## APPENDIX I Import Source Material Chemical Analytical Data



November 6, 2013

Analytical Report for Service Request No: K1311829

Kevin Richardson Geo Test Services 741 Marine Drive Bellingham, WA 98225

#### Dear Kevin:

Enclosed are the results of the samples submitted to our laboratory on October 17, 2013. For your reference, these analyses have been assigned our service request number K1311829.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at <a href="www.alsglobal.com">www.alsglobal.com</a>. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3275. You may also contact me via Email at Chris.Leaf@alsglobal.com.

Respectfully submitted,

ALS Group USA Corp. dba ALS Environmental

Chris Leaf Project Manager

CL/aj Page 1 of \_\_15

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626 USA | PHONE +1 360 577 7222 | FAX +1 360 636 1068 ALS Group USA, Corp. Part of the ALS Group An ALS Limited Company



#### **Acronyms**

ASTM American Society for Testing and Materials

A2LA American Association for Laboratory Accreditation

CARB California Air Resources Board

CAS Number Chemical Abstract Service registry Number

CFC Chlorofluorocarbon
CFU Colony-Forming Unit

DEC Department of Environmental Conservation

DEQ Department of Environmental Quality

DHS Department of Health Services

DOE Department of Ecology
DOH Department of Health

EPA U. S. Environmental Protection Agency

ELAP Environmental Laboratory Accreditation Program

GC Gas Chromatography

GC/MS Gas Chromatography/Mass Spectrometry

LOD Limit of Detection
LOQ Limit of Quantitation

LUFT Leaking Underground Fuel Tank

M Modified

MCL Maximum Contaminant Level is the highest permissible concentration of a substance

allowed in drinking water as established by the USEPA.

MDL Method Detection Limit
MPN Most Probable Number
MRL Method Reporting Limit

NA Not Applicable
NC Not Calculated

NCASI National Council of the Paper Industry for Air and Stream Improvement

ND Not Detected

NIOSH National Institute for Occupational Safety and Health

PQL Practical Quantitation Limit

RCRA Resource Conservation and Recovery Act

SIM Selected Ion Monitoring

TPH Total Petroleum Hydrocarbons

tr Trace level is the concentration of an analyte that is less than the PQL but greater

than or equal to the MDL.

#### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
  DOD-QSM 4.2 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

#### **Metals Data Qualifiers**

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. DOD-QSM 4.2 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

#### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
  DOD-QSM 4.2 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

#### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

## ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2286
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L12-28
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Georgia DNR	http://www.gaepd.org/Documents/techguide_pcb.html#cel	881
Hawaii DOH	Not available	-
Idaho DHW	http://www.healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx	-
Indiana DOH	http://www.in.gov/isdh/24859.htm	C-WA-01
ISO 17025	http://www.pjlabs.com/	L12-27
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	3016
Maine DHS	Not available	WA0035
Michigan DEQ	http://www.michigan.gov/deq/0,1607,7-135-3307_4131_4156,00.html	9949
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-368
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA35
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA200001
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	704427-08-TX
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C1203
Wisconsin DNR	http://dnr.wi.gov/	998386840
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com_	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.caslab.com or at the accreditation bodies web site

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

ALS Environmental 8620 Holly Drive, Suite 100 Everett, WA 98208 Phone (425) 356-2600 (425) 356-2626 http://www.alsglobal.com

### **Chain Of Custody/ Laboratory Analysis Request**

ALS Job# (Laboratory USE Ormy)

\* Turnaround request less than standard may incur Rush Charges

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Cooler Receipt and Preservation Form Service Request **K13\_\_/14**80 Client / Project: Received: (1) DHL Hand Delivered Fed Ex **UPS** PDX Samples were received via? Courier Box. Other NA Cooler. Envelope Samples were received in: (circle) If yes, how many and where?\_ Were custody seals on coolers? Y N If present, were they signed and dated? If present, were custody seals intact? Corr. Thermometer Coole#CGC#D Tracking Number 🐉 📜 4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves

5. Were custody papers properly filled out (ink, signed, etc.)?	NA Y	N
6. Did all bottles arrive in good condition (unbroken)? Indicate in the table below.	NA Y	N
7. Were all sample labels complete (i.e analysis, preservation, etc.)?	NA (Y	N
8. Did all sample labels and tags agree with custody papers? Indicate major discrepancies in the table on page 2.	NA Y	N
9. Were appropriate bottles/containers and volumes received for the tests indicated?	NA (Y	N
10. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below	NA Y	N
11. Were VOA vials received without headspace? Indicate in the table below.	NA Y	N
12. Was C12/Res negative?	(NA) Y	N
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## ALS

ALS Environmental
8620 Holly Drive, Suite 100
Everett, WA 98208
Phone (425) 356-2600
Fax (425) 356-2626
http://www.alsglobal.com

## Chain Of Custody/ Laboratory Analysis Request

ALS Job#	(Laboratory Use Only)
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### **Cooler Receipt and Preservation Form**

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## COLUMBIA ANALYTICAL SERVICES, INC. LOG-IN and RE-ISSUE INFORMATION SHEET

Date: 10/31/13	an particular production of a superscript of the superfection of t
Date: 10/3//19	10 D
K/3/1278, K/3/1350, K 13/14	
Sample ID's K1311279-001	K1311480-001
+7 -002	
K1311350-001	re isone William istorie i qual irreproperties in superioristic sur
-002	
-003	
Received information for this request from:	
Project Chemist Bottle Order	ClientBottles
Others (Specify)	
Re-issue Instructions: Run 9060	TOC ASAP
Re-issue Due Date: Nov  Special Instructions:	4,2013 48 hr /2 Bda
	NUSH

## ALS Group USA, Corp. dba ALS Environmental

Analytical Report

**Client:** Geo Test Services

Project:

**Sample Matrix:** Sediment

**Analysis Method:** 9060

**Prep Method:** Method

Service Request: K1311829

**Date Collected:** 10/15/13 - 10/22/13

**Date Received:** 10/17/13 - 10/23/13

Units: Percent

Basis: Dry, per Method

#### Carbon, Total Organic (TOC)

					Date	Date	
Sample Name	Lab Code	Result	MRL	Dil.	Analyzed	Extracted	Q
Sample 1	K1311829-001	1.72	0.10	1	11/05/13 15:04	11/5/13	
Sample 1 Dup	K1311829-002	1.99	0.10	1	11/05/13 16:21	11/5/13	
Boulder Hill-Sample 1	K1311829-003	ND U	0.10	1	11/05/13 16:36	11/5/13	
Boulder Hill-Sample 2	K1311829-004	ND U	0.10	1	11/05/13 16:49	11/5/13	
Belleville Pit-S1	K1311829-005	ND U	0.10	1	11/05/13 17:03	11/5/13	
Belleville Pit-S2	K1311829-006	ND U	0.10	1	11/05/13 17:53	11/5/13	
Lakeside-Anacortes (S1)	K1311829-007	ND U	0.10	1	11/05/13 18:07	11/5/13	
Lakeside-Anacortes (S2)	K1311829-008	ND U	0.10	1	11/05/13 18:21	11/5/13	
Method Blank	K1311829-MB	ND U	0.10	1	11/05/13 14:50	11/5/13	

#### ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Geo Test Services Service Request: K1311829

Project **Date Collected:** 10/15/13

Sample Matrix: Sediment **Date Received:** 10/17/13

**Date Analyzed:** 11/05/13

**Replicate Sample Summary General Chemistry Parameters** 

Sample Name: Sample 1 Units: Percent

Lab Code: K1311829-001 Basis: Dry, per Method

> **Duplicate** Sample

K1311829-

Sample **Analysis** 001DUP

**Analyte Name** Method Result **MRL** Result RPD Limit Average Carbon, Total Organic (TOC) 9060 0.10 1.72 1.76

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Printed 11/6/2013 9:23:04 AM Superset Reference:13-0000268347 rev 00

#### ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

**Client:** Geo Test Services **Service Request:** 

K1311829

**Project:** 

Sediment

**Date Collected:** 

10/15/13

**Date Received:** 

10/17/13

Date Analyzed: **Date Extracted:**  11/5/13 11/5/13

**Duplicate Matrix Spike Summary** Carbon, Total Organic (TOC)

Sample Name:

Sample Matrix:

Sample 1

**Units:** 

Percent

Lab Code:

K1311829-001

**Basis:** 

Dry, per Method

**Analysis Method: Prep Method:** 

9060

Method

**Duplicate Matrix Spike** 

K1311829-001DMS

**Matrix Spike** K1311829-001MS

RPD Sample **Spike** Spike % Rec Analyte Name Result Result Amount % Rec Result Amount % Rec Limits **RPD** Limit Carbon, Total Organic (TOC) 1.72 7.02 4.62 6.78 4.64 70-122

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

#### ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: Geo Test Services

**Project:** 

**Service Request:** 

K1311829

**Date Analyzed:** 

11/05/13

Sample Matrix: Sediment **Date Extracted:** 

11/05/13

**Lab Control Sample Summary** Carbon, Total Organic (TOC)

**Analysis Method:** 

9060 Method

**Units: Basis:** 

Percent

Dry, per Method

**Analysis Lot:** 

366876

Spike

% Rec

Sample Name Lab Control Sample

**Prep Method:** 

Lab Code K1311829-LCS Result

Amount 0.28

% Rec 104

Limits

0.285

72-122



November 1, 2013

Analytical Report for Service Request No: K1311350

Revised Service Request No: K1311350.01

Kevin Richardson Geo Test Services 741 Marine Drive Bellingham, WA 98225

#### Dear Kevin:

Enclosed is the revised report for the samples submitted to our laboratory on October 19, 2013. For your reference, these analyses have been assigned our service request number K1311350.

The Semi-Volatile Organic Compounds have been reported to the MRL/MDL in this revision.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at <a href="www.alsglobal.com">www.alsglobal.com</a>. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3275. You may also contact me via Email at Chris.Leaf@alsglobal.com.

Respectfully submitted,

ALS Group USA Corp. dba ALS Environmental

Chris Leaf Project Manager **REVISED** 5:28 pm, Nov 01, 2013

CL/lb Page 1 of <u>41</u>

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626 USA | PHONE +1 360 577 7222 | FAX +1 360 636 1068 ALS Group USA, Corp. Part of the ALS Group An ALS Limited Company



#### **Acronyms**

ASTM American Society for Testing and Materials

A2LA American Association for Laboratory Accreditation

CARB California Air Resources Board

CAS Number Chemical Abstract Service registry Number

CFC Chlorofluorocarbon
CFU Colony-Forming Unit

DEC Department of Environmental Conservation

DEQ Department of Environmental Quality

DHS Department of Health Services

DOE Department of Ecology
DOH Department of Health

EPA U. S. Environmental Protection Agency

ELAP Environmental Laboratory Accreditation Program

GC Gas Chromatography

GC/MS Gas Chromatography/Mass Spectrometry

LOD Limit of Detection
LOQ Limit of Quantitation

LUFT Leaking Underground Fuel Tank

M Modified

MCL Maximum Contaminant Level is the highest permissible concentration of a substance

allowed in drinking water as established by the USEPA.

MDL Method Detection Limit
MPN Most Probable Number
MRL Method Reporting Limit

NA Not Applicable
NC Not Calculated

NCASI National Council of the Paper Industry for Air and Stream Improvement

ND Not Detected

NIOSH National Institute for Occupational Safety and Health

PQL Practical Quantitation Limit

RCRA Resource Conservation and Recovery Act

SIM Selected Ion Monitoring

TPH Total Petroleum Hydrocarbons

tr Trace level is the concentration of an analyte that is less than the PQL but greater

than or equal to the MDL.

#### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
  DOD-QSM 4.2 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

#### **Metals Data Qualifiers**

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. DOD-QSM 4.2 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

#### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
  DOD-QSM 4.2 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

#### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

## ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2286
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L12-28
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Georgia DNR	http://www.gaepd.org/Documents/techguide_pcb.html#cel	881
Hawaii DOH	Not available	-
Idaho DHW	http://www.healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx	-
Indiana DOH	http://www.in.gov/isdh/24859.htm	C-WA-01
ISO 17025	http://www.pjlabs.com/	L12-27
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	3016
Maine DHS	Not available	WA0035
Michigan DEQ	http://www.michigan.gov/deq/0,1607,7-135-3307_4131_4156,00.html	9949
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-368
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA35
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA200001
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	704427-08-TX
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C1203
Wisconsin DNR	http://dnr.wi.gov/	998386840
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com_	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.caslab.com or at the accreditation bodies web site

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

#### ALS ENVIRONMENTAL

Client:Geo Test ServicesService Request No.:K1311350Project:NADate Received:10/19/2013

Sample Matrix: Sediment

#### **Case Narrative**

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

#### **Sample Receipt**

Four sediment samples were received for analysis at ALS Environmental on 10/19/2013. The samples were received in good condition and consistent with the accompanying chain of custody form except as noted on the cooler receipt and preservation form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

#### **Total Metals**

No anomalies associated with the analysis of these samples were observed.

#### PCB Aroclors by EPA Method 8082

#### **Second Source Exceptions:**

The analysis of PCB Aroclors by EPA 8082A requires the use of dual column confirmation. The Initial Calibration Verification (ICV) evaluation criteria were not met on the confirmation column for Aroclor 1232 in CAL12822. The ICV criteria were met on the alternate column. The data quality was not affected. No further corrective action was necessary.

No other anomalies associated with the analysis of these samples were observed.

#### Semivolatile Organic Compounds by EPA Method 8270

#### **Calibration Verification Exceptions:**

The following analytes were flagged as outside the control criterion for Continuing Calibration Verification (CCV) MS26\1028F003.D: Benzo(b)fluoranthene. In accordance with the EPA Method, 80% or more of the CCV analytes must have passed within 20% of the true value. The remaining analytes are allowed a 40% difference as per the ALS SOP. The CCV met these criteria. No further corrective action was required.

No other anomalies associated with the analysis of these samples were observed.

Approved by

# ALS

ALS Environmental
8620 Holly Drive, Suite 100
Everett, WA 98208
Phone (425) 356-2600
Fax (425) 356-2626
http://www.alsglobal.com

### Chain Of Custody/ Laboratory Analysis Request

ALS Job#

(Laboratory Use Only)

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## PC##

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#### **Cooler Receipt and Preservation Form**

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Received:	(	<u>v                                     </u>	Opened:	10/19/	12	By:	7)	Unload		119/12 B	y: 10	<u>)                                     </u>
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#### ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client: Geo Test Services Service Request: K1311350

**Project:** 

Sample Matrix: Sediment

**Total Solids** 

**Prep Method:** NONE Units: PERCENT **Analysis Method:** 160.3M Basis: Wet

**Test Notes:** 

Date Date Date **Result Notes** Collected Received Analyzed Lab Code Result Sample Name Boulder Hill-Sample 1 K1311350-001 10/18/2013 10/19/2013 10/24/2013 92.7 Boulder Hill-Sample 2 95.3 K1311350-002 10/18/2013 10/19/2013 10/24/2013 Belleville Pit-S1 K1311350-003 95.3 10/18/2013 10/19/2013 10/24/2013 Belleville Pit-S2 K1311350-004 10/19/2013 92.2 10/18/2013 10/24/2013

Printed: 10/25/2013 Page 1 of 1 13:30  $u:\Stealth\Crystal.rpt\Solids.rpt$ SuperSet Reference: W1311870 8

## ALS Group USA, Corp. dba ALS Environmental

#### - Cover Page -INORGANIC ANALYSIS DATA PACKAGE

Client: Service Request: K1311350 Geo Test Services

**Project Name:** Project No.:

Sample Name:	Lab Code:
Batch QC1D	K1310745-001D
Batch QC1S	K1310745-001S
Batch QC2D	K1311196-001D
Batch QC2S	K1311196-001S
Boulder Hill-Sample 1	K1311350-001
Boulder Hill-Sample 2	K1311350-002
Belleville Pit-S1	K1311350-003
Belleville Pit-S2	K1311350-004
Method Blank	K1311350-MB

Client: Geo Test Services Service Request: K1311350

Project No.: NA Date Collected: 10/18/13

Project Name: NA Date Received: 10/19/13

Matrix: SEDIMENT Units: mg/Kg

Basis: DRY

Sample Name: Boulder Hill-Sample 1 Lab Code: K1311350-001

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	С	Q
Arsenic	6010C	4.1	2.0	10/21/13	10/22/13	4.1	U	
Cadmium	6010C	0.2	2.0	10/21/13	10/22/13	0.2	U	
Chromium	6010C	0.8	2.0	10/21/13	10/22/13	21.5		
Copper	6010C	0.8	2.0	10/21/13	10/22/13	33.0		
Lead	6010C	2.1	2.0	10/21/13	10/22/13	2.2		
Mercury	7471B	0.02	1.0	10/22/13	10/23/13	0.02		
Silver	6010C	0.8	2.0	10/21/13	10/22/13	0.8	U	
Zinc	6010C	1.0	2.0	10/21/13	10/22/13	36.6		·

% Solids: 92.7

Client: Geo Test Services Service Request: K1311350

Project No.: NA Date Collected: 10/18/13

Project Name: NA Date Received: 10/19/13

Matrix: SEDIMENT Units: mg/Kg

Basis: DRY

Sample Name: Boulder Hill-Sample 2 Lab Code: K1311350-002

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	С	Q
Arsenic	6010C	3.7	2.0	10/21/13	10/22/13	3.7	U	
Cadmium	6010C	0.2	2.0	10/21/13	10/22/13	0.2	U	
Chromium	6010C	0.7	2.0	10/21/13	10/22/13	17.5		
Copper	6010C	0.7	2.0	10/21/13	10/22/13	20.0		
Lead	6010C	1.9	2.0	10/21/13	10/22/13	2.5		
Mercury	7471B	0.02	1.0	10/22/13	10/23/13	0.03		
Silver	6010C	0.7	2.0	10/21/13	10/22/13	0.7	U	
Zinc	6010C	0.93	2.0	10/21/13	10/22/13	28.5		·

% **Solids:** 95.3

Client: Geo Test Services Service Request: K1311350

Project No.: NA Date Collected: 10/18/13

Project Name: NA Date Received: 10/19/13

Matrix: SEDIMENT Units: mg/Kg

Basis: DRY

Sample Name: Belleville Pit-S1 Lab Code: K1311350-003

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	С	Q
Arsenic	6010C	3.8	2.0	10/21/13	10/22/13	3.8	U	
Cadmium	6010C	0.2	2.0	10/21/13	10/22/13	0.2	U	
Chromium	6010C	0.8	2.0	10/21/13	10/22/13	18.7		
Copper	6010C	0.8	2.0	10/21/13	10/22/13	17.1		
Lead	6010C	1.9	2.0	10/21/13	10/22/13	2.2		
Mercury	7471B	0.02	1.0	10/22/13	10/23/13	0.02	U	
Silver	6010C	0.8	2.0	10/21/13	10/22/13	0.8	U	
Zinc	6010C	0.94	2.0	10/21/13	10/22/13	29.7		

% **Solids:** 95.3

Client: Geo Test Services Service Request: K1311350

Project No.: NA Date Collected: 10/18/13

Project Name: NA Date Received: 10/19/13

Matrix: SEDIMENT Units: mg/Kg

Basis: DRY

Sample Name: Belleville Pit-S2 Lab Code: K1311350-004

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	С	Q
Arsenic	6010C	3.8	2.0	10/21/13	10/22/13	3.8	U	
Cadmium	6010C	0.2	2.0	10/21/13	10/22/13	0.2	U	
Chromium	6010C	0.8	2.0	10/21/13	10/22/13	24.7		
Copper	6010C	0.8	2.0	10/21/13	10/22/13	25.7		
Lead	6010C	1.9	2.0	10/21/13	10/22/13	2.5		
Mercury	7471B	0.02	1.0	10/22/13	10/23/13	0.02	U	
Silver	6010C	0.8	2.0	10/21/13	10/22/13	0.8	U	
Zinc	6010C	0.94	2.0	10/21/13	10/22/13	37.5		

% Solids: 92.2

Client: Geo Test Services Service Request: K1311350

Project No.: NA Date Collected:

Project Name: NA Date Received:

Matrix: SEDIMENT Units: mg/Kg

Basis: DRY

Sample Name: Method Blank Lab Code: K1311350-MB

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	С	Q
Arsenic	6010C	4.0	2.0	10/21/13	10/22/13	4.0	U	
Cadmium	6010C	0.2	2.0	10/21/13	10/22/13	0.2	U	
Chromium	6010C	0.8	2.0	10/21/13	10/22/13	0.8	U	
Copper	6010C	0.8	2.0	10/21/13	10/22/13	0.8	U	
Lead	6010C	2.0	2.0	10/21/13	10/22/13	2.0	U	
Mercury	7471B	0.02	1.0	10/22/13	10/23/13	0.02	U	
Silver	6010C	0.8	2.0	10/21/13	10/22/13	0.8	U	
Zinc	6010C	1.0	2.0	10/21/13	10/22/13	1.0	U	

% Solids: 100.0

#### Metals

- 5A -

#### SPIKE SAMPLE RECOVERY

Client: Geo Test Services Service Request: K1311350

Project No.: NA Units: MG/KG

Project Name: NA Basis: DRY

Matrix: SOIL % Solids: 99.9

Sample Name: Batch QC1S Lab Code: K1310745-001S

Analyte	Control Limit %R	Spike Result	С	Sample Result	С	Spike Added	%R	Q	Method
Arsenic	75 - 125	84.1		3.9	U	98.10	85.7		6010C
Cadmium	75 - 125	8.7		0.2		9.81	86.6		6010C
Chromium	75 - 125	38.1		2.5		39.20	90.8		6010C
Copper	75 - 125	48.8		5.7		49.10	87.8		6010C
Lead	75 - 125	91.0		7.2		98.10	85.4		6010C
Silver	75 - 125	8.7		0.8	υ	9.81	88.7		6010C
Zinc	75 - 125	90.0		4.6		98.10	87.1		6010C

#### Metals

#### - 5A -

#### SPIKE SAMPLE RECOVERY

Client: Geo Test Services Service Request: K1311350

Project No.: NA

Units: MG/KG

Project Name:

Basis: As Rec

Matrix: SOIL

Sample Name:

Batch QC2S

Lab Code: K1311196-001S

Analyte	Control Limit %R	Spike Result C	Sample Result C	Spike Added	%R	Q	Method
Mercury	80 - 120	0.49	0.08	0.41	100.0		7471B

dba ALS Environmental

#### Metals

#### - 6 -DUPLICATES

Client: Geo Test Services Service Request: K1311350

Project No.: NA Units: MG/KG

Project Name: NA Basis: DRY

Matrix: SOIL % Solids: 99.9

Sample Name: Batch QClD Lab Code: K1310745-001D

Analyte	Control Limit	Sample (S)	С	Duplicate (D)	С	RPD	Q	Method
Arsenic		3.9	Ū	3.9	Ū			6010C
Cadmium		0.2		0.2	υ	200.0		6010C
Chromium		2.5		2.5		0.0		6010C
Copper	20	5.7		5.8		1.7		6010C
Lead		7.2		6.6		8.7		6010C
Silver		0.8	U	0.8	Ū			6010C
Zinc		4.6		4.6		0.0		6010C

#### Metals

#### - 6 -**DUPLICATES**

Client: Geo Test Services Service Request: K1311350

Project No.: Units: NA MG/KG

Project Name: Basis: NA As Rec

Matrix: SOIL

> Batch QC2D Lab Code: K1311196-001D Sample Name:

Analyte	Control Limit	Sample (S)	С	Duplicate (D)	С	RPD	Q	Method
Mercury		0.08		0.08		0.0		7471B

#### Metals

-7-

#### LABORATORY CONTROL SAMPLE

Client: Geo Test Services

Service Request: K1311350

Project No.: NA

Project Name: NA

Aqueous LCS Source:

Solid LCS Source:

ERA D076-540

	Aqueous (ug/L)			Solid (mg/kg)				
Analyte	True	Found	%R	True	Found	C Lin	mits	%R
Arsenic	İ			94.5	98.3	82	117	104.0
Cadmium				60.5	57.3	83	117	94.7
Chromium				70.4	66.9	82	118	95.0
Copper				79.6	85.1	84	116	106.9
Lead				91.8	88.2	82	118	96.1
Mercury				3.73	3.67	72	128	98.4
Silver				34.4	35.1	66	134	102.0
Zinc				140	135	82	118	96.4

#### ALS Group USA, Corp. dba ALS Environmental

**Analytical Results** 

**Client:** Geo Test Services

**Project:** 

**Sample Matrix:** 

Sediment

**Date Collected:** 10/18/2013

Service Request: K1311350

**Date Received:** 10/19/2013

#### Polychlorinated Biphenyls (PCBs)

Sample Name: Boulder Hill-Sample 1 Lab Code: K1311350-001

**Extraction Method:** EPA 3541 **Analysis Method:** 8082A

Units: mg/Kg Basis: Dry

Level: Low

			Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	Factor	Extracted	Analyzed	Lot	Note
Aroclor 1016	ND U	0.054	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1221	ND U	0.11	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1232	ND U	0.054	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1242	ND U	0.054	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1248	ND U	0.054	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1254	ND U	0.054	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1260	ND U	0.054	1	10/22/13	10/25/13	KWG1311883	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note	
Decachlorobiphenyl	87	43-148	10/25/13	Acceptable	

**Comments:** 

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**Analytical Results** 

**Client:** Geo Test Services

**Project:** 

**Sample Matrix:** 

Sediment

Service Request: K1311350

**Date Collected:** 10/18/2013 **Date Received:** 10/19/2013

#### Polychlorinated Biphenyls (PCBs)

Sample Name: Boulder Hill-Sample 2 Lab Code: K1311350-002

**Extraction Method:** EPA 3541 **Analysis Method:** 8082A

Units: mg/Kg Basis: Dry

Level: Low

			Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	Factor	Extracted	Analyzed	Lot	Note
Aroclor 1016	ND U	0.052	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1221	ND U	0.11	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1232	ND U	0.052	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1242	ND U	0.052	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1248	ND U	0.052	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1254	ND U	0.052	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1260	ND U	0.052	1	10/22/13	10/25/13	KWG1311883	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note	
Decachlorobiphenyl	87	43-148	10/25/13	Acceptable	

**Comments:** 

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Analytical Results

**Client:** Geo Test Services

**Project: Sample Matrix:** 

Sediment

Service Request: K1311350 **Date Collected:** 10/18/2013

**Date Received:** 10/19/2013

Polychlorinated Biphenyls (PCBs)

Sample Name: Belleville Pit-S1 Lab Code: K1311350-003

**Extraction Method:** EPA 3541 **Analysis Method:** 8082A

Units: mg/Kg Basis: Dry

Level: Low

			Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	Factor	Extracted	Analyzed	Lot	Note
Aroclor 1016	ND U	0.052	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1221	ND U	0.11	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1232	ND U	0.052	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1242	ND U	0.052	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1248	ND U	0.052	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1254	ND U	0.052	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1260	ND U	0.052	1	10/22/13	10/25/13	KWG1311883	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note	
Decachlorobiphenyl	83	43-148	10/25/13	Acceptable	

**Comments:** 

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SuperSet Reference:

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Analytical Results

**Client:** Geo Test Services

**Project:** 

**Sample Matrix:** 

Service Request: K1311350 **Date Collected:** 10/18/2013

**Date Received:** 10/19/2013

#### Polychlorinated Biphenyls (PCBs)

Sample Name: Belleville Pit-S2 Lab Code: K1311350-004

Sediment

Basis: Dry Level: Low

Units: mg/Kg

**Extraction Method:** EPA 3541 **Analysis Method:** 8082A

			Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	Factor	Extracted	Analyzed	Lot	Note
Aroclor 1016	ND U	0.054	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1221	ND U	0.11	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1232	ND U	0.054	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1242	ND U	0.054	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1248	ND U	0.054	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1254	ND U	0.054	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1260	ND U	0.054	1	10/22/13	10/25/13	KWG1311883	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note	
Decachlorobiphenyl	78	43-148	10/25/13	Acceptable	

**Comments:** 

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Analytical Results

**Client:** Geo Test Services

**Project:** 

Service Request: K1311350

Date Collected: NA Date Received: NA

**Sample Matrix:** Sediment

#### Polychlorinated Biphenyls (PCBs)

Sample Name: Method Blank Lab Code: KWG1311883-4

**Extraction Method:** EPA 3541 **Analysis Method:** 8082A

Units: mg/Kg Basis: Dry

Level: Low

			Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	Factor	Extracted	Analyzed	Lot	Note
Aroclor 1016	ND U	0.050	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1221	ND U	0.099	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1232	ND U	0.050	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1242	ND U	0.050	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1248	ND U	0.050	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1254	ND U	0.050	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1260	ND U	0.050	1	10/22/13	10/24/13	KWG1311883	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note	
Decachlorobiphenyl	81	43-148	10/24/13	Acceptable	

**Comments:** 

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Page

QA/QC Report

Client: Geo Test Services Service Request: K1311350

**Project:** 

Sample Matrix: Sediment

Surrogate Recovery Summary Polychlorinated Biphenyls (PCBs)

Extraction Method:EPA 3541Units:PercentAnalysis Method:8082ALevel:Low

Sample Name	<u>Lab Code</u>	Sur1
Batch QC	K1311278-001	100
Boulder Hill-Sample 1	K1311350-001	87
Boulder Hill-Sample 2	K1311350-002	87
Belleville Pit-S1	K1311350-003	83
Belleville Pit-S2	K1311350-004	78
Method Blank	KWG1311883-4	81
Batch QCMS	KWG1311883-1	70
Batch QCDMS	KWG1311883-2	103
Lab Control Sample	KWG1311883-3	102

Surrogate Recovery Control Limits (%)

Sur1 = Decachlorobiphenyl 43-148

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

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 SuperSet Reference:
 RR161471

QA/QC Report

**Client:** Geo Test Services

**Project:** 

**Sample Matrix:** 

Sediment

Service Request: K1311350

**Date Extracted:** 10/22/2013 **Date Analyzed:** 10/24/2013 -

10/25/2013

Matrix Spike/Duplicate Matrix Spike Summary Polychlorinated Biphenyls (PCBs)

Sample Name:

Batch QC

Lab Code:

K1311278-001

**Extraction Method:** 

EPA 3541

**Analysis Method:** 

8082A

Basis: Dry

Level: Low

Extraction Lot: KWG1311883

Units: mg/Kg

Batch QCMS KWG1311883-1

Batch QCDMS KWG1311883-2

**Matrix Spike** 

**Duplicate Matrix Spike** 

Analyte Name	Sample Result	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec	%Rec Limits	RPD	RPD Limit
Aroclor 1016	ND	0.444	0.705	63	0.637	0.701	91	23-145	36	40
Aroclor 1260	ND	0.462	0.705	65	0.656	0.701	94	24-148	35	40

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

**Client:** Geo Test Services

**Project:** 

**Date Extracted:** 10/22/2013

Service Request: K1311350

Sediment Sample Matrix:

**Date Analyzed:** 10/24/2013

Lab Control Spike Summary Polychlorinated Biphenyls (PCBs)

**Extraction Method: Analysis Method:** 

EPA 3541 8082A

Units: mg/Kg Basis: Dry

Level: Low Extraction Lot: KWG1311883

Lab Control Sample KWG1311883-3

Lab Control Spike

		Spike		%Rec
Analyte Name	Result	Amount	%Rec	Limits
Aroclor 1016	0.851	1.00	85	42-122
Aroclor 1260	0.917	1.00	92	50-124

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Analytical Results

**Client:** Geo Test Services

Project:

Sample Matrix:

Sediment

Service Request: K1311350

**Date Collected:** 10/18/2013

**Date Received:** 10/19/2013

#### Semi-Volatile Organic Compounds by GC/MS

**Sample Name:** Boulder Hill-Sample 1 Lab Code: K1311350-001

**Extraction Method:** EPA 3541 **Analysis Method:** 8270D

Units: ug/Kg Basis: Dry

Level: Low

Dilution Date Date **Extraction** MDL **MRL Factor Extracted** Analyzed **Analyte Name** Result Q Lot Note ND U KWG1311653 28 3.1 1 10/22/13 10/28/13 Phenol ND U 9.2 2.5 1 10/22/13 10/28/13 KWG1311653 1,4-Dichlorobenzene ND U 9.2 2.4 1 10/22/13 10/28/13 KWG1311653 1,2-Dichlorobenzene 19 4.9 KWG1311653 Benzyl Alcohol ND U 1 10/22/13 10/28/13 KWG1311653 2-Methylphenol ND U 9.2 4.1 1 10/22/13 10/28/13 4-Methylphenol† ND U 9.2 4.5 1 10/22/13 10/28/13 KWG1311653 1 KWG1311653 2,4-Dimethylphenol ND U 46 6.3 10/22/13 10/28/13 ND U 400 96 KWG1311653 Benzoic Acid 1 10/22/13 10/28/13 1,2,4-Trichlorobenzene ND U 9.2 2.6 1 10/22/13 10/28/13 KWG1311653 Naphthalene ND U 9.2 2.9 1 10/22/13 10/28/13 KWG1311653 ND U 9.2 3.0 1 10/22/13 10/28/13 KWG1311653 Hexachlorobutadiene 9.2 KWG1311653 2-Methylnaphthalene ND U 2.8 1 10/22/13 10/28/13 ND U 9.2 2.6 1 10/22/13 10/28/13 KWG1311653 Acenaphthylene Dimethyl Phthalate ND U 9.2 4.0 10/22/13 10/28/13 KWG1311653 1 KWG1311653 9.2 Acenaphthene ND U 3.2 1 10/22/13 10/28/13 Dibenzofuran ND U 9.2 3.4 1 10/22/13 10/28/13 KWG1311653 Fluorene ND U 9.2 3.3 1 10/22/13 10/28/13 KWG1311653 ND U 9.2 3.7 1 10/22/13 10/28/13 KWG1311653 Diethyl Phthalate N-Nitrosodiphenylamine ND U 9.2 3.2 1 10/22/13 10/28/13 KWG1311653 KWG1311653 9.2 3.3 1 Hexachlorobenzene ND U 10/22/13 10/28/13 5.3 KWG1311653 Pentachlorophenol ND U 92 1 10/22/13 10/28/13 9.2 3.6 1 10/22/13 Phenanthrene ND U KWG1311653 10/28/13 ND U 9.2 3.2 KWG1311653 Anthracene 1 10/22/13 10/28/13 Di-n-butyl Phthalate ND U 19 4.8 1 10/22/13 10/28/13 KWG1311653 KWG1311653 Fluoranthene ND U 9.2 3.7 1 10/22/13 10/28/13 KWG1311653 Pyrene ND U 9.2 3.7 1 10/22/13 10/28/13 KWG1311653 Butyl Benzyl Phthalate 9.2 3.7 1 ND U 10/22/13 10/28/13 KWG1311653 ND U 9.2 3.6 1 10/22/13 10/28/13 Benz(a)anthracene KWG1311653 ND U 9.2 4.1 1 10/22/13 10/28/13 Chrysene ND U 8.9 KWG1311653 Bis(2-ethylhexyl) Phthalate 92 1 10/22/13 10/28/13 Di-n-octyl Phthalate ND U 9.2 3.2 1 10/22/13 10/28/13 KWG1311653 ND U 9.2 3.4 1 KWG1311653 Benzo(b)fluoranthene 10/22/13 10/28/13 KWG1311653 Benzo(k)fluoranthene ND U 9.2 4.0 1 10/22/13 10/28/13

Comments:

REVISED 5:27 pm, Nov 01, 2013

Analytical Results

Client: Geo Test Services

Project:

**Sample Matrix:** 

Sediment

**Service Request:** K1311350 **Date Collected:** 10/18/2013

**Date Received:** 10/19/2013

Semi-Volatile Organic Compounds by GC/MS

**Sample Name:** Boulder Hill-Sample 1 **Lab Code:** K1311350-001

EPA 3541

Basis: Dry

**Extraction Method: Analysis Method:** 

8270D

Level: Low

Units: ug/Kg

				Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Benzo(a)pyrene	ND U	9.2	3.6	1	10/22/13	10/28/13	KWG1311653	
Indeno(1,2,3-cd)pyrene	ND U	9.2	3.2	1	10/22/13	10/28/13	KWG1311653	
Dibenz(a,h)anthracene	ND U	9.2	3.0	1	10/22/13	10/28/13	KWG1311653	
Benzo(g,h,i)perylene	ND U	9.2	3.7	1	10/22/13	10/28/13	KWG1311653	

		Control	Date	
Surrogate Name	%Rec	Limits	Analyzed	Note
Phenol-d6	46	20-86	10/28/13	Acceptable
Nitrobenzene-d5	48	27-91	10/28/13	Acceptable
2-Fluorobiphenyl	53	25-97	10/28/13	Acceptable
2,4,6-Tribromophenol	38	10-119	10/28/13	Acceptable
Terphenyl-d14	64	33-129	10/28/13	Acceptable

#### † Analyte Comments

4-Methylphenol

This analyte cannot be separated from 3-Methylphenol.

Comments:

**REVISED** 5:27 pm, Nov 01, 2013

Analytical Results

Client: Geo Test Services

Project:

**Sample Matrix:** 

Sediment

Service Request: K1311350

**Date Collected:** 10/18/2013 **Date Received:** 10/19/2013

#### Semi-Volatile Organic Compounds by GC/MS

**Sample Name:** Boulder Hill-Sample 2 **Lab Code:** K1311350-002

**Extraction Method:** EPA 3541 **Analysis Method:** 8270D

Units: ug/Kg
Basis: Dry
Level: Low

					Dilution	Date	Date	Extraction	
Analyte Name	Result	Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Phenol	3.7	J	27	3.1	1	10/22/13	10/28/13	KWG1311653	
1,4-Dichlorobenzene	ND	U	8.9	2.5	1	10/22/13	10/28/13	KWG1311653	
1,2-Dichlorobenzene	ND	U	8.9	2.4	1	10/22/13	10/28/13	KWG1311653	
Benzyl Alcohol	ND	U	18	4.9	1	10/22/13	10/28/13	KWG1311653	
2-Methylphenol	ND	U	8.9	4.1	1	10/22/13	10/28/13	KWG1311653	
4-Methylphenol†	ND	U	8.9	4.5	1	10/22/13	10/28/13	KWG1311653	
2,4-Dimethylphenol	ND	U	45	6.3	1	10/22/13	10/28/13	KWG1311653	
Benzoic Acid	ND	U	400	96	1	10/22/13	10/28/13	KWG1311653	
1,2,4-Trichlorobenzene	ND	U	8.9	2.6	1	10/22/13	10/28/13	KWG1311653	
Naphthalene	ND	U	8.9	2.9	1	10/22/13	10/28/13	KWG1311653	
Hexachlorobutadiene	ND	U	8.9	3.0	1	10/22/13	10/28/13	KWG1311653	
2-Methylnaphthalene	ND	U	8.9	2.8	1	10/22/13	10/28/13	KWG1311653	
Acenaphthylene	ND	U	8.9	2.6	1	10/22/13	10/28/13	KWG1311653	
Dimethyl Phthalate	ND	U	8.9	4.0	1	10/22/13	10/28/13	KWG1311653	
Acenaphthene	ND	U	8.9	3.2	1	10/22/13	10/28/13	KWG1311653	
Dibenzofuran	ND	U	8.9	3.4	1	10/22/13	10/28/13	KWG1311653	
Fluorene	ND	U	8.9	3.3	1	10/22/13	10/28/13	KWG1311653	
Diethyl Phthalate	ND	U	8.9	3.7	1	10/22/13	10/28/13	KWG1311653	
N-Nitrosodiphenylamine	ND	U	8.9	3.2	1	10/22/13	10/28/13	KWG1311653	
Hexachlorobenzene	ND	U	8.9	3.3	1	10/22/13	10/28/13	KWG1311653	
Pentachlorophenol	ND	U	89	5.3	1	10/22/13	10/28/13	KWG1311653	
Phenanthrene	ND	U	8.9	3.6	1	10/22/13	10/28/13	KWG1311653	
Anthracene	ND	U	8.9	3.2	1	10/22/13	10/28/13	KWG1311653	
Di-n-butyl Phthalate	ND	U	18	4.8	1	10/22/13	10/28/13	KWG1311653	
Fluoranthene	ND	U	8.9	3.7	1	10/22/13	10/28/13	KWG1311653	
Pyrene	ND	U	8.9	3.7	1	10/22/13	10/28/13	KWG1311653	
Butyl Benzyl Phthalate	ND	U	8.9	3.7	1	10/22/13	10/28/13	KWG1311653	
Benz(a)anthracene	ND	U	8.9	3.6	1	10/22/13	10/28/13	KWG1311653	
Chrysene	ND	U	8.9	4.1	1	10/22/13	10/28/13	KWG1311653	
Bis(2-ethylhexyl) Phthalate	ND	U	89	8.9	1	10/22/13	10/28/13	KWG1311653	
Di-n-octyl Phthalate	ND	U	8.9	3.2	1	10/22/13	10/28/13	KWG1311653	
Benzo(b)fluoranthene	ND	U	8.9	3.4	1	10/22/13	10/28/13	KWG1311653	
Benzo(k)fluoranthene	ND	U	8.9	4.0	1	10/22/13	10/28/13	KWG1311653	

**Comments:** 

**REVISED** 5:27 pm, Nov 01, 2013

Analytical Results

**Client:** Geo Test Services

**Project:** 

**Sample Matrix:** 

Sediment

Service Request: K1311350

**Date Collected:** 10/18/2013 **Date Received:** 10/19/2013

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Boulder Hill-Sample 2 Lab Code:

K1311350-002

**Extraction Method:** EPA 3541 **Analysis Method:** 8270D

Units: ug/Kg Basis: Dry

Level: Low

				Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Benzo(a)pyrene	ND U	8.9	3.6	1	10/22/13	10/28/13	KWG1311653	
Indeno(1,2,3-cd)pyrene	ND U	8.9	3.2	1	10/22/13	10/28/13	KWG1311653	
Dibenz(a,h)anthracene	ND U	8.9	3.0	1	10/22/13	10/28/13	KWG1311653	
Benzo(g,h,i)perylene	ND U	8.9	3.7	1	10/22/13	10/28/13	KWG1311653	

	Control	Date	
%Rec	Limits	Analyzed	Note
49	20-86	10/28/13	Acceptable
50	27-91	10/28/13	Acceptable
57	25-97	10/28/13	Acceptable
42	10-119	10/28/13	Acceptable
69	33-129	10/28/13	Acceptable
	50 57 42	%Rec         Limits           49         20-86           50         27-91           57         25-97           42         10-119	%Rec         Limits         Analyzed           49         20-86         10/28/13           50         27-91         10/28/13           57         25-97         10/28/13           42         10-119         10/28/13

#### † Analyte Comments

4-Methylphenol

This analyte cannot be separated from 3-Methylphenol.

**Comments:** 

**REVISED** 5:27 pm, Nov 01, 2013

Analytical Results

Client: Geo Test Services

**Project:** 

**Sample Matrix:** 

Sediment

Service Request: K1311350 **Date Collected:** 10/18/2013 **Date Received:** 10/19/2013

Units: ug/Kg

Basis: Dry

#### Semi-Volatile Organic Compounds by GC/MS

Sample Name: Belleville Pit-S1 Lab Code: K1311350-003

**Extraction Method:** EPA 3541 Level: Low **Analysis Method:** 8270D

Analyte Name	Result	0	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	3.4		27	3.1	1	10/22/13	10/28/13	KWG1311653	
1,4-Dichlorobenzene	ND		9.0	2.5	1	10/22/13	10/28/13	KWG1311653	
1,2-Dichlorobenzene	ND		9.0	2.4	1	10/22/13	10/28/13	KWG1311653	
Benzyl Alcohol	ND	U	18	4.9	1	10/22/13	10/28/13	KWG1311653	
2-Methylphenol	ND	U	9.0	4.1	1	10/22/13	10/28/13	KWG1311653	
4-Methylphenol†	ND	U	9.0	4.5	1	10/22/13	10/28/13	KWG1311653	
2,4-Dimethylphenol	ND	U	45	6.3	1	10/22/13	10/28/13	KWG1311653	
Benzoic Acid	ND	U	400	96	1	10/22/13	10/28/13	KWG1311653	
1,2,4-Trichlorobenzene	ND	U	9.0	2.6	1	10/22/13	10/28/13	KWG1311653	
Naphthalene	ND	U	9.0	2.9	1	10/22/13	10/28/13	KWG1311653	
Hexachlorobutadiene	ND	U	9.0	3.0	1	10/22/13	10/28/13	KWG1311653	
2-Methylnaphthalene	ND	U	9.0	2.8	1	10/22/13	10/28/13	KWG1311653	
Acenaphthylene	ND	U	9.0	2.6	1	10/22/13	10/28/13	KWG1311653	
Dimethyl Phthalate	ND	U	9.0	4.0	1	10/22/13	10/28/13	KWG1311653	
Acenaphthene	ND	U	9.0	3.2	1	10/22/13	10/28/13	KWG1311653	
Dibenzofuran	ND		9.0	3.4	1	10/22/13	10/28/13	KWG1311653	
Fluorene	ND		9.0	3.3	1	10/22/13	10/28/13	KWG1311653	
Diethyl Phthalate	ND	U	9.0	3.7	1	10/22/13	10/28/13	KWG1311653	
N-Nitrosodiphenylamine	ND		9.0	3.2	1	10/22/13	10/28/13	KWG1311653	
Hexachlorobenzene	ND	U	9.0	3.3	1	10/22/13	10/28/13	KWG1311653	
Pentachlorophenol	ND	U	90	5.3	1	10/22/13	10/28/13	KWG1311653	
Phenanthrene	ND	U	9.0	3.6	1	10/22/13	10/28/13	KWG1311653	
Anthracene	ND	U	9.0	3.2	1	10/22/13	10/28/13	KWG1311653	
Di-n-butyl Phthalate	ND	U	18	4.8	1	10/22/13	10/28/13	KWG1311653	
Fluoranthene	ND	U	9.0	3.7	1	10/22/13	10/28/13	KWG1311653	
Pyrene	ND	_	9.0	3.7	1	10/22/13	10/28/13	KWG1311653	
Butyl Benzyl Phthalate	ND	U	9.0	3.7	1	10/22/13	10/28/13	KWG1311653	
Benz(a)anthracene	ND		9.0	3.6	1	10/22/13	10/28/13	KWG1311653	
Chrysene	ND	U	9.0	4.1	1	10/22/13	10/28/13	KWG1311653	
Bis(2-ethylhexyl) Phthalate	24	J	90	8.9	1	10/22/13	10/28/13	KWG1311653	
Di-n-octyl Phthalate	ND		9.0	3.2	1	10/22/13	10/28/13	KWG1311653	
Benzo(b)fluoranthene	ND	U	9.0	3.4	1	10/22/13	10/28/13	KWG1311653	
Benzo(k)fluoranthene	ND	U	9.0	4.0	1	10/22/13	10/28/13	KWG1311653	

**Comments:** 

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Merged

SuperSet Reference:

Analytical Results

**Client:** Geo Test Services

**Project:** 

**Sample Matrix:** 

Sediment

Service Request: K1311350 **Date Collected:** 10/18/2013 **Date Received:** 10/19/2013

#### Semi-Volatile Organic Compounds by GC/MS

Sample Name: Belleville Pit-S1 Lab Code: K1311350-003

Basis: Dry Level: Low

Units: ug/Kg

**Extraction Method:** EPA 3541 **Analysis Method:** 8270D

				Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Benzo(a)pyrene	ND U	9.0	3.6	1	10/22/13	10/28/13	KWG1311653	
Indeno(1,2,3-cd)pyrene	ND U	9.0	3.2	1	10/22/13	10/28/13	KWG1311653	
Dibenz(a,h)anthracene	ND U	9.0	3.0	1	10/22/13	10/28/13	KWG1311653	
Benzo(g,h,i)perylene	ND U	9.0	3.7	1	10/22/13	10/28/13	KWG1311653	

		Control	Date		
Surrogate Name	%Rec	Limits	Analyzed	Note	
Phenol-d6	40	20-86	10/28/13	Acceptable	
Nitrobenzene-d5	42	27-91	10/28/13	Acceptable	
2-Fluorobiphenyl	47	25-97	10/28/13	Acceptable	
2,4,6-Tribromophenol	36	10-119	10/28/13	Acceptable	
Terphenyl-d14	65	33-129	10/28/13	Acceptable	

#### † Analyte Comments

4-Methylphenol

This analyte cannot be separated from 3-Methylphenol.

**Comments:** 

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Page

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Printed: 11/01/2013 12:47:11 u:\Stealth\Crystal.rpt\Form1mNew.rpt

Form 1A - Organic

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SuperSet Reference:

Analytical Results

**Client:** Geo Test Services

**Project:** 

**Sample Matrix:** 

Sediment

Service Request: K1311350

**Date Collected:** 10/18/2013

**Date Received:** 10/19/2013

#### Semi-Volatile Organic Compounds by GC/MS

Sample Name: Belleville Pit-S2 Lab Code: K1311350-004

**Extraction Method: Analysis Method:** 

EPA 3541 8270D

Units: ug/Kg Basis: Dry

Level: Low

					Dilution	Date	Date	Extraction	
Analyte Name	Result	Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Phenol	3.8	J	28	3.1	1	10/22/13	10/28/13	KWG1311653	
1,4-Dichlorobenzene	ND	U	9.2	2.5	1	10/22/13	10/28/13	KWG1311653	
1,2-Dichlorobenzene	ND	U	9.2	2.4	1	10/22/13	10/28/13	KWG1311653	
Benzyl Alcohol	ND	U	19	4.9	1	10/22/13	10/28/13	KWG1311653	
2-Methylphenol	ND	U	9.2	4.1	1	10/22/13	10/28/13	KWG1311653	
4-Methylphenol†	ND	U	9.2	4.5	1	10/22/13	10/28/13	KWG1311653	
2,4-Dimethylphenol	ND	U	46	6.3	1	10/22/13	10/28/13	KWG1311653	
Benzoic Acid	ND	U	400	96	1	10/22/13	10/28/13	KWG1311653	
1,2,4-Trichlorobenzene	ND	U	9.2	2.6	1	10/22/13	10/28/13	KWG1311653	
Naphthalene	ND	U	9.2	2.9	1	10/22/13	10/28/13	KWG1311653	
Hexachlorobutadiene	ND	U	9.2	3.0	1	10/22/13	10/28/13	KWG1311653	
2-Methylnaphthalene	ND	U	9.2	2.8	1	10/22/13	10/28/13	KWG1311653	
Acenaphthylene	ND	U	9.2	2.6	1	10/22/13	10/28/13	KWG1311653	
Dimethyl Phthalate	ND	U	9.2	4.0	1	10/22/13	10/28/13	KWG1311653	
Acenaphthene	ND	U	9.2	3.2	1	10/22/13	10/28/13	KWG1311653	
Dibenzofuran	ND	U	9.2	3.4	1	10/22/13	10/28/13	KWG1311653	
Fluorene	ND	U	9.2	3.3	1	10/22/13	10/28/13	KWG1311653	
Diethyl Phthalate	ND	U	9.2	3.7	1	10/22/13	10/28/13	KWG1311653	
N-Nitrosodiphenylamine	ND	U	9.2	3.2	1	10/22/13	10/28/13	KWG1311653	
Hexachlorobenzene	ND	U	9.2	3.3	1	10/22/13	10/28/13	KWG1311653	
Pentachlorophenol	ND	U	92	5.3	1	10/22/13	10/28/13	KWG1311653	
Phenanthrene	ND	U	9.2	3.6	1	10/22/13	10/28/13	KWG1311653	
Anthracene	ND	U	9.2	3.2	1	10/22/13	10/28/13	KWG1311653	
Di-n-butyl Phthalate	ND	U	19	4.8	1	10/22/13	10/28/13	KWG1311653	
Fluoranthene	ND	U	9.2	3.7	1	10/22/13	10/28/13	KWG1311653	
Pyrene	ND	U	9.2	3.7	1	10/22/13	10/28/13	KWG1311653	
Butyl Benzyl Phthalate	ND	U	9.2	3.7	1	10/22/13	10/28/13	KWG1311653	
Benz(a)anthracene	ND	U	9.2	3.6	1	10/22/13	10/28/13	KWG1311653	
Chrysene	ND	U	9.2	4.1	1	10/22/13	10/28/13	KWG1311653	
Bis(2-ethylhexyl) Phthalate	ND	U	92	8.9	1	10/22/13	10/28/13	KWG1311653	
Di-n-octyl Phthalate	ND	U	9.2	3.2	1	10/22/13	10/28/13	KWG1311653	
Benzo(b)fluoranthene	ND	U	9.2	3.4	1	10/22/13	10/28/13	KWG1311653	
Benzo(k)fluoranthene	ND	U	9.2	4.0	1	10/22/13	10/28/13	KWG1311653	
·								·	

**Comments:** 

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RR161736

Analytical Results

**Client:** Geo Test Services

**Project:** 

**Sample Matrix:** 

Sediment

Service Request: K1311350 **Date Collected:** 10/18/2013

**Date Received:** 10/19/2013

#### Semi-Volatile Organic Compounds by GC/MS

Sample Name: Belleville Pit-S2 Lab Code: K1311350-004

**Extraction Method:** EPA 3541 **Analysis Method:** 8270D

Units: ug/Kg Basis: Dry

Level: Low

				Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Benzo(a)pyrene	ND U	9.2	3.6	1	10/22/13	10/28/13	KWG1311653	
Indeno(1,2,3-cd)pyrene	ND U	9.2	3.2	1	10/22/13	10/28/13	KWG1311653	
Dibenz(a,h)anthracene	ND U	9.2	3.0	1	10/22/13	10/28/13	KWG1311653	
Benzo(g,h,i)perylene	ND U	9.2	3.7	1	10/22/13	10/28/13	KWG1311653	

Phenol-d6         48         20-86         10/28/13         Acceptable           Nitrobenzene-d5         48         27-91         10/28/13         Acceptable           2-Fluorobiphenyl         56         25-97         10/28/13         Acceptable
2-Fluorobiphenyl 56 25-97 10/28/13 Acceptable
2,4,6-Tribromophenol 47 10-119 10/28/13 Acceptable
Terphenyl-d14 67 33-129 10/28/13 Acceptable

#### † Analyte Comments

4-Methylphenol

This analyte cannot be separated from 3-Methylphenol.

**Comments:** 

**REVISED** 5:27 pm, Nov 01, 2013

Analytical Results

Client: Geo Test Services

Project:

Sample Matrix:

Sediment

Service Request: K1311350

Date Collected: NA
Date Received: NA

#### Semi-Volatile Organic Compounds by GC/MS

Sample Name: Method Blank Lab Code: KWG1311653-5

**Extraction Method:** EPA 3541 **Analysis Method:** 8270D

Units: ug/Kg
Basis: Dry

Level: Low

Dilution Date Date **Extraction** MDL **MRL Factor Extracted** Analyzed **Analyte Name** Result Q Lot Note ND U KWG1311653 20 3.1 10/22/13 10/28/13 Phenol 1 ND U 6.6 2.5 1 10/22/13 10/28/13 KWG1311653 1,4-Dichlorobenzene ND U 6.6 2.4 1 10/22/13 10/28/13 KWG1311653 1,2-Dichlorobenzene 4.9 KWG1311653 Benzyl Alcohol ND U 14 1 10/22/13 10/28/13 KWG1311653 2-Methylphenol ND U 7.5 4.1 1 10/22/13 10/28/13 4-Methylphenol† ND U 7.5 4.5 1 10/22/13 10/28/13 KWG1311653 1 KWG1311653 2,4-Dimethylphenol ND U 33 6.3 10/22/13 10/28/13 ND U 400 96 KWG1311653 Benzoic Acid 1 10/22/13 10/28/13 1,2,4-Trichlorobenzene ND U 6.6 2.6 1 10/22/13 10/28/13 KWG1311653 Naphthalene ND U 6.6 2.9 1 10/22/13 10/28/13 KWG1311653 ND U 3.0 1 10/22/13 10/28/13 KWG1311653 Hexachlorobutadiene 6.6 KWG1311653 2-Methylnaphthalene ND U 6.6 2.8 1 10/22/13 10/28/13 ND U 6.6 2.6 1 10/22/13 10/28/13 KWG1311653 Acenaphthylene Dimethyl Phthalate 4.0 10/22/13 10/28/13 KWG1311653 ND U 6.6 1 KWG1311653 Acenaphthene ND U 6.6 3.2 1 10/22/13 10/28/13 Dibenzofuran ND U 6.6 3.4 1 10/22/13 10/28/13 KWG1311653 Fluorene ND U 6.6 3.3 1 10/22/13 10/28/13 KWG1311653 ND U 3.7 1 10/22/13 10/28/13 KWG1311653 Diethyl Phthalate 6.6 N-Nitrosodiphenylamine ND U 6.6 3.2 1 10/22/13 10/28/13 KWG1311653 KWG1311653 3.3 Hexachlorobenzene ND U 6.6 1 10/22/13 10/28/13 5.3 KWG1311653 Pentachlorophenol ND U 66 1 10/22/13 10/28/13 3.6 ND U 1 10/22/13 KWG1311653 Phenanthrene 6.6 10/28/13 ND U 3.2 KWG1311653 Anthracene 6.6 1 10/22/13 10/28/13 Di-n-butyl Phthalate ND U 14 4.8 1 10/22/13 10/28/13 KWG1311653 KWG1311653 Fluoranthene ND U 6.6 3.7 1 10/22/13 10/28/13 KWG1311653 Pyrene ND U 6.6 3.7 1 10/22/13 10/28/13 KWG1311653 3.7 1 Butyl Benzyl Phthalate ND U 6.6 10/22/13 10/28/13 KWG1311653 ND U 6.6 3.6 1 10/22/13 10/28/13 Benz(a)anthracene KWG1311653 ND U 4.1 1 10/22/13 10/28/13 Chrysene 6.6 8.9 KWG1311653 Bis(2-ethylhexyl) Phthalate ND U 66 1 10/22/13 10/28/13 Di-n-octyl Phthalate ND U 3.2 1 10/22/13 10/28/13 KWG1311653 6.6 3.4 1 KWG1311653 Benzo(b)fluoranthene ND U 6.6 10/22/13 10/28/13 KWG1311653 Benzo(k)fluoranthene ND U 6.6 4.0 1 10/22/13 10/28/13

Comments:

**REVISED** 5:27 pm, Nov 01, 2013

Analytical Results

Client: Geo Test Services

Project:

**Sample Matrix:** 

Sediment

Service Request: K1311350

Date Collected: NA

Date Received: NA

#### Semi-Volatile Organic Compounds by GC/MS

**Sample Name:** Method Blank **Lab Code:** KWG1311653-5

**Extraction Method:** EPA 3541 **Analysis Method:** 8270D

Units: ug/Kg Basis: Dry

Level: Low

				Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Benzo(a)pyrene	ND U	6.6	3.6	1	10/22/13	10/28/13	KWG1311653	
Indeno(1,2,3-cd)pyrene	ND U	6.6	3.2	1	10/22/13	10/28/13	KWG1311653	
Dibenz(a,h)anthracene	ND U	6.6	3.0	1	10/22/13	10/28/13	KWG1311653	
Benzo(g,h,i)perylene	ND U	6.6	3.7	1	10/22/13	10/28/13	KWG1311653	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	50	20-86	10/28/13	Acceptable
Nitrobenzene-d5	52	27-91	10/28/13	Acceptable
2-Fluorobiphenyl	57	25-97	10/28/13	Acceptable
2,4,6-Tribromophenol	42	10-119	10/28/13	Acceptable
Terphenyl-d14	78	33-129	10/28/13	Acceptable

#### † Analyte Comments

4-Methylphenol

This analyte cannot be separated from 3-Methylphenol.

Comments:

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SuperSet Reference:

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Merged

QA/QC Report

Client: Geo Test Services Service Request: K1311350

**Project:** 

Sample Matrix: Sediment

### Surrogate Recovery Summary Semi-Volatile Organic Compounds by GC/MS

Extraction Method:EPA 3541Units:PercentAnalysis Method:8270DLevel:Low

Sample Name	<u>Lab Code</u>	Sur1	Sur2	Sur3	Sur4	Sur5
Boulder Hill-Sample 1	K1311350-001	46	48	53	38	64
Boulder Hill-Sample 2	K1311350-002	49	50	57	42	69
Belleville Pit-S1	K1311350-003	40	42	47	36	65
Belleville Pit-S2	K1311350-004	48	48	56	47	67
Method Blank	KWG1311653-5	50	52	57	42	78
Boulder Hill-Sample 1MS	KWG1311653-1	48	49	55	53	59
Boulder Hill-Sample 1DMS	KWG1311653-2	44	44	48	48	59
Lab Control Sample	KWG1311653-3	43	43	49	50	59
Duplicate Lab Control Sample	KWG1311653-4	33	32	36	35	46

#### Surrogate Recovery Control Limits (%)

Sur1 = Phenol-d6	20-86	Sur5 = Terphenyl-d14	33-129
Sur2 = Nitrobenzene-d5	27-91		
Sur3 = 2-Fluorobiphenyl	25-97		
Sur4 = 2,4,6-Tribromophenol	10-119		

Results flagged with an asterisk  $(\mbox{\ensuremath{}^{*}})$  indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

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 1

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 SuperSet Reference:
 RR161736

QA/QC Report

**Client:** Geo Test Services

**Project:** 

Sediment **Sample Matrix:** 

Service Request: K1311350

**Date Extracted:** 10/22/2013 **Date Analyzed:** 10/28/2013

Matrix Spike/Duplicate Matrix Spike Summary Semi-Volatile Organic Compounds by GC/MS

Sample Name:

Boulder Hill-Sample 1

Lab Code:

K1311350-001

**Extraction Method:** 

EPA 3541

**Analysis Method:** 

8270D

Units: ug/Kg Basis: Dry

Level: Low

Extraction Lot: KWG1311653

Boulder Hill-Sample 1MS

Boulder Hill-Sample 1DMS

KWG1311653-1

KWG1311653-2 **Duplicate Matrix Spike** 

Matrix Spike

Analyte Name	Sample Result	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec	%Rec Limits	RPD	RPD Limit
Phenol	ND	132	228	58	117	228	51	15-98	12	40
1,4-Dichlorobenzene	ND	128	228	56	117	228	51	19-93	9	40
1,2,4-Trichlorobenzene	ND	134	228	59	122	228	53	23-99	9	40
Acenaphthene	ND	145	228	64	128	228	56	10-132	12	40
Diethyl Phthalate	ND	140	228	62	111	228	49	10-135	23	40
Pentachlorophenol	ND	119	228	52	101	228	44	10-123	16	40
Pyrene	ND	170	228	75	169	228	74	17-129	0	40
Benzo(a)pyrene	ND	169	228	74	168	228	73	13-126	1	40

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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SuperSet Reference:

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QA/QC Report

**Client:** Geo Test Services

**Project: Sample Matrix:** 

Sediment

Service Request: K1311350 **Date Extracted:** 10/22/2013 **Date Analyzed:** 10/28/2013

#### Lab Control Spike/Duplicate Lab Control Spike Summary Semi-Volatile Organic Compounds by GC/MS

**Extraction Method:** EPA 3541 **Analysis Method:** 8270D

Units: ug/Kg Basis: Dry

Level: Low Extraction Lot: KWG1311653

Lab Control Sample KWG1311653-3 Lab Control Spike

Duplicate Lab Control Sample KWG1311653-4 **Duplicate Lab Control Spike** 

		Spike			Spike		%Rec		RPD
Analyte Name	Result	Amount	%Rec	Result	Amount	%Rec	Limits	RPD	Limit
Phenol	135	250	54	98.8	250	40	27-97	31	40
1,4-Dichlorobenzene	131	250	52	95.9	250	38	28-89	31	40
1,2-Dichlorobenzene	131	250	52	96.5	250	39	27-91	30	40
Benzyl Alcohol	108	250	43	74.7	250	30	25-103	36	40
2-Methylphenol	131	250	52	94.3	250	38	18-95	32	40
4-Methylphenol	143	250	57	101	250	40	17-99	35	40
2,4-Dimethylphenol	409	750	55	298	750	40	10-93	31	40
Benzoic Acid	114	750	15	107	750	14	10-96	6	40
1,2,4-Trichlorobenzene	137	250	55	99.0	250	40	27-94	32	40
Naphthalene	137	250	55	98.4	250	39	27-93	32	40
Hexachlorobutadiene	135	250	54	97.9	250	39	25-96	32	40
2-Methylnaphthalene	147	250	59	104	250	41	27-96	34	40
Acenaphthylene	158	250	63	107	250	43	33-99	39	40
Dimethyl Phthalate	168	250	67	114	250	45	39-100	39	40
Acenaphthene	148	250	59	101	250	41	32-91	37	40
Dibenzofuran	152	250	61	103	250	41	34-92	38	40
Fluorene	153	250	61	103	250	41	32-96	39	40
Diethyl Phthalate	166	250	66	119	250	47	41-100	33	40
N-Nitrosodiphenylamine	143	250	57	99.4	250	40	36-96	36	40
Hexachlorobenzene	161	250	64	113	250	45	40-99	35	40
Pentachlorophenol	137	250	55	108	250	43	21-97	24	40
Phenanthrene	165	250	66	118	250	47	39-98	34	40
Anthracene	163	250	65	115	250	46	40-98	35	40
Di-n-butyl Phthalate	181	250	72	139	250	56	42-109	26	40
Fluoranthene	170	250	68	129	250	51	42-104	28	40
Pyrene	190	250	76	141	250	56	45-106	30	40
Butyl Benzyl Phthalate	178	250	71	136	250	54	45-111	27	40
Benz(a)anthracene	177	250	71	133	250	53	44-108	28	40
Chrysene	169	250	68	128	250	51	46-108	28	40
Bis(2-ethylhexyl) Phthalate	183	250	73	208	250	83	47-110	13	40
Di-n-octyl Phthalate	180	250	72	141	250	56	45-109	24	40
Benzo(b)fluoranthene	186	250	74	138	250	55	46-106	30	40
Benzo(k)fluoranthene	157	250	63	117	250	47	47-107	29	40
Benzo(a)pyrene	187	250	75	138	250	55	42-110	30	40
Indeno(1,2,3-cd)pyrene	205	250	82	157	250	63	47-109	27	40

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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SuperSet Reference:

QA/QC Report

Client: Geo Test Services

Project:

Sample Matrix: Sediment

Service Request: K1311350

**Date Extracted:** 10/22/2013

**Date Analyzed:** 10/28/2013

Lab Control Spike/Duplicate Lab Control Spike Summary Semi-Volatile Organic Compounds by GC/MS

Extraction Method:
Analysis Method:

EPA 3541

8270D

Units: ug/Kg

Basis: Dry Level: Low

Extraction Lot: KWG1311653

Lab Control Sample

KWG1311653-3 Lab Control Spike Duplicate Lab Control Sample

KWG1311653-4

**Duplicate Lab Control Spike** 

		Spike			Spike		%Rec		RPD
Analyte Name	Result	Amount	%Rec	Result	Amount	%Rec	Limits	RPD	Limit
Dibenz(a,h)anthracene	169	250	68	124	250	49	47-106	31	40
Benzo(g,h,i)perylene	157	250	63	117	250	47	44-108	29	40

Results flagged with an asterisk  $(\mbox{\ensuremath{}^{*}})$  indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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Form 3C - Organic

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SuperSet Reference:



November 1, 2013

Analytical Report for Service Request No: K1311480

Revised Service Request No: K1311480.01

Kevin Richardson Geo Test Services 741 Marine Drive Bellingham, WA 98225

RE: Marine Sediments/13-0599

Dear Kevin:

Enclosed is the revised report for the samples submitted to our laboratory on October 23, 2013. For your reference, these analyses have been assigned our service request number K1311480.

The Semi-Volatile Organic Compounds have been reported to the MRL/MDL in this revision.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3275. You may also contact me via Email at Chris.Leaf@alsglobal.com.

Respectfully submitted,

ALS Group USA Corp. dba ALS Environmental

Chris Leaf Project Manager

REVISED 5:33 pm, Nov 01, 2013

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> ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626 USA | PHONE +1 360 577 7222 | FAX +1 360 636 1068 ALS Group USA, Corp. Part of the ALS Group An ALS Limited Company



#### **Acronyms**

ASTM American Society for Testing and Materials

A2LA American Association for Laboratory Accreditation

CARB California Air Resources Board

CAS Number Chemical Abstract Service registry Number

CFC Chlorofluorocarbon
CFU Colony-Forming Unit

DEC Department of Environmental Conservation

DEQ Department of Environmental Quality

DHS Department of Health Services

DOE Department of Ecology
DOH Department of Health

EPA U. S. Environmental Protection Agency

ELAP Environmental Laboratory Accreditation Program

GC Gas Chromatography

GC/MS Gas Chromatography/Mass Spectrometry

LOD Limit of Detection
LOQ Limit of Quantitation

LUFT Leaking Underground Fuel Tank

M Modified

MCL Maximum Contaminant Level is the highest permissible concentration of a substance

allowed in drinking water as established by the USEPA.

MDL Method Detection Limit
MPN Most Probable Number
MRL Method Reporting Limit

NA Not Applicable
NC Not Calculated

NCASI National Council of the Paper Industry for Air and Stream Improvement

ND Not Detected

NIOSH National Institute for Occupational Safety and Health

PQL Practical Quantitation Limit

RCRA Resource Conservation and Recovery Act

SIM Selected Ion Monitoring

TPH Total Petroleum Hydrocarbons

tr Trace level is the concentration of an analyte that is less than the PQL but greater

than or equal to the MDL.

#### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
  DOD-QSM 4.2 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

#### **Metals Data Qualifiers**

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. DOD-QSM 4.2 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

#### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
  DOD-QSM 4.2 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

#### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

# ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2286
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L12-28
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Georgia DNR	http://www.gaepd.org/Documents/techguide_pcb.html#cel	881
Hawaii DOH	Not available	-
Idaho DHW	http://www.healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx	-
Indiana DOH	http://www.in.gov/isdh/24859.htm	C-WA-01
ISO 17025	http://www.pjlabs.com/	L12-27
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	3016
Maine DHS	Not available	WA0035
Michigan DEQ	http://www.michigan.gov/deq/0,1607,7-135-3307_4131_4156,00.html	9949
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-368
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA35
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA200001
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	704427-08-TX
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C1203
Wisconsin DNR	http://dnr.wi.gov/	998386840
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com_	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.caslab.com or at the accreditation bodies web site

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

#### ALS ENVIRONMENTAL

 Client:
 Geo Test Services
 Service Request No.:
 K1311480

 Project:
 13-0599
 Date Received:
 10/23/2013

Sample Matrix: Sediment

#### **Case Narrative**

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

#### **Sample Receipt**

Two sediment samples were received for analysis at ALS Environmental on 10/23/2013. The samples were received in good condition and consistent with the accompanying chain of custody form except as noted on the cooler receipt and preservation form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

#### **Total Metals**

No anomalies associated with the analysis of these samples were observed.

#### PCB Aroclors by EPA Method 8082

#### **Second Source Exceptions:**

The analysis of PCB Aroclors by EPA 8082A requires the use of dual column confirmation. The Initial Calibration Verification (ICV) evaluation criteria were not met on the confirmation column for Aroclor 1232 in CAL12822. The ICV criteria were met on the alternate column. The data quality was not affected. No further corrective action was necessary.

#### **Relative Percent Difference Exceptions:**

The Relative Percent Difference (RPD) for Aroclor 1016 and Aroclor 1260 in the replicate matrix spike analyses of sample Lakeside-Anacortes (S1) was outside control criteria. The high RPD values were attributable to an apparent low bias in the Duplicate Matrix Spike (DMS). All surrogate and spike recoveries in the matrix spikes and associated Laboratory Control Sample (LCS) were within acceptance limits, which indicated the analytical batch was in control. No further corrective action was appropriate.

No other anomalies associated with the analysis of these samples were observed.

#### Semivolatile Organic Compounds by EPA Method 8270

#### **Calibration Verification Exceptions:**

The following analytes were flagged as outside the control criterion for Continuing Calibration Verification (CCV) MS26\1028F003.D: Benzo(b)fluoranthene. In accordance with the EPA Method, 80% or more of the CCV analytes must have passed within 20% of the true value. The remaining analytes are allowed a 40% difference as per the ALS SOP. The CCV met these criteria. No further corrective action was required.

No other anomalies associated with the analysis of these samples were observed.

Approved by

# s) Environmentai

44124

#### CHAIN OF CUSTODY

44124 1317 South 13th Ave. Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068 COC Set COC#

Page 1 of 1

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Project Name (3-0599	Project N	13-0599		]	70	[ 5	ì	28D	80D							
Project Manager Kevin R	ichard	<u>\$0.0</u>		] ,,	į.		-	2	<del></del>	_						
Company GEOTEST SEY	vices I	ne.		NER												
Address 741 Marcine	Vien	Dr., Bellingham	LUA	MTA	Solids											
Phone # 360 - 920 - 1146 Sampler Signature	email IA e	un Cogentest	1116. C	3,2			=		F 8							
Sampler Signature	Sampler	Printed Name J		1 S	Tot	PCB	SVO	ĝ	/ Metais							
	Dan	iel Geigi		NUMBER	TS-MET / Total	8082A / I	8270D / SVO L	74718/	601007		2	3	4	5	Remarks	
CLIENT SAMPLE ID	LABID	SAMPLING Date Time	Matrix										****		**************************************	•
1. Lakeside - Anacorio (5	*	10172/13 8 46		3	区	7	人	*	X							1
2. Lukeside Anawks (5)		w(28/13 8 74		3	1	7-	1	*	7							
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9.					<u> </u>											
10.																
Report Requirements	8	oice Information													Circle which metals :	are to be analyzed
I. Routine Report: Method Blank, Surrogate as required		13-0 <b>5</b> 99 : GeoTest				Total	Meta	ils A	J (A	S) SI	b 8	la Be	8	Ca <b>(</b>	Ca Co Cr Cu Fe	PD Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg
* II. Report Dup., MS, MSD					Di	ssolve	ed Me	etals	Al	As	Sb	Ва	Be	B Ca	a Cd Co Cr Cu F	E Pb Mg Min Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg
as required	Turnar	ound Requireme	nts :	Specia									******************			carbon Procedure: AK CA WI Northwest Other(Circle One)
III. CLP Like Summary (no raw data)	£	4 hr48 nr.	1113	I	V C	be	٤٦	wi	r K.	ing	j.	v. th		Chi	is Leaf. 1	re have sent previous samples and these 3-204-320). Need results on this on
IV. Data Validation Report		Standard		nec	J	pa	De.	9.0	11A	<i>y</i> ~	5-6 <sub>1</sub>	A The	اد سها اد	-4-1	and was t	Si your efforts were wisherson
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V. EDU	Requested Report Date		•			•
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Firm Contest Sovices	10/23/3 1030	Firm	Firm	Fir	'n	Firm
Date/Time シ/ね/なば	Date/Time	Date/Time	Date/Time	Da	te/Time	Date/Time



Cooler Receipt and Preservation Form

Client / Project: (800 te	***************************************			e Request $K$	13_1480,		
Received: <u>70/23/13</u> C	pened: 10/23	13 By	y: Bil	Unloade	d: 10/23/13	By:	
<ol> <li>Samples were received via?</li> <li>Samples were received in: (circ</li> </ol>		UPS Box	DHL PD. Envelope	Other		d NA	
3. Were <u>custody seals</u> on coolers?				many and wh	-	Y	N
If present, were custody seals in	C. SEC. THE SECOND SUPERIOR OF THE CO. C. S.	N Thermomet		ocad	igned and dated?  Tracking		1N
Raw Corrected Raw Cooler Temp Cooler Temp Temp Blank	Corrected Corr. Temp Blank Factor	Inermomet	er Coolein	NA	HadCKING		NA Filed
0.110,1	- 4	282		<del></del>	2043 7767	6241	
						777	
4. Packing material: Inserts B		And the second little of the second little of the second	cks Wet Ice	Dry Ice S	Sleeves DAP	21	
5. Were custody papers properly i			e.			NA Y	N
6. Did all bottles arrive in good co				v.		NA Y	N
7. Were all sample labels complete					. 17	NA (Y	N
8. Did all sample labels and tags a	-	-	*	_	e table on page 2.	NA Y	N
9. Were appropriate bottles/contain					in the table below	NA Y	N N
<ul><li>10. Were the pH-preserved bottles</li><li>11. Were VOA vials received with</li></ul>				pri <i>t inaicaie</i>	in the lable below	NA Y	N
12. Was C12/Res negative?	iout neadspace: mu	icaie in ine ia	idie delow.			/NA. Y	N
12. Was O12/Res negative.							
Sample ID on Bottle		Sample ID on	200		Identified b	y:	
Sample ID	Bottle Count C Bottle Type T	out of Head- emp space E	Broke pH	Reagent	Volume Reagent		Time
оширено	CHARLES LYPE WHEN PARTY	emp space 2	MOKE HERDINER HOW	aceagent and		31.3930333 annual5	Manne 200
Notes, Discrepancies, & Resolu	tions:						
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Analytical Results

Client: Geo Test Services Service Request: K1311480

**Project:** Marine Sediments/13-0599

Sample Matrix: Sediment

**Total Solids** 

Prep Method: NONE Units: PERCENT

Analysis Method: 160.3M Basis: Wet

**Test Notes:** 

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
Lakeside-Anacortes (S1)	K1311480-001	10/22/2013	10/23/2013	10/25/2013	95.9	
Lakeside-Anacortes (S2)	K1311480-002	10/22/2013	10/23/2013	10/25/2013	95.2	

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 Page
 1 of 1
 1

 u:\Stealth\\Crystal.rpt\\Solids.rpt
 SuperSet Reference:
 W1311917

QA/QC Report

 Client:
 Geo Test Services
 Service Request:
 K1311480

 Project:
 Marine Sediments/13-0599
 Date Collected:
 10/22/2013

 Sample Matrix:
 Sediment
 Date Received:
 10/23/2013

 Date Analyzed:
 10/25/2013

Duplicate Sample Summary Total Solids

Prep Method:NONEUnits:PERCENTAnalysis Method:160.3MBasis:Wet

**Test Notes:** 

**Duplicate** Relative Sample Percent Sample **Result Notes** Difference Result Result Lab Code Sample Name Average Lakeside-Anacortes (S1) K1311480-001 95.9 95.8 95.9 <1

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SuperSet Reference: W1311917

#### - Cover Page -INORGANIC ANALYSIS DATA PACKAGE

Client: Service Request: K1311480 Geo Test Services

**Project Name:** Marine Sediments

Project No.: 13-0599

Sample Name:	<u>Lab Code:</u>
Batch QC1D	K1311119-003D
Batch QC1S	K1311119-003S
Batch QC2D	K1311437-016D
Batch QC2S	<u>K1311437-016S</u>
Lakeside-Anacortes (S1)	K1311480-001
Lakeside-Anacortes (S2)	<u>K1311480-002</u>
Method Blank	K1311480-MB

#### Metals - 1 -INORGANIC ANALYSIS DATA PACKAGE

Client: Geo Test Services Service Request: K1311480

Project No.: 13-0599 Date Collected: 10/22/13

Project Name: Marine Sediments Date Received: 10/23/13

Matrix: SEDIMENT Units: mg/Kg

Basis: DRY

Sample Name: Lakeside-Anacortes (S1) Lab Code: K1311480-001

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	С	Q
Arsenic	6010C	4.0	2.0	10/24/13	10/25/13	4.0	U	
Cadmium	6010C	0.2	2.0	10/24/13	10/25/13	0.3		
Chromium	6010C	0.8	2.0	10/24/13	10/25/13	250		
Copper	6010C	0.8	2.0	10/24/13	10/25/13	81.3		
Lead	6010C	2.0	2.0	10/24/13	10/25/13	2.0	U	
Mercury	7471B	0.02	1.0	10/29/13	10/29/13	0.03		
Silver	6010C	1.6	2.0	10/24/13	10/25/13	1.6	U	
Zinc	6010C	0.99	2.0	10/24/13	10/25/13	57.0		·

% Solids: 95.9

#### Metals - 1 -INORGANIC ANALYSIS DATA PACKAGE

Client: Geo Test Services Service Request: K1311480

Project No.: 13-0599 Date Collected: 10/22/13

Project Name: Marine Sediments Date Received: 10/23/13

Matrix: SEDIMENT Units: mg/Kg

Basis: DRY

Sample Name: Lakeside-Anacortes (S2) Lab Code: K1311480-002

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	С	Q
Arsenic	6010C	4.1	2.0	10/24/13	10/25/13	4.1	U	
Cadmium	6010C	0.2	2.0	10/24/13	10/25/13	0.2		
Chromium	6010C	0.8	2.0	10/24/13	10/25/13	105		
Copper	6010C	0.8	2.0	10/24/13	10/25/13	113		
Lead	6010C	2.1	2.0	10/24/13	10/25/13	2.1	U	
Mercury	7471B	0.02	1.0	10/29/13	10/29/13	0.03		
Silver	6010C	1.7	2.0	10/24/13	10/25/13	1.7	U	
Zinc	6010C	1.0	2.0	10/24/13	10/25/13	71.6		

% Solids: 95.2

#### Metals - 1 -INORGANIC ANALYSIS DATA PACKAGE

Client: Geo Test Services Service Request: K1311480

Project No.: 13-0599 Date Collected:

Project Name: Marine Sediments Date Received:

Matrix: SEDIMENT Units: mg/Kg

Basis: DRY

Sample Name: Method Blank Lab Code: K1311480-MB

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	С	Q
Arsenic	6010C	4.0	2.0	10/24/13	10/25/13	4.0	U	
Cadmium	6010C	0.2	2.0	10/24/13	10/25/13	0.2	U	
Chromium	6010C	0.8	2.0	10/24/13	10/25/13	0.8	U	
Copper	6010C	0.8	2.0	10/24/13	10/25/13	0.8	U	
Lead	6010C	2.0	2.0	10/24/13	10/25/13	2.0	U	
Mercury	7471B	0.02	1.0	10/29/13	10/29/13	0.02	U	
Silver	6010C	1.6	2.0	10/24/13	10/25/13	1.6	U	
Zinc	6010C	1.0	2.0	10/24/13	10/25/13	1.5		·

% Solids: 100.0

#### Metals

- 5A -

#### SPIKE SAMPLE RECOVERY

Client: Geo Test Services Service Request: K1311480

Project No.: 13-0599 Units: MG/KG

Project Name: Marine Sediments Basis: DRY

Matrix: SOIL % Solids: 9.0

Sample Name: Batch QC1S Lab Code: K1311119-003S

Analyte	Control Limit %R	Spike Result	C	Sample Result	C	Spike Added	%R	Q	Method
Arsenic	75 - 125	337		14.5	υ	363.09	92.8		6010C
Cadmium	75 - 125	36.9		0.7	U	36.31	101.6		6010C
Chromium	75 - 125	158		12.6		145.24	100.1		6010C
Copper	75 - 125	688		501		181.54	103.0		6010C
Lead	75 - 125	363		7.8		363.09	97.8		6010C
Silver	75 - 125	33.9		5.8	U	36.31	93.4		6010C
Zinc	75 - 125	1000		615		363.09	106.0		6010C

#### Metals

- 5A -

#### SPIKE SAMPLE RECOVERY

Client: Geo Test Services

Service Request: K1311480

Project No.: 13-0599

Units: MG/KG

Project Name: Marine Sediments

Basis: As Rec

Matrix: SEDIMENT

Sample Name:

Batch QC2S

Lab Code: K1311437-016S

Analyte	Control Limit %R	Spike Result	Sample Result C	Spike Added	%R	Q	Method
Mercury	80 - 120	0.61	0.08	0.45	117.8		7471B

dba ALS Environmental

## Metals

## - 6 -DUPLICATES

Client: Geo Test Services Service Request: K1311480

Project No.: 13-0599 Units: MG/KG

Project Name: Marine Sediments Basis: DRY

Matrix: SOIL % Solids: 9.0

Sample Name: Batch QClD Lab Code: K1311119-003D

Analyte	Control Limit	Sample (S)	С	Duplicate (D)	С	RPD	Q	Method
Arsenic		14.5	U	14.6	U			6010C
Cadmium		0.7	Ū	0.7	υ			6010C
Chromium		12.6		12.2		3.2		6010C
Copper	20	501		524		4.5		6010C
Lead		7.8		7.3	Ū	200.0		6010C
Silver		5.8	υ	5.8	υ			6010C
Zinc	20	615		607		1.3		6010C

## - 6 -**DUPLICATES**

MG/KG

Client: Geo Test Services Service Request: K1311480

Project No.: Units:

Project Name: Basis: Marine Sediments As Rec

Matrix: SEDIMENT

Mercury

13-0599

Batch QC2D K1311437-016D Sample Name: Lab Code: Control C С RPD Analyte Sample (S) Duplicate (D) Q Method Limit 0.08 0.0 7471B 0.08

-7-

## LABORATORY CONTROL SAMPLE

Client: Geo Test Services Service Request: K1311480

Project No.: 13-0599

Project Name: Marine Sediments

Aqueous LCS Source: Inorganic Ventures Solid LCS Source: ERA D076-540

	Aqueous	(ug/L)		Solid (mg/kg)					
Analyte	True	Found	%R	True	Found	C Lin	nits	%R	
Arsenic	5000	4720	94.4	94.5	94.1	82	117	99.6	
Cadmium	2500	2490	99.6	60.5	64.8	83	117	107.1	
Chromium	1000	974	97.4	70.4	69.8	82	118	99.1	
Copper	1250	1200	96.0	79.6	83.4	84	116	104.8	
Lead	5000	4860	97.2	91.8	94.8	82	118	103.3	
Mercury	5	5.15	103.0	3.73	3.77	72	128	101.1	
Silver	1250	1170	93.6	34.4	35.0	66	134	101.7	
Zinc	2500	2520	100.8	140	148	82	118	105.7	

Analytical Results

**Client:** Geo Test Services

Service Request: K1311480 Marine Sediments/13-0599 **Date Collected:** 10/22/2013 **Project: Sample Matrix:** Sediment **Date Received:** 10/23/2013

Polychlorinated Biphenyls (PCBs)

Sample Name: Lakeside-Anacortes (S1) Units: mg/Kg Lab Code: K1311480-001 Basis: Dry

**Extraction Method:** EPA 3541 Level: Low

**Analysis Method:** 8082A

Analyte Name	Result Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND U	0.052	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1221	ND U	0.11	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1232	ND U	0.052	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1242	ND U	0.052	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1248	ND U	0.052	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1254	ND U	0.052	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1260	ND U	0.052	1	10/24/13	10/25/13	KWG1311947	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note	
Decachlorobiphenyl	85	43-148	10/25/13	Acceptable	

Analytical Results

**Client:** Geo Test Services

Service Request: K1311480 Marine Sediments/13-0599 **Date Collected:** 10/22/2013 **Project:** Sediment **Date Received:** 10/23/2013

**Sample Matrix:** 

Polychlorinated Biphenyls (PCBs)

Sample Name: Lakeside-Anacortes (S2) Units: mg/Kg Lab Code: K1311480-002 Basis: Dry **Extraction Method:** EPA 3541 Level: Low

**Analysis Method:** 8082A

Analyte Name	Result Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND U	0.053	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1221	ND U	0.11	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1232	ND U	0.053	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1242	ND U	0.053	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1248	ND U	0.053	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1254	ND U	0.053	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1260	ND U	0.053	1	10/24/13	10/25/13	KWG1311947	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	88	43-148	10/25/13	Acceptable

**Analytical Results** 

**Client:** Geo Test Services

Marine Sediments/13-0599 **Project:** 

**Sample Matrix:** Sediment Service Request: K1311480

Date Collected: NA Date Received: NA

## Polychlorinated Biphenyls (PCBs)

Sample Name: Method Blank Lab Code: KWG1311947-4

**Extraction Method:** EPA 3541 **Analysis Method:** 8082A

Units: mg/Kg Basis: Dry

Level: Low

Analyte Name	Result O	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
·			1 4001				11000
Aroclor 1016	ND U	0.049	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1221	ND U	0.098	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1232	ND U	0.049	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1242	ND U	0.049	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1248	ND U	0.049	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1254	ND U	0.049	1	10/24/13	10/25/13	KWG1311947	
Aroclor 1260	ND U	0.049	1	10/24/13	10/25/13	KWG1311947	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note	
Decachlorobiphenyl	87	43-148	10/25/13	Acceptable	

QA/QC Report

Service Request: K1311480

**Client:** Geo Test Services

Marine Sediments/13-0599 **Project:** 

Sediment **Sample Matrix:** 

> **Surrogate Recovery Summary** Polychlorinated Biphenyls (PCBs)

EPA 3541 Units: Percent **Extraction Method: Analysis Method:** 8082A Level: Low

Sample Name	Lab Code	Sur1
Lakeside-Anacortes (S1)	K1311480-001	85
Lakeside-Anacortes (S2)	K1311480-002	88
Method Blank	KWG1311947-4	87
Lakeside-Anacortes (S1)MS	KWG1311947-1	93
Lakeside-Anacortes (S1)DMS	KWG1311947-2	44
Lab Control Sample	KWG1311947-3	69

**Surrogate Recovery Control Limits (%)** 

Sur1 = Decachlorobiphenyl

43-148

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Form 2A - Organic 1 of 1 Printed: 10/29/2013 17:06:13 Page 22

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SuperSet Reference: RR161594

QA/QC Report

**Client:** Geo Test Services

**Project:** Marine Sediments/13-0599

**Sample Matrix:** Sediment Service Request: K1311480 **Date Extracted:** 10/24/2013

**Date Analyzed:** 10/25/2013

Units: mg/Kg

Basis: Dry

Level: Low

Extraction Lot: KWG1311947

## Matrix Spike/Duplicate Matrix Spike Summary Polychlorinated Biphenyls (PCBs)

Sample Name:

Lakeside-Anacortes (S1)

Lab Code:

K1311480-001

**Extraction Method:** 

EPA 3541

**Analysis Method:** 8082A

Lakeside-Anacortes

Lakeside-Anacortes (S1)MS KWG1311947-1

(S1)DMS KWG1311947-2

**Matrix Spike** 

**Duplicate Matrix Spike** 

	Sample		Spike			Spike		%Rec		RPD
Analyte Name	Result	Result	Amount	%Rec	Result	Amount	%Rec	Limits	RPD	Limit
Aroclor 1016	ND	0.512	0.509	101	0.231	0.518	45	23-145	76 *	40
Aroclor 1260	ND	0.549	0.509	108	0.254	0.518	49	24-148	73 *	40

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Form 3A - Organic Printed: 10/29/2013 17:06:17 Page 1 of 1 SuperSet Reference: RR161594

QA/QC Report

Client: Geo Test Services

**Project:** Marine Sediments/13-0599

Sample Matrix: Sediment

Service Request: K1311480

**Date Extracted:** 10/24/2013 **Date Analyzed:** 10/25/2013

Lab Control Spike Summary Polychlorinated Biphenyls (PCBs)

**Extraction Method:** EPA 3541 **Analysis Method:** 8082A

Units: mg/KgBasis: Dry

Level: Low

**Extraction Lot:** KWG1311947

Lab Control Sample KWG1311947-3 Lab Control Spike

		Spike	_	%Rec
Analyte Name	Result	Amount	%Rec	Limits
Aroclor 1016	0.396	0.500	79	42-122
Aroclor 1260	0.421	0.500	84	50-124

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Analytical Results

Client: Geo Test Services

**Project:** Marine Sediments/13-0599

Sample Matrix: Sediment

**Service Request:** K1311480 **Date Collected:** 10/22/2013

**Date Received:** 10/23/2013

## Semi-Volatile Organic Compounds by GC/MS

Sample Name: Lakeside-Anacortes (S1)

Lab Code: K1311480-001
Extraction Method: EPA 3541
Analysis Method: 8270D

Units: ug/Kg
Basis: Dry

Level: Low

					Dilution	Date	Date	Extraction	
Analyte Name	Result	Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Phenol	ND	U	21	3.1	1	10/22/13	10/28/13	KWG1311653	
1,4-Dichlorobenzene	ND	U	6.9	2.5	1	10/22/13	10/28/13	KWG1311653	
1,2-Dichlorobenzene	ND	U	6.9	2.4	1	10/22/13	10/28/13	KWG1311653	
Benzyl Alcohol	ND	U	14	4.9	1	10/22/13	10/28/13	KWG1311653	
2-Methylphenol	ND	U	7.5	4.1	1	10/22/13	10/28/13	KWG1311653	
4-Methylphenol†	ND	U	7.5	4.5	1	10/22/13	10/28/13	KWG1311653	
2,4-Dimethylphenol	ND	U	35	6.3	1	10/22/13	10/28/13	KWG1311653	
Benzoic Acid	ND	U	400	96	1	10/22/13	10/28/13	KWG1311653	
1,2,4-Trichlorobenzene	ND	U	6.9	2.6	1	10/22/13	10/28/13	KWG1311653	
Naphthalene	ND	U	6.9	2.9	1	10/22/13	10/28/13	KWG1311653	
Hexachlorobutadiene	ND	U	6.9	3.0	1	10/22/13	10/28/13	KWG1311653	
2-Methylnaphthalene	ND	U	6.9	2.8	1	10/22/13	10/28/13	KWG1311653	
Acenaphthylene	ND	U	6.9	2.6	1	10/22/13	10/28/13	KWG1311653	
Dimethyl Phthalate	ND	U	6.9	4.0	1	10/22/13	10/28/13	KWG1311653	
Acenaphthene	ND	U	6.9	3.2	1	10/22/13	10/28/13	KWG1311653	
Dibenzofuran	ND	U	6.9	3.4	1	10/22/13	10/28/13	KWG1311653	
Fluorene	ND	U	6.9	3.3	1	10/22/13	10/28/13	KWG1311653	
Diethyl Phthalate	ND	U	6.9	3.7	1	10/22/13	10/28/13	KWG1311653	
N-Nitrosodiphenylamine	ND	U	6.9	3.2	1	10/22/13	10/28/13	KWG1311653	
Hexachlorobenzene	ND	U	6.9	3.3	1	10/22/13	10/28/13	KWG1311653	
Pentachlorophenol	ND	U	69	5.3	1	10/22/13	10/28/13	KWG1311653	
Phenanthrene	ND	U	6.9	3.6	1	10/22/13	10/28/13	KWG1311653	
Anthracene	ND	U	6.9	3.2	1	10/22/13	10/28/13	KWG1311653	
Di-n-butyl Phthalate	ND	U	14	4.8	1	10/22/13	10/28/13	KWG1311653	
Fluoranthene	ND	U	6.9	3.7	1	10/22/13	10/28/13	KWG1311653	
Pyrene	ND	U	6.9	3.7	1	10/22/13	10/28/13	KWG1311653	
Butyl Benzyl Phthalate	ND	U	6.9	3.7	1	10/22/13	10/28/13	KWG1311653	
Benz(a)anthracene	ND	U	6.9	3.6	1	10/22/13	10/28/13	KWG1311653	
Chrysene	ND	U	6.9	4.1	1	10/22/13	10/28/13	KWG1311653	
Bis(2-ethylhexyl) Phthalate	ND	U	69	8.9	1	10/22/13	10/28/13	KWG1311653	
Di-n-octyl Phthalate	ND	U	6.9	3.2	1	10/22/13	10/28/13	KWG1311653	
Benzo(b)fluoranthene	ND		6.9	3.4	1	10/22/13	10/28/13	KWG1311653	
Benzo(k)fluoranthene	ND	U	6.9	4.0	1	10/22/13	10/28/13	KWG1311653	

Comments:

**REVISED** 5:32 pm, Nov 01, 2013

Analytical Results

Client: Geo Test Services

**Project:** Marine Sediments/13-0599

Sample Matrix: Sediment

**Service Request:** K1311480 **Date Collected:** 10/22/2013

**Date Received:** 10/23/2013

## Semi-Volatile Organic Compounds by GC/MS

Sample Name: Lakeside-Anacortes (S1)

Lab Code: K1311480-001
Extraction Method: EPA 3541
Analysis Method: 8270D

Units: ug/Kg
Basis: Dry

Level: Low

				Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Benzo(a)pyrene	ND U	6.9	3.6	1	10/22/13	10/28/13	KWG1311653	
Indeno(1,2,3-cd)pyrene	ND U	6.9	3.2	1	10/22/13	10/28/13	KWG1311653	
Dibenz(a,h)anthracene	ND U	6.9	3.0	1	10/22/13	10/28/13	KWG1311653	
Benzo(g,h,i)perylene	ND U	6.9	3.7	1	10/22/13	10/28/13	KWG1311653	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	49	20-86	10/28/13	Acceptable
Nitrobenzene-d5	48	27-91	10/28/13	Acceptable
2-Fluorobiphenyl	55	25-97	10/28/13	Acceptable
2,4,6-Tribromophenol	47	10-119	10/28/13	Acceptable
Terphenyl-d14	72	33-129	10/28/13	Acceptable

#### † Analyte Comments

4-Methylphenol

This analyte cannot be separated from 3-Methylphenol.

Comments:

**REVISED** 5:32 pm, Nov 01, 2013

Analytical Results

Client: Geo Test Services

**Project:** Marine Sediments/13-0599

Sample Matrix: Sediment

**Service Request:** K1311480 **Date Collected:** 10/22/2013

**Date Received:** 10/23/2013

## Semi-Volatile Organic Compounds by GC/MS

Sample Name: Lakeside-Anacortes (S2)

Lab Code:K1311480-002Extraction Method:EPA 3541Analysis Method:8270D

Units: ug/KgBasis: DryLevel: Low

					Dilution	Date	Date	Extraction	
Analyte Name	Result	Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Phenol	ND	U	21	3.1	1	10/22/13	10/28/13	KWG1311653	
1,4-Dichlorobenzene	ND	U	7.0	2.5	1	10/22/13	10/28/13	KWG1311653	
1,2-Dichlorobenzene	ND	U	7.0	2.4	1	10/22/13	10/28/13	KWG1311653	
Benzyl Alcohol	ND	U	14	4.9	1	10/22/13	10/28/13	KWG1311653	
2-Methylphenol	ND	U	7.5	4.1	1	10/22/13	10/28/13	KWG1311653	
4-Methylphenol†	ND	U	7.5	4.5	1	10/22/13	10/28/13	KWG1311653	
2,4-Dimethylphenol	ND	U	35	6.3	1	10/22/13	10/28/13	KWG1311653	
Benzoic Acid	ND	U	400	96	1	10/22/13	10/28/13	KWG1311653	
1,2,4-Trichlorobenzene	ND	U	7.0	2.6	1	10/22/13	10/28/13	KWG1311653	
Naphthalene	ND	U	7.0	2.9	1	10/22/13	10/28/13	KWG1311653	
Hexachlorobutadiene	ND	U	7.0	3.0	1	10/22/13	10/28/13	KWG1311653	
2-Methylnaphthalene	ND	U	7.0	2.8	1	10/22/13	10/28/13	KWG1311653	
Acenaphthylene	ND	U	7.0	2.6	1	10/22/13	10/28/13	KWG1311653	
Dimethyl Phthalate	ND	U	7.0	4.0	1	10/22/13	10/28/13	KWG1311653	
Acenaphthene	ND	U	7.0	3.2	1	10/22/13	10/28/13	KWG1311653	
Dibenzofuran	ND	U	7.0	3.4	1	10/22/13	10/28/13	KWG1311653	
Fluorene	ND	U	7.0	3.3	1	10/22/13	10/28/13	KWG1311653	
Diethyl Phthalate	ND	U	7.0	3.7	1	10/22/13	10/28/13	KWG1311653	
N-Nitrosodiphenylamine	ND	U	7.0	3.2	1	10/22/13	10/28/13	KWG1311653	
Hexachlorobenzene	ND	U	7.0	3.3	1	10/22/13	10/28/13	KWG1311653	
Pentachlorophenol	ND	U	70	5.3	1	10/22/13	10/28/13	KWG1311653	
Phenanthrene	ND	U	7.0	3.6	1	10/22/13	10/28/13	KWG1311653	
Anthracene	ND	U	7.0	3.2	1	10/22/13	10/28/13	KWG1311653	
Di-n-butyl Phthalate	ND	U	14	4.8	1	10/22/13	10/28/13	KWG1311653	
Fluoranthene	ND	U	7.0	3.7	1	10/22/13	10/28/13	KWG1311653	
Pyrene	ND	U	7.0	3.7	1	10/22/13	10/28/13	KWG1311653	
Butyl Benzyl Phthalate	ND	U	7.0	3.7	1	10/22/13	10/28/13	KWG1311653	
Benz(a)anthracene	ND	U	7.0	3.6	1	10/22/13	10/28/13	KWG1311653	
Chrysene	ND	U	7.0	4.1	1	10/22/13	10/28/13	KWG1311653	
Bis(2-ethylhexyl) Phthalate	ND	U	70	8.9	1	10/22/13	10/28/13	KWG1311653	
Di-n-octyl Phthalate	ND	U	7.0	3.2	1	10/22/13	10/28/13	KWG1311653	
Benzo(b)fluoranthene	ND	U	7.0	3.4	1	10/22/13	10/28/13	KWG1311653	
Benzo(k)fluoranthene	ND	U	7.0	4.0	1	10/22/13	10/28/13	KWG1311653	

**Comments:** 

**REVISED** 5:32 pm, Nov 01, 2013

RR161737

Analytical Results

Client: Geo Test Services

**Project:** Marine Sediments/13-0599

Sample Matrix: Sediment

**Service Request:** K1311480 **Date Collected:** 10/22/2013 **Date Received:** 10/23/2013

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Lakeside-Anacortes (S2)

**Lab Code:** K1311480-002

**Extraction Method:** EPA 3541 **Analysis Method:** 8270D

Units: ug/Kg Basis: Dry

Level: Low

				Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Benzo(a)pyrene	ND U	7.0	3.6	1	10/22/13	10/28/13	KWG1311653	
Indeno(1,2,3-cd)pyrene	ND U	7.0	3.2	1	10/22/13	10/28/13	KWG1311653	
Dibenz(a,h)anthracene	ND U	7.0	3.0	1	10/22/13	10/28/13	KWG1311653	
Benzo(g,h,i)perylene	ND U	7.0	3.7	1	10/22/13	10/28/13	KWG1311653	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note	
Phenol-d6	48	20-86	10/28/13	Acceptable	
Nitrobenzene-d5	48	27-91	10/28/13	Acceptable	
2-Fluorobiphenyl	53	25-97	10/28/13	Acceptable	
2,4,6-Tribromophenol	47	10-119	10/28/13	Acceptable	
Terphenyl-d14	66	33-129	10/28/13	Acceptable	

#### † Analyte Comments

4-Methylphenol

This analyte cannot be separated from 3-Methylphenol.

Comments:

**REVISED** 5:32 pm, Nov 01, 2013

Merged

Analytical Results

Client: Geo Test Services

**Project:** Marine Sediments/13-0599

Sample Matrix: Sediment

Service Request: K1311480

Date Collected: NA

Date Received: NA

## Semi-Volatile Organic Compounds by GC/MS

**Sample Name:** Method Blank **Lab Code:** KWG1311653-5

**Extraction Method:** EPA 3541 **Analysis Method:** 8270D

Units: ug/KgBasis: DryLevel: Low

					Dilution	Date	Date	Extraction	
Analyte Name	Result	Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Phenol	ND	U	20	3.1	1	10/22/13	10/28/13	KWG1311653	
1,4-Dichlorobenzene	ND	U	6.6	2.5	1	10/22/13	10/28/13	KWG1311653	
1,2-Dichlorobenzene	ND	U	6.6	2.4	1	10/22/13	10/28/13	KWG1311653	
Benzyl Alcohol	ND	U	14	4.9	1	10/22/13	10/28/13	KWG1311653	
2-Methylphenol	ND	U	7.5	4.1	1	10/22/13	10/28/13	KWG1311653	
4-Methylphenol†	ND	U	7.5	4.5	1	10/22/13	10/28/13	KWG1311653	
2,4-Dimethylphenol	ND	U	33	6.3	1	10/22/13	10/28/13	KWG1311653	
Benzoic Acid	ND	U	400	96	1	10/22/13	10/28/13	KWG1311653	
1,2,4-Trichlorobenzene	ND	U	6.6	2.6	1	10/22/13	10/28/13	KWG1311653	
Naphthalene	ND	U	6.6	2.9	1	10/22/13	10/28/13	KWG1311653	
Hexachlorobutadiene	ND		6.6	3.0	1	10/22/13	10/28/13	KWG1311653	
2-Methylnaphthalene	ND	U	6.6	2.8	1	10/22/13	10/28/13	KWG1311653	
Acenaphthylene	ND	U	6.6	2.6	1	10/22/13	10/28/13	KWG1311653	
Dimethyl Phthalate	ND	U	6.6	4.0	1	10/22/13	10/28/13	KWG1311653	
Acenaphthene	ND	U	6.6	3.2	1	10/22/13	10/28/13	KWG1311653	
Dibenzofuran	ND	U	6.6	3.4	1	10/22/13	10/28/13	KWG1311653	
Fluorene	ND	U	6.6	3.3	1	10/22/13	10/28/13	KWG1311653	
Diethyl Phthalate	ND	U	6.6	3.7	1	10/22/13	10/28/13	KWG1311653	
N-Nitrosodiphenylamine	ND	U	6.6	3.2	1	10/22/13	10/28/13	KWG1311653	
Hexachlorobenzene	ND	U	6.6	3.3	1	10/22/13	10/28/13	KWG1311653	
Pentachlorophenol	ND	U	66	5.3	1	10/22/13	10/28/13	KWG1311653	
Phenanthrene	ND	U	6.6	3.6	1	10/22/13	10/28/13	KWG1311653	
Anthracene	ND	U	6.6	3.2	1	10/22/13	10/28/13	KWG1311653	
Di-n-butyl Phthalate	ND	U	14	4.8	1	10/22/13	10/28/13	KWG1311653	
Fluoranthene	ND	U	6.6	3.7	1	10/22/13	10/28/13	KWG1311653	
Pyrene	ND	U	6.6	3.7	1	10/22/13	10/28/13	KWG1311653	
Butyl Benzyl Phthalate	ND	U	6.6	3.7	1	10/22/13	10/28/13	KWG1311653	
Benz(a)anthracene	ND	U	6.6	3.6	1	10/22/13	10/28/13	KWG1311653	
Chrysene	ND	U	6.6	4.1	1	10/22/13	10/28/13	KWG1311653	
Bis(2-ethylhexyl) Phthalate	ND	U	66	8.9	1	10/22/13	10/28/13	KWG1311653	
Di-n-octyl Phthalate	ND	U	6.6	3.2	1	10/22/13	10/28/13	KWG1311653	
Benzo(b)fluoranthene	ND		6.6	3.4	1	10/22/13	10/28/13	KWG1311653	
Benzo(k)fluoranthene	ND	U	6.6	4.0	1	10/22/13	10/28/13	KWG1311653	

Comments:

**REVISED** 5:32 pm, Nov 01, 2013

Analytical Results

**Client:** Geo Test Services

Marine Sediments/13-0599 **Project:** 

Sample Matrix: Sediment Service Request: K1311480

Date Collected: NA Date Received: NA

## Semi-Volatile Organic Compounds by GC/MS

Sample Name: Method Blank Units: ug/Kg Lab Code: KWG1311653-5 Basis: Dry **Extraction Method:** EPA 3541 Level: Low

**Analysis Method:** 8270D

				Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Benzo(a)pyrene	ND U	6.6	3.6	1	10/22/13	10/28/13	KWG1311653	
Indeno(1,2,3-cd)pyrene	ND U	6.6	3.2	1	10/22/13	10/28/13	KWG1311653	
Dibenz(a,h)anthracene	ND U	6.6	3.0	1	10/22/13	10/28/13	KWG1311653	
Benzo(g,h,i)perylene	ND U	6.6	3.7	1	10/22/13	10/28/13	KWG1311653	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	50	20-86	10/28/13	Acceptable
Nitrobenzene-d5	52	27-91	10/28/13	Acceptable
2-Fluorobiphenyl	57	25-97	10/28/13	Acceptable
2,4,6-Tribromophenol	42	10-119	10/28/13	Acceptable
Terphenyl-d14	78	33-129	10/28/13	Acceptable

#### † Analyte Comments

4-Methylphenol

This analyte cannot be separated from 3-Methylphenol.

**Comments:** 

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QA/QC Report

Client: Geo Test Services

**Project:** Marine Sediments/13-0599

Sample Matrix: Sediment

## Surrogate Recovery Summary Semi-Volatile Organic Compounds by GC/MS

Extraction Method:EPA 3541Units:PercentAnalysis Method:8270DLevel:Low

Sample Name	Lab Code	Sur1	Sur2	Sur3	Sur4	Sur5
Batch QC	K1311350-001	46	48	53	38	64
Lakeside-Anacortes (S1)	K1311480-001	49	48	55	47	72
Lakeside-Anacortes (S2)	K1311480-002	48	48	53	47	66
Method Blank	KWG1311653-5	50	52	57	42	78
Batch QCMS	KWG1311653-1	48	49	55	53	59
Batch QCDMS	KWG1311653-2	44	44	48	48	59
Lab Control Sample	KWG1311653-3	43	43	49	50	59
Duplicate Lab Control Sample	KWG1311653-4	33	32	36	35	46

## Surrogate Recovery Control Limits (%)

Sur1 = Phenol-d6	20-86	Sur5 = Terphenyl-d14	33-129
Sur2 = Nitrobenzene-d5	27-91		
Sur3 = 2-Fluorobiphenyl	25-97		
Sur4 = 2,4,6-Tribromophenol	10-119		

Results flagged with an asterisk  $(\mbox{\ensuremath{}^{*}})$  indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

**REVISED**5:32 pm, Nov 01, 2013

RR161737

SuperSet Reference:

Service Request: K1311480

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QA/QC Report

**Client:** Geo Test Services

**Project:** Marine Sediments/13-0599

**Sample Matrix:** Sediment Service Request: K1311480 **Date Extracted:** 10/22/2013

**Date Analyzed:** 10/28/2013

Matrix Spike/Duplicate Matrix Spike Summary Semi-Volatile Organic Compounds by GC/MS

Sample Name: Batch QC Lab Code:

K1311350-001

**Extraction Method: Analysis Method:** 

EPA 3541 8270D

Units: ug/Kg Basis: Dry

Level: Low

Extraction Lot: KWG1311653

Batch QCMS KWG1311653-1 **Matrix Spike** 

Batch QCDMS KWG1311653-2 **Duplicate Matrix Spike** 

Analyte Name	Sample Result	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec	%Rec Limits	RPD	RPD Limit
Phenol	ND	132	228	58	117	228	51	15-98	12	40
1,4-Dichlorobenzene	ND	128	228	56	117	228	51	19-93	9	40
1,2,4-Trichlorobenzene	ND	134	228	59	122	228	53	23-99	9	40
Acenaphthene	ND	145	228	64	128	228	56	10-132	12	40
Diethyl Phthalate	ND	140	228	62	111	228	49	10-135	23	40
Pentachlorophenol	ND	119	228	52	101	228	44	10-123	16	40
Pyrene	ND	170	228	75	169	228	74	17-129	0	40
Benzo(a)pyrene	ND	169	228	74	168	228	73	13-126	1	40

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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Page

QA/QC Report

Client: Geo Test Services

**Project:** Marine Sediments/13-0599

Sample Matrix: Sediment

Service Request: K1311480

Date Extracted: 10/22/2013

**Date Analyzed:** 10/28/2013

## Lab Control Spike/Duplicate Lab Control Spike Summary Semi-Volatile Organic Compounds by GC/MS

**Extraction Method:** EPA 3541 **Analysis Method:** 8270D

Units: ug/Kg Basis: Dry

Level: Low Extraction Lot: KWG1311653

Lab Control Sample KWG1311653-3 Lab Control Spike Duplicate Lab Control Sample KWG1311653-4 Duplicate Lab Control Spike

		Spike			Spike		%Rec		RPD
Analyte Name	Result	Amount	%Rec	Result	Amount	%Rec	Limits	RPD	Limit
Phenol	135	250	54	98.8	250	40	27-97	31	40
1,4-Dichlorobenzene	131	250	52	95.9	250	38	28-89	31	40
1,2-Dichlorobenzene	131	250	52	96.5	250	39	27-91	30	40
Benzyl Alcohol	108	250	43	74.7	250	30	25-103	36	40
2-Methylphenol	131	250	52	94.3	250	38	18-95	32	40
4-Methylphenol	143	250	57	101	250	40	17-99	35	40
2,4-Dimethylphenol	409	750	55	298	750	40	10-93	31	40
Benzoic Acid	114	750	15	107	750	14	10-96	6	40
1,2,4-Trichlorobenzene	137	250	55	99.0	250	40	27-94	32	40
Naphthalene	137	250	55	98.4	250	39	27-93	32	40
Hexachlorobutadiene	135	250	54	97.9	250	39	25-96	32	40
2-Methylnaphthalene	147	250	59	104	250	41	27-96	34	40
Acenaphthylene	158	250	63	107	250	43	33-99	39	40
Dimethyl Phthalate	168	250	67	114	250	45	39-100	39	40
Acenaphthene	148	250	59	101	250	41	32-91	37	40
Dibenzofuran	152	250	61	103	250	41	34-92	38	40
Fluorene	153	250	61	103	250	41	32-96	39	40
Diethyl Phthalate	166	250	66	119	250	47	41-100	33	40
N-Nitrosodiphenylamine	143	250	57	99.4	250	40	36-96	36	40
Hexachlorobenzene	161	250	64	113	250	45	40-99	35	40
Pentachlorophenol	137	250	55	108	250	43	21-97	24	40
Phenanthrene	165	250	66	118	250	47	39-98	34	40
Anthracene	163	250	65	115	250	46	40-98	35	40
Di-n-butyl Phthalate	181	250	72	139	250	56	42-109	26	40
Fluoranthene	170	250	68	129	250	51	42-104	28	40
Pyrene	190	250	76	141	250	56	45-106	30	40
Butyl Benzyl Phthalate	178	250	71	136	250	54	45-111	27	40
Benz(a)anthracene	177	250	71	133	250	53	44-108	28	40
Chrysene	169	250	68	128	250	51	46-108	28	40
Bis(2-ethylhexyl) Phthalate	183	250	73	208	250	83	47-110	13	40
Di-n-octyl Phthalate	180	250	72	141	250	56	45-109	24	40
Benzo(b)fluoranthene	186	250	74	138	250	55	46-106	30	40
Benzo(k)fluoranthene	157	250	63	117	250	47	47-107	29	40
Benzo(a)pyrene	187	250	75	138	250	55	42-110	30	40
Indeno(1,2,3-cd)pyrene	205	250	82	157	250	63	47-109	27	40

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

REVISED
5:32 pm, Nov 01, 2013

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Form 3C - Organic

Page 1 of

SuperSet Reference:

QA/QC Report

**Client:** Geo Test Services

**Project:** Marine Sediments/13-0599

**Sample Matrix:** Sediment Service Request: K1311480

**Date Extracted:** 10/22/2013 **Date Analyzed:** 10/28/2013

Lab Control Spike/Duplicate Lab Control Spike Summary Semi-Volatile Organic Compounds by GC/MS

**Extraction Method: Analysis Method:** 

EPA 3541

8270D

Units: ug/Kg

Basis: Dry

Level: Low Extraction Lot: KWG1311653

Lab Control Sample KWG1311653-3

Lab Control Spike

Duplicate Lab Control Sample

KWG1311653-4

**Duplicate Lab Control Spike** 

		Spike			Spike		%Rec		RPD
Analyte Name	Result	Amount	%Rec	Result	Amount	%Rec	Limits	RPD	Limit
Dibenz(a,h)anthracene	169	250	68	124	250	49	47-106	31	40
Benzo(g,h,i)perylene	157	250	63	117	250	47	44-108	29	40

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**REVISED** 5:32 pm, Nov 01, 2013

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Form 3C - Organic

34

Page 2 of 2

SuperSet Reference:

RR161737



November 1, 2013

Analytical Report for Service Request No: K1311278

Revised Service Request No: K1311278.01

Kevin Richardson Geo Test Services 741 Marine Drive Bellingham, WA 98225

#### Dear Kevin:

Enclosed is the revised report for the samples submitted to our laboratory on October 17, 2013. For your reference, these analyses have been assigned our service request number K1311278.

The Semi-Volatile Organic Compounds have been reported to the MRL/MDL in this revision.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at <a href="www.alsglobal.com">www.alsglobal.com</a>. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3275. You may also contact me via Email at Chris.Leaf@alsglobal.com.

Respectfully submitted,

ALS Group USA Corp. dba ALS Environmental

Chris Leaf
Project Manager

CL/lb Page 1 of <u>36</u>

**REVISED**5:21 pm, Nov 01, 2013

ADDRESS 1317 S. 13<sup>th</sup> Avenue, Kelso, WA 98626 USA PHONE +1 360 577 7222 FAX +1 360 636 1068

ALS Group USA, Corp. Part of the ALS Group An ALS Limited Company



## **Acronyms**

ASTM American Society for Testing and Materials

A2LA American Association for Laboratory Accreditation

CARB California Air Resources Board

CAS Number Chemical Abstract Service registry Number

CFC Chlorofluorocarbon
CFU Colony-Forming Unit

DEC Department of Environmental Conservation

DEQ Department of Environmental Quality

DHS Department of Health Services

DOE Department of Ecology
DOH Department of Health

EPA U. S. Environmental Protection Agency

ELAP Environmental Laboratory Accreditation Program

GC Gas Chromatography

GC/MS Gas Chromatography/Mass Spectrometry

LOD Limit of Detection
LOQ Limit of Quantitation

LUFT Leaking Underground Fuel Tank

M Modified

MCL Maximum Contaminant Level is the highest permissible concentration of a substance

allowed in drinking water as established by the USEPA.

MDL Method Detection Limit
MPN Most Probable Number
MRL Method Reporting Limit

NA Not Applicable
NC Not Calculated

NCASI National Council of the Paper Industry for Air and Stream Improvement

ND Not Detected

NIOSH National Institute for Occupational Safety and Health

PQL Practical Quantitation Limit

RCRA Resource Conservation and Recovery Act

SIM Selected Ion Monitoring

TPH Total Petroleum Hydrocarbons

tr Trace level is the concentration of an analyte that is less than the PQL but greater

than or equal to the MDL.

#### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
  DOD-QSM 4.2 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

#### **Metals Data Qualifiers**

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. DOD-QSM 4.2 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

#### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
  DOD-QSM 4.2 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

#### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

# ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2286
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L12-28
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Georgia DNR	http://www.gaepd.org/Documents/techguide_pcb.html#cel	881
Hawaii DOH	Not available	-
Idaho DHW	http://www.healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx	-
Indiana DOH	http://www.in.gov/isdh/24859.htm	C-WA-01
ISO 17025	http://www.pjlabs.com/	L12-27
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	3016
Maine DHS	Not available	WA0035
Michigan DEQ	http://www.michigan.gov/deq/0,1607,7-135-3307_4131_4156,00.html	9949
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-368
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA35
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA200001
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	704427-08-TX
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C1203
Wisconsin DNR	http://dnr.wi.gov/	998386840
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com_	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.caslab.com or at the accreditation bodies web site

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

#### ALS ENVIRONMENTAL

Client:Geo Test ServicesService Request No.:K1311278Project:NADate Received:10/17/2013

Sample Matrix: Sediment

#### **Case Narrative**

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

#### **Sample Receipt**

One sediment sample was received for analysis at ALS Environmental on 10/17/2013. The samples were received in good condition and consistent with the accompanying chain of custody form except as noted on the cooler receipt and preservation form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory. Per client instructions, one half of the sample volume submitted was labeled as a second sample named Sample 1– Dup.

#### **Total Metals**

No anomalies associated with the analysis of these samples were observed.

## PCB Aroclors by EPA Method 8082

#### **Second Source Exceptions:**

The analysis of PCB Aroclors by EPA 8082A requires the use of dual column confirmation. The Initial Calibration Verification (ICV) evaluation criteria were not met on the confirmation column for Aroclor 1232 in CAL12822. The ICV criteria were met on the alternate column. The data quality was not affected. No further corrective action was necessary.

No other anomalies associated with the analysis of these samples were observed.

## Semivolatile Organic Compounds by EPA Method 8270

#### **Lab Control Sample Exceptions:**

The advisory criterion was exceeded for Benzoic Acid in the replicate Laboratory Control Samples (LCS/DLCS) KWG1311570-3 and KWG1311570-4. As per the ALS/Kelso Standard Operating Procedure (SOP) for this method, these compounds are not included in the subset of analytes used to control the analysis. The recovery information reported for these analytes is for advisory purposes only (i.e. to provide additional detail related to the performance of each individual compound). No further corrective action was required.

## **Elevated Detection Limits:**

The detection limit was elevated for Butyl Benzyl Phthalate in samples Sample 1 and Sample 1-Dup. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compound at the normal limit. The results were flagged to indicate the matrix interference.

Approved by

## Semivolatile Organic Compounds by EPA Method 8270 (cont.)

The detection limit was elevated for Benzo(a)pyrene in sample 1-Dup. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution of the target compound at the normal limit. The result was flagged to indicate the matrix interference.

Approved by

ALS Environmental 8620 Holly Drive, Suite 100 Everett, WA 98208 Phone (425) 356-2600 (425) 356-2626 http://www.alsglobal.com Fax

## Chain Of Custody/ **Laboratory Analysis Request**

ALS Job#

(Laboratory Use Utily)

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Analytical Results

Client: Geo Test Services Service Request: K1311278

**Project:** 

Sample Matrix: Sediment

**Total Solids** 

Units: PERCENT

**Prep Method:** NONE **Analysis Method:** 160.3M

**Test Notes:** 

Basis: Wet

Date Date Date **Result Notes** Collected Received Analyzed Lab Code Sample Name Result Sample 1 K1311278-001 10/15/2013 10/17/2013 10/24/2013 94.2 94.0 Sample 1-Dup K1311278-002 10/17/2013 10/24/2013 10/15/2013

Printed: 10/25/2013 13:32 Page 1 of 1  $u:\Stealth\Crystal.rpt\Solids.rpt$ W1311833 9

## - Cover Page -INORGANIC ANALYSIS DATA PACKAGE

Client: Service Request: K1311278 Geo Test Services

**Project Name:** Project No.:

Sample Name:	Lab Code:
Batch QCD	K1311224-002D
Batch QCS	K1311224-002S
Batch QCSD	K1311224-002SD
Sample 1	K1311278-001
Sample 1D	K1311278-001D
Sample 1S	K1311278-001S
Sample 1-Dup	K1311278-002
Method Blank	K1311278-MB

## Metals - 1 -INORGANIC ANALYSIS DATA PACKAGE

Client: Geo Test Services Service Request: K1311278

Project No.: NA Date Collected: 10/15/13

Project Name: NA Date Received: 10/17/13

Matrix: SEDIMENT Units: mg/Kg

Basis: DRY

Sample Name: Sample 1 Lab Code: K1311278-001

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	С	Q
Arsenic	6010C	3.9	2.0	10/18/13	10/19/13	3.9	U	
Cadmium	6010C	0.2	2.0	10/18/13	10/19/13	0.2	U	
Chromium	6010C	0.8	2.0	10/18/13	10/19/13	29.3		
Copper	6010C	0.8	2.0	10/18/13	10/19/13	17.0		
Lead	6010C	3.9	2.0	10/18/13	10/19/13	3.9	U	
Mercury	7471B	0.02	1.0	10/21/13	10/22/13	0.03		
Silver	6010C	0.8	2.0	10/18/13	10/19/13	0.8	U	
Zinc	6010C	0.98	2.0	10/18/13	10/19/13	32.9		·

% Solids: 94.2

Geo Test Services

Client:

## Metals - 1 -INORGANIC ANALYSIS DATA PACKAGE

Service Request:

Project No.: NA Date Collected: 10/15/13

Project Name: NA Date Received: 10/17/13

Matrix: SEDIMENT Units: mg/Kg

Basis: DRY

K1311278

Sample Name: Sample 1-Dup Lab Code: K1311278-002

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	С	Q
Arsenic	6010C	4.1	2.0	10/18/13	10/19/13	4.1	U	
Cadmium	6010C	0.2	2.0	10/18/13	10/19/13	0.2	U	
Chromium	6010C	0.8	2.0	10/18/13	10/19/13	30.4		
Copper	6010C	0.8	2.0	10/18/13	10/19/13	16.8		
Lead	6010C	4.1	2.0	10/18/13	10/19/13	4.1	U	
Mercury	7471B	0.02	1.0	10/21/13	10/22/13	0.05		
Silver	6010C	0.8	2.0	10/18/13	10/19/13	0.8	U	
Zinc	6010C	1.0	2.0	10/18/13	10/19/13	32.7		·

% Solids: 94.0

## Metals - 1 -INORGANIC ANALYSIS DATA PACKAGE

Client: Geo Test Services Service Request: K1311278

Project No.: NA Date Collected:

Project Name: NA Date Received:

Matrix: SEDIMENT Units: mg/Kg

Basis: DRY

Sample Name: Method Blank Lab Code: K1311278-MB

Analyte	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	С	Q
Arsenic	6010C	4.0	2.0	10/18/13	10/19/13	4.0	U	
Cadmium	6010C	0.2	2.0	10/18/13	10/19/13	0.2	U	
Chromium	6010C	0.8	2.0	10/18/13	10/19/13	0.8	U	
Copper	6010C	0.8	2.0	10/18/13	10/19/13	0.8	U	
Lead	6010C	4.0	2.0	10/18/13	10/19/13	4.0	U	
Mercury	7471B	0.02	1.0	10/21/13	10/22/13	0.02	U	
Silver	6010C	0.8	2.0	10/18/13	10/19/13	0.8	U	
Zinc	6010C	1.0	2.0	10/18/13	10/19/13	1.0	U	·

% Solids: 100.0

- 5A -

## SPIKE SAMPLE RECOVERY

Client: Geo Test Services Ser

Service Request: K1311278

Project No.: NA Units: MG/KG

Project Name: NA Basis: AS REC

Matrix: SEDIMENT

Sample Name: Batch QCS Lab Code: K1311224-002S

Analyte	Control Limit %R	Spike Result C	Sample Result C	Spike Added	Q %R	Method
Mercury	80 - 120	0.30	0.05	0.28	89.3	7471B

- 5A -

## SPIKE SAMPLE RECOVERY

Client: Geo Test Services Service Request: K1311278

Project No.: NA Units: MG/KG

Project Name: NA Basis: AS REC

Matrix: SEDIMENT

Sample Name: Batch QCSD Lab Code: K1311224-002SD

Analyte	Control Limit %R	Spike Result C	Sample Result C	Spike Added	Q %R	Method
Mercury	80 - 120	0.33	0.05	0.28	100.0	7471B

- 5A -

## SPIKE SAMPLE RECOVERY

Client: Geo Test Services Service Request: K1311278

Project No.: NA Units: MG/KG

Project Name: NA Basis: DRY

Matrix: SEDIMENT % solids: 94.2

Sample Name: Sample 1S Lab Code: K1311278-001S

Analyte	Control Limit %R	Spike Result	С	Sample Result	C	Spike Added	%R	Q	Method
Arsenic	75 - 125	98.3		3.9	υ	101.10	97.2		6010C
Cadmium	75 - 125	9.1		0.2	U	10.11	90.0		6010C
Chromium	75 - 125	67.8		29.3		40.44	95.2		6010C
Copper	75 - 125	65.6		17.0		50.55	96.1		6010C
Lead	75 - 125	93.1		3.9	υ	101.10	92.1		6010C
Silver	75 - 125	9.3		0.8	U	10.11	92.0		6010C
Zinc	75 - 125	121		32.9		101.10	87.1		6010C

## - 6 -**DUPLICATES**

Client: Geo Test Services Service Request: K1311278

Project No.: Units: NA MG/KG

Project Name: Basis: NA AS REC

Matrix: SEDIMENT

> Sample Name: Batch QCD Lab Code: K1311224-002D

Analyte	Control Limit	Sample (S)	С	Duplicate (D)	С	RPD	Q	Method
Mercury		0.051		0.025		68.4		7471B

#### Metals

## - 6 -**DUPLICATES**

Client: Geo Test Services Service Request: K1311278

Project No.: Units: NA MG/KG

Project Name: Basis: NA AS REC

Matrix: SEDIMENT

> Sample Name: Batch QCSD Lab Code: K1311224-002SD

Analyte	Control Limit	Sample (S) C	Duplicate (D)	C	RPD	Q	Method
Mercury	20	0.30	0.33		9.5		7471B

dba ALS Environmental

#### Metals

## - 6 -DUPLICATES

Client: Geo Test Services Service Request: K1311278

Project No.: NA Units: MG/KG

Project Name: NA Basis: DRY

Matrix: SEDIMENT % Solids: 94.2

Sample Name: Sample 1D Lab Code: K1311278-001D

Analyte	Control Limit	Sample (S)	С	Duplicate (D)	С	RPD	Q	Method
Arsenic		3.9	Ū	4.0	Ū			6010C
Cadmium		0.20	Ū	0.20	υ			6010C
Chromium	20	29.3		29.2		0.3		6010C
Copper	20	17.0		17.1		0.6		6010C
Lead		3.9	U	4.0	Ū			6010C
Silver		0.8	υ	0.8	υ			6010C
Zinc	20	32.9		32.9		0.0		6010C

# Metals

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#### LABORATORY CONTROL SAMPLE

Geo Test Services Client:

Service Request: K1311278

Project No.:

Project Name: NA

Aqueous LCS Source: Solid LCS Source: ERA D076-540

	Aqueou	ıs (ug/L)			Solid (	mg/kg)	-	
Analyte	True	Found	%R	True	Found	C Lir	mits	%R
Arsenic	İ			94.5	95.3	82	117	100.8
Cadmium				60.5	54.8	83	117	90.6
Chromium				70.4	64.2	82	118	91.2
Copper				79.6	79.5	84	116	99.9
Lead				91.8	84.0	82	118	91.5
Mercury				3.73	3.77	72	128	101.1
Silver				34.4	32.9	66	134	95.6
Zinc				140	125	82	118	89.3

Analytical Results

Client: Geo Test Services

Project:

**Sample Matrix:** 

Geo Test Bervices

Sediment

Service Request: K1311278

**Date Collected:** 10/15/2013 **Date Received:** 10/17/2013

# Polychlorinated Biphenyls (PCBs)

Sample Name:Sample 1Lab Code:K1311278-001

Extraction Method:
Analysis Method:

EPA 3541 8082A Units: mg/Kg Basis: Dry

Level: Low

Analyte Name	Result Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND U	0.069	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1221	ND U	0.14	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1232	ND U	0.069	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1242	ND U	0.069	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1248	ND U	0.069	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1254	ND U	0.069	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1260	ND U	0.069	1	10/22/13	10/24/13	KWG1311883	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	100	43-148	10/24/13	Acceptable

Comments:

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Analytical Results

**Client:** Geo Test Services

**Project: Sample Matrix:** 

Sediment

Service Request: K1311278 **Date Collected:** 10/15/2013

**Date Received:** 10/17/2013

# Polychlorinated Biphenyls (PCBs)

Sample Name: Sample 1-Dup Lab Code: K1311278-002

Level: Low

Units: mg/Kg

Basis: Dry

**Extraction Method:** EPA 3541 **Analysis Method:** 8082A

			Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	Factor	Extracted	Analyzed	Lot	Note
Aroclor 1016	ND U	0.071	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1221	ND U	0.15	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1232	ND U	0.071	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1242	ND U	0.071	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1248	ND U	0.071	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1254	ND U	0.071	1	10/22/13	10/25/13	KWG1311883	
Aroclor 1260	ND U	0.071	1	10/22/13	10/25/13	KWG1311883	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	107	43-148	10/25/13	Acceptable

**Comments:** 

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Analytical Results

Client: Geo Test Services

Project: Sample Matrix:

Sediment

Service Request: K1311278

Date Collected: NA

Date Received: NA

# Polychlorinated Biphenyls (PCBs)

**Sample Name:** Method Blank **Lab Code:** KWG1311883-4

**Extraction Method: Analysis Method:** 

EPA 3541 8082A Units: mg/Kg
Basis: Dry

Level: Low

1 of 1

Page

Analyte Name	Result Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND U	0.050	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1221	ND U	0.099	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1232	ND U	0.050	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1242	ND U	0.050	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1248	ND U	0.050	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1254	ND U	0.050	1	10/22/13	10/24/13	KWG1311883	
Aroclor 1260	ND U	0.050	1	10/22/13	10/24/13	KWG1311883	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note	
Decachlorobiphenyl	81	43-148	10/24/13	Acceptable	

Comments:

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QA/QC Report

**Client:** Geo Test Services Service Request: K1311278

**Project:** 

Sediment **Sample Matrix:** 

> **Surrogate Recovery Summary** Polychlorinated Biphenyls (PCBs)

EPA 3541 Units: Percent **Extraction Method: Analysis Method:** 8082A Level: Low

Sample Name	Lab Code	Sur1
Sample 1	K1311278-001	100
Sample 1-Dup	K1311278-002	107
Method Blank	KWG1311883-4	81
Sample 1MS	KWG1311883-1	70
Sample 1DMS	KWG1311883-2	103
Lab Control Sample	KWG1311883-3	102

**Surrogate Recovery Control Limits (%)** 

Sur1 = Decachlorobiphenyl

43-148

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

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QA/QC Report

**Client:** Geo Test Services

**Project: Sample Matrix:** 

Sediment

Service Request: K1311278 **Date Extracted:** 10/22/2013 **Date Analyzed:** 10/24/2013 -

Units: mg/Kg

Basis: Dry

Level: Low

Extraction Lot: KWG1311883

10/25/2013

Matrix Spike/Duplicate Matrix Spike Summary Polychlorinated Biphenyls (PCBs)

Sample Name: Lab Code:

Sample 1

**Extraction Method:** 

EPA 3541

**Analysis Method:** 8082A

K1311278-001

Sample 1MS KWG1311883-1

Sample 1DMS

KWG1311883-2

**Matrix Spike Duplicate Matrix Spike** 

Analyte Name	Sample Result	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec	%Rec Limits	RPD	RPD Limit
Aroclor 1016	ND	0.444	0.705	63	0.637	0.701	91	23-145	36	40
Aroclor 1260	ND	0.462	0.705	65	0.656	0.701	94	24-148	35	40

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

**Client:** Geo Test Services

**Project:** 

Sediment **Sample Matrix:** 

**Date Extracted:** 10/22/2013

**Date Analyzed:** 10/24/2013

Service Request: K1311278

Lab Control Spike Summary Polychlorinated Biphenyls (PCBs)

**Extraction Method:** EPA 3541 Units: mg/Kg **Analysis Method:** 8082A Basis: Dry

Level: Low

Extraction Lot: KWG1311883

Lab Control Sample KWG1311883-3 Lab Control Spike

		Spike		%Rec
Analyte Name	Result	Amount	%Rec	Limits
Aroclor 1016	0.851	1.00	85	42-122
Aroclor 1260	0.917	1.00	92	50-124

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Analytical Results

**Client:** Geo Test Services

**Project:** 

**Sample Matrix:** 

Sediment

Service Request: K1311278

**Date Collected:** 10/15/2013 **Date Received:** 10/17/2013

Units: ug/Kg

Basis: Dry

Level: Low

#### Semi-Volatile Organic Compounds by GC/MS

Sample Name: Sample 1 Lab Code: K1311278-001

**Extraction Method: Analysis Method:** 

EPA 3541

8270D

Analyte Name	Result	0	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	ND		27	3.1	1	10/18/13	10/23/13	KWG1311570	11010
1,4-Dichlorobenzene	ND ND		9.0	2.5	1	10/18/13	10/23/13	KWG1311570	
1,2-Dichlorobenzene	ND		9.0	2.4	1	10/18/13	10/23/13	KWG1311570	
Benzyl Alcohol	ND		18	4.9	1	10/18/13	10/23/13	KWG1311570	
2-Methylphenol	ND		9.0	4.1	1	10/18/13	10/23/13	KWG1311570	
4-Methylphenol†	6.2		9.0	4.5	1	10/18/13	10/23/13	KWG1311570	
2,4-Dimethylphenol	ND		45	6.3	1	10/18/13	10/23/13	KWG1311570	
Benzoic Acid	ND		400	96	1	10/18/13	10/23/13	KWG1311570	*
1,2,4-Trichlorobenzene	ND		9.0	2.6	1	10/18/13	10/23/13	KWG1311570	
Naphthalene	ND		9.0	2.9	1	10/18/13	10/23/13	KWG1311570	
Hexachlorobutadiene	ND		9.0	3.0	1	10/18/13	10/23/13	KWG1311570	
2-Methylnaphthalene	ND		9.0	2.8	1	10/18/13	10/23/13	KWG1311570	
Acenaphthylene	ND		9.0	2.6	1	10/18/13	10/23/13	KWG1311570	
Dimethyl Phthalate	ND		9.0	4.0	1	10/18/13	10/23/13	KWG1311570	
Acenaphthene	8.1		9.0	3.2	1	10/18/13	10/23/13	KWG1311570	
Dibenzofuran	4.6	J	9.0	3.4	1	10/18/13	10/23/13	KWG1311570	
Fluorene	6.6		9.0	3.3	1	10/18/13	10/23/13	KWG1311570	
Diethyl Phthalate	ND		9.0	3.7	1	10/18/13	10/23/13	KWG1311570	
N-Nitrosodiphenylamine	ND	U	9.0	3.2	1	10/18/13	10/23/13	KWG1311570	
Hexachlorobenzene	ND		9.0	3.3	1	10/18/13	10/23/13	KWG1311570	
Pentachlorophenol	ND	U	90	5.3	1	10/18/13	10/23/13	KWG1311570	
Phenanthrene	42		9.0	3.6	1	10/18/13	10/23/13	KWG1311570	
Anthracene	6.5	J	9.0	3.2	1	10/18/13	10/23/13	KWG1311570	
Di-n-butyl Phthalate	5.5	J	18	4.8	1	10/18/13	10/23/13	KWG1311570	
Fluoranthene	43		9.0	3.7	1	10/18/13	10/23/13	KWG1311570	
Pyrene	31		9.0	3.7	1	10/18/13	10/23/13	KWG1311570	
Butyl Benzyl Phthalate	ND	Ui	33	33	1	10/18/13	10/23/13	KWG1311570	
Benz(a)anthracene	6.2	J	9.0	3.6	1	10/18/13	10/23/13	KWG1311570	
Chrysene	8.9	J	9.0	4.1	1	10/18/13	10/23/13	KWG1311570	
Bis(2-ethylhexyl) Phthalate	65	J	90	8.9	1	10/18/13	10/23/13	KWG1311570	
Di-n-octyl Phthalate	ND	U	9.0	3.2	1	10/18/13	10/23/13	KWG1311570	
Benzo(b)fluoranthene	6.8	J	9.0	3.4	1	10/18/13	10/23/13	KWG1311570	
Benzo(k)fluoranthene	ND	U	9.0	4.0	1	10/18/13	10/23/13	KWG1311570	

**Comments:** 

**REVISED** 5:20 pm, Nov 01, 2013

Analytical Results

Client: Geo Test Services

Project:

Sample Matrix:

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Sediment

Service Request: K1311278

**Date Collected:** 10/15/2013 **Date Received:** 10/17/2013

#### Semi-Volatile Organic Compounds by GC/MS

Sample Name: Sample 1 Lab Code: K1311278-001 Units: ug/Kg
Basis: Dry

Level: Low

**Extraction Method:** EPA 3541 **Analysis Method:** 8270D

				Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Benzo(a)pyrene	ND Ui	9.0	7.5	1	10/18/13	10/23/13	KWG1311570	
Indeno(1,2,3-cd)pyrene	ND U	9.0	3.2	1	10/18/13	10/23/13	KWG1311570	
Dibenz(a,h)anthracene	ND U	9.0	3.0	1	10/18/13	10/23/13	KWG1311570	
Benzo(g,h,i)perylene	ND U	9.0	3.7	1	10/18/13	10/23/13	KWG1311570	

<sup>\*</sup> See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note	
Phenol-d6	35	20-86	10/23/13	Acceptable	
Nitrobenzene-d5	40	27-91	10/23/13	Acceptable	
2-Fluorobiphenyl	43	25-97	10/23/13	Acceptable	
2,4,6-Tribromophenol	57	10-119	10/23/13	Acceptable	
Terphenyl-d14	54	33-129	10/23/13	Acceptable	

#### † Analyte Comments

4-Methylphenol

This analyte cannot be separated from 3-Methylphenol.

Comments:

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 SuperSet Reference:
 RR161738

Analytical Results

Client: Geo Test Services

Project:

**Sample Matrix:** 

Sediment

Service Request: K1311278

**Date Collected:** 10/15/2013 **Date Received:** 10/17/2013

## Semi-Volatile Organic Compounds by GC/MS

Sample Name:Sample 1-DupLab Code:K1311278-002

**Extraction Method:** EPA 3541 **Analysis Method:** 8270D

Basis: Dry
Level: Low

Units: ug/Kg

1,4-Dichlorobenzene         ND U         9.0         2.5         1         10/18/13         10/23/13           1,2-Dichlorobenzene         ND U         9.0         2.4         1         10/18/13         10/23/13           Benzyl Alcohol         ND U         18         4.9         1         10/18/13         10/23/13           2-Methylphenol         ND U         9.0         4.1         1         10/18/13         10/23/13           4-Methylphenol†         ND U         9.0         4.5         1         10/18/13         10/23/13           2,4-Dimethylphenol         ND U         45         6.3         1         10/18/13         10/23/13           Benzoic Acid         ND U         400         96         1         10/18/13         10/23/13           1,2,4-Trichlorobenzene         ND U         9.0         2.6         1         10/18/13         10/23/13           Naphthalene         ND U         9.0         2.9         1         10/18/13         10/23/13           Hexachlorobutadiene         ND U         9.0         2.8         1         10/18/13         10/23/13           2-Methylnaphthalene         ND U         9.0         2.8         1         10/18/13         <	KWG1311570 KWG1311570 KWG1311570 KWG1311570 KWG1311570 KWG1311570	0/23/13 0/23/13		1	2.4				Analyte Name
1,2-Dichlorobenzene         ND U         9.0         2.4         1         10/18/13         10/23/13           Benzyl Alcohol         ND U         18         4.9         1         10/18/13         10/23/13           2-Methylphenol         ND U         9.0         4.1         1         10/18/13         10/23/13           4-Methylphenol†         ND U         9.0         4.5         1         10/18/13         10/23/13           2,4-Dimethylphenol         ND U         45         6.3         1         10/18/13         10/23/13           Benzoic Acid         ND U         400         96         1         10/18/13         10/23/13           1,2,4-Trichlorobenzene         ND U         9.0         2.6         1         10/18/13         10/23/13           Naphthalene         ND U         9.0         2.9         1         10/18/13         10/23/13           Hexachlorobutadiene         ND U         9.0         3.0         1         10/18/13         10/23/13           2-Methylnaphthalene         ND U         9.0         2.8         1         10/18/13         10/23/13	KWG1311570 KWG1311570 KWG1311570 KWG1311570	0/23/13	10/18/13		3.1	27	U	ND	Phenol
Benzyl Alcohol         ND U         18         4.9         1         10/18/13         10/23/13           2-Methylphenol         ND U         9.0         4.1         1         10/18/13         10/23/13           4-Methylphenol†         ND U         9.0         4.5         1         10/18/13         10/23/13           2,4-Dimethylphenol         ND U         45         6.3         1         10/18/13         10/23/13           Benzoic Acid         ND U         400         96         1         10/18/13         10/23/13           1,2,4-Trichlorobenzene         ND U         9.0         2.6         1         10/18/13         10/23/13           Naphthalene         ND U         9.0         2.9         1         10/18/13         10/23/13           Hexachlorobutadiene         ND U         9.0         3.0         1         10/18/13         10/23/13           2-Methylnaphthalene         ND U         9.0         2.8         1         10/18/13         10/23/13	KWG1311570 KWG1311570 KWG1311570		10/10/15	1	2.5	9.0	U	ND	1,4-Dichlorobenzene
2-Methylphenol         ND U         9.0         4.1         1         10/18/13         10/23/13           4-Methylphenol†         ND U         9.0         4.5         1         10/18/13         10/23/13           2,4-Dimethylphenol         ND U         45         6.3         1         10/18/13         10/23/13           Benzoic Acid         ND U         400         96         1         10/18/13         10/23/13           1,2,4-Trichlorobenzene         ND U         9.0         2.6         1         10/18/13         10/23/13           Naphthalene         ND U         9.0         2.9         1         10/18/13         10/23/13           Hexachlorobutadiene         ND U         9.0         3.0         1         10/18/13         10/23/13           2-Methylnaphthalene         ND U         9.0         2.8         1         10/18/13         10/23/13	KWG1311570 KWG1311570	0/23/13	10/18/13	1	2.4	9.0	U	ND	1,2-Dichlorobenzene
4-Methylphenol†         ND U         9.0         4.5         1         10/18/13         10/23/13           2,4-Dimethylphenol         ND U         45         6.3         1         10/18/13         10/23/13           Benzoic Acid         ND U         400         96         1         10/18/13         10/23/13           1,2,4-Trichlorobenzene         ND U         9.0         2.6         1         10/18/13         10/23/13           Naphthalene         ND U         9.0         2.9         1         10/18/13         10/23/13           Hexachlorobutadiene         ND U         9.0         3.0         1         10/18/13         10/23/13           2-Methylnaphthalene         ND U         9.0         2.8         1         10/18/13         10/23/13	KWG1311570	0/25/15	10/18/13	1	4.9	18	U	ND	Benzyl Alcohol
2,4-Dimethylphenol       ND U       45       6.3       1       10/18/13       10/23/13         Benzoic Acid       ND U       400       96       1       10/18/13       10/23/13         1,2,4-Trichlorobenzene       ND U       9.0       2.6       1       10/18/13       10/23/13         Naphthalene       ND U       9.0       2.9       1       10/18/13       10/23/13         Hexachlorobutadiene       ND U       9.0       3.0       1       10/18/13       10/23/13         2-Methylnaphthalene       ND U       9.0       2.8       1       10/18/13       10/23/13		0/23/13	10/18/13	1	4.1	9.0	U	ND	2-Methylphenol
Benzoic Acid         ND U         400         96         1         10/18/13         10/23/13           1,2,4-Trichlorobenzene         ND U         9.0         2.6         1         10/18/13         10/23/13           Naphthalene         ND U         9.0         2.9         1         10/18/13         10/23/13           Hexachlorobutadiene         ND U         9.0         3.0         1         10/18/13         10/23/13           2-Methylnaphthalene         ND U         9.0         2.8         1         10/18/13         10/23/13	KWG1311570	0/23/13	10/18/13	1	4.5	9.0	U	ND	4-Methylphenol†
1,2,4-Trichlorobenzene         ND U         9.0         2.6         1         10/18/13         10/23/13           Naphthalene         ND U         9.0         2.9         1         10/18/13         10/23/13           Hexachlorobutadiene         ND U         9.0         3.0         1         10/18/13         10/23/13           2-Methylnaphthalene         ND U         9.0         2.8         1         10/18/13         10/23/13		0/23/13	10/18/13	1	6.3	45	U	ND	2,4-Dimethylphenol
Naphthalene         ND U         9.0         2.9         1         10/18/13         10/23/13           Hexachlorobutadiene         ND U         9.0         3.0         1         10/18/13         10/23/13           2-Methylnaphthalene         ND U         9.0         2.8         1         10/18/13         10/23/13	KWG1311570 *	0/23/13	10/18/13	1	96	400	U	ND	Benzoic Acid
Hexachlorobutadiene         ND U         9.0         3.0         1         10/18/13         10/23/13           2-Methylnaphthalene         ND U         9.0         2.8         1         10/18/13         10/23/13	KWG1311570	0/23/13	10/18/13	1	2.6	9.0	U	ND	1,2,4-Trichlorobenzene
2-Methylnaphthalene ND U 9.0 2.8 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	2.9	9.0	U	ND	Naphthalene
2.101.131.1101.121.121.121.121.121.121.121.121.1	KWG1311570	0/23/13	10/18/13	1	3.0	9.0	U	ND	Hexachlorobutadiene
Acenaphthylene ND U 9.0 2.6 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	2.8	9.0	U	ND	2-Methylnaphthalene
	KWG1311570	0/23/13	10/18/13	1	2.6	9.0	U	ND	Acenaphthylene
Dimethyl Phthalate ND U 9.0 4.0 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	4.0	9.0	U	ND	Dimethyl Phthalate
Acenaphthene 7.4 J 9.0 3.2 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	3.2	9.0	<b>1</b> J	7.4	Acenaphthene
Dibenzofuran 4.5 J 9.0 3.4 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	3.4	9.0	5 J	4.5	Dibenzofuran
Fluorene <b>6.8</b> J 9.0 3.3 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	3.3	9.0	<b>3</b> J	6.8	Fluorene
Diethyl Phthalate ND U 9.0 3.7 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	3.7	9.0	U	ND	Diethyl Phthalate
N-Nitrosodiphenylamine ND U 9.0 3.2 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	3.2	9.0	U	ND	N-Nitrosodiphenylamine
Hexachlorobenzene ND U 9.0 3.3 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	3.3	9.0	U	ND	Hexachlorobenzene
Pentachlorophenol ND U 90 5.3 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	5.3	90	U	ND	Pentachlorophenol
Phenanthrene 40 9.0 3.6 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	3.6	9.0	)	40	Phenanthrene
Anthracene 7.5 J 9.0 3.2 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	3.2	9.0	5 J	7.5	Anthracene
Di-n-butyl Phthalate 5.1 J 18 4.8 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	4.8	18	l J	5.1	Di-n-butyl Phthalate
Fluoranthene 45 9.0 3.7 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	3.7	9.0	5	45	Fluoranthene
Pyrene 37 9.0 3.7 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	3.7	9.0	7	37	Pyrene
Butyl Benzyl Phthalate ND Ui 23 23 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	23	23	) Ui	ND	Butyl Benzyl Phthalate
Benz(a)anthracene <b>9.4</b> 9.0 3.6 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	3.6	9.0	1	9.4	Benz(a)anthracene
Chrysene 12 9.0 4.1 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	4.1	9.0	2	12	Chrysene
Bis(2-ethylhexyl) Phthalate <b>120</b> 90 8.9 1 10/18/13 10/23/13	KWG1311570	0/23/13	10/18/13	1	8.9	90	)	120	Bis(2-ethylhexyl) Phthalate
The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s		0/00/40	10/18/13	1	3.2	9.0	U	ND	•
	KWG1311570	0/23/13					_		
Benzo(k)fluoranthene 5.4 J 9.0 4.0 1 10/18/13 10/23/13	KWG1311570	0/23/13		1			,	16	* *

**Comments:** 

**REVISED** 5:20 pm, Nov 01, 2013

Analytical Results

**Client:** Geo Test Services

**Project:** 

Sample Matrix:

Sediment

Service Request: K1311278 **Date Collected:** 10/15/2013

**Date Received:** 10/17/2013

#### Semi-Volatile Organic Compounds by GC/MS

Sample Name: Sample 1-Dup Lab Code: K1311278-002 **Extraction Method:** EPA 3541

Units: ug/Kg Basis: Dry

Level: Low

**Analysis Method:** 

8270D

				Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Benzo(a)pyrene	ND Ui	16	16	1	10/18/13	10/23/13	KWG1311570	
Indeno(1,2,3-cd)pyrene	<b>8.0</b> J	9.0	3.2	1	10/18/13	10/23/13	KWG1311570	
Dibenz(a,h)anthracene	ND U	9.0	3.0	1	10/18/13	10/23/13	KWG1311570	
Benzo(g,h,i)perylene	8.5 J	9.0	3.7	1	10/18/13	10/23/13	KWG1311570	

<sup>\*</sup> See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	29	20-86	10/23/13	Acceptable
Nitrobenzene-d5	35	27-91	10/23/13	Acceptable
2-Fluorobiphenyl	43	25-97	10/23/13	Acceptable
2,4,6-Tribromophenol	43	10-119	10/23/13	Acceptable
Terphenyl-d14	54	33-129	10/23/13	Acceptable

#### † Analyte Comments

4-Methylphenol

This analyte cannot be separated from 3-Methylphenol.

**Comments:** 

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**Analytical Results** 

Client: Geo Test Services

**Project:** 

**Sample Matrix:** 

Sediment

Service Request: K1311278

Date Collected: NA
Date Received: NA

#### Semi-Volatile Organic Compounds by GC/MS

**Sample Name:** Method Blank **Lab Code:** KWG1311570-5

**Extraction Method:** EPA 3541 **Analysis Method:** 8270D

Units: ug/Kg Basis: Dry

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Phenol	ND	U	26	3.1	1	10/18/13	10/23/13	KWG1311570	
1,4-Dichlorobenzene	ND	U	8.5	2.5	1	10/18/13	10/23/13	KWG1311570	
1,2-Dichlorobenzene	ND	U	8.5	2.4	1	10/18/13	10/23/13	KWG1311570	
Benzyl Alcohol	ND	U	17	4.9	1	10/18/13	10/23/13	KWG1311570	
2-Methylphenol	ND	U	8.5	4.1	1	10/18/13	10/23/13	KWG1311570	
4-Methylphenol†	ND	U	8.5	4.5	1	10/18/13	10/23/13	KWG1311570	
2,4-Dimethylphenol	ND	U	43	6.3	1	10/18/13	10/23/13	KWG1311570	
Benzoic Acid	ND	U	400	96	1	10/18/13	10/23/13	KWG1311570	*
1,2,4-Trichlorobenzene	ND	U	8.5	2.6	1	10/18/13	10/23/13	KWG1311570	
Naphthalene	ND	U	8.5	2.9	1	10/18/13	10/23/13	KWG1311570	
Hexachlorobutadiene	ND	U	8.5	3.0	1	10/18/13	10/23/13	KWG1311570	
2-Methylnaphthalene	ND	U	8.5	2.8	1	10/18/13	10/23/13	KWG1311570	
Acenaphthylene	ND	U	8.5	2.6	1	10/18/13	10/23/13	KWG1311570	
Dimethyl Phthalate	ND	U	8.5	4.0	1	10/18/13	10/23/13	KWG1311570	
Acenaphthene	ND	U	8.5	3.2	1	10/18/13	10/23/13	KWG1311570	
Dibenzofuran	ND	U	8.5	3.4	1	10/18/13	10/23/13	KWG1311570	
Fluorene	ND	U	8.5	3.3	1	10/18/13	10/23/13	KWG1311570	
Diethyl Phthalate	ND	U	8.5	3.7	1	10/18/13	10/23/13	KWG1311570	
N-Nitrosodiphenylamine	ND	U	8.5	3.2	1	10/18/13	10/23/13	KWG1311570	
Hexachlorobenzene	ND	U	8.5	3.3	1	10/18/13	10/23/13	KWG1311570	
Pentachlorophenol	ND	U	85	5.3	1	10/18/13	10/23/13	KWG1311570	
Phenanthrene	ND	U	8.5	3.6	1	10/18/13	10/23/13	KWG1311570	
Anthracene	ND	U	8.5	3.2	1	10/18/13	10/23/13	KWG1311570	
Di-n-butyl Phthalate	ND	U	17	4.8	1	10/18/13	10/23/13	KWG1311570	
Fluoranthene	ND	U	8.5	3.7	1	10/18/13	10/23/13	KWG1311570	
Pyrene	ND	U	8.5	3.7	1	10/18/13	10/23/13	KWG1311570	
Butyl Benzyl Phthalate	ND	U	8.5	3.7	1	10/18/13	10/23/13	KWG1311570	
Benz(a)anthracene	ND	U	8.5	3.6	1	10/18/13	10/23/13	KWG1311570	
Chrysene	ND	U	8.5	4.1	1	10/18/13	10/23/13	KWG1311570	
Bis(2-ethylhexyl) Phthalate	ND	U	85	8.9	1	10/18/13	10/23/13	KWG1311570	
Di-n-octyl Phthalate	ND	U	8.5	3.2	1	10/18/13	10/23/13	KWG1311570	
Benzo(b)fluoranthene	ND	U	8.5	3.4	1	10/18/13	10/23/13	KWG1311570	
Benzo(k)fluoranthene	ND	U	8.5	4.0	1	10/18/13	10/23/13	KWG1311570	

**Comments:** 

**REVISED** 5:20 pm, Nov 01, 2013

Analytical Results

Client: Geo Test Services

**Project:** 

**Sample Matrix:** 

Sediment

Service Request: K1311278

Date Collected: NA Date Received: NA

## Semi-Volatile Organic Compounds by GC/MS

Sample Name: Method Blank Lab Code: KWG1311570-5 Units: ug/Kg Basis: Dry

Level: Low

**Extraction Method: Analysis Method:** 

EPA 3541 8270D

				Dilution	Date	Date	Extraction	
Analyte Name	Result Q	MRL	MDL	Factor	Extracted	Analyzed	Lot	Note
Benzo(a)pyrene	ND U	8.5	3.6	1	10/18/13	10/23/13	KWG1311570	
Indeno(1,2,3-cd)pyrene	ND U	8.5	3.2	1	10/18/13	10/23/13	KWG1311570	
Dibenz(a,h)anthracene	ND U	8.5	3.0	1	10/18/13	10/23/13	KWG1311570	
Benzo(g,h,i)perylene	ND U	8.5	3.7	1	10/18/13	10/23/13	KWG1311570	

<sup>\*</sup> See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Phenol-d6	44	20-86	10/23/13	Acceptable
Nitrobenzene-d5	48	27-91	10/23/13	Acceptable
2-Fluorobiphenyl	51	25-97	10/23/13	Acceptable
2,4,6-Tribromophenol	53	10-119	10/23/13	Acceptable
Terphenyl-d14	69	33-129	10/23/13	Acceptable

#### † Analyte Comments

4-Methylphenol

This analyte cannot be separated from 3-Methylphenol.

**Comments:** 

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QA/QC Report

Client: Geo Test Services Service Request: K1311278

**Project:** 

Sample Matrix: Sediment

# Surrogate Recovery Summary Semi-Volatile Organic Compounds by GC/MS

Extraction Method:EPA 3541Units:PercentAnalysis Method:8270DLevel:Low

Sample Name	Lab Code	Sur1	Sur2	Sur3	Sur4	Sur5
Sample 1	K1311278-001	35	40	43	57	54
Sample 1-Dup	K1311278-002	29	35	43	43	54
Method Blank	KWG1311570-5	44	48	51	53	69
Sample 1MS	KWG1311570-1	40	47	45	61	59
Sample 1DMS	KWG1311570-2	37	46	45	47	46
Lab Control Sample	KWG1311570-3	44	47	44	46	55
Duplicate Lab Control Sample	KWG1311570-4	40	46	46	50	52

## Surrogate Recovery Control Limits (%)

Sur1 = Phenol-d6	20-86	Sur5 = Terphenyl-d14	33-129
Sur2 = Nitrobenzene-d5	27-91		
Sur3 = 2-Fluorobiphenyl	25-97		
Sur4 = 2,4,6-Tribromophenol	10-119		

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

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SuperSet Reference:

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QA/QC Report

**Client:** Geo Test Services

**Project:** 

**Sample Matrix:** 

Sediment

Service Request: K1311278 **Date Extracted:** 10/18/2013 **Date Analyzed:** 10/23/2013

Matrix Spike/Duplicate Matrix Spike Summary Semi-Volatile Organic Compounds by GC/MS

Sample Name: Lab Code:

Sample 1

K1311278-001

**Extraction Method: Analysis Method:** 

EPA 3541 8270D

Units: ug/Kg

Basis: Dry

Level: Low

Extraction Lot: KWG1311570

Sample 1MS KWG1311570-1 Matrix Spike

Sample 1DMS KWG1311570-2

**Duplicate Matrix Spike** 

Analyte Name	Sample Result	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec	%Rec Limits	RPD	RPD Limit
Phenol	ND	106	224	47	103	224	46	15-98	3	40
1,4-Dichlorobenzene	ND	100	224	45	105	224	47	19-93	5	40
1,2,4-Trichlorobenzene	ND	103	224	46	108	224	48	23-99	4	40
Acenaphthene	8.1	119	224	50	123	224	51	10-132	3	40
Diethyl Phthalate	ND	112	224	50	110	224	49	10-135	1	40
Pentachlorophenol	ND	133	224	60	116	224	52	10-123	14	40
Pyrene	31	210	224	80	201	224	76	17-129	4	40
Benzo(a)pyrene	ND	149	224	67	158	224	70	13-126	5	40

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client: Geo Test Services

Project:

**Sample Matrix:** 

Sediment

Service Request: K1311278

**Date Extracted:** 10/18/2013 **Date Analyzed:** 10/23/2013

## Lab Control Spike/Duplicate Lab Control Spike Summary Semi-Volatile Organic Compounds by GC/MS

**Extraction Method:** EPA 3541 **Analysis Method:** 8270D

Units: ug/Kg Basis: Dry

Level: Low Extraction Lot: KWG1311570

Lab Control Sample KWG1311570-3 Lab Control Spike Duplicate Lab Control Sample KWG1311570-4 Duplicate Lab Control Spike

Analyte Name	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec	%Rec Limits	RPD	RPD Limit
Phenol	128	250	51	130	250	52	27-97	2	40
1,4-Dichlorobenzene	126	250	50	149	250	60	28-89	17	40
1,2-Dichlorobenzene	126	250	51	139	250	55	27-91	9	40
Benzyl Alcohol	96.1	250	38	117	250	47	25-103	19	40
2-Methylphenol	106	250	42	143	250	57	18-95	30	40
4-Methylphenol	112	250	45	132	250	53	17-99	16	40
2,4-Dimethylphenol	363	750	48	390	750	52	10-93	7	40
Benzoic Acid	ND	750	0 *	ND	750	0 *	10-96	NC	40
1,2,4-Trichlorobenzene	126	250	50	132	250	53	27-94	4	40
Naphthalene	132	250	53	135	250	54	27-93	2	40
Hexachlorobutadiene	124	250	49	127	250	51	25-96	3	40
2-Methylnaphthalene	130	250	52	146	250	58	27-96	12	40
Acenaphthylene	136	250	55	155	250	62	33-99	13	40
Dimethyl Phthalate	138	250	55	147	250	59	39-100	6	40
Acenaphthene	132	250	53	145	250	58	32-91	10	40
Dibenzofuran	144	250	58	150	250	60	34-92	4	40
Fluorene	165	250	66	150	250	60	32-96	10	40
Diethyl Phthalate	154	250	62	151	250	60	41-100	2	40
N-Nitrosodiphenylamine	139	250	56	136	250	55	36-96	2	40
Hexachlorobenzene	133	250	53	166	250	66	40-99	22	40
Pentachlorophenol	114	250	46	136	250	54	21-97	18	40
Phenanthrene	147	250	59	159	250	64	39-98	8	40
Anthracene	149	250	59	162	250	65	40-98	8	40
Di-n-butyl Phthalate	148	250	59	186	250	75	42-109	23	40
Fluoranthene	142	250	57	179	250	71	42-104	23	40
Pyrene	163	250	65	170	250	68	45-106	4	40
Butyl Benzyl Phthalate	167	250	67	170	250	68	45-111	1	40
Benz(a)anthracene	156	250	63	166	250	66	44-108	6	40
Chrysene	167	250	67	176	250	70	46-108	5	40
Bis(2-ethylhexyl) Phthalate	160	250	64	179	250	71	47-110	11	40
Di-n-octyl Phthalate	167	250	67	179	250	71	45-109	7	40
Benzo(b)fluoranthene	159	250	64	169	250	68	46-106	6	40
Benzo(k)fluoranthene	158	250	63	173	250	69	47-107	9	40
Benzo(a)pyrene	158	250	63	171	250	68	42-110	8	40
Indeno(1,2,3-cd)pyrene	165	250	66	173	250	69	47-109	5	40

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client: Geo Test Services

**Project:** 

**Sample Matrix:** 

Sediment

Service Request: K1311278

**Date Extracted:** 10/18/2013

**Date Analyzed:** 10/23/2013

Lab Control Spike/Duplicate Lab Control Spike Summary Semi-Volatile Organic Compounds by GC/MS

Extraction Method:
Analysis Method:

EPA 3541

8270D

Units: ug/Kg

Basis: Dry

Level: Low Extraction Lot: KWG1311570

Lab Control Sample KWG1311570-3

Lab Control Spike

Duplicate Lab Control Sample KWG1311570-4

**Duplicate Lab Control Spike** 

	Spike			Spike			%Rec		RPD
Analyte Name	Result	Amount	%Rec	Result	Amount	%Rec	Limits	RPD	Limit
Dibenz(a,h)anthracene	161	250	64	174	250	70	47-106	8	40
Benzo(g,h,i)perylene	151	250	61	165	250	66	44-108	9	40

Results flagged with an asterisk  $(\mbox{\ensuremath{}^{*}})$  indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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