75 µm)	100	0	**0.00**	0-5

SDS#: **P33978**

Type 2 Armor			
Size	Total Weight (LB)	% Passing by Weight	Particle Count
>12"	0	0%	0
>9"	177	55%	2
>5"	100.5	31%	32
>3"	44	14%	31
Total	321.5	100%	65

Source: New Shine Quarry
Date Sampled: 10/22/15

Sieve Analysis

Contract No.:
Project No.: 10615191
Project Name: Port Gamble Beach Replenishment
Mix Type: Type III Armor
Agg. Source: Shine Quarry
Plant Operator:

Sampler: Chazz Woo
Date Sampled: 10/13/2015
Time: 3:00 PM
Tester: T. Casey
Date Tested: 10/14/2015
Location:

Coarse and Fine Sieve Analysis

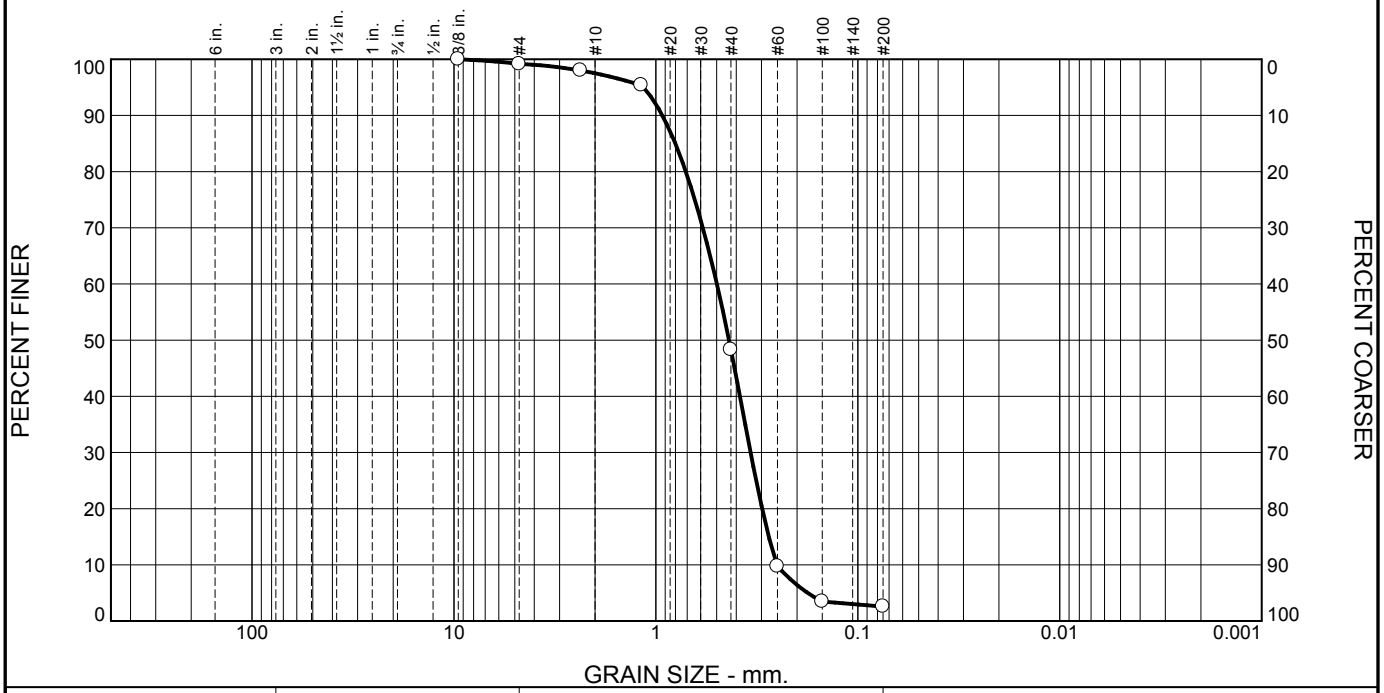
Total Weight of Sample: **43660.0**

Weight of Sample (Passing 4.75mm.): **43660.0**

Sieve Sizes	Percent Retained	Percent Passing	Garding	Specs.
4"(100mm)	0	100	**100**	100
2.5" (62.5mm)	72	28	**28**	20-60
1" (25 mm)	94	6	**6**	0-22
3/4" (19.0mm)	100	0	**0**	
#4 (4.75mm)	100	0	**0**	
#8 (2.36 mm)	99	0	**0**	
#16 (1.18 mm)	99	0	**0**	
#30 (600 µm)	99	0	**0**	
#50 (300 µm)	99	0	**0**	
#100 (150 µm)	99	0	**0**	
#200 (75 µm)	99	0	**0.00**	

SDS#: **P33977**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.8	1.7	49.2	45.7	2.6	

Test Results (ASTM C136 & ASTM C11)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8	100.0		
#4	99.2		
#8	98.0		
#16	95.4		
#40	48.3		
#60	9.7		
#100	3.5		
#200	2.6		

* (no specification provided)

Material Description

POORLY-GRADED SAND

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SP **AASHTO (M 145)=** A-1-b

Coefficients

D_{90}= 0.9289 D_{85}= 0.8012 D_{60}= 0.4990
D_{50}= 0.4345 D_{30}= 0.3395 D_{15}= 0.2761
D_{10}= 0.2515 C_u= 1.98 C_c= 0.92

Remarks

MATERIAL: FILTER MATERIAL
LOCATION: SAMPLED FROM CLIENT
SOURCE: ZIMMER PIT

Date Received: 9/30/15 **Date Tested:** 9/30/15

Tested By: JH

Checked By: AC

Title: LABORATORY MANAGER

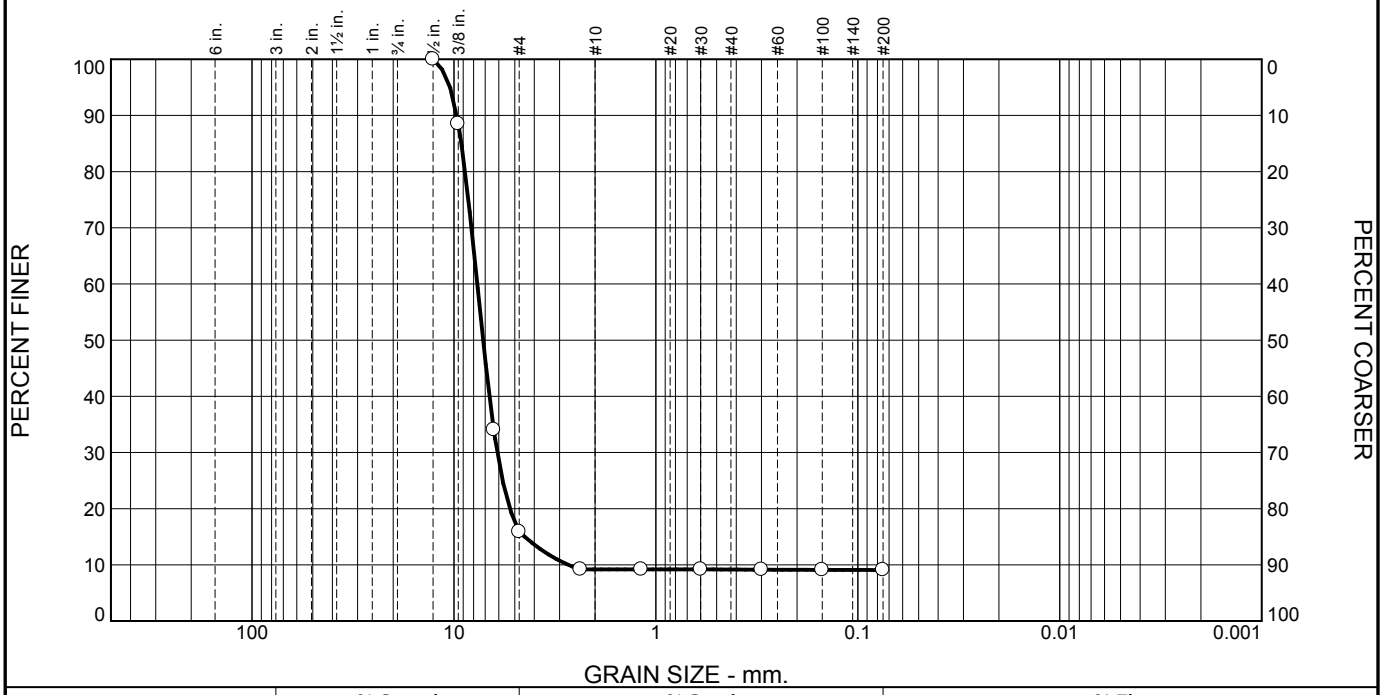
Source of Sample: IMPORT **Date Sampled:**
Sample Number: P33931

Krazan

Client: ORION
Project: PORT GAMBLE BEACH REPLACEMENT

Project No: 106-15xxx **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	84.1	6.7	0.0	0.1	9.1	

TEST RESULTS (C136)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1/2	100.0		
3/8	88.5		
1/4	34.0		
#4	15.9		
#8	9.2		
#16	9.2		
#30	9.2		
#50	9.1		
#100	9.1		
#200	9.1		

* (no specification provided)

Material Description

3/8"Pea Gravel

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 9.6875 D_{85}= 9.1969 D_{60}= 7.6628
D_{50}= 7.1687 D_{30}= 6.1032 D_{15}= 4.4620
D_{10}= 2.7133 C_u= 2.82 C_c= 1.79

Remarks

Date Received: 10/9/15 **Date Tested:** 10/12/15

Tested By: J. Hunsaker

Checked By: T. Casey

Title: Labratory Supervisor

Location: Dicky Pit
Sample Number: P33990 **Depth:** Dicky Pit Stockpile **Date Sampled:** 10/8/15

Krazan

Client:
Project:

Project No: **Figure**