DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 377TH AIR BASE WING (AFGSC)

Colonel Eric H. Froehlich
377 ABW/CC
2000 Wyoming Blvd SE
Kirtland AFB NM 87117-5600

DEC 13 2015

Ms. Kathryn Roberts
Director, Resource Protection Division
New Mexico Environment Department
Office of the Secretary
PO Box 5469
Santa Fe, NM 87502-5469

Ms. Michelle Hunter
Chief, Groundwater Quality Bureau
New Mexico Environment Department
1190 Saint Francis Drive
PO Box 5469
Santa Fe, NM 87502-5469

Dear Ms. Roberts and Ms. Hunter

Per Kirtland Air Force Base (KAFB) *Hazardous Waste Treatment Facility Operating Permit, EPA ID No. NM9570024423 §1.27* and *Discharge Permit DP-1770, Kirtland Air Force Base Bulk Fuels Facility Ethylene Dibromide Remediation, §IV(C) (17), Contingency Plan*, KAFB is submitting a written report, titled, "CORRECTIVE ACTION REPORT FOR UNAUTHORIZED DISCHARGE AT THE FULK FUEL FACILITY TEMPORARY GROUNDWATER TREATMENT FACILITY, KIRTLAND AFB, NM". The report provides details about the findings of the unauthorized discharge that occurred on KAFB between 1600 on 12 November and 0900 13 November 2015.

If you have questions or concerns, please do not hesitate to contact Mr. Wayne Bitner at 505-853-3484 or at ludie.bitner@us.af.mil or Ms. Victoria Branson at 505-846-6362 or at victoria.branson@us.af.mil.

Sincerely,

ERIC H. FROEHLICH, Colonel, USAF
Commander

cc:
Kieling, NMED HWB
Huddleson, NMED GWQB
McQuillen & Agnew, NMED

KAFB4361

KIRTLAND AIR FORCE BASE
ALBUQUERQUE, NEW MEXICO

Corrective Action Report for Unauthorized Discharge at the Bulk Fuel Facility Temporary Groundwater Treatment Facility, Kirtland Air Force Base, NM

Bulk Fuels Facility
Solid Waste Management Unit ST-106/SS-111

December 2015

377 MSG/CEANR
2050 Wyoming Blvd. SE
Kirtland AFB, New Mexico 87117-5270

KIRTLAND AIR FORCE BASE
ALBUQUERQUE, NEW MEXICO

CORRECTIVE ACTION REPORT FOR UNAUTHORIZED DISCHARGE AT THE BULK FUEL FACILITY TEMPORARY GROUNDWATER TREATMENT FACILITY, KIRTLAND AIR FORCE BASE, NM

BULK FUELS FACILITY
SOLID WASTE MANAGEMENT UNIT ST-106/SS-111

December 2015

Prepared for
U.S. Army Corps of Engineers
Albuquerque District
4101 Jefferson Plaza NE
Albuquerque, New Mexico 87109

USACE Contract No. W912DY-10-D-0014
Delivery Order 0002

Prepared by
CB&I Federal Services LLC
2440 Louisiana Blvd. NE, Suite 300
Albuquerque, New Mexico 87110

40 CFR 270.11
DOCUMENT CERTIFICATION
DECEMBER 2015

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

ERIC H. FROEHLICH, Colonel, USAF
Commander, 377th Air Base Wing

This document has been approved for public release.

KIRTLAND AIR FORCE BASE
377th Air Base Wing Public Affairs

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ACRONYMS AND ABBREVIATIONS

BFF	Bulk Fuel Facility
DoD	U.S. Department of Defense
DRO	diesel range organics
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency
GCAL	Gulf Coast Analytical Laboratories
LOQ	Limit of Quantitation
TTS	Temporary Groundwater Treatment Facility

1. BACKGROUND INFORMATION

Facility Owner

Eric H. Froehlich, Colonel, USAF 377 ABW/CC
2000 Wyoming Blvd SE
Kirtland AFB NM 87117-5600

Facility Operator

Mike Amdurer, Project Manager; Jason Tarbert, Task Manager; and Kellie Russell and Jared Stoffel, Operators CB&I Inc.
2400 Louisiana Blvd NE
Albuquerque, NM 87110
Phone: (505) 262-8800

Facility

Bulk Fuel Facility (BFF) Temporary Groundwater Treatment Facility (TTS), Kirtland Air Force Base, NM

2. DESCRIPTION OF THE DISCHARGE

Unauthorized Discharge Specifics

The unauthorized discharge occurred overnight between Thursday November 12, 2015 and Friday November 13, 2015 and was discovered at approximately 0900 on Friday November 13, 2015. The discharge occurred at the TTS, which is located on Kirtland Air Force Base in the Zia Park area, east of Louisiana and north of Ridgecrest (Figure 1). The duration of the discharge was less than or equal to 17 hours, occurring at some point between the last inspection at 1600 November 12 and the first inspection at 0900 November 13, 2015. The most recent chemical analysis of the untreated water, from a sample collected on October 15, 2015, showed an EDB concentration of 0.078J µg/L (a J qualifier means the result is estimated, with the concentration less than the Limit of Quantitation (LOQ). All other reportable contaminants (benzene, iron, manganese, toluene and total xylenes) were non-detect.

Source and Cause of Unauthorized Discharge

A sump pump and hose are used to pump rainwater from the secondary containment liner of the TTS into one of the influent tanks for treatment prior to discharge. The hose for the sump pump was left in an influent tank below the water surface overnight. This tank contained untreated groundwater from extraction well KAFB-106228. The untreated water siphoned back through the hose and sump pump into the secondary containment. Some untreated water then leaked through a dime-sized hole in the secondary containment liner and infiltrated into the surface soil. The water flowed along a drainage path northward, to a point outside the TTS fencing, within Zia Park. It infiltrated in an approximate 15 foot by 11 foot area just beyond the TTS fence line, and some flowed approximately 20 feet eastward along a narrow drainage path (Figure 2).

Volume of Unauthorized Discharge

An estimated 50 to 200 gallons of untreated groundwater was discharged from the secondary containment of the TTS. This estimate is based on a 200 square foot area of the discharge outside the secondary containment, 3 to 12 inch depth of wet or moist soil, 27% soil porosity, and an assumed 25% to 50% saturation.

Based on the depth and area of the water within the secondary containment, plus the volume that escaped the secondary containment, it is estimated that a total of approximately 500 gallons of water had been siphoned out of Tank 5.

3. ACTIONS TAKEN TO MITIGATE DAMAGE FROM THE UNAUTHORIZED DISCHARGE

USACE arrived on site onNovember 13, 2015 and gave direction to the CB&I team to measure the footprint of the release, excavate impacted soil and containerize it. The following actions were performed:

1. All water remaining in the secondary containment was immediately pumped back into an influent tank
2. The hole in the secondary containment was patched, and the entire liner was examined to identify any other holes or potentially weak areas, and patches applied to any suspect areas
3. Based on the extent of wet or moist soil, the footprint of the discharge area was identified and flagged. Since it had not rained recently, it was assumed that any moisture in surface soil represented the discharged water.
4. Two discrete surface soil samples were collected from the discharge area footprint
5. The wet or moist soil within the flagged discharge area footprint was excavated to a depth of 6 to 12 inches. The excavation was performed using a rubber-tired backhoe in 6 inch lifts, with the need for additional lifts determined by the presence of wet or moist soil at the bottom of the excavation; where dry soil was encountered the excavation did not go deeper.
6. Two discrete confirmation samples were collected from the bottom of the excavated area
7. The excavated soil was containerized in a lined roll-off bin which was labeled appropriately, with disposal to be determined based on analytical results
8. The open excavation and roll-off bin were covered with plastic for weather protection
9. An influent tank water sample was collected to validate the concentration of EDB in the groundwater that had been discharged into the secondary containment, and
10. All samples were sent to a U.S. Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP)-certified laboratory for analysis.

4. COMPOSITION OF THE UNAUTHORIZED DISCHARGE

The following samples were collected on November 13, 2015 (Figure 2):

1. Water in influent Tank 5 (from well KAFB-106228), which was the source of the release
2. Two surface soil samples from within the discharge area footprint(Initial-01 and Initial-02), and
3. Two confirmation soil samples from the bottom of the potentially contaminated soil excavation area (Conf-01 and Conf-02).

The soil samples were collected using sterile, disposable sample scoops and each soil sample was placed into two laboratory-supplied 8-ounce glass jars (a total of 16 ounces per sample for analysis).

The Tank 5 water sample was analyzed by Gulf Coast Analytical Labs (GCAL) for EDB by Environmental Protection Agency (EPA) Method 8011. EDB was detected at a concentration of 0.10 micrograms per liter, twice the DP-1770 discharge limit of 0.05 μg/L (Table 1).

The soil samples were submitted to GCAL and analyzed by two methods:

- extracted per the TCLP procedure (EPA Method 1311) and analyzed for a spectrum of analytes, including EPA Method 8260B for EDB. TCLP analysis was performed because it is required by Kirtland AFB for disposal at the onsite landfill; based on groundwater samples from well KAFB-106228 and nearby monitoring wells, there was no expectation that the TCLP analysis would indicate that the soil was characteristically-hazardous.
- total soil analysis for EDB by EPA Method 8260B

The analytical results for EDB are presented in Table 1. EPA Method 5035A was not used for the soil samples because it requires use of either sodium bisulfate preservative or EnCore samplers and freezing at the lab within 48 hours, and neither the preservative nor the samplers were available for this time-critical sampling (before the impending rain event). GCAL lab reports are provided in Appendix A. All soil sample results have a “U” qualifier for EDB, indicating that EDB was not detected in any soil sample at a

concentration above the Limit of Detection (LOD) for that sample. No other fuel-related volatile organic compounds were detected. Additional analytes not related to the groundwater release were detected in the TCLP leachate:barium, lead, endrin and heptachlor epoxide; and diesel range organics (DRO) were detected in the total soil analysis. All results were below TCLP regulatory limits or NMED residential SSL standards (Table 2).

An additional set of two discrete soil samples from the bottom of the excavated area, and one composite sample from the roll-off containing the excavated soil, were collected on November 17, 2015. These samples were collected using sterile, disposable sample scoops and each soil sample was placed into one laboratory-supplied 8-ounce glass jar). They were submitted to Empirical Laboratories for analysis of EDB using EPA Method 8011, which has lower detection limits than EPA Method 8260B. EDB was not detected in these samples (Table 1). Lab reports are provided in Appendix B.

Because EPA Method 5035A was not used for the collection, preservation and shipping of the soil samples described above, an additional composite of the excavated soil in the roll-off, and two additional confirmation samples from the bottom of the excavated area, will be collected, preserved and shipped per Method 5035A as required in the UFP QAPP (USACE, 2010, Worksheet #19C).

5. PROPOSED ACTIONS TO PREVENT FUTURE UNAUTHORIZED DISCHARGES OF THIS NATURE

The TTS will only be operated during normal working hours (approximately 0800 to 1600, Monday through Friday) from the date it was restarted (December 1, 2015) until it is finally shut down and demobilized (expected late December, 2015). A daily checklist is used to inspect the TTS, ensure that it is operating properly, and all hoses are properly connected, shut off, and stored each evening. The checklist also ensures that regular inspection of the containment liner takes place and any repairs or needed reinforcements are made immediately upon observation.

6. SCHEDULE FOR COMPLETION OF PROPOSED ACTIONS

As detailed above, the potentially contaminated soil has been excavated and isolated in a roll-off container. One set of initial surface soil samples and two sets of confirmation samples were taken from the spill area and EDB was not detected in any samples. In addition, the soil meets all criteria for disposal at the Kirtland AFB active on-site landfill (LF-268). Following approval of this Corrective Action Plan and acceptance by the landfill, containerized soil will be disposed of at the landfill and the excavation will be backfilled with clean soil.

REFERENCES

Code of Federal Regulations, 2011. 40 CFR 261.24 – Toxicity Characteristic. 55 FR 11862, Mar. 29, 1990, as amended at 55 FR 22684, June 1, 1990; 55 FR 26987, June 29, 1990; 58 FR 46049, Aug. 31, 1993; 67 FR 11254, Mar. 13, 2002; 71 FR 40259, July 14, 2006.

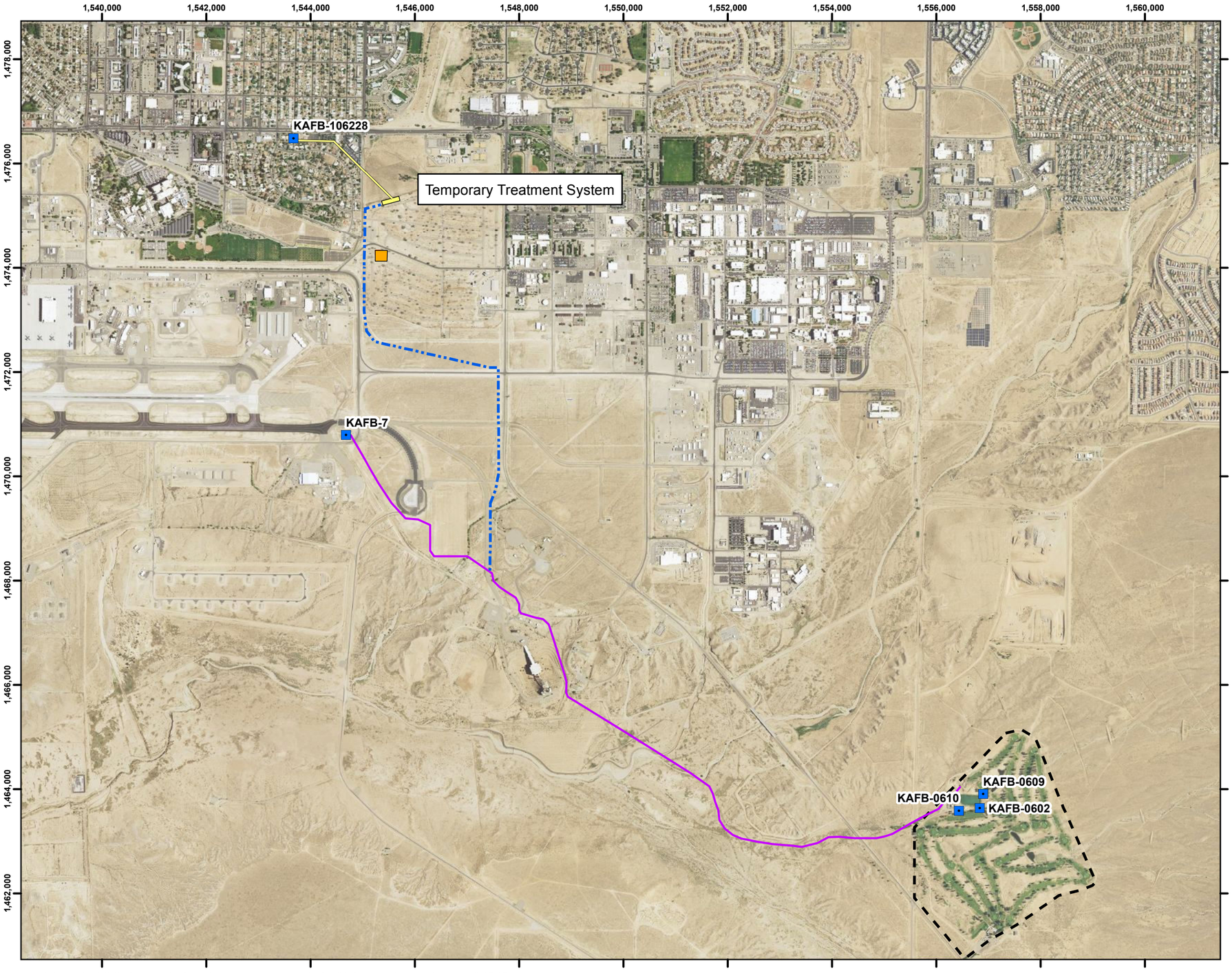
EPA. 2015. Risk-Based Screening Table - Generic Tables. http://www2.epa.gov/risk/risk-based-screening-table-generic-tables

NMED. December 2014. Risk Assessment Guidance for Site Investigations and Remediation. Table A-1: NMED Soil Screening Levels.

Shell Chemical Corporation. 1959. Handbook of Aldrin, Dieldrin, and Endrin Formulations.

USACE. 2010. Quality Assurance Project Plan/Sampling and Analysis Plan for Bulk Fuels Facility Spill Solid Waste Management Units ST-106 and SS-111 Kirtland Air Force Base, Albuquerque, New Mexico. October.

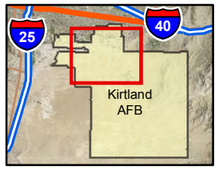
FIGURES



H:\Kirtland_AFB\GIS_Documents\Project_Maps\Misc_Maps\KAFB_161_temp_gwts_layout.mxd 12/10/15

Legend

- Existing Extraction Well
- Temporary Discharge Pipeline
- Pipe from KAFB-7
- Influent Pipe
- Temporary Treatment System Area
- Full Scale Groundwater Treatment System Building
- Tijeras Arroyo Golf Course



SITE LOCATION

Revision Date: 12/10/15

N

0 1,000 2,000 4,000

Feet

1 inch = 2,000 feet

Projection : NAD83 State Plane New Mexico Central FIPS3002 Feet

KIRTLAND BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE 1

TEMPORARY TREATMENT SYSTEM LOCATION

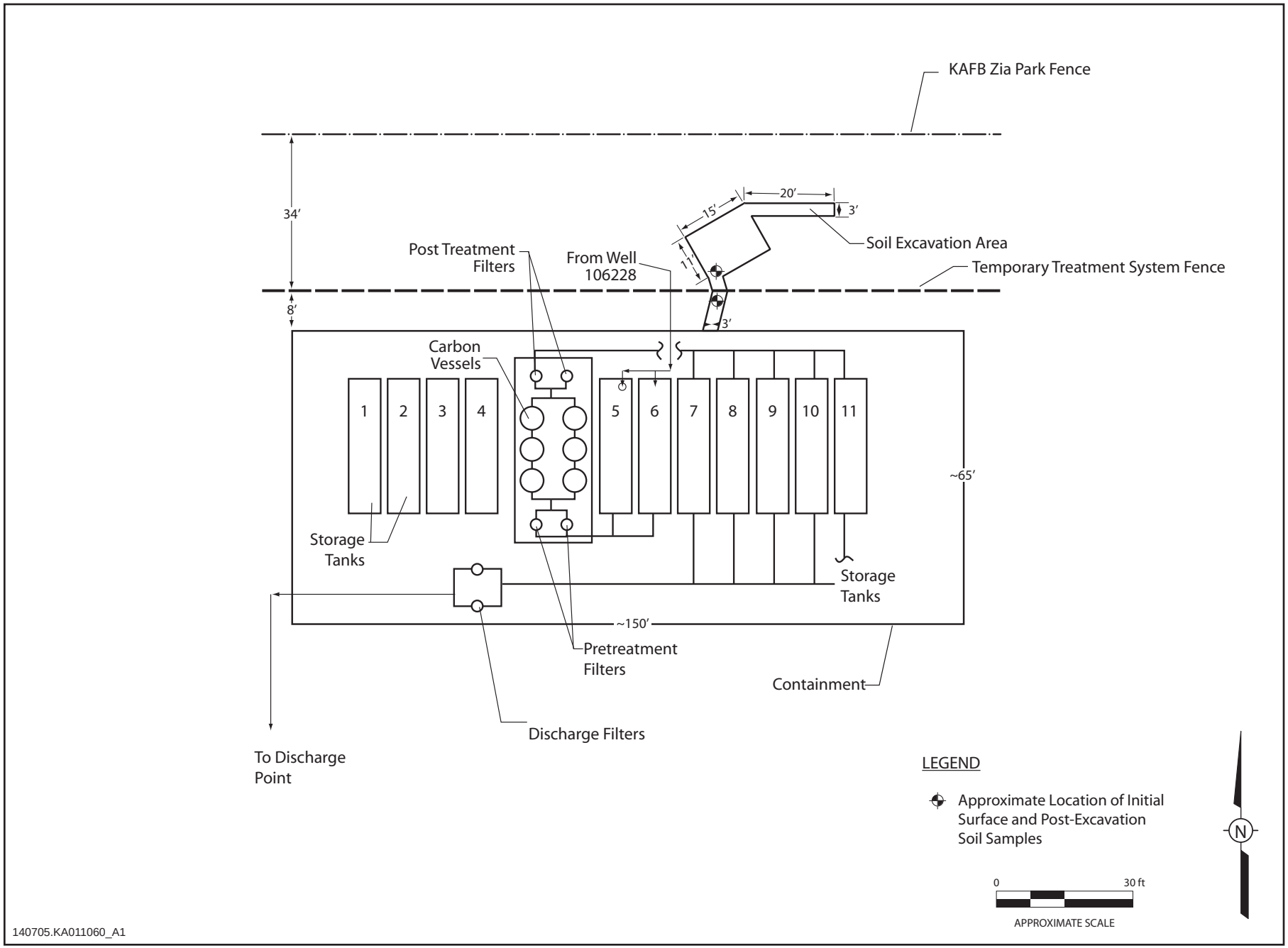


Figure 2
Temporary Treatment System

TABLES

Table 1. Analyical Results for EDB in Soil and Water Samples

Soil Sample/Location	Date Collected	Analytical Laboratory	Analytical Method	EPA Regional Screening Level[1]	NM Residential Soil SSL[2]	Final EDB Result	Unit	Qualifier	DL	LOD	LOQ
Initial-01/surface soil, outside fence	11/13/2015	GCAL	EPA 1311/8260B (TCLP extraction)[3]	NE	NE	20	mg/L	U	8	20	200
	11/13/2015	GCAL	EPA 8260B (total)	36	672	2.18	mg/kg[4]	U	0.546	2.18	5.46
Initial-02/surface soil, inside fence	11/13/2015	GCAL	EPA 1311/8260B (TCLP extraction)[3]	NE	NE	20	mg/L	U	8	20	200
	11/13/2015	GCAL	EPA 8260B (total)	36	672	2	mg/kg[4]	U	0.501	2	5.01
Conf-01/bottom of excavation, outside fence	11/13/2015	GCAL	EPA 1311/8260B (TCLP extraction)[3]	NE	NE	20	mg/L	U	8	20	200
	11/13/2015	GCAL	EPA 8260B (total)	36	672	2.14	mg/kg[4]	U	0.535	2.14	5.35
Conf-02/bottom of excavation, inside fence	11/13/2015	GCAL	EPA 1311/8260B (TCLP extraction)[3]	NE	NE	20	mg/L	U	8	20	200
	11/13/2015	GCAL	EPA 8260B (total)	36	672	2.25	mg/kg[4]	U	0.561	2.25	5.61

Duplicate Soil Sample/Location	Date Collected	Analytical Laboratory	Analytical Method	EPA Regional Screening Level[1]	NM Residential Soil SSL[2]	Final EDB Result	Unit	Qualifier	DL	LOD	LOQ
Initial Outside-03/duplicate of Conf-01	11/17/2105	Empirical	EPA 8011	36	672	0.151	mg/kg	U	0.754	0.151	0.226
Initial Inside-03/duplicate of Conf-02	11/17/2105	Empirical	EPA 8011	36	672	0.159	mg/kg	U	0.797	0.159	0.239
TTS Rolloff-03	11/17/2015	Empirical	EPA 8011	36	672	0.149	mg/kg	U	0.747	0.149	0.224

Water Sample	Date Collected		Analytical Method	DP-1770 limit	NM GW Standard[5]	Final EDB Result		Qualifier	DL	LOD	LOQ
TTS Tank 5 (source of release)	11/13/2015		EPA 8011	0.05	0.1	**0.100**	mg/L		0.0075	0.020	0.020

Notes

All Final EDB Results are qualified as "U", indicating that EDB was not detected at a concentration equal to or higher than the LOD

1. EPA, 2015. Risk-Based Screening Table - Generic Tables. http://www2.epa.gov/risk/risk-based-screening-table-generic-tables. Lowest value selected.
2. NMED, December 2014. Risk Assessment Guidance for Site Investigations and Remediation. Table A-1: NMED Soil Screening Levels.
3. EPA 1311/8260B (TCLP extraction) results for soil converted from mg/L of leachate (as provided in the in the lab's report) to ug/L.
4. Soil results in ug/kg are reported on a dry basis and have been corrected for moisture content in the sample.
5. NMAC 20.6.2.3103.

DL = detection limit (the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence)
LOD = limit of detection (the smallest concentration of a substance that must be present in a sample in order to be detected at 99% confidence level)
LOQ = limit of quantitation (lowest concentration of a substance that produces a quantitative result within specified limits of precision and bias)
NE = Regulatory standards not established.
U = not detected at the LOD

Table 2. Other Analytes Detected in Soil Samples

TCLP Leachate Analyses

Analyte	Analytical Method	Measured Concentration Range (TCLP Leachate)	TCLP Limit
Barium	1311/6020A	1.16 - 1.54 mg/L	100 mg/L
Lead	1311/6020A	0.037J - 2.50 mg/L	5.0 mg/L
Endrin	1311/8081B	0.0000500J - 0.0000520J mg/L	0.02 mg/L
heptachlor epoxide	1311/8081B	0.0000257J - 0.0000870J mg/L	0.008 mg/L

Total Soil Analyses

Analyte	Analytical Method	Measured Concentration Range	KAFB Landfill Acceptance Limit
DRO	8015C	2.27J - 37.6 mg/kg	100 mg/kg

APPENDIX A

Gulf Coast Analytical Laboratories
Analytical Results

NELAP CERTIFICATE NUMBER: 01955
DOD ELAP CERTIFICATE NUMBER: L14-243

ANALYTICAL RESULTS

PERFORMED BY

GCAL, LLC
7979 Innovation Park Dr.
Baton Rouge, LA 70820

Report Date 11/16/2015

GCAL Report 215111410

Project Kirtland AFB IDW 140705

Deliver To	***Additional Recipients***
Susan Huang CB&I 4005 Port Chicago Highway Concord, CA 94520 (925)288-2099	Lisa George, CB&I

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
DL	Diluted analysis – when appended to Client Sample ID
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
00:01	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
J	DOD flag on analyte in the parent sample for MS/MSD outside acceptance criteria
U	Indicates the compound was analyzed for but not detected
B or V	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD – see narrative
E	The result is estimated because it exceeded the instrument calibration range
E	Metals - % diference for the serial dilution is > 10%

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the NELAC Institute standard and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____
Authorized Signature
GCAL Report 215111410

Certifications

10/02/2015

Certification	Certification Number
DOD ELAP	L14-243
Alabama	01955
Arizona	AZ0718
Arkansas	12-060-0
Colorado	01955
Delaware	01955
Florida	E87854
Georgia	01955
Hawaii	01955
Idaho	01955
Illinois	200048
Indiana	01955
Kansas	E-10354
Kentucky	95
Louisiana	01955
Maryland	01955
Massachusetts	01955
Michigan	01955
Mississippi	01955
Missouri	01955
Montana	N/A
Nebraska	01955
New Mexico	01955
North Carolina	618
North Dakota	R-195
Oklahoma	9403
South Carolina	73006001
South Dakota	01955
Tennessee	01955
Texas	T104704178
Vermont	01955
Virginia	460215
USDA Soil Permit	P330-10-00117

Case Narrative

Client: CB&I **Report:** 215111410

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

No anomalies were found for the analyzed sample(s).

Q Flag Summary

NO Q FLAGS FOR THIS WORKORDER

Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21511141001	EDB-01	Water	11/13/2015 15:50	11/14/2015 10:10

Summary of Compounds Detected

EDB-01	**Collect Date**	11/13/2015 15:50	**GCAL ID**	21511141001
	Receive Date	11/14/2015 10:10	**Matrix**	Water

EPA 8011

CAS#	Parameter	Result	DL	LOD	LOQ	Units
106-93-4	1,2-Dibromoethane	0.100	0.00750	0.020	0.020	ug/L

Sample Results

EDB-01	**Collect Date**	11/13/2015 15:50	**GCAL ID**	21511141001
	Receive Date	11/14/2015 10:10	**Matrix**	Water

EPA 8011

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/14/2015 12:25	572486	EPA 8011	1	11/14/2015 16:05	ARW	572509

CAS#	Parameter	Result	DL	LOD	LOQ	Units
106-93-4	**1,2-Dibromoethane**	**0.100**	**0.00750**	**0.020**	**0.020**	**ug/L**

GC Semi-Volatiles QC Summary

Analytical Batch	Client ID	MB572486		LCS572486				LCSD572486					
572509	GCAL ID	1509936		1509937				1509938					
Prep Batch	Sample Type	MB		LCS				LCSD					
572486	Prep Date	11/14/2015 12:25		11/14/2015 12:25				11/14/2015 12:25					
Prep Method	Analysis Date	11/14/2015 15:15		11/14/2015 15:31				11/14/2015 15:48					
EPA 8011	Matrix	Water		Water				Water					
EPA 8011		Units Result	ug/L LOD	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit	
1,2-Dibromoethane	106-93-4	0.020U	0.020	0.273	0.311	114	60 - 140	0.272	0.310	114	0	40	

Client ID: 4769 - CB&I

SDG: 215111410

PM: RKW

CHAIN OF CUSTODY

Page 1

CB&I Federal Services

Company Name: CB&I Federal Services
Address: 2440 Louisiana Blvd NE, Ste 300
City / State / Zip: Albuquerque, NM 87110
Manager: Justin Martinez
Phone/Fax Number: 505 507 7881
Send Report To: Susan Huang
Phone/Fax Number: 925-288-2099 (work)/925-827-5927 (fax)
Address: 4005 Port Chicago Highway
City: Concord, CA 94520

Project Number: 140705
Project Name: KAFB-BFF
Project Location: Kirtland AFB, NM
Subcontract Agreement: KA011060
Lab Destination: GCAL
Lab Contact: Kim Drag
Lab Phone #: 704-607-7735

Requesting Testing Program: EDB by SW8011

Lab Sample Number	Sample Identification	Collection Information: Date	Time	G/C	Matrix	# of Bottles	Container	PRESERVATION: ICE	Turn Around Time Required
EDB-01	TTS	11/13/15	1550	G	GW	3	3x40 ml VOA	X	24 hr -1

EP

~~Lab to filter dissolved metals.~~ EP 11/13/15 8079 5210 5650 43E24

Sampler(s) Name(s): JM, MM

Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Eric Dan Ray	11/13/15	1730			
FedEx	11-14-15	10:10	Dodie McCune	11-14-15	10:10

Turnaround Time: 24 hr

Level Of QC Required: I II III Project Specific:

Method Codes

C = Composite
G = Grab

Matrix Codes

DW = Drinking Water
GW = Ground Water
WW = Waste Water
SW = Surface Water
LIQ = Other Liquid
SOL = Other Solid
SO = Soil
SL = Sludge
CP = Chip Samples
WP = Wipe Samples
GS = Air Sample

GCAL ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIVING CHECKLIST

215111410

SAMPLE DELIVERY GROUP 215111410

Client PM RKW 4769 - CB&I	**Transport Method** FEDEX
Profile Number 210418	**Received By** McCune, Dodie N.
Line Item(s) 3 - IDW Water	**Receive Date(s)** 11/14/15

CHECKLIST	YES	NO	NA
Were all samples received using proper thermal preservation?	☑	☐	☐
When used, were all custody seals intact?	☑	☐	☐
Were all samples received in proper containers?	☑	☐	☐
Were all samples received using proper chemical preservation?	☐	☐	☑
Was preservative added to any container at the lab?	☐	☑	☐
Were all containers received in good condition?	☑	☐	☐
Were all VOC water samples received without head space?	☑	☐	☐
Do all sample labels match the Chain of Custody?	☑	☐	☐
Did the Chain of Custody list the sampling technician?	☑	☐	☐
Was the COC maintained i.e. all signatures, dates and time of receipt included?	☑	☐	☐

COOLERS

Airbill	Thermometer ID: E24	Temp(°C)
807952165650		4.3

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.4

Page 1 of 1

NELAP CERTIFICATE NUMBER: 01955
DOD ELAP CERTIFICATE NUMBER: L14-243

ANALYTICAL RESULTS

PERFORMED BY

GCAL, LLC
7979 Innovation Park Dr.
Baton Rouge, LA 70820

Report Date 11/20/2015

GCAL Report 215111409

Project Kirtland AFB IDW 140705

Deliver To	*Additional Recipients*
Susan Huang CB&I 4005 Port Chicago Highway Concord, CA 94520 (925)288-2099	Lisa George, CB&I

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with GCAL's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
DL	Diluted analysis – when appended to Client Sample ID
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
00:01	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
J	DOD flag on analyte in the parent sample for MS/MSD outside acceptance criteria
U	Indicates the compound was analyzed for but not detected
B or V	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD – see narrative
E	The result is estimated because it exceeded the instrument calibration range
E	Metals - % diference for the serial dilution is > 10%

Sample receipt at GCAL is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of GCAL. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with the NELAC Institute standard and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

_____
Authorized Signature
GCAL Report 215111409

Certifications

10/02/2015

Certification	Certification Number
DOD ELAP	L14-243
Alabama	01955
Arizona	AZ0718
Arkansas	12-060-0
Colorado	01955
Delaware	01955
Florida	E87854
Georgia	01955
Hawaii	01955
Idaho	01955
Illinois	200048
Indiana	01955
Kansas	E-10354
Kentucky	95
Louisiana	01955
Maryland	01955
Massachusetts	01955
Michigan	01955
Mississippi	01955
Missouri	01955
Montana	N/A
Nebraska	01955
New Mexico	01955
North Carolina	618
North Dakota	R-195
Oklahoma	9403
South Carolina	73006001
South Dakota	01955
Tennessee	01955
Texas	T104704178
Vermont	01955
Virginia	460215
USDA Soil Permit	P330-10-00117

Case Narrative

Client: CB&I **Report:** 215111409

Gulf Coast Analytical Laboratories received and analyzed the sample(s) listed on the Report Sample Summary page of this report. Receipt of the sample(s) is documented by the attached chain of custody. This applies only to the sample(s) listed in this report. No sample integrity or quality control exceptions were identified unless noted below.

VOLATILES GAS CHROMATOGRAPHY

In the EPA 8015C GRO analysis, samples 21511140901 (INITIAL-01), 21511140902 (INITIAL-02), 21511140903 (CONF-01) , and 21511140904 (CONF-02) were analyzed at a 50 (methanol extract) dilution.

METALS

In the EPA 1311/6020A analysis, samples 21511140901 (INITIAL-01),21511140902 (INITIAL-02), 21511140903 (CONF-01) and 21511140904 (CONF-02) were prepped and analyzed at a dilution. The reporting limits are at or below the regulatory limits at this dilution.

In the EPA 1311/6020A analysis for prep batch 572556The MS and/or MSD was above the upper control limit for TCLP Selenium. The concentration detected in the sample is not above the regulatory limit; therefore the data is reportable. The LCS recovery is acceptable.

Q Flag Summary

NO Q FLAGS FOR THIS WORKORDER

Sample Summary

GCAL ID	Client ID	Matrix	Collect Date/Time	Receive Date/Time
21511140901	INITIAL-01	Solid	11/13/2015 15:30	11/14/2015 10:10
21511140902	INITIAL-02	Solid	11/13/2015 15:45	11/14/2015 10:10
21511140903	CONF-01	Solid	11/13/2015 16:04	11/14/2015 10:10
21511140904	CONF-02	Solid	11/13/2015 16:02	11/14/2015 10:10

Summary of Compounds Detected

INITIAL-01

Collect Date	11/13/2015 15:30	**GCAL ID**	21511140901
Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 8015C DRO *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
GCSV-00-4	Diesel Range Organics	5.01	1.50	2.30	4.59	mg/kg

EPA 1311/6020A

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-39-3	Barium	1.16	0.025	0.050	0.10	mg/L

EPA 9045D

CAS#	Parameter	Result	DL	LOD	LOQ	Units
pH	pH	8.05	1.00	1.00	1.00	pH unit

INITIAL-02

Collect Date	11/13/2015 15:45	**GCAL ID**	21511140902
Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 1311/8081B

CAS#	Parameter	Result	DL	LOD	LOQ	Units
72-20-8	Endrin	0.0000500J	0.0000200	0.0000400	0.00100	mg/L
1024-57-3	Heptachlor epoxide	0.0000870J	0.0000200	0.0000400	0.000500	mg/L

EPA 8015C DRO *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
GCSV-00-4	Diesel Range Organics	37.6	1.47	2.26	4.51	mg/kg

EPA 1311/6020A

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-39-3	Barium	1.54	0.025	0.050	0.10	mg/L
7439-92-1	Lead	2.50	0.025	0.050	0.10	mg/L

Summary of Compounds Detected

INITIAL-02

Collect Date	11/13/2015 15:45	**GCAL ID**	21511140902
Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 9045D

CAS#	Parameter	Result	DL	LOD	LOQ	Units
pH	pH	8.04	1.00	1.00	1.00	pH unit

CONF-01

Collect Date	11/13/2015 16:04	**GCAL ID**	21511140903
Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 1311/8081B

CAS#	Parameter	Result	DL	LOD	LOQ	Units
72-20-8	Endrin	0.0000520J	0.0000200	0.0000400	0.00100	mg/L
1024-57-3	Heptachlor epoxide	0.0000257J	0.0000200	0.0000400	0.000500	mg/L

EPA 8015C DRO *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
GCSV-00-4	Diesel Range Organics	3.72J	1.47	2.25	4.49	mg/kg

EPA 1311/6020A

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-39-3	Barium	1.39	0.025	0.050	0.10	mg/L

EPA 9045D

CAS#	Parameter	Result	DL	LOD	LOQ	Units
pH	pH	7.71	1.00	1.00	1.00	pH unit

Summary of Compounds Detected

CONF-02	**Collect Date**	11/13/2015 16:02	**GCAL ID**	21511140904
	Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 8015C DRO *Results Reported on Dry Weight Basis

CAS#	Parameter	Result	DL	LOD	LOQ	Units
GCSV-00-4	Diesel Range Organics	5.31	1.50	2.30	4.61	mg/kg

EPA 1311/6020A

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-39-3	Barium	1.31	0.025	0.050	0.10	mg/L
7439-92-1	Lead	0.037J	0.025	0.050	0.10	mg/L

EPA 9045D

CAS#	Parameter	Result	DL	LOD	LOQ	Units
pH	pH	7.31	1.00	1.00	1.00	pH unit

Sample Results

INITIAL-01	**Collect Date**	11/13/2015 15:30	**GCAL ID**	21511140901
	Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 1311/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/14/2015 14:00	572500	EPA 1311(TCLP)	40	11/18/2015 11:40	LBH	572669

CAS#	Parameter	Result	DL	LOD	LOQ	Units
75-35-4	1,1-Dichloroethene	0.020U	0.00800	0.020	0.040	mg/L
106-93-4	1,2-Dibromoethane	0.020U	0.00800	0.020	0.200	mg/L
107-06-2	1,2-Dichloroethane	0.020U	0.00800	0.020	0.040	mg/L
78-93-3	2-Butanone	0.020U	0.00800	0.020	1.00	mg/L
71-43-2	Benzene	0.020U	0.00800	0.020	0.040	mg/L
56-23-5	Carbon tetrachloride	0.020U	0.010	0.020	0.040	mg/L
108-90-7	Chlorobenzene	0.020U	0.00800	0.020	0.040	mg/L
67-66-3	Chloroform	0.020U	0.00800	0.020	0.040	mg/L
127-18-4	Tetrachloroethene	0.020U	0.00800	0.020	0.040	mg/L
79-01-6	Trichloroethene	0.020U	0.00800	0.020	0.040	mg/L
75-01-4	Vinyl chloride	0.020U	0.00800	0.020	0.040	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	2000	1860	ug/L	93	62 - 130
1868-53-7	Dibromofluoromethane	2000	2110	ug/L	106	65 - 127
2037-26-5	Toluene d8	2000	2030	ug/L	102	71 - 134
17060-07-0	1,2-Dichloroethane-d4	2000	2080	ug/L	104	62 - 127

EPA 8260B *Results Reported on Dry Weight Basis

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	11/18/2015 14:22	CJR	572792

CAS#	Parameter	Result	DL	LOD	LOQ	Units
106-93-4	1,2-Dibromoethane	0.00218U	0.000546	0.00218	0.00546	mg/kg
71-43-2	Benzene	0.000546U	0.000273	0.000546	0.00546	mg/kg
100-41-4	Ethylbenzene	0.000546U	0.000273	0.000546	0.00546	mg/kg
108-88-3	Toluene	0.000546U	0.000273	0.000546	0.00546	mg/kg
1330-20-7	Xylene (total)	0.00164U	0.000546	0.00164	0.016	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	0.0480	.046	ug/Kg	97	85 - 120
1868-53-7	Dibromofluoromethane	0.0480	.046	ug/Kg	97	65 - 130
2037-26-5	Toluene d8	0.0480	.05	ug/Kg	106	85 - 115
17060-07-0	1,2-Dichloroethane-d4	0.0480	.045	ug/Kg	95	62 - 125

Sample Results

INITIAL-01	**Collect Date**	11/13/2015 15:30	**GCAL ID**	21511140901
	Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 1311/8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/16/2015 08:00	572551	EPA 3510C	1	11/16/2015 21:31	CLS	572623

CAS#	Parameter	Result	DL	LOD	LOQ	Units
106-46-7	1,4-Dichlorobenzene	0.0050U	0.0025	0.0050	0.0500	mg/L
95-95-4	2,4,5-Trichlorophenol	0.0050U	0.0025	0.0050	0.0500	mg/L
88-06-2	2,4,6-Trichlorophenol	0.0050U	0.0025	0.0050	0.0500	mg/L
121-14-2	2,4-Dinitrotoluene	0.0050U	0.0025	0.0050	0.0100	mg/L
1319-77-3	Cresols	0.0100U	0.0050	0.0100	0.1000	mg/L
118-74-1	Hexachlorobenzene	0.0050U	0.0025	0.0050	0.0100	mg/L
87-68-3	Hexachlorobutadiene	0.0050U	0.0025	0.0050	0.0500	mg/L
67-72-1	Hexachloroethane	0.0050U	0.0025	0.0050	0.0500	mg/L
1319-77-3MP	m,p-Cresol	0.0050U	0.0025	0.0050	0.0500	mg/L
98-95-3	Nitrobenzene	0.0050U	0.0025	0.0050	0.0500	mg/L
95-48-7	o-Cresol	0.0050U	0.0025	0.0050	0.0500	mg/L
87-86-5	Pentachlorophenol	0.0050U	0.0025	0.0050	0.2500	mg/L
110-86-1	Pyridine	0.0250U	0.0075	0.0250	0.0500	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	250	184	ug/L	74	44 - 120
321-60-8	2-Fluorobiphenyl	250	189	ug/L	76	44 - 119
1718-51-0	Terphenyl-d14	250	221	ug/L	88	50 - 134
4165-62-2	Phenol-d5	500	153	ug/L	31	10 - 123
367-12-4	2-Fluorophenol	500	233	ug/L	47	19 - 119
118-79-6	2,4,6-Tribromophenol	500	390	ug/L	78	43 - 140

EPA 8015C GRO *Results Reported on Dry Weight Basis

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	50	11/17/2015 18:58	JAR	572672

CAS#	Parameter	Result	DL	LOD	LOQ	Units
8006-61-9	Gasoline Range Organics	2.27U	0.635	2.27	5.67	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	1.48	1.05	ug/Kg	71	47 - 164

Sample Results

INITIAL-01	**Collect Date**	11/13/2015 15:30	**GCAL ID**	21511140901
	Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 1311/8081B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 16:00	572688	EPA 3510C	1	11/18/2015 08:40	DLB	572790

CAS#	Parameter	Result	DL	LOD	LOQ	Units
57-74-9	Chlordane (Technical)	0.000500U	0.000250	0.000500	0.00250	mg/L
72-20-8	Endrin	0.0000400U	0.0000200	0.0000400	0.00100	mg/L
58-89-9	gamma-BHC (Lindane)	0.0000400U	0.0000100	0.0000400	0.000500	mg/L
76-44-8	Heptachlor	0.0000800U	0.0000400	0.0000800	0.000500	mg/L
1024-57-3	Heptachlor epoxide	0.0000400U	0.0000200	0.0000400	0.000500	mg/L
72-43-5	Methoxychlor	0.000100U	0.0000500	0.000100	0.000500	mg/L
8001-35-2	Toxaphene	0.000500U	0.000250	0.000500	0.00250	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
877-09-8	Tetrachloro-m-xylene	5	3.86	ug/L	77	44 - 124
2051-24-3	Decachlorobiphenyl	5	4.29	ug/L	86	30 - 139

EPA 1311/8151A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 10:30	572625	EPA 1311/8151A	1	11/18/2015 09:09	ARW	572786

CAS#	Parameter	Result	DL	LOD	LOQ	Units
93-72-1	2,4,5-TP (Silvex)	0.00250U	0.00100	0.00250	0.00500	mg/L
94-75-7	2,4'-D	0.00250U	0.00100	0.00250	0.00500	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
19719-28-9	DCAA	20	7.57	ug/L	38	18 - 136

EPA 8015C DRO *Results Reported on Dry Weight Basis

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/16/2015 08:45	572504	EPA 3550C	1	11/16/2015 16:27	SDD	572631

CAS#	Parameter	Result	DL	LOD	LOQ	Units
GCSV-00-4	**Diesel Range Organics**	**5.01**	**1.50**	**2.30**	**4.59**	**mg/kg**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	1.67	1.36	ug/Kg	82	45 - 130

Sample Results

INITIAL-01	**Collect Date**	11/13/2015 15:30	**GCAL ID**	21511140901
	Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 1311/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/16/2015 11:15	572556	EPA 3010A	10	11/17/2015 12:02	AWG	572662

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-38-2	Arsenic	0.050U	0.025	0.050	0.10	mg/L
7440-39-3	**Barium**	**1.16**	**0.025**	**0.050**	**0.10**	**mg/L**
7440-43-9	Cadmium	0.050U	0.025	0.050	0.10	mg/L
7440-47-3	Chromium	0.050U	0.025	0.050	0.10	mg/L
7439-92-1	Lead	0.050U	0.025	0.050	0.10	mg/L
7782-49-2	Selenium	0.050U	0.025	0.050	0.10	mg/L
7440-22-4	Silver	0.050U	0.025	0.050	0.10	mg/L

EPA 1311/7470A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 12:30	572651	EPA 7470A	1	11/18/2015 17:10	LWZ	572590

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7439-97-6	Mercury	0.00020U	0.000070	0.00020	0.0020	mg/L

EPA 1030

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	11/18/2015 11:00	JEM	572793

CAS#	Parameter	Result	DL	LOD	LOQ	Units
000000-01-7	Ignitable	NO	2	2	2	NONE

EPA 9012B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 09:40	572642	EPA 7.3.3.2	1	11/17/2015 20:09	DMT	572805

CAS#	Parameter	Result	DL	LOD	LOQ	Units
57-12-5R	Reactivity Cyanide	240U	240	240	240	mg/kg

Sample Results

INITIAL-01

Collect Date	11/13/2015 15:30	**GCAL ID**	21511140901
Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 9034

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 09:40	572643	EPA 7.3.4.2	1	11/18/2015 09:17	WRR	572740

CAS#	Parameter	Result	DL	LOD	LOQ	Units
18496-25-8R	Reactivity Sulfide	240U	240	240	240	mg/kg

EPA 9045D

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	11/15/2015 08:20	MOS	572503

CAS#	Parameter	Result	DL	LOD	LOQ	Units
pH	**pH**	**8.05**	**1.00**	**1.00**	**1.00**	**pH unit**

INITIAL-02

Collect Date	11/13/2015 15:45	**GCAL ID**	21511140902
Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 1311/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/14/2015 14:00	572500	EPA 1311(TCLP)	40	11/18/2015 11:59	LBH	572669

CAS#	Parameter	Result	DL	LOD	LOQ	Units
75-35-4	1,1-Dichloroethene	0.020U	0.00800	0.020	0.040	mg/L
106-93-4	1,2-Dibromoethane	0.020U	0.00800	0.020	0.200	mg/L
107-06-2	1,2-Dichloroethane	0.020U	0.00800	0.020	0.040	mg/L
78-93-3	2-Butanone	0.020U	0.00800	0.020	1.00	mg/L
71-43-2	Benzene	0.020U	0.00800	0.020	0.040	mg/L
56-23-5	Carbon tetrachloride	0.020U	0.010	0.020	0.040	mg/L
108-90-7	Chlorobenzene	0.020U	0.00800	0.020	0.040	mg/L
67-66-3	Chloroform	0.020U	0.00800	0.020	0.040	mg/L
127-18-4	Tetrachloroethene	0.020U	0.00800	0.020	0.040	mg/L
79-01-6	Trichloroethene	0.020U	0.00800	0.020	0.040	mg/L
75-01-4	Vinyl chloride	0.020U	0.00800	0.020	0.040	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	2000	1870	ug/L	94	62 - 130
1868-53-7	Dibromofluoromethane	2000	2100	ug/L	105	65 - 127
2037-26-5	Toluene d8	2000	2020	ug/L	101	71 - 134
17060-07-0	1,2-Dichloroethane-d4	2000	2120	ug/L	106	62 - 127

Sample Results

INITIAL-02	**Collect Date**	11/13/2015 15:45	**GCAL ID**	21511140902
	Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 8260B

*Results Reported on Dry Weight Basis

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	11/18/2015 14:44	CJR	572792

CAS#	Parameter	Result	DL	LOD	LOQ	Units
106-93-4	1,2-Dibromoethane	0.00200U	0.000501	0.00200	0.00501	mg/kg
71-43-2	Benzene	0.000501U	0.000250	0.000501	0.00501	mg/kg
100-41-4	Ethylbenzene	0.000501U	0.000250	0.000501	0.00501	mg/kg
108-88-3	Toluene	0.000501U	0.000250	0.000501	0.00501	mg/kg
1330-20-7	Xylene (total)	0.00150U	0.000501	0.00150	0.015	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	0.0440	.042	ug/Kg	95	85 - 120
1868-53-7	Dibromofluoromethane	0.0440	.042	ug/Kg	96	65 - 130
2037-26-5	Toluene d8	0.0440	.047	ug/Kg	106	85 - 115
17060-07-0	1,2-Dichloroethane-d4	0.0440	.043	ug/Kg	97	62 - 125

EPA 1311/8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/16/2015 08:00	572551	EPA 3510C	1	11/16/2015 21:48	CLS	572623

CAS#	Parameter	Result	DL	LOD	LOQ	Units
106-46-7	1,4-Dichlorobenzene	0.0050U	0.0025	0.0050	0.0500	mg/L
95-95-4	2,4,5-Trichlorophenol	0.0050U	0.0025	0.0050	0.0500	mg/L
88-06-2	2,4,6-Trichlorophenol	0.0050U	0.0025	0.0050	0.0500	mg/L
121-14-2	2,4-Dinitrotoluene	0.0050U	0.0025	0.0050	0.0100	mg/L
1319-77-3	Cresols	0.0100U	0.0050	0.0100	0.1000	mg/L
118-74-1	Hexachlorobenzene	0.0050U	0.0025	0.0050	0.0100	mg/L
87-68-3	Hexachlorobutadiene	0.0050U	0.0025	0.0050	0.0500	mg/L
67-72-1	Hexachloroethane	0.0050U	0.0025	0.0050	0.0500	mg/L
1319-77-3MP	m,p-Cresol	0.0050U	0.0025	0.0050	0.0500	mg/L
98-95-3	Nitrobenzene	0.0050U	0.0025	0.0050	0.0500	mg/L
95-48-7	o-Cresol	0.0050U	0.0025	0.0050	0.0500	mg/L
87-86-5	Pentachlorophenol	0.0050U	0.0025	0.0050	0.2500	mg/L
110-86-1	Pyridine	0.0250U	0.0075	0.0250	0.0500	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	250	183	ug/L	73	44 - 120
321-60-8	2-Fluorobiphenyl	250	185	ug/L	74	44 - 119
1718-51-0	Terphenyl-d14	250	226	ug/L	90	50 - 134
4165-62-2	Phenol-d5	500	166	ug/L	33	10 - 123
367-12-4	2-Fluorophenol	500	251	ug/L	50	19 - 119
118-79-6	2,4,6-Tribromophenol	500	391	ug/L	78	43 - 140

Sample Results

INITIAL-02	Collect Date	11/13/2015 15:45	GCAL ID	21511140902
	Receive Date	11/14/2015 10:10	Matrix	Solid

EPA 8015C GRO

*Results Reported on Dry Weight Basis

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	50	11/17/2015 19:17	JAR	572672

CAS#	Parameter	Result	DL	LOD	LOQ	Units
8006-61-9	Gasoline Range Organics	2.30U	0.644	2.30	5.75	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	1.52	1.13	ug/Kg	74	47 - 164

EPA 1311/8081B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 16:00	572688	EPA 3510C	1	11/18/2015 08:53	DLB	572790

CAS#	Parameter	Result	DL	LOD	LOQ	Units
57-74-9	Chlordane (Technical)	0.000500U	0.000250	0.000500	0.00250	mg/L
72-20-8	**Endrin**	**0.0000500J**	**0.0000200**	**0.0000400**	**0.00100**	**mg/L**
58-89-9	gamma-BHC (Lindane)	0.0000400U	0.0000100	0.0000400	0.000500	mg/L
76-44-8	Heptachlor	0.0000800U	0.0000400	0.0000800	0.000500	mg/L
1024-57-3	**Heptachlor epoxide**	**0.0000870J**	**0.0000200**	**0.0000400**	**0.000500**	**mg/L**
72-43-5	Methoxychlor	0.000100U	0.0000500	0.000100	0.000500	mg/L
8001-35-2	Toxaphene	0.000500U	0.000250	0.000500	0.00250	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
877-09-8	Tetrachloro-m-xylene	5	3.98	ug/L	80	44 - 124
2051-24-3	Decachlorobiphenyl	5	4.62	ug/L	92	30 - 139

EPA 1311/8151A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 10:30	572625	EPA 1311/8151A	1	11/18/2015 09:37	ARW	572786

CAS#	Parameter	Result	DL	LOD	LOQ	Units
93-72-1	2,4,5-TP (Silvex)	0.00250U	0.00100	0.00250	0.00500	mg/L
94-75-7	2,4'-D	0.00250U	0.00100	0.00250	0.00500	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
19719-28-9	DCAA	20	10.5	ug/L	53	18 - 136

Sample Results

INITIAL-02	**Collect Date**	11/13/2015 15:45	**GCAL ID**	21511140902
	Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 8015C DRO

*Results Reported on Dry Weight Basis

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/16/2015 08:45	572504	EPA 3550C	1	11/17/2015 07:57	SDD	572665

CAS#	Parameter	Result	DL	LOD	LOQ	Units
GCSV-00-4	**Diesel Range Organics**	**37.6**	**1.47**	**2.26**	**4.51**	**mg/kg**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	1.66	1.1	ug/Kg	66	45 - 130

EPA 1311/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/16/2015 11:15	572556	EPA 3010A	10	11/17/2015 12:05	AWG	572662

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-38-2	Arsenic	0.050U	0.025	0.050	0.10	mg/L
7440-39-3	**Barium**	**1.54**	**0.025**	**0.050**	**0.10**	**mg/L**
7440-43-9	Cadmium	0.050U	0.025	0.050	0.10	mg/L
7440-47-3	Chromium	0.050U	0.025	0.050	0.10	mg/L
7439-92-1	**Lead**	**2.50**	**0.025**	**0.050**	**0.10**	**mg/L**
7782-49-2	Selenium	0.050U	0.025	0.050	0.10	mg/L
7440-22-4	Silver	0.050U	0.025	0.050	0.10	mg/L

EPA 1311/7470A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 12:30	572651	EPA 7470A	1	11/18/2015 17:13	LWZ	572590

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7439-97-6	Mercury	0.00020U	0.000070	0.00020	0.0020	mg/L

EPA 1030

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	11/18/2015 11:00	JEM	572793

CAS#	Parameter	Result	DL	LOD	LOQ	Units
000000-01-7	Ignitable	NO	2	2	2	NONE

Sample Results

INITIAL-02

Collect Date	11/13/2015 15:45	**GCAL ID**	21511140902
Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 9012B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 09:40	572642	EPA 7.3.3.2	1	11/17/2015 20:11	DMT	572805

CAS#	Parameter	Result	DL	LOD	LOQ	Units
57-12-5R	Reactivity Cyanide	248U	248	248	248	mg/kg

EPA 9034

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 09:40	572643	EPA 7.3.4.2	1	11/18/2015 09:17	WRR	572740

CAS#	Parameter	Result	DL	LOD	LOQ	Units
18496-25-8R	Reactivity Sulfide	248U	248	248	248	mg/kg

EPA 9045D

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	11/15/2015 08:20	MOS	572503

CAS#	Parameter	Result	DL	LOD	LOQ	Units
pH	**pH**	**8.04**	**1.00**	**1.00**	**1.00**	**pH unit**

CONF-01

Collect Date	11/13/2015 16:04	**GCAL ID**	21511140903
Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 1311/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/14/2015 14:00	572500	EPA 1311(TCLP)	40	11/18/2015 12:19	LBH	572669

CAS#	Parameter	Result	DL	LOD	LOQ	Units
75-35-4	1,1-Dichloroethene	0.020U	0.00800	0.020	0.040	mg/L
106-93-4	1,2-Dibromoethane	0.020U	0.00800	0.020	0.200	mg/L
107-06-2	1,2-Dichloroethane	0.020U	0.00800	0.020	0.040	mg/L
78-93-3	2-Butanone	0.020U	0.00800	0.020	1.00	mg/L
71-43-2	Benzene	0.020U	0.00800	0.020	0.040	mg/L
56-23-5	Carbon tetrachloride	0.020U	0.010	0.020	0.040	mg/L
108-90-7	Chlorobenzene	0.020U	0.00800	0.020	0.040	mg/L
67-66-3	Chloroform	0.020U	0.00800	0.020	0.040	mg/L
127-18-4	Tetrachloroethene	0.020U	0.00800	0.020	0.040	mg/L
79-01-6	Trichloroethene	0.020U	0.00800	0.020	0.040	mg/L

Sample Results

CONF-01	**Collect Date**	11/13/2015 16:04	**GCAL ID**	21511140903
	Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 1311/8260B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/14/2015 14:00	572500	EPA 1311(TCLP)	40	11/18/2015 12:19	LBH	572669

CAS#	Parameter	Result	DL	LOD	LOQ	Units
75-01-4	Vinyl chloride	0.020U	0.00800	0.020	0.040	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	2000	1870	ug/L	94	62 - 130
1868-53-7	Dibromofluoromethane	2000	2140	ug/L	107	65 - 127
2037-26-5	Toluene d8	2000	2020	ug/L	101	71 - 134
17060-07-0	1,2-Dichloroethane-d4	2000	2160	ug/L	108	62 - 127

EPA 8260B *Results Reported on Dry Weight Basis

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	11/18/2015 15:06	CJR	572792

CAS#	Parameter	Result	DL	LOD	LOQ	Units
106-93-4	1,2-Dibromoethane	0.00214U	0.000535	0.00214	0.00535	mg/kg
71-43-2	Benzene	0.000535U	0.000267	0.000535	0.00535	mg/kg
100-41-4	Ethylbenzene	0.000535U	0.000267	0.000535	0.00535	mg/kg
108-88-3	Toluene	0.000535U	0.000267	0.000535	0.00535	mg/kg
1330-20-7	Xylene (total)	0.00160U	0.000535	0.00160	0.016	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	0.0480	.046	ug/Kg	97	85 - 120
1868-53-7	Dibromofluoromethane	0.0480	.046	ug/Kg	96	65 - 130
2037-26-5	Toluene d8	0.0480	.05	ug/Kg	104	85 - 115
17060-07-0	1,2-Dichloroethane-d4	0.0480	.046	ug/Kg	97	62 - 125

EPA 1311/8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/16/2015 08:00	572551	EPA 3510C	1	11/16/2015 22:04	CLS	572623

CAS#	Parameter	Result	DL	LOD	LOQ	Units
106-46-7	1,4-Dichlorobenzene	0.0050U	0.0025	0.0050	0.0500	mg/L
95-95-4	2,4,5-Trichlorophenol	0.0050U	0.0025	0.0050	0.0500	mg/L
88-06-2	2,4,6-Trichlorophenol	0.0050U	0.0025	0.0050	0.0500	mg/L
121-14-2	2,4-Dinitrotoluene	0.0050U	0.0025	0.0050	0.0100	mg/L
1319-77-3	Cresols	0.0100U	0.0050	0.0100	0.1000	mg/L
118-74-1	Hexachlorobenzene	0.0050U	0.0025	0.0050	0.0100	mg/L
87-68-3	Hexachlorobutadiene	0.0050U	0.0025	0.0050	0.0500	mg/L
67-72-1	Hexachloroethane	0.0050U	0.0025	0.0050	0.0500	mg/L

Sample Results

CONF-01	**Collect Date**	11/13/2015 16:04	**GCAL ID**	21511140903
	Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 1311/8270D (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/16/2015 08:00	572551	EPA 3510C	1	11/16/2015 22:04	CLS	572623

CAS#	Parameter	Result	DL	LOD	LOQ	Units
1319-77-3MP	m,p-Cresol	0.0050U	0.0025	0.0050	0.0500	mg/L
98-95-3	Nitrobenzene	0.0050U	0.0025	0.0050	0.0500	mg/L
95-48-7	o-Cresol	0.0050U	0.0025	0.0050	0.0500	mg/L
87-86-5	Pentachlorophenol	0.0050U	0.0025	0.0050	0.2500	mg/L
110-86-1	Pyridine	0.0250U	0.0075	0.0250	0.0500	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	250	181	ug/L	72	44 - 120
321-60-8	2-Fluorobiphenyl	250	184	ug/L	74	44 - 119
1718-51-0	Terphenyl-d14	250	241	ug/L	96	50 - 134
4165-62-2	Phenol-d5	500	155	ug/L	31	10 - 123
367-12-4	2-Fluorophenol	500	235	ug/L	47	19 - 119
118-79-6	2,4,6-Tribromophenol	500	398	ug/L	80	43 - 140

EPA 8015C GRO *Results Reported on Dry Weight Basis

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	50	11/17/2015 19:28	JAR	572672

CAS#	Parameter	Result	DL	LOD	LOQ	Units
8006-61-9	Gasoline Range Organics	2.22U	0.623	2.22	5.56	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	1.49	1.01	ug/Kg	68	47 - 164

EPA 1311/8081B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 16:00	572688	EPA 3510C	1	11/18/2015 09:06	DLB	572790

CAS#	Parameter	Result	DL	LOD	LOQ	Units
57-74-9	Chlordane (Technical)	0.000500U	0.000250	0.000500	0.00250	mg/L
72-20-8	**Endrin**	**0.0000520J**	**0.0000200**	**0.0000400**	**0.00100**	**mg/L**
58-89-9	gamma-BHC (Lindane)	0.0000400U	0.0000100	0.0000400	0.000500	mg/L
76-44-8	Heptachlor	0.0000800U	0.0000400	0.0000800	0.000500	mg/L

Sample Results

CONF-01	**Collect Date**	11/13/2015 16:04	**GCAL ID**	21511140903
	Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 1311/8081B (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 16:00	572688	EPA 3510C	1	11/18/2015 09:06	DLB	572790

CAS#	Parameter	Result	DL	LOD	LOQ	Units
1024-57-3	**Heptachlor epoxide**	**0.0000257J**	**0.0000200**	**0.0000400**	**0.000500**	**mg/L**
72-43-5	Methoxychlor	0.000100U	0.0000500	0.000100	0.000500	mg/L
8001-35-2	Toxaphene	0.000500U	0.000250	0.000500	0.00250	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
877-09-8	Tetrachloro-m-xylene	5	3.88	ug/L	78	44 - 124
2051-24-3	Decachlorobiphenyl	5	4.25	ug/L	85	30 - 139

EPA 1311/8151A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 10:30	572625	EPA 1311/8151A	1	11/18/2015 10:06	ARW	572786

CAS#	Parameter	Result	DL	LOD	LOQ	Units
93-72-1	2,4,5-TP (Silvex)	0.00250U	0.00100	0.00250	0.00500	mg/L
94-75-7	2,4'-D	0.00250U	0.00100	0.00250	0.00500	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
19719-28-9	DCAA	20	17.2	ug/L	86	18 - 136

EPA 8015C DRO *Results Reported on Dry Weight Basis

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/16/2015 08:45	572504	EPA 3550C	1	11/16/2015 16:56	SDD	572631

CAS#	Parameter	Result	DL	LOD	LOQ	Units
GCSV-00-4	**Diesel Range Organics**	**3.72J**	**1.47**	**2.25**	**4.49**	**mg/kg**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	1.67	1.42	ug/Kg	85	45 - 130

Sample Results

CONF-01	**Collect Date**	11/13/2015 16:04	**GCAL ID**	21511140903
	Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 1311/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/16/2015 11:15	572556	EPA 3010A	10	11/17/2015 12:09	AWG	572662

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-38-2	Arsenic	0.050U	0.025	0.050	0.10	mg/L
7440-39-3	**Barium**	**1.39**	**0.025**	**0.050**	**0.10**	**mg/L**
7440-43-9	Cadmium	0.050U	0.025	0.050	0.10	mg/L
7440-47-3	Chromium	0.050U	0.025	0.050	0.10	mg/L
7439-92-1	Lead	0.050U	0.025	0.050	0.10	mg/L
7782-49-2	Selenium	0.050U	0.025	0.050	0.10	mg/L
7440-22-4	Silver	0.050U	0.025	0.050	0.10	mg/L

EPA 1311/7470A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 12:30	572651	EPA 7470A	1	11/18/2015 17:15	LWZ	572590

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7439-97-6	Mercury	0.00020U	0.000070	0.00020	0.0020	mg/L

EPA 1030

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	11/18/2015 11:00	JEM	572793

CAS#	Parameter	Result	DL	LOD	LOQ	Units
000000-01-7	Ignitable	NO	2	2	2	NONE

EPA 9012B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 09:40	572642	EPA 7.3.3.2	1	11/17/2015 20:14	DMT	572805

CAS#	Parameter	Result	DL	LOD	LOQ	Units
57-12-5R	Reactivity Cyanide	243U	243	243	243	mg/kg

Sample Results

CONF-01

Collect Date	11/13/2015 16:04	**GCAL ID**	21511140903
Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 9034

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 09:40	572643	EPA 7.3.4.2	1	11/18/2015 09:17	WRR	572740

CAS#	Parameter	Result	DL	LOD	LOQ	Units
18496-25-8R	Reactivity Sulfide	243U	243	243	243	mg/kg

EPA 9045D

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	11/15/2015 08:20	MOS	572503

CAS#	Parameter	Result	DL	LOD	LOQ	Units
pH	**pH**	**7.71**	**1.00**	**1.00**	**1.00**	**pH unit**

CONF-02

Collect Date	11/13/2015 16:02	**GCAL ID**	21511140904
Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 1311/8260B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/14/2015 14:00	572500	EPA 1311(TCLP)	40	11/18/2015 12:38	LBH	572669

CAS#	Parameter	Result	DL	LOD	LOQ	Units
75-35-4	1,1-Dichloroethene	0.020U	0.00800	0.020	0.040	mg/L
106-93-4	1,2-Dibromoethane	0.020U	0.00800	0.020	0.200	mg/L
107-06-2	1,2-Dichloroethane	0.020U	0.00800	0.020	0.040	mg/L
78-93-3	2-Butanone	0.020U	0.00800	0.020	1.00	mg/L
71-43-2	Benzene	0.020U	0.00800	0.020	0.040	mg/L
56-23-5	Carbon tetrachloride	0.020U	0.010	0.020	0.040	mg/L
108-90-7	Chlorobenzene	0.020U	0.00800	0.020	0.040	mg/L
67-66-3	Chloroform	0.020U	0.00800	0.020	0.040	mg/L
127-18-4	Tetrachloroethene	0.020U	0.00800	0.020	0.040	mg/L
79-01-6	Trichloroethene	0.020U	0.00800	0.020	0.040	mg/L
75-01-4	Vinyl chloride	0.020U	0.00800	0.020	0.040	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	2000	1850	ug/L	93	62 - 130
1868-53-7	Dibromofluoromethane	2000	2140	ug/L	107	65 - 127
2037-26-5	Toluene d8	2000	2010	ug/L	101	71 - 134
17060-07-0	1,2-Dichloroethane-d4	2000	2150	ug/L	108	62 - 127

Sample Results

CONF-02	**Collect Date**	11/13/2015 16:02	**GCAL ID**	21511140904
	Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 8260B

*Results Reported on Dry Weight Basis

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	11/18/2015 15:28	CJR	572792

CAS#	Parameter	Result	DL	LOD	LOQ	Units
106-93-4	1,2-Dibromoethane	0.00225U	0.000561	0.00225	0.00561	mg/kg
71-43-2	Benzene	0.000561U	0.000281	0.000561	0.00561	mg/kg
100-41-4	Ethylbenzene	0.000561U	0.000281	0.000561	0.00561	mg/kg
108-88-3	Toluene	0.000561U	0.000281	0.000561	0.00561	mg/kg
1330-20-7	Xylene (total)	0.00168U	0.000561	0.00168	0.017	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
460-00-4	4-Bromofluorobenzene	0.0490	.046	ug/Kg	94	85 - 120
1868-53-7	Dibromofluoromethane	0.0490	.047	ug/Kg	96	65 - 130
2037-26-5	Toluene d8	0.0490	.052	ug/Kg	106	85 - 115
17060-07-0	1,2-Dichloroethane-d4	0.0490	.046	ug/Kg	95	62 - 125

EPA 1311/8270D

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/16/2015 08:00	572551	EPA 3510C	1	11/16/2015 22:21	CLS	572623

CAS#	Parameter	Result	DL	LOD	LOQ	Units
106-46-7	1,4-Dichlorobenzene	0.0050U	0.0025	0.0050	0.0500	mg/L
95-95-4	2,4,5-Trichlorophenol	0.0050U	0.0025	0.0050	0.0500	mg/L
88-06-2	2,4,6-Trichlorophenol	0.0050U	0.0025	0.0050	0.0500	mg/L
121-14-2	2,4-Dinitrotoluene	0.0050U	0.0025	0.0050	0.0100	mg/L
1319-77-3	Cresols	0.0100U	0.0050	0.0100	0.1000	mg/L
118-74-1	Hexachlorobenzene	0.0050U	0.0025	0.0050	0.0100	mg/L
87-68-3	Hexachlorobutadiene	0.0050U	0.0025	0.0050	0.0500	mg/L
67-72-1	Hexachloroethane	0.0050U	0.0025	0.0050	0.0500	mg/L
1319-77-3MP	m,p-Cresol	0.0050U	0.0025	0.0050	0.0500	mg/L
98-95-3	Nitrobenzene	0.0050U	0.0025	0.0050	0.0500	mg/L
95-48-7	o-Cresol	0.0050U	0.0025	0.0050	0.0500	mg/L
87-86-5	Pentachlorophenol	0.0050U	0.0025	0.0050	0.2500	mg/L
110-86-1	Pyridine	0.0250U	0.0075	0.0250	0.0500	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
4165-60-0	Nitrobenzene-d5	250	190	ug/L	76	44 - 120
321-60-8	2-Fluorobiphenyl	250	194	ug/L	78	44 - 119
1718-51-0	Terphenyl-d14	250	247	ug/L	99	50 - 134
4165-62-2	Phenol-d5	500	172	ug/L	34	10 - 123
367-12-4	2-Fluorophenol	500	253	ug/L	51	19 - 119
118-79-6	2,4,6-Tribromophenol	500	415	ug/L	83	43 - 140

Sample Results

CONF-02	Collect Date	11/13/2015 16:02	GCAL ID	21511140904
	Receive Date	11/14/2015 10:10	Matrix	Solid

EPA 8015C GRO

*Results Reported on Dry Weight Basis

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	50	11/17/2015 19:42	JAR	572672

CAS#	Parameter	Result	DL	LOD	LOQ	Units
8006-61-9	Gasoline Range Organics	2.29U	0.640	2.29	5.71	mg/kg

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
106-39-8	Bromochlorobenzene	1.49	1.12	ug/Kg	75	47 - 164

EPA 1311/8081B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 16:00	572688	EPA 3510C	1	11/18/2015 09:18	DLB	572790

CAS#	Parameter	Result	DL	LOD	LOQ	Units
57-74-9	Chlordane (Technical)	0.000500U	0.000250	0.000500	0.00250	mg/L
72-20-8	Endrin	0.0000400U	0.0000200	0.0000400	0.00100	mg/L
58-89-9	gamma-BHC (Lindane)	0.0000400U	0.0000100	0.0000400	0.000500	mg/L
76-44-8	Heptachlor	0.0000800U	0.0000400	0.0000800	0.000500	mg/L
1024-57-3	Heptachlor epoxide	0.0000400U	0.0000200	0.0000400	0.000500	mg/L
72-43-5	Methoxychlor	0.000100U	0.0000500	0.000100	0.000500	mg/L
8001-35-2	Toxaphene	0.000500U	0.000250	0.000500	0.00250	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
877-09-8	Tetrachloro-m-xylene	5	3.99	ug/L	80	44 - 124
2051-24-3	Decachlorobiphenyl	5	4.27	ug/L	85	30 - 139

EPA 1311/8151A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 10:30	572625	EPA 1311/8151A	1	11/18/2015 10:34	ARW	572786

CAS#	Parameter	Result	DL	LOD	LOQ	Units
93-72-1	2,4,5-TP (Silvex)	0.00250U	0.00100	0.00250	0.00500	mg/L
94-75-7	2,4'-D	0.00250U	0.00100	0.00250	0.00500	mg/L

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
19719-28-9	DCAA	20	13.6	ug/L	68	18 - 136

Sample Results

CONF-02	**Collect Date**	11/13/2015 16:02	**GCAL ID**	21511140904
	Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 8015C DRO

*Results Reported on Dry Weight Basis

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/16/2015 08:45	572504	EPA 3550C	1	11/16/2015 17:09	SDD	572631

CAS#	Parameter	Result	DL	LOD	LOQ	Units
GCSV-00-4	**Diesel Range Organics**	**5.31**	**1.50**	**2.30**	**4.61**	**mg/kg**

CAS#	Surrogate	Conc. Spiked	Conc. Rec	Units	% Recovery	Rec Limits
84-15-1	o-Terphenyl	1.67	1.34	ug/Kg	80	45 - 130

EPA 1311/6020A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/16/2015 11:15	572556	EPA 3010A	10	11/17/2015 12:12	AWG	572662

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7440-38-2	Arsenic	0.050U	0.025	0.050	0.10	mg/L
7440-39-3	**Barium**	**1.31**	**0.025**	**0.050**	**0.10**	**mg/L**
7440-43-9	Cadmium	0.050U	0.025	0.050	0.10	mg/L
7440-47-3	Chromium	0.050U	0.025	0.050	0.10	mg/L
7439-92-1	**Lead**	**0.037J**	**0.025**	**0.050**	**0.10**	**mg/L**
7782-49-2	Selenium	0.050U	0.025	0.050	0.10	mg/L
7440-22-4	Silver	0.050U	0.025	0.050	0.10	mg/L

EPA 1311/7470A

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 12:30	572651	EPA 7470A	1	11/18/2015 17:17	LWZ	572590

CAS#	Parameter	Result	DL	LOD	LOQ	Units
7439-97-6	Mercury	0.00020U	0.000070	0.00020	0.0020	mg/L

EPA 1030

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	11/18/2015 11:00	JEM	572793

CAS#	Parameter	Result	DL	LOD	LOQ	Units
000000-01-7	Ignitable	NO	2	2	2	NONE

Sample Results

CONF-02	**Collect Date**	11/13/2015 16:02	**GCAL ID**	21511140904
	Receive Date	11/14/2015 10:10	**Matrix**	Solid

EPA 9012B

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 09:40	572642	EPA 7.3.3.2	1	11/17/2015 20:20	DMT	572805

CAS#	Parameter	Result	DL	LOD	LOQ	Units
57-12-5R	Reactivity Cyanide	250U	250	250	250	mg/kg

EPA 9034

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
11/17/2015 09:40	572643	EPA 7.3.4.2	1	11/18/2015 09:17	WRR	572740

CAS#	Parameter	Result	DL	LOD	LOQ	Units
18496-25-8R	Reactivity Sulfide	250U	250	250	250	mg/kg

EPA 9045D

Prep Date	Prep Batch	Prep Method	Dilution	Analysis Date	By	Analytical Batch
NA	NA	NA	1	11/15/2015 08:20	MOS	572503

CAS#	Parameter	Result	DL	LOD	LOQ	Units
pH	**pH**	**7.31**	**1.00**	**1.00**	**1.00**	**pH unit**

GC/MS Volatiles QC Summary

Analytical Batch 572669	Client ID	MB572669		LCS572669				LCSD572669				
	GCAL ID	1510697		1510698				1510699				
	Sample Type	MB		LCS				LCSD				
	Prep Date	NA		NA				NA				
	Analysis Date	11/18/2015 10:42		11/18/2015 09:20				11/18/2015 09:43				
	Matrix	Water		Water				Water				
EPA 1311/8260B		Units Result	mg/L LOD	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
1,1-Dichloroethene	75-35-4	0.000500U	0.000500	0.050	0.054	109	69 - 129	0.050	0.053	105	3	30
1,2-Dibromoethane	106-93-4	0.000500U	0.000500	0.050	0.052	104	70 - 124	0.050	0.053	105	1	30
1,2-Dichloroethane	107-06-2	0.000500U	0.000500	0.050	0.053	105	71 - 129	0.050	0.053	107	2	30
2-Butanone	78-93-3	0.000500U	0.000500	0.050	0.055	110	58 - 137	0.050	0.058	117	6	30
Benzene	71-43-2	0.000500U	0.000500	0.050	0.055	109	70 - 129	0.050	0.054	108	1	30
Carbon tetrachloride	56-23-5	0.000500U	0.000500	0.050	0.056	112	76 - 128	0.050	0.055	110	2	30
Chlorobenzene	108-90-7	0.000500U	0.000500	0.050	0.048	97	74 - 123	0.050	0.048	95	2	30
Chloroform	67-66-3	0.000500U	0.000500	0.050	0.054	108	75 - 122	0.050	0.053	106	1	30
Tetrachloroethene	127-18-4	0.000500U	0.000500	0.050	0.052	104	68 - 128	0.050	0.050	100	4	30
Trichloroethene	79-01-6	0.000500U	0.000500	0.050	0.052	103	76 - 129	0.050	0.051	101	2	30
Vinyl chloride	75-01-4	0.000500U	0.000500	0.050	0.054	108	68 - 132	0.050	0.055	110	2	30
Surrogate												
1,2-Dichloroethane-d4	17060-07-0	.0535	107	.05	.0536	107	62 - 127	.05	.0531	106	1	NA
4-Bromofluorobenzene	460-00-4	.0475	95	.05	.0498	100	62 - 130	.05	.0493	99	1	NA
Dibromofluoromethane	1868-53-7	.0531	106	.05	.0524	105	65 - 127	.05	.0524	105	0	NA
Toluene d8	2037-26-5	.0511	102	.05	.0493	99	71 - 134	.05	.0487	97	1	NA

Analytical Batch 572669	Client ID	EB TRENCH		1508774MS				1508774MSD				
	GCAL ID	21511116001		1510700				1510701				
	Sample Type	SAMPLE		MS				MSD				
	Prep Date	NA		NA				NA				
	Analysis Date	11/18/2015 11:01		11/18/2015 13:36				11/18/2015 13:55				
	Matrix	Solid		Solid				Solid				
EPA 1311/8260B		Units Result	mg/L LOD	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
1,1-Dichloroethene	75-35-4	0.00	0.020	2.00	1.97	99	69 - 129	2.00	1.95	98	1	30
1,2-Dichloroethane	107-06-2	0.00	0.020	2.00	2.12	106	71 - 129	2.00	2.13	107	1	30
2-Butanone	78-93-3	0.00	0.020	2.00	2.15	108	58 - 137	2.00	2.11	106	2	30
Benzene	71-43-2	0.00	0.020	2.00	2.15	108	70 - 129	2.00	2.13	107	1	30
Carbon tetrachloride	56-23-5	0.00	0.020	2.00	2.06	103	76 - 128	2.00	2.01	101	2	30
Chlorobenzene	108-90-7	0.00	0.020	2.00	1.95	98	74 - 123	2.00	1.95	98	0	30
Chloroform	67-66-3	0.00	0.020	2.00	2.14	107	75 - 122	2.00	2.11	106	1	30
Tetrachloroethene	127-18-4	0.00	0.020	2.00	1.93	97	68 - 128	2.00	1.90	95	2	30
Trichloroethene	79-01-6	0.00	0.020	2.00	1.96	98	76 - 129	2.00	1.93	97	2	30
Vinyl chloride	75-01-4	0.00	0.020	2.00	1.91	96	68 - 132	2.00	1.93	97	1	30
Surrogate												
1,2-Dichloroethane-d4	17060-07-0	2.1	105	2	2.12	106	62 - 127	2	2.12	106	0	NA
4-Bromofluorobenzene	460-00-4	1.84	92	2	1.95	98	62 - 130	2	1.94	97	1	NA
Dibromofluoromethane	1868-53-7	2.09	105	2	2.09	105	65 - 127	2	2.09	105	0	NA
Toluene d8	2037-26-5	2.01	101	2	1.93	97	71 - 134	2	1.94	97	1	NA

Analytical Batch 572669	Client ID	TR#21076 WALL BRICK 19-..		1509064MS			
	GCAL ID	21511123301		1510702			
	Sample Type	SAMPLE		MS			
	Prep Date	NA		NA			
	Analysis Date	11/18/2015 11:20		11/18/2015 14:15			
	Matrix	Solid		Solid			
EPA 1311/8260B		Units Result	mg/L LOD	Spike Added	Result	%R	Control Limits%R
1,1-Dichloroethene	75-35-4	0.00	0.020	2.00	2.13	107	69 - 129
1,2-Dichloroethane	107-06-2	0.00	0.020	2.00	2.14	107	71 - 129
2-Butanone	78-93-3	0.00	0.020	2.00	2.00	100	58 - 137
Benzene	71-43-2	0.00	0.020	2.00	2.18	109	70 - 129
Carbon tetrachloride	56-23-5	0.00	0.020	2.00	2.22	111	76 - 128
Chlorobenzene	108-90-7	0.00	0.020	2.00	1.98	99	74 - 123
Chloroform	67-66-3	0.00	0.020	2.00	2.17	109	75 - 122

GC/MS Volatiles QC Summary

Analytical Batch 572669	Client ID	TR#21076 WALL BRICK 19-..		1509064MS			
	GCAL ID	21511123301		1510702			
	Sample Type	SAMPLE		MS			
	Prep Date	NA		NA			
	Analysis Date	11/18/2015 11:20		11/18/2015 14:15			
	Matrix	Solid		Solid			
EPA 1311/8260B		Units Result	mg/L LOD	Spike Added	Result	%R	Control Limits%R
Tetrachloroethene	127-18-4	0.00	0.020	2.00	2.01	101	68 - 128
Trichloroethene	79-01-6	0.00	0.020	2.00	2.01	101	76 - 129
Vinyl chloride	75-01-4	0.00	0.020	2.00	2.12	106	68 - 132
Surrogate							
1,2-Dichloroethane-d4	17060-07-0			2	2.11	106	62 - 127
4-Bromofluorobenzene	460-00-4			2	1.93	97	62 - 130
Dibromofluoromethane	1868-53-7			2	2.08	104	65 - 127
Toluene d8	2037-26-5			2	1.93	97	71 - 134

Analytical Batch 572792	Client ID	MB572792		LCS572792				LCSD572792				
	GCAL ID	1511255		1511256				1511257				
	Sample Type	MB		LCS				LCSD				
	Prep Date	NA		NA				NA				
	Analysis Date	11/18/2015 13:50		11/18/2015 12:21				11/18/2015 12:44				
	Matrix	Solid		Solid				Solid				
EPA 8260B		Units Result	mg/kg LOD	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
1,2-Dibromoethane	106-93-4	0.00200U	0.00200	0.050	0.046	93	70 - 125	0.050	0.048	95	2	30
Benzene	71-43-2	0.000500U	0.000500	0.050	0.048	96	75 - 125	0.050	0.048	96	0	30
Ethylbenzene	100-41-4	0.000500U	0.000500	0.050	0.051	102	75 - 125	0.050	0.052	104	2	30
Toluene	108-88-3	0.000500U	0.000500	0.050	0.049	99	70 - 125	0.050	0.051	102	4	30
Xylene (total)	1330-20-7	0.00150U	0.00150	0.150	0.156	104	75 - 125	0.150	0.157	105	1	30
Surrogate												
1,2-Dichloroethane-d4	17060-07-0	.0493	99	.05	.05	100	62 - 125	.05	.0476	95	5	NA
4-Bromofluorobenzene	460-00-4	.0482	96	.05	.0493	99	85 - 120	.05	.0502	100	2	NA
Dibromofluoromethane	1868-53-7	.0489	98	.05	.0505	101	65 - 130	.05	.0481	96	5	NA
Toluene d8	2037-26-5	.05	100	.05	.0492	98	85 - 115	.05	.0504	101	2	NA

GC/MS Semi-Volatiles QC Summary

Analytical Batch	Client ID	MB572551		LCS572551				LCSD572551				
572623	GCAL ID	1510200		1510201				1510202				
Prep Batch	Sample Type	MB		LCS				LCSD				
572551	Prep Date	11/16/2015 08:00		11/16/2015 08:00				11/16/2015 08:00				
Prep Method	Analysis Date	11/16/2015 20:09		11/16/2015 20:25				11/16/2015 20:42				
EPA 3510C	Matrix	Water		Water				Water				
EPA 1311/8270D		Units Result	mg/L LOD	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
1,4-Dichlorobenzene	106-46-7	0.0050U	0.0050	0.050	0.042	84	29 - 112	0.050	0.041	82	2	30
2,4,5-Trichlorophenol	95-95-4	0.0050U	0.0050	0.050	0.049	98	53 - 123	0.050	0.048	97	2	30
2,4,6-Trichlorophenol	88-06-2	0.0050U	0.0050	0.050	0.047	94	50 - 125	0.050	0.047	94	0	30
2,4-Dinitrotoluene	121-14-2	0.0050U	0.0050	0.050	0.050	100	57 - 128	0.050	0.049	98	2	30
Cresols	1319-77-3	0.0100U	0.0100	0.100	0.082	82	24 - 125	0.100	0.080	80	1	30
Hexachlorobenzene	118-74-1	0.0050U	0.0050	0.050	0.046	92	53 - 125	0.050	0.046	92	0	30
Hexachlorobutadiene	87-68-3	0.0050U	0.0050	0.050	0.041	81	22 - 124	0.050	0.038	76	7	30
Hexachloroethane	67-72-1	0.0050U	0.0050	0.050	0.041	81	21 - 115	0.050	0.040	80	2	30
m,p-Cresol	1319-77-3MP	0.0050U	0.0050	0.050	0.040	80	29 - 110	0.050	0.039	78	3	30
Nitrobenzene	98-95-3	0.0050U	0.0050	0.050	0.046	92	45 - 121	0.050	0.047	95	3	30
o-Cresol	95-48-7	0.0050U	0.0050	0.050	0.041	83	30 - 117	0.050	0.041	82	0	30
Pentachlorophenol	87-86-5	0.0050U	0.0050	0.050	0.047	94	35 - 138	0.050	0.048	96	2	30
Pyridine	110-86-1	0.0250U	0.0250	0.050	0.015	29	10 - 120	0.050	0.018	35	19	30
Surrogate												
2,4,6-Tribromophenol	118-79-6	.0894	89	.1	.0907	91	43 - 140	.1	.0895	90	1	NA
2-Fluorobiphenyl	321-60-8	.0437	87	.05	.045	90	44 - 119	.05	.0439	88	2	NA
2-Fluorophenol	367-12-4	.0526	53	.1	.0571	57	19 - 119	.1	.0538	54	6	NA
Nitrobenzene-d5	4165-60-0	.0449	90	.05	.0444	89	44 - 120	.05	.0441	88	1	NA
Phenol-d5	4165-62-2	.0353	35	.1	.0415	42	10 - 123	.1	.0377	38	10	NA
Terphenyl-d14	1718-51-0	.0489	98	.05	.0499	100	50 - 134	.05	.048	96	4	NA

Analytical Batch	Client ID	KAFB-7-IDW01		1509921MS			
572623	GCAL ID	21511140801		1510203			
Prep Batch	Sample Type	SAMPLE		MS			
572551	Prep Date	11/16/2015 08:00		11/16/2015 08:00			
Prep Method	Analysis Date	11/16/2015 20:58		11/16/2015 21:15			
EPA 3510C	Matrix	Solid		Solid			
EPA 1311/8270D		Units Result	mg/L LOD	Spike Added	Result	%R	Control Limits%R
1,4-Dichlorobenzene	106-46-7	0.00	0.0304	0.304	0.227	75	29 - 112
2,4,5-Trichlorophenol	95-95-4	0.00	0.0304	0.304	0.271	89	53 - 123
2,4,6-Trichlorophenol	88-06-2	0.00	0.0304	0.304	0.261	86	50 - 125
2,4-Dinitrotoluene	121-14-2	0.00	0.0304	0.304	0.293	96	57 - 128
Cresols	1319-77-3	0.00	0.0607	0.607	0.426	70	24 - 125
Hexachlorobenzene	118-74-1	0.00	0.0304	0.304	0.260	86	53 - 125
Hexachlorobutadiene	87-68-3	0.00	0.0304	0.304	0.224	74	22 - 124
Hexachloroethane	67-72-1	0.00	0.0304	0.304	0.220	72	21 - 115
m,p-Cresol	1319-77-3MP	0.00	0.0304	0.304	0.210	69	29 - 110
Nitrobenzene	98-95-3	0.00	0.0304	0.304	0.251	83	45 - 121
o-Cresol	95-48-7	0.00	0.0304	0.304	0.217	72	30 - 117
Pentachlorophenol	87-86-5	0.00	0.0304	0.304	0.264	87	35 - 138
Pyridine	110-86-1	0.00	0.1519	0.304	0.101	33	10 - 120
Surrogate							
2,4,6-Tribromophenol	118-79-6			.5	.426	85	43 - 140
2-Fluorobiphenyl	321-60-8			.25	.199	80	44 - 119
2-Fluorophenol	367-12-4			.5	.243	49	19 - 119
Nitrobenzene-d5	4165-60-0			.25	.197	79	44 - 120
Phenol-d5	4165-62-2			.5	.17	34	10 - 123
Terphenyl-d14	1718-51-0			.25	.227	91	50 - 134

GC Volatiles QC Summary

Analytical Batch 572672	Client ID	MB572672		LCS572672			
	GCAL ID	1510733		1510734			
	Sample Type	MB		LCS			
	Prep Date	NA		NA			
	Analysis Date	11/17/2015 18:32		11/17/2015 18:19			
	Matrix	Solid		Solid			
EPA 8015C GRO		Units Result	mg/kg LOD	Spike Added	Result	%R	Control Limits%R
Gasoline Range Organics	8006-61-9	2.00U	2.00	25.0	24.1	96	67 - 127
Surrogate							
Bromochlorobenzene	106-39-8	1.1	73	1.5	1.4	93	47 - 164

Analytical Batch 572672	Client ID	CONF-02		1509930MS				1509930MSD				
	GCAL ID	21511140904		1510735				1510736				
	Sample Type	SAMPLE		MS				MSD				
	Prep Date	NA		NA				NA				
	Analysis Date	11/17/2015 19:42		11/17/2015 19:55				11/17/2015 20:08				
	Matrix	Solid		Solid				Solid				
EPA 8015C GRO		Units Result	mg/kg LOD	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Gasoline Range Organics	8006-61-9	0.00	2.29	28.6	30.2	106	67 - 127	28.6	29.5	103	2	30
Surrogate												
Bromochlorobenzene	106-39-8	1.12	75	1.49	1.36	91	47 - 164	1.49	1.38	93	1	NA

GC Semi-Volatiles QC Summary

Analytical Batch	Client ID	MB572688		LCS572688				LCSD572688				
572790	GCAL ID	1510851		1510852				1510853				
Prep Batch	Sample Type	MB		LCS				LCSD				
572688	Prep Date	11/17/2015 16:00		11/17/2015 16:00				11/17/2015 16:00				
Prep Method	Analysis Date	11/18/2015 08:01		11/18/2015 08:14				11/18/2015 08:27				
EPA 3510C	Matrix	Water		Water				Water				
EPA 1311/8081B		Units Result	mg/L LOD	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Chlordane (Technical)	57-74-9	0.0000500U	0.0000500									
Endrin	72-20-8	0.00000400U	0.00000400	0.000500	0.000490	98	60 - 138	0.000500	0.000498	100	2	30
gamma-BHC (Lindane)	58-89-9	0.00000400U	0.00000400	0.000500	0.000510	102	59 - 134	0.000500	0.000517	103	1	30
Heptachlor	76-44-8	0.00000800U	0.00000800	0.000500	0.000485	97	54 - 130	0.000500	0.000490	98	1	30
Heptachlor epoxide	1024-57-3	0.00000400U	0.00000400	0.000500	0.000517	103	61 - 133	0.000500	0.000525	105	2	30
Methoxychlor	72-43-5	0.0000100U	0.0000100	0.000500	0.000476	95	54 - 145	0.000500	0.000488	98	2	30
Toxaphene	8001-35-2	0.0000500U	0.0000500									
Surrogate												
Decachlorobiphenyl	2051-24-3	.00035	70	.0005	.000346	69	30 - 139	.0005	.000352	70	2	NA
Tetrachloro-m-xylene	877-09-8	.0005	100	.0005	.000474	95	44 - 124	.0005	.000479	96	1	NA

Analytical Batch	Client ID	KAFB-7-IDW01		1509921MS			
572790	GCAL ID	21511140801		1510854			
Prep Batch	Sample Type	SAMPLE		MS			
572688	Prep Date	11/17/2015 16:00		11/17/2015 16:00			
Prep Method	Analysis Date	11/18/2015 09:57		11/18/2015 10:10			
EPA 3510C	Matrix	Solid		Solid			
EPA 1311/8081B		Units Result	mg/L LOD	Spike Added	Result	%R	Control Limits%R
Endrin	72-20-8	0.00	0.0000486	0.00607	0.00615	101	60 - 138
gamma-BHC (Lindane)	58-89-9	0.00	0.0000486	0.00607	0.00634	104	59 - 134
Heptachlor	76-44-8	0.00	0.0000972	0.00607	0.00518	85	54 - 130
Heptachlor epoxide	1024-57-3	0.00	0.0000486	0.00607	0.00643	106	61 - 133
Methoxychlor	72-43-5	0.00	0.000121	0.00607	0.00573	94	54 - 145
Surrogate							
Decachlorobiphenyl	2051-24-3			.005	.00406	81	30 - 139
Tetrachloro-m-xylene	877-09-8			.005	.00432	86	44 - 124

Analytical Batch	Client ID	MB572625		LCS572625				LCSD572625				
572786	GCAL ID	1510543		1510544				1510545				
Prep Batch	Sample Type	MB		LCS				LCSD				
572625	Prep Date	11/17/2015 10:30		11/17/2015 10:30				11/17/2015 10:30				
Prep Method	Analysis Date	11/18/2015 07:45		11/18/2015 08:13				11/18/2015 08:41				
EPA 8151A	Matrix	Water		Water				Water				
EPA 1311/8151A		Units Result	mg/L LOD	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
2,4,5-TP (Silvex)	93-72-1	0.00250U	0.00250	0.00100	0.00067	67	44 - 130	0.00100	0.00066	66	2	40
2,4'-D	94-75-7	0.00250U	0.00250	0.00099	0.00063	64	29 - 143	0.00099	0.00065	65	3	40
Surrogate												
DCAA	19719-28-9	.00134	67	.002	.0012	60	18 - 136	.002	.00126	63	5	NA

Analytical Batch	Client ID	14081-D2-25		1508946MS			
572786	GCAL ID	21511121101		1510547			
Prep Batch	Sample Type	SAMPLE		MS			
572625	Prep Date	11/17/2015 10:30		11/17/2015 10:30			
Prep Method	Analysis Date	11/18/2015 11:43		11/18/2015 12:11			
EPA 8151A	Matrix	Solid		Solid			
EPA 1311/8151A		Units Result	mg/L LOD	Spike Added	Result	%R	Control Limits%R
2,4,5-TP (Silvex)	93-72-1	0.00000	0.03186	0.01274	0.00765	60	42 - 155
2,4'-D	94-75-7	0.00000	0.03186	0.01263	0.00726	58	30 - 164
Surrogate							
DCAA	19719-28-9			.02	.0112	56	18 - 136

GC Semi-Volatiles QC Summary

Analytical Batch	Client ID	KAFB-7-IDW01		1509921MS			
572786	GCAL ID	21511140801		1510546			
Prep Batch	Sample Type	SAMPLE		MS			
572625	Prep Date	11/17/2015 10:30		11/17/2015 10:30			
Prep Method	Analysis Date	11/18/2015 12:39		11/18/2015 13:08			
EPA 8151A	Matrix	Solid		Solid			
EPA 1311/8151A		Units Result	mg/L LOD	Spike Added	Result	%R	Control Limits%R
2,4,5-TP (Silvex)	93-72-1	0.00000	0.03037	0.01215	0.01016	84	42 - 155
2,4'-D	94-75-7	0.00000	0.03037	0.01204	0.00889	74	30 - 164
Surrogate							
DCAA	19719-28-9			.02	.0166	83	18 - 136

Analytical Batch	Client ID	MB572504		LCS572504				LCSD572504				
572631	GCAL ID	1510108		1510109				1510110				
Prep Batch	Sample Type	MB		LCS				LCSD				
572504	Prep Date	11/16/2015 08:45		11/16/2015 08:45				11/16/2015 08:45				
Prep Method	Analysis Date	11/16/2015 14:40		11/16/2015 14:54				11/16/2015 15:08				
EPA 3550C	Matrix	Solid		Solid				Solid				
EPA 8015C DRO		Units Result	mg/kg LOD	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Diesel Range Organics	GCSV-00-4	2.00U	2.00	33.3	28.3	85	38 - 132	33.3	29.2	88	3	30
Surrogate												
o-Terphenyl	84-15-1	1.4	84	1.67	1.56	94	45 - 130	1.67	1.53	92	2	NA

Analytical Batch	Client ID	KAFB-7-IDW01		1509921MS				1509921MSD				
572631	GCAL ID	21511140801		1510111				1510112				
Prep Batch	Sample Type	SAMPLE		MS				MSD				
572504	Prep Date	11/16/2015 08:45		11/16/2015 08:45				11/16/2015 08:45				
Prep Method	Analysis Date	11/16/2015 15:43		11/16/2015 15:58				11/16/2015 16:10				
EPA 3550C	Matrix	Solid		Solid				Solid				
EPA 8015C DRO		Units Result	mg/kg LOD	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
Diesel Range Organics	GCSV-00-4	169	12.1	40.5	197	67	38 - 132	40.5	193	59	2	30
Surrogate												
o-Terphenyl	84-15-1			1.67	1.56	94	45 - 130	1.67	1.52	91	3	NA

Inorganics QC Summary

Analytical Batch	Client ID	MB572651		LCS572651			
572590	GCAL ID	1510635		1510636			
Prep Batch	Sample Type	MB		LCS			
572651	Prep Date	11/17/2015 12:30		11/17/2015 12:30			
Prep Method	Analysis Date	11/18/2015 17:06		11/18/2015 17:08			
EPA 7470A	Matrix	Water		Water			
EPA 1311/7470A		Units Result	mg/L LOD	Spike Added	Result	%R	Control Limits%R
Mercury	7439-97-6	0.00020U	0.00020	0.0050	0.0046	92	80 - 120

Analytical Batch	Client ID	KAFB-7-IDW01		1509921MS			
572874	GCAL ID	21511140801		1510676			
Prep Batch	Sample Type	SAMPLE		MS			
572651	Prep Date	11/17/2015 12:30		11/17/2015 12:30			
Prep Method	Analysis Date	11/19/2015 16:10		11/19/2015 16:12			
EPA 7470A	Matrix	Solid		Solid			
EPA 1311/7470A		Units Result	mg/L LOD	Spike Added	Result	%R	Control Limits%R
Mercury	7439-97-6	0.0	0.00024	0.0061	0.0050	83	80 - 120

Analytical Batch	Client ID	MB572556		LCS572556			
572662	GCAL ID	1510213		1510214			
Prep Batch	Sample Type	MB		LCS			
572556	Prep Date	11/16/2015 11:15		11/16/2015 11:15			
Prep Method	Analysis Date	11/17/2015 10:20		11/17/2015 10:23			
EPA 3010A	Matrix	Water		Water			
EPA 1311/6020A		Units Result	mg/L LOD	Spike Added	Result	%R	Control Limits%R
Arsenic	7440-38-2	0.00050U	0.00050	0.050	0.052	104	80 - 120
Barium	7440-39-3	0.00050U	0.00050	0.050	0.054	108	80 - 120
Cadmium	7440-43-9	0.00050U	0.00050	0.050	0.054	108	80 - 120
Chromium	7440-47-3	0.00050U	0.00050	0.050	0.054	108	80 - 120
Lead	7439-92-1	0.00050U	0.00050	0.050	0.056	111	80 - 120
Selenium	7782-49-2	0.00050U	0.00050	0.010	0.010	103	80 - 120
Silver	7440-22-4	0.00050U	0.00050	0.050	0.054	109	80 - 120

Analytical Batch	Client ID	KAFB-7-IDW01		1509921MS			
572662	GCAL ID	21511140801		1510256			
Prep Batch	Sample Type	SAMPLE		MS			
572556	Prep Date	11/16/2015 11:15		11/16/2015 11:15			
Prep Method	Analysis Date	11/17/2015 11:55		11/17/2015 11:59			
EPA 3010A	Matrix	Solid		Solid			
EPA 1311/6020A		Units Result	mg/L LOD	Spike Added	Result	%R	Control Limits%R
Arsenic	7440-38-2	0.0	0.061	0.61	0.62	103	80 - 120
Barium	7440-39-3	1.26	0.061	0.61	1.94	113	80 - 120
Cadmium	7440-43-9	0.000090	0.061	0.61	0.66	109	80 - 120
Chromium	7440-47-3	0.0	0.061	0.61	0.63	104	80 - 120
Lead	7439-92-1	0.00035	0.061	0.61	0.67	110	80 - 120
Selenium	7782-49-2	0.0	0.061	0.12	0.15	**124***	80 - 120
Silver	7440-22-4	0.0000085	0.061	0.61	0.66	109	80 - 120

General Chemistry QC Summary

Analytical Batch	Client ID	MB572643		LCS572643			
572740	GCAL ID	1510605		1510606			
Prep Batch	Sample Type	MB		LCS			
572643	Prep Date	11/17/2015 09:40		11/17/2015 09:40			
Prep Method	Analysis Date	11/18/2015 09:17		11/18/2015 09:17			
EPA 7.3.4.2	Matrix	Solid		Solid			
EPA 9034		Units Result	mg/kg LOD	Spike Added	Result	%R	Control Limits%R
Reactivity Sulfide	18496-25-8R	250U	250	1000	1202	120	47 - 120

Analytical Batch	Client ID	BLEND DECK CLEAN OUT #1		1509178DUP		
572740	GCAL ID	21511124901		1510607		
Prep Batch	Sample Type	SAMPLE		DUP		
572643	Prep Date	11/17/2015 09:40		11/17/2015 09:40		
Prep Method	Analysis Date	11/18/2015 09:17		11/18/2015 09:17		
EPA 7.3.4.2	Matrix	Solid		Solid		
EPA 9034		Units Result	mg/kg LOD	Result	RPD	RPD Limit
Reactivity Sulfide	18496-25-8R	0	250	0	0	25

Analytical Batch	Client ID	MB572642		LCS572642			
572805	GCAL ID	1510602		1510603			
Prep Batch	Sample Type	MB		LCS			
572642	Prep Date	11/17/2015 09:40		11/17/2015 09:40			
Prep Method	Analysis Date	11/17/2015 19:53		11/17/2015 19:55			
EPA 7.3.3.2	Matrix	Solid		Solid			
EPA 9012B		Units Result	mg/kg LOD	Spike Added	Result	%R	Control Limits%R
Reactivity Cyanide	57-12-5R	250U	250	250	13.8	6	1 - 25

Analytical Batch	Client ID	BLEND DECK CLEAN OUT #1		1509178DUP		
572805	GCAL ID	21511124901		1510604		
Prep Batch	Sample Type	SAMPLE		DUP		
572642	Prep Date	11/17/2015 09:40		11/17/2015 09:40		
Prep Method	Analysis Date	11/17/2015 20:00		11/17/2015 20:02		
EPA 7.3.3.2	Matrix	Solid		Solid		
EPA 9012B		Units Result	mg/kg LOD	Result	RPD	RPD Limit
Reactivity Cyanide	57-12-5R	0.0	250	0.0	0	20

Analytical Batch	Client ID	KAFB-7-IDW01		1509921DUP		
572503	GCAL ID	21511140801		1510107		
	Sample Type	SAMPLE		DUP		
	Prep Date	NA		NA		
	Analysis Date	11/15/2015 08:20		11/15/2015 08:20		
	Matrix	Solid		Solid		
EPA 9045D		Units Result	pH unit LOD	Result	RPD	RPD Limit
pH	pH	6.62	1.00	6.63	0	6

Client ID: 4769 - CB&I

SDG: 215111409

PM: RKW

CHAIN OF CUSTODY

Page 1

CB&I Federal Services

Company Name: CB&I Federal Services
Address: 2440 Louisiana Blvd NE, Ste 300
City / State / Zip: Albuquerque, NM 87110
Manager: ~~Kathleen Romalia~~ EP Justin Martinez
Phone/Fax Number: ~~303-486-2510~~ EP 505 507 7881
Send Report To: Susan Huang
Phone/Fax Number: 925-288-2099 (work)/925-827-5927 (fax)
Address: 4005 Port Chicago Highway
City: Concord, CA 94520

Project Number: 140705
Project Name: KAFB-BFF
Project Location: Kirtland AFB, NM
Subcontract Agreement: KA011060
Lab Destination: GCAL
Lab Contact: Kimberly Drag
Lab Phone #: 704-607-7735

Requesting Testing Program

Lab Sample Number	Sample Identification	Collection Information Date	Time	G/C	Matrix	# of Bottles	PRESERVATION Container	BTEX (8260) + 1,2-Dibromoethane	TPH-DRO (8015B)	TPH-GRO by 8015B	TCLP Pesticides (1311 8081B) TCLP Herbicides (1311 8151A)	TCLP VOCs 8260B	RCI Chapter 7, 7.3, 4.2	TCLP Metals (1311 6010C)	TCLP Mecury (1311 7470A)	TCLP SVOCS by 1311 8270D	Turn Around Time Required
								ICE									
								8oz glass									
Initial-01	TTS	11/13/15	1530	G	SO	2		X	X	X	X	X	X	X	X	X	5 day-1
Initial-02	TTS	11/13/15	1545	G	SO	2		X	X	X	X	X	X	X	X	X	5 day-2
Conf-01	TTS	11/13/15	1604	G	SO	2		X	X	X	X	X	X	X	X	X	5 day-3
Conf-02	TTS	11/13/15	1602	G	SO	2		X	X	X	X	X	X	X	X	X	5 day-4

EP

8079 5216 5660 4.3E24

Sampler(s) Name(s): MM, EP, GB

Relinquished By	Date	Time	Received By	Date	Time
Eva Dawn Fry	11/13/15	1730			
Fed Ex	11-14-15	10:10	Dodie McCune	11-14-15	10:10

Turnaround Time: 5 day TAT

Level Of QC Required: I (II) III Project Specific:

Method Codes

C = Composite
G = Grab

Matrix Codes

DW = Drinking Water
GW = Ground Water
WW = Waste Water
SW = Surface Water
LIQ = Other Liquid
SOL = Other Solid
SO = Soil
SL = Sludge
CP = Chip Samples
WP = Wipe Samples
GS = Air Sample

GCAL ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIVING CHECKLIST

215111409

SAMPLE DELIVERY GROUP 215111409	
Client PM RKW 4769 - CB&I	**Transport Method** FEDEX
Profile Number 210418	**Received By** McCune, Dodie N.
Line Item(s) 4 - KAFB RAPID	**Receive Date(s)** 11/14/15

CHECKLIST	YES	NO	NA
Were all samples received using proper thermal preservation?	☑	☐	☐
When used, were all custody seals intact?	☑	☐	☐
Were all samples received in proper containers?	☑	☐	☐
Were all samples received using proper chemical preservation?	☐	☐	☑
Was preservative added to any container at the lab?	☐	☑	☐
Were all containers received in good condition?	☑	☐	☐
Were all VOC water samples received without head space?	☐	☐	☑
Do all sample labels match the Chain of Custody?	☑	☐	☐
Did the Chain of Custody list the sampling technician?	☑	☐	☐
Was the COC maintained i.e. all signatures, dates and time of receipt included?	☑	☐	☐

COOLERS

Airbill	Thermometer ID: E24	Temp(°C)
807952165650		4.3

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

Revision 1.4

Page 1 of 1

APPENDIX B

Empirical Laboratories
Analytical Results

ANALYTICAL DATA PACKAGE
SDG # 1511180

PROJECT NAME: KIRTLAND AFB 2015
PROJECT LOCATION: ALBUQUERQUE, NEW MEXICO

SUBMITTAL TO:
Susan Huang
CB&I FEDERAL SERVICES, LLC
4005 Port Chicago Highway
Concord, CA 94520

SUBMITTAL BY:
Empirical Laboratories, LLC (EL)
621 Mainstream Drive, Suite 270
Nashville, TN 37228
Tel (615)345-1115
Fax (866)417-0548

LABORATORY CONTACT PERSON:
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Email: mwalker@empirlabs.com

Original Report Date: December 4, 2015
Report Revision #: N/A
Revision Date: N/A
Total # of Pages: 40

THIS DOCUMENT MEETS DoD QSM 4.2 STANDARDS

The results relate to only the samples associated with the referenced SDG and the submitted data has been produced in accordance with laboratory procedures. The Laboratory's Technical Lab Director, Mr. Rick Davis, is responsible for the final data produced and reported. His signature is listed at the end of the Case Narrative within the Analytical Data Package. If applicable to this report package, details on report revisions and the information on subcontracted analysis are listed in the package Case Narrative. This report shall not be reproduced, except in full, without the written approval of Empirical Laboratories, LLC.

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Sample Delivery Group Case Narrative

Receipt Information:

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision:

This is an original submittal of the final report package.

Analytical Information:

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. Sample preparation and dilution information is provided within the final results report and at the beginning of each form set. The following information is provided specific to individual methods:

SW8011:

The following batch spikes exceeded criteria:

5K20003-BSD1 with a positive bias on column 2 for 1,2-Dibromo-3-chloropropane ; note – no positive results were detected in the associated samples

No additional anomalies or deviations are noted and the proper data qualifiers have been applied.

Data Qualifiers:

As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

DL: The detection limit (DL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The DL is supported by the method detection limit (MDL) which is determined from analysis of a sample containing the analyte in a given matrix.

LOD: The Limit of Detection is an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. This definition is further clarified in the DoD QSM 4.2 revisions as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.

LOQ: The Limit of Quantitation is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. This term is further clarified within the DoD QSM 4.2 as the lowest concentration that produces a quantitative result within specified limits of precision and bias.

*****: Exceeding quality control criteria are associated with the reported result.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound. For Metals, the qualifier indicates that the serial dilution was outside of the control limits and the compound should be considered estimated due to the presence of interference.

H1: The result was analyzed outside of the EPA recommended holding time.

H2: The result was extracted outside of the EPA recommended holding time.

H3: The sample for this analyte was received outside of the EPA recommended holding time.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the LOQ. One should feel confident that the result is greater than zero and less than the LOQ.

M: Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In inorganics, it indicates that the parameters DL/LOD/LOQ have been raised.

N: The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

Q: The relative percent difference (RPD) and/or percent recovery exceeded limits in the associated Blank Spike and/or Blank Spike Duplicate.

S: The associated internal standard exceeded criteria.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the DL.

X: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

Y: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

Z: The parameter shows lack of confirmation/detection, which may be due to a negative bias in the ICV or CCV which exceeds the lower control limit.

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

A: The peak was manually integrated as it was not integrated in the original chromatogram.

B: The peak was manually integrated due to resolution or coelution issues in the original chromatogram.

C: The peak was manually integrated to correct the baseline from the original chromatogram.

D: The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.

E: The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

LIMS Definitions / Naming Conventions:

The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

BLK: LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK

appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

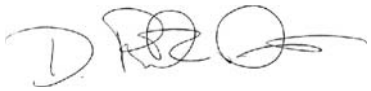
BS: LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.

MS: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

IDs: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And "**RE"** implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:

I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, the Data Quality Manager, Technical Directors or Project Managers are authorized to sign this Statement of Data Authenticity.



Mr. Rick D. Davis
Laboratory Technical Director / VP Operations

ORGANIC CALCULATIONS

GC/MS Volatiles

$$\text{Final Concentration} = \frac{\text{On-column(ug/L or ug/Kg) * Expected Vol/Weight (mL or g) * Dilution}}{\text{Initial Vol/Weight (mL or g) * (Percent Solids/100) (if applicable)}}$$

Note - Expected Vol/Weight value is found in "Final Vol" column of Preparation Batch Summary.

GC/MS Extractables

$$\text{Final Concentration} = \frac{\text{On-column(ng/uL) * Final Vol (ml) * Dilution *(1000uL/mL)}}{\text{Initial Vol/Weight (mL or g) * (Percent Solids/100) (if applicable)}}$$

= ng/mL or ng/g

= ug/L or ug/kg

GC or LC Extractables

$$\text{Final Concentration} = \frac{\text{On-column(ng/mL) * Final Vol (mL) * Dilution}}{\text{Initial Vol/Weight (mL or g) * (Percent Solids/100) (if applicable)}}$$

= ng/mL or ng/g

= ug/L or ug/kg

Empirical Laboratories, LLC
Certifications/Approvals
(Revised 11/06/2015)

DoD ELAP QSM5.0, Certificate Number L2226
- Aqueous
- Non-aqueous
- Expires: 01/30/2016

State of Florida, Department of Health – NELAP, Lab ID: E87646
- Clean Water Act
- RCRA/CERCLA
- Expires: 06/30/2016

State of Georgia, Environmental Protection Agency – NELAP, Self Certification
- Expires: 11/30/2015

Commonwealth of Kentucky, Energy and Environment Cabinet – WWLCP, Laboratory Number: 98017
- Wastewater
- Expires: 12/31/2015

Commonwealth of Kentucky, Department of Environmental Protection – UST, Certificate Number: 77
- Aqueous
- Non-aqueous
- Expires: 11/30/2015

State of New Jersey, Department of Environmental Protection – NELAP Primary, Lab ID: TN473
- Water Pollution
- Solid and Hazardous Waste
- Expires: 11/30/2015

State of North Carolina, Department of Environment and Natural Resources - Certificate Number: 643
- Aqueous
- Non-aqueous
- Expires: 12/31/2015

State of Texas, Commission on Environmental Quality – NELAP, Certificate Number: T104704307-15-11
- Aqueous
- Non-aqueous
- Expires: 12/31/2015

State of Utah, Department of Health – NELAP, Certificate Number: TN0042015-7
- Aqueous
- Non-aqueous
- Expires: 07/31/2016

Commonwealth of Virginia, Department of General Services – NELAP, Certificate Number: 7700, Lab ID: 460243
- Aqueous
- Non-aqueous
- Expires: 12/14/2015

State of Washington, Department of Ecology – NELAP, Lab ID: C934-15
- Groundwater
- Solid and Hazardous Waste
- Expires: 03/18/2016

Sample Receipt Information

1511180-01 A

CHAIN OF CUSTODY

Ref. Document # 140705-TTS-Investigation

Page 1

CB&I Federal Services

Company Name: CB&I Federal Services
Address: 2440 Louisiana Blvd NE, Ste 300
City / State / Zip: Albuquerque, NM 87110
Manager: Mike Andurer
Phone/Fax Number: 303-486-2503
Send Report To: Susan Huang
Phone/Fax Number: 925-288-2099 (work)/925-827-5927 (fax)
Address: 4005 Port Chicago Highway
City: Concord, CA 94520

Project Number: 140705
Project Name: KAFB-BFF
Project Location: Kirtland AFB, NM
Subcontract Agreement:
Lab Destination: Empirical Laboratories
Lab Contact: Jennifer Chandler
Lab Phone #: 615-345-1115

	Lab Sample Number	Sample Identification	Collection Information Date	Time	G/C	Matrix	# of Bottles	PRESERVATION / Container	Requesting Testing Program: EDB by SW8011							Turn Around Time Required
									None							
									8oz jar							
01	Initial-Inside-03	TTS-Inside	11/17/15	0830	G	SO	1		X							4 day
02	Initial-Outside-03	TTS-Outside	11/17/15	0830	G	SO	1		X							4 day
03	TTS-Rolloff-03	TTS-Rolloff	11/17/15	0830	G	SO	1		X							4 day

[redacted]

Sampler(s) Name(s): Jared Stoffel

Relinquished By	Date	Time	Received By	Date	Time
Justin L. Matty	11/17/15	1030	J Jones	11/18/15	0850

Turnaround Time:

Level Of QC Required: I (II) III Project Specific:

Method Codes
C = Composite
G = Grab

Matrix Codes
DW = Drinking Water
GW = Ground Water
WW = Waste Water
SW = Surface Water
LIQ = Other Liquid
SOL = Other Solid
SO = Soil
SL = Sludge
CP = Chip Samples
WP = Wipe Samples
GS = Air Sample

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 11/18/15 @ 0850 Work order# 1511180

1. Tracking # 5660 (last 4 digits, FedEx)

   Courier: FedEx

2. Temperature of rep. sample or temp blank when opened: 2.5 °C + correction factor(+0.4) = 2.9 °C

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

   If yes, how many and where: 2. front + back

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

   I certify that I opened the cooler and answered questions 1-6 (initial/date) JTG 11/18/15

7. Were custody seals on containers: YES NO and intact YES...NO...NA

   Were these signed and dated correctly? YES...NO...NA

8. Packing material used? Bubble wrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry Ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13. a. Were VOA vials received? YES...NO...NA

    b. Was there observable headspace present in any VOA vial (>5mm-6mm)? YES...NO...NA

14. Was there a Trip Blank in this cooler (custody seals present/intact)? YES...NO...NA...Comments_____
    If multiple coolers, sequence #_____

    I certify that I unloaded the cooler and answered questions 7-14 (initial/date) JTG 11/18/15

15. a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

    b. Did the bottle labels indicate that the correct preservatives were used? YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

    I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial/date) JTG 11/18/15

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA If not, PM notified? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA If not, PM notified? YES...NO...NA

21. Were there Non-Conformance issues at login? YES...NO...NCR#_____

I certify that I entered this project into LIMS and answered questions 17-21 (initial/date) JTG 11/18/15

I certify that I attached a label with the unique LIMS number to each container (initial/date) JTG 11/18/15

I certify that I notified the laboratory of any short holding time or RUSH parameters (initial/date) JTG 11/18/15

C:\Users\thutchings\Desktop\Cooler Receipt Updated 2014.doc

III. EMPIRICAL LABORATORIES, LLC
DATA ENTRY VERIFICATION FORM – PROJECT MANAGEMENT

Work Order#: 1511180

	Verification Item	Yes	No	NA
1.	**Cooler Receipt Form Issues reviewed and communicated to client**			X
2.	**Element/ Project Screen/items verified to match the COC/CRF:**			
a.	**Client/Project**	X		
b.	Comments requiring laboratory reminder?	X		
c.	Client and/or Project Memo requiring laboratory reminder?		X	
3.	**Receipt Screen items verified to match the COC/CRF:**			
a.	Received Date/Received By	X		
b.	Workorder Due Date	X		
c.	Package Due Date	X		
d.	TAT	X		
e.	SDG Identifier Populated	X		
4.	**Sample Information verified against COC for each sample:**			
a.	Name	X		
b.	QC Source		X	
c.	Matrix	X		
d.	Sample Type	X		
e.	Sampled Date/Time (Correct Time Zone)	X		
f.	Work Analyses/Versions	X		
g.	Sample Issues included in comments			X
h.	Unpreserved VOA holding time set to 7 days			X
5.	**Containers consistent with tests requested**	X		
6.	**Field data entered and matching COC, if applicable**			X
	I certify that I have performed a second check of the LIMS information against the COC to confirm accuracy (initial/date):	MJW 11/18/15		

H:\DataEntryVerificationForm.doc

WORK ORDER

Printed: 11/18/2015 9:46:06PM

1511180

Empirical Laboratories, LLC

Client: CB&I
Project: Kirtland AFB 2015

Project Manager: Marianne J. Walker
Project Number: SHW_Kirtland

Report To:
CB&I
Susan Huang
4005 Port Chicago Highway
Concord, CA 94520
Phone: (925) 288-2099
Fax: (925) 288-0888

Invoice To:
CB&I
Accounts Payable
PO Box 98519
Baton Rouge, LA 70884
Phone :(225) 932-2500
Fax: (225) 932-2661

Date Due: 11/24/2015 16:00 (4 day TAT)

Received By: Joshua T. Gross
Date Received: 11/18/2015 08:50

Logged In By: Joshua T. Gross
Date Logged In: 11/18/2015 09:23

Samples Received at: **2.9°C**

Custody Seals	Yes	Received On Ice	Yes
Containers Intact	Yes		
COC/Labels Agree	Yes		
Preservation Confirme	No		

Analysis	Due	TAT	Expires	Comments
1511180-01 Initial-Inside-03 [Solid] Sampled 11/17/2015 08:30 (GMT-07:00) Mountain Time (US				
WC_PERCENT_SOLIDS_2540B	11/24/2015 16:00	4	11/24/2015 09:30	
SGC_EDB_8011	11/24/2015 16:00	4	12/01/2015 09:30	GoodSurrOrRERUN! DiluteBasedOn8260results!
1511180-02 Initial-Outside-03 [Solid] Sampled 11/17/2015 08:30 (GMT-07:00) Mountain Time (US				
WC_PERCENT_SOLIDS_2540B	11/24/2015 16:00	4	11/24/2015 09:30	
SGC_EDB_8011	11/24/2015 16:00	4	12/01/2015 09:30	GoodSurrOrRERUN! DiluteBasedOn8260results!
1511180-03 TTS-Rolloff-03 [Solid] Sampled 11/17/2015 08:30 (GMT-07:00) Mountain Time (US				
WC_PERCENT_SOLIDS_2540B	11/24/2015 16:00	4	11/24/2015 09:30	
SGC_EDB_8011	11/24/2015 16:00	4	12/01/2015 09:30	GoodSurrOrRERUN! DiluteBasedOn8260results!

Reviewed By

Date

Sample Delivery Group Assignment Form

CLIENT: CB&I
PROJECT NAME: Kirtland AFB 2015
SDG #: 1511180

QC LEVEL: Level III
Report Due: 11/24/2015
Client Sample Count: 3

Sample Type	Sampled	Received	Lab ID	Client ID	Report Matrix	SM2540B	SW8011
Client Sample	11/17/2015	11/18/2015	1511180-01	Initial-Inside-03	Solid	X	X
Client Sample	11/17/2015	11/18/2015	1511180-02	Initial-Outside-03	Solid	X	X
Client Sample	11/17/2015	11/18/2015	1511180-03	TTS-Rolloff-03	Solid	X	X

Data for SW8011 Forms

Sample Extraction Data

Prep Method: EDB_soil-SW8011

Lab Number [Field ID]	Batch	Nominal Initial/Final	Initial [g]	Final [mL]	Dilution	% Solids	Notes	Date
1511180-01 [Initial-Inside-03]	5K20003	5.00/35.00	5.34	35.0	1.00	82.22		11/20/15
1511180-02 [Initial-Outside-03]	5K20003	5.00/35.00	5.31	35.0	1.00	87.44		11/20/15
1511180-03 [TTS-Rolloff-03]	5K20003	5.00/35.00	5.29	35.0	1.00	88.56		11/20/15

ANALYSIS DATA SHEET

Initial-Inside-03

Laboratory:	Empirical Laboratories, LLC			SDG:	1511180
Client:	CB&I			Project:	Kirtland AFB 2015
Matrix:	Solid	Laboratory ID:	1511180-01	File ID:	007F0301.D
Sampled:	11/17/15 08:30	Prepared:	11/20/15 10:25	Analyzed:	11/20/15 17:35
Solids:	82.22	Preparation:	EDB_soil	Dilution:	1

Batch: 5K20003 Sequence: 5L33701 Calibration: 5336007 Instrument: GL-ECD2

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
106-93-4	1,2-Dibromoethane		0.0797	0.159	0.239	U
96-12-8	1,2-Dibromo-3-chloropropane		0.0797	0.159	0.239	U

Total Target Analytes Reported 2 Project Analytes: 2

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
1,3-Dibromopropane	15.85	15.20	95.9	30 - 130	
1,3-Dibromopropane [2C]	15.85	17.31	109	30 - 130	

ANALYSIS DATA SHEET

Initial-Outside-03

Laboratory:	Empirical Laboratories, LLC			SDG:	1511180
Client:	CB&I			Project:	Kirtland AFB 2015
Matrix:	Solid	Laboratory ID:	1511180-02	File ID:	008F0301.D
Sampled:	11/17/15 08:30	Prepared:	11/20/15 10:25	Analyzed:	11/20/15 17:47
Solids:	87.44	Preparation:	EDB_soil	Dilution:	1

Batch: 5K20003 Sequence: 5L33701 Calibration: 5336007 Instrument: GL-ECD2

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
106-93-4	1,2-Dibromoethane		0.0754	0.151	0.226	U
96-12-8	1,2-Dibromo-3-chloropropane		0.0754	0.151	0.226	U

Total Target Analytes Reported 2 Project Analytes: 2

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
1,3-Dibromopropane	14.99	13.33	88.9	30 - 130	
1,3-Dibromopropane [2C]	14.99	15.05	100	30 - 130	

ANALYSIS DATA SHEET

TTS-Rolloff-03

Laboratory:	Empirical Laboratories, LLC			SDG:	1511180
Client:	CB&I			Project:	Kirtland AFB 2015
Matrix:	Solid	Laboratory ID:	1511180-03	File ID:	009F0301.D
Sampled:	11/17/15 08:30	Prepared:	11/20/15 10:25	Analyzed:	11/20/15 17:58
Solids:	88.56	Preparation:	EDB_soil	Dilution:	1

Batch: 5K20003 Sequence: 5L33701 Calibration: 5336007 Instrument: GL-ECD2

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
106-93-4	1,2-Dibromoethane		0.0747	0.149	0.224	U
96-12-8	1,2-Dibromo-3-chloropropane		0.0747	0.149	0.224	U

Total Target Analytes Reported 2 Project Analytes: 2

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
1,3-Dibromopropane	14.86	13.91	93.6	30 - 130	
1,3-Dibromopropane [2C]	14.86	16.19	109	30 - 130	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8011

Laboratory:	Empirical Laboratories, LLC	SDG:	1511180
Client:	CB&I	Project:	Kirtland AFB 2015
Sequence:	5L33701	Instrument:	GL-ECD2
		Calibration:	5336007

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (5L33701-CCV1) ug/L				Lab File ID: 003F0301.D		Analyzed: 11/20/15 16:48		
1,3-Dibromopropane	1.989	94.0	80 - 120	3.576	3.576	0.0000	+/-0.030	
1,3-Dibromopropane [2C]	1.989	107	80 - 120	4.086	4.086	0.0000	+/-0.030	
Blank (5K20003-BLK1) ug/Kg wet				Lab File ID: 004F0301.D		Analyzed: 11/20/15 17:00		
1,3-Dibromopropane	13.92	88.1	30 - 130	3.576	3.576	0.0000	+/-0.030	
1,3-Dibromopropane [2C]	13.92	105	30 - 130	4.086	4.086	0.0000	+/-0.030	
LCS (5K20003-BS1) ug/Kg wet				Lab File ID: 005F0301.D		Analyzed: 11/20/15 17:11		
1,3-Dibromopropane	13.92	86.0	30 - 130	3.576	3.576	0.0000	+/-0.030	
1,3-Dibromopropane [2C]	13.92	99.2	30 - 130	4.086	4.086	0.0000	+/-0.030	
LCS Dup (5K20003-BSD1) ug/Kg wet				Lab File ID: 006F0301.D		Analyzed: 11/20/15 17:23		
1,3-Dibromopropane	13.92	102	30 - 130	3.576	3.576	0.0000	+/-0.030	
1,3-Dibromopropane [2C]	13.92	123	30 - 130	4.086	4.086	0.0000	+/-0.030	
Initial-Inside-03 (1511180-01) ug/Kg dry				Lab File ID: 007F0301.D		Analyzed: 11/20/15 17:35		
1,3-Dibromopropane	15.85	95.9	30 - 130	3.576	3.576	0.0000	+/-0.030	
1,3-Dibromopropane [2C]	15.85	109	30 - 130	4.086	4.086	0.0000	+/-0.030	
Initial-Outside-03 (1511180-02) ug/Kg dry				Lab File ID: 008F0301.D		Analyzed: 11/20/15 17:47		
1,3-Dibromopropane	14.99	88.9	30 - 130	3.576	3.576	0.0000	+/-0.030	
1,3-Dibromopropane [2C]	14.99	100	30 - 130	4.086	4.086	0.0000	+/-0.030	
TTS-Rolloff-03 (1511180-03) ug/Kg dry				Lab File ID: 009F0301.D		Analyzed: 11/20/15 17:58		
1,3-Dibromopropane	14.86	93.6	30 - 130	3.576	3.576	0.0000	+/-0.030	
1,3-Dibromopropane [2C]	14.86	109	30 - 130	4.086	4.086	0.0000	+/-0.030	
Calibration Check (5L33701-CCV2) ug/L				Lab File ID: 010F0301.D		Analyzed: 11/20/15 18:10		
1,3-Dibromopropane	1.989	95.3	80 - 120	3.58	3.576	0.0040	+/-0.030	
1,3-Dibromopropane [2C]	1.989	112	80 - 120	4.09	4.086	0.0040	+/-0.030	

LCS / LCS DUPLICATE RECOVERY

SW8011

Laboratory:	Empirical Laboratories, LLC	SDG:	1511180
Client:	CB&I	Project:	Kirtland AFB 2015
Matrix:	Solid		
Batch:	5K20003	Laboratory ID:	5K20003-BS1
Preparation:	EDB_soil	Initial/Final:	5 g / 35 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
1,2-Dibromoethane	3.500	2.848	81.4	30 - 130
1,2-Dibromoethane [2C]	3.500	3.186	91.0	30 - 130
1,2-Dibromo-3-chloropropane	3.500	2.944	84.1	30 - 130
1,2-Dibromo-3-chloropropane [2C]	3.500	3.489	99.7	30 - 130

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,2-Dibromoethane	3.500	3.297	94.2	14.6	30	30 - 130
1,2-Dibromoethane [2C]	3.500	3.768	108	16.7	30	30 - 130
1,2-Dibromo-3-chloropropane	3.500	3.659	105	21.7	30	30 - 130
1,2-Dibromo-3-chloropropane [2C]	**3.500**	**4.579**	**131 ***	**27.0**	**30**	**30 - 130**

PREPARATION BATCH SUMMARY

SW8011

Laboratory: Empirical Laboratories, LLC SDG: 1511180

Client: CB&I Project: Kirtland AFB 2015

Batch: 5K20003 Batch Matrix: Solid Preparation: EDB_soil

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Initial-Inside-03	1511180-01	11/20/15 10:25	5.34	35.00
Initial-Outside-03	1511180-02	11/20/15 10:25	5.31	35.00
TTS-Rolloff-03	1511180-03	11/20/15 10:25	5.29	35.00
Blank	5K20003-BLK1	11/20/15 10:25	5.00	35.00
LCS	5K20003-BS1	11/20/15 10:25	5.00	35.00
LCS Dup	5K20003-BSD1	11/20/15 10:25	5.00	35.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC	SDG:	1511180
Client:	CB&I	Project:	Kirtland AFB 2015

Matrix:		Laboratory ID:	5K20003-BLK1	File ID:	004F0301.D
Sampled:		Prepared:	11/20/15 10:25	Analyzed:	11/20/15 17:00
Solids:		Preparation:	EDB_soil	Dilution:	

Batch:	5K20003	Sequence:	5L33701	Calibration:	5336007	Instrument:	GL-ECD2

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	DL	LOD	LOQ	Q
106-93-4	1,2-Dibromoethane		0.0700	0.140	0.210	U
96-12-8	1,2-Dibromo-3-chloropropane		0.0700	0.140	0.210	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
1,3-Dibromopropane	13.92	12.27	88.1	30 - 130	
1,3-Dibromopropane [2C]	13.92	14.59	105	30 - 130	

ANALYSIS DATA SHEET

LCS

Laboratory: Empirical Laboratories, LLC SDG: 1511180

Client: CB&I Project: Kirtland AFB 2015

Matrix: Laboratory ID: 5K20003-BS1 File ID: 005F0301.D

Sampled: Prepared: Analyzed: 11/20/15 17:11

Solids: Preparation: EDB_soil Dilution:

Batch: 5K20003 Sequence: 5L33701 Calibration: 5336007 Instrument: GL-ECD2

CAS NO.	COMPOUND	ONC. (ug/Kg we	DL	LOD	LOQ	Q
106-93-4	1,2-Dibromoethane	**2.848**	0.0700	0.140	0.210	
96-12-8	1,2-Dibromo-3-chloropropane	**2.944**	0.0700	0.140	0.210	

Total Target Analytes Reported: 4

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
1,3-Dibromopropane	13.92	11.97	86.0	30 - 130	

ANALYSIS DATA SHEET

LCS

Laboratory: Empirical Laboratories, LLC SDG: 1511180

Client: CB&I Project: Kirtland AFB 2015

Matrix: Laboratory ID: 5K20003-BS1 File ID: 005R0301.D

Sampled: Prepared: Analyzed: 11/20/15 17:11

Solids: Preparation: EDB_soil Dilution:

Batch: 5K20003 Sequence: 5L33701 Calibration: 5336007 Instrument: GL-ECD2

CAS NO.	COMPOUND	ONC. (ug/Kg we	DL	LOD	LOQ	Q
106-93-4	1,2-Dibromoethane [2C]	**3.186**	0.0700	0.140	0.210	
96-12-8	1,2-Dibromo-3-chloropropane [2C]	**3.489**	0.0700	0.140	0.210	

Total Target Analytes Reported: 4

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
1,3-Dibromopropane [2C]	13.92	13.81	99.2	30 - 130	

ANALYSIS DATA SHEET

LCS Dup

Laboratory:	Empirical Laboratories, LLC	SDG:	1511180
Client:	CB&I	Project:	Kirtland AFB 2015

Matrix:		Laboratory ID:	5K20003-BSD1	File ID:	006F0301.D
Sampled:		Prepared:		Analyzed:	11/20/15 17:23
Solids:		Preparation:	EDB_soil	Dilution:	

Batch:	5K20003	Sequence:	5L33701	Calibration:	5336007	Instrument:	GL-ECD2

CAS NO.	COMPOUND	ONC. (ug/Kg we	DL	LOD	LOQ	Q
106-93-4	1,2-Dibromoethane	**3.297**	0.0700	0.140	0.210	
96-12-8	1,2-Dibromo-3-chloropropane	**3.659**	0.0700	0.140	0.210	

Total Target Analytes Reported: 4

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
1,3-Dibromopropane	13.92	14.19	102	30 - 130	

ANALYSIS DATA SHEET

LCS Dup

Laboratory: Empirical Laboratories, LLC SDG: 1511180

Client: CB&I Project: Kirtland AFB 2015

Matrix: Laboratory ID: 5K20003-BSD1 File ID: 006R0301.D

Sampled: Prepared: Analyzed: 11/20/15 17:23

Solids: Preparation: EDB_soil Dilution:

Batch: 5K20003 Sequence: 5L33701 Calibration: 5336007 Instrument: GL-ECD2

CAS NO.	COMPOUND	ONC. (ug/Kg we	DL	LOD	LOQ	Q
106-93-4	1,2-Dibromoethane [2C]	**3.768**	0.0700	0.140	0.210	
96-12-8	1,2-Dibromo-3-chloropropane [2C]	**4.579**	0.0700	0.140	0.210	

Total Target Analytes Reported: 4

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
1,3-Dibromopropane [2C]	13.92	17.10	123	30 - 130	

INITIAL CALIBRATION STANDARDS

SW8011

Laboratory:	Empirical Laboratories, LLC	SDG:	1511180
Client:	CB&I	Project:	Kirtland AFB 2015
Sequence:	5L33622	Instrument:	GL-ECD2
Calibration:	5336007		

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
15K0427	EDB ICAL 1 (0.02ppb)	5L33622-CAL1	003R0301.D	11/18/15 21:24
15K0427	EDB ICAL 1 (0.02ppb)	5L33622-CAL1	003F0301.D	11/18/15 21:24
15K0428	EDB ICAL 2 (0.05ppb)	5L33622-CAL2	004R0301.D	11/18/15 21:35
15K0428	EDB ICAL 2 (0.05ppb)	5L33622-CAL2	004F0301.D	11/18/15 21:35
15K0429	EDB ICAL 3 (0.1ppb)	5L33622-CAL3	005R0301.D	11/18/15 21:47
15K0429	EDB ICAL 3 (0.1ppb)	5L33622-CAL3	005F0301.D	11/18/15 21:47
15K0430	EDB ICAL 4 (0.2ppb)	5L33622-CAL4	006R0301.D	11/18/15 21:59
15K0430	EDB ICAL 4 (0.2ppb)	5L33622-CAL4	006F0301.D	11/18/15 21:59
15K0431	EDB ICAL 5 (0.5ppb)	5L33622-CAL5	007R0301.D	11/18/15 22:10
15K0431	EDB ICAL 5 (0.5ppb)	5L33622-CAL5	007F0301.D	11/18/15 22:10
15K0432	EDB ICAL 6 (0.75ppb)	5L33622-CAL6	008R0301.D	11/18/15 22:22
15K0432	EDB ICAL 6 (0.75ppb)	5L33622-CAL6	008F0301.D	11/18/15 22:22
15K0433	EDB ICAL 7 (1.0ppb)	5L33622-CAL7	009R0301.D	11/18/15 22:33
15K0433	EDB ICAL 7 (1.0ppb)	5L33622-CAL7	009F0301.D	11/18/15 22:33

ANALYSIS SEQUENCE SUMMARY

SW8011

Laboratory:	Empirical Laboratories, LLC	SDG:	1511180
Client:	CB&I	Project:	Kirtland AFB 2015
Sequence:	5L33622	Instrument:	GL-ECD2
Calibration:	5336007		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Cal Standard	5L33622-CAL1	003R0301.D	11/18/15 21:24
Cal Standard	5L33622-CAL1	003F0301.D	11/18/15 21:24
Cal Standard	5L33622-CAL2	004F0301.D	11/18/15 21:35
Cal Standard	5L33622-CAL2	004R0301.D	11/18/15 21:35
Cal Standard	5L33622-CAL3	005F0301.D	11/18/15 21:47
Cal Standard	5L33622-CAL3	005R0301.D	11/18/15 21:47
Cal Standard	5L33622-CAL4	006R0301.D	11/18/15 21:59
Cal Standard	5L33622-CAL4	006F0301.D	11/18/15 21:59
Cal Standard	5L33622-CAL5	007R0301.D	11/18/15 22:10
Cal Standard	5L33622-CAL5	007F0301.D	11/18/15 22:10
Cal Standard	5L33622-CAL6	008F0301.D	11/18/15 22:22
Cal Standard	5L33622-CAL6	008R0301.D	11/18/15 22:22
Cal Standard	5L33622-CAL7	009F0301.D	11/18/15 22:33
Cal Standard	5L33622-CAL7	009R0301.D	11/18/15 22:33
Initial Cal Check	5L33622-ICV1	010R0301.D	11/18/15 22:45
Initial Cal Check	5L33622-ICV1	010F0301.D	11/18/15 22:45

ANALYSIS SEQUENCE SUMMARY

SW8011

Laboratory:	Empirical Laboratories, LLC	SDG:	1511180
Client:	CB&I	Project:	Kirtland AFB 2015
Sequence:	5L33701	Instrument:	GL-ECD2
Calibration:	5336007		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Calibration Check	5L33701-CCV1	003R0301.D	11/20/15 16:48
Calibration Check	5L33701-CCV1	003F0301.D	11/20/15 16:48
Blank	5K20003-BLK1	004R0301.D	11/20/15 17:00
Blank	5K20003-BLK1	004F0301.D	11/20/15 17:00
LCS	5K20003-BS1	005R0301.D	11/20/15 17:11
LCS	5K20003-BS1	005F0301.D	11/20/15 17:11
LCS Dup	5K20003-BSD1	006R0301.D	11/20/15 17:23
LCS Dup	5K20003-BSD1	006F0301.D	11/20/15 17:23
Initial-Inside-03	1511180-01	007R0301.D	11/20/15 17:35
Initial-Inside-03	1511180-01	007F0301.D	11/20/15 17:35
Initial-Outside-03	1511180-02	008R0301.D	11/20/15 17:47
Initial-Outside-03	1511180-02	008F0301.D	11/20/15 17:47
TTS-Rolloff-03	1511180-03	009F0301.D	11/20/15 17:58
TTS-Rolloff-03	1511180-03	009R0301.D	11/20/15 17:58
Calibration Check	5L33701-CCV2	010R0301.D	11/20/15 18:10
Calibration Check	5L33701-CCV2	010F0301.D	11/20/15 18:10

INITIAL CALIBRATION DATA

SW8011

Laboratory:	Empirical Laboratories, LLC		SDG:	1511180	
Client:	CB&I		Project:	Kirtland AFB 2015	
Calibration:	5336007		Instrument:	GL-ECD2	
Matrix:	Water		Calibration Dates:	11/18/15 21:24	11/18/15 22:33

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
1,2-Dibromoethane	0.02	16900	0.05	16180	0.1	16360	0.2	14150	0.5	13036	0.75	11684
1,2-Dibromoethane [2C]	0.02	10300	0.05	9880	0.1	9980	0.2	9225	0.5	9036	0.75	8372
1,2-Dibromo-3-chloropropane	0.02	21300	0.05	21080	0.1	20680	0.2	18425	0.5	17690	0.75	16182.67
1,2-Dibromo-3-chloropropane [2C]	0.02	9200	0.05	9400	0.1	9830	0.2	9425	0.5	10000	0.75	9557.333
1,3-Dibromopropane	0.09944	10116.65	0.1989	9079.939	0.4972	7940.467	0.9944	7463.797	1.989	7406.737	2.983	6379.819
1,3-Dibromopropane [2C]	0.09944	6637.168	0.1989	6108.597	0.4972	5657.683	0.9944	5459.574	1.989	5978.381	2.983	5231.981

INITIAL CALIBRATION DATA (Continued)

SW8011

Laboratory:	Empirical Laboratories, LLC	SDG:	1511180
Client:	CB&I	Project:	Kirtland AFB 2015
Calibration:	5336007	Instrument:	GL-ECD2
Matrix:	Water	Calibration Dates:	11/18/15 21:24 11/18/15 22:33

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
1,2-Dibromoethane	1	12290										
1,2-Dibromoethane [2C]	1	9138										
1,2-Dibromo-3-chloropropane	1	17290										
1,2-Dibromo-3-chloropropane [2C]	1	11199										
1,3-Dibromopropane	3.978	6680.744										
1,3-Dibromopropane [2C]	3.978	5806.184										

INITIAL CALIBRATION DATA (Continued)

SW8011

Laboratory:	Empirical Laboratories, LLC		SDG:	1511180	
Client:	CB&I		Project:	Kirtland AFB 2015	
Calibration:	5336007		Instrument:	GL-ECD2	
Matrix:	Water		Calibration Dates:	11/18/15 21:24	11/18/15 22:33

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
1,2-Dibromoethane	14371.43	14.76233	2.072571	5.754607E-02			20	
1,2-Dibromoethane [2C]	9418.714	7.073103	2.615571	4.470518E-02			20	
1,2-Dibromo-3-chloropropane	18949.67	10.84261	4.79	1.029116E-02			20	
1,2-Dibromo-3-chloropropane [2C]	9801.619	6.866239	5.183	1.814962E-02			20	
1,3-Dibromopropane	7866.88	16.84047	3.582571	0.0332603			20	
1,3-Dibromopropane [2C]	5839.938	7.895278	4.092143	4.233824E-02			20	

Per current DoD QSM requirements, effective 03/17/2014, Empirical has updated the linear calibration coefficient requirements to reflect a limit of 0.990 for "r2" rather than the previously reported limit of 0.995 for "r". The change in assessment criteria is consistent with regulatory requirements.

INITIAL CALIBRATION CHECK

SW8011

Laboratory:	Empirical Laboratories, LLC	SDG:	1511180
Client:	CB&I	Project:	Kirtland AFB 2015
Instrument ID:	GL-ECD2	Calibration:	5336007
Lab File ID:	010F0301.D	Calibration Date:	11/18/15 00:00
Sequence:	5L33622	Injection Date:	11/18/15
Lab Sample ID:	5L33622-ICV1	Injection Time:	22:45

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
1,2-Dibromoethane	A	0.5000	0.4753	14371.43	13662		-4.9	20
1,2-Dibromoethane [2C]	A	0.5000	0.5032	9418.714	9478		0.6	20
1,2-Dibromo-3-chloropropane	A	0.5000	0.4955	18949.67	18778		-0.9	20
1,2-Dibromo-3-chloropropane [2C]	A	0.5000	0.5411	9801.619	10608		8.2	20
1,3-Dibromopropane	A	1.989	1.908	7866.88	7547.511		-4.1	20
1,3-Dibromopropane [2C]	A	1.989	2.110	5839.938	6195.576		6.1	20

CONTINUING CALIBRATION CHECK

SW8011

Laboratory:	Empirical Laboratories, LLC	SDG:	1511180
Client:	CB&I	Project:	Kirtland AFB 2015
Instrument ID:	GL-ECD2	Calibration:	5336007
Lab File ID:	003F0301.D	Calibration Date:	11/18/15 00:00
Sequence:	5L33701	Injection Date:	11/20/15
Lab Sample ID:	5L33701-CCV1	Injection Time:	16:48

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
1,2-Dibromoethane	A	0.5000	0.4702	14371.43	13516		-6.0	20
1,2-Dibromoethane [2C]	A	0.5000	0.5297	9418.714	9978		5.9	20
1,2-Dibromo-3-chloropropane	A	0.5000	0.4711	18949.67	17856		-5.8	20
1,2-Dibromo-3-chloropropane [2C]	A	0.5000	0.5638	9801.619	11052		12.8	20
1,3-Dibromopropane	A	1.989	1.870	7866.88	7395.173		-6.0	20
1,3-Dibromopropane [2C]	A	1.989	2.127	5839.938	6244.344		6.9	20

CONTINUING CALIBRATION CHECK

SW8011

Laboratory:	Empirical Laboratories, LLC	SDG:	1511180
Client:	CB&I	Project:	Kirtland AFB 2015
Instrument ID:	GL-ECD2	Calibration:	5336007
Lab File ID:	010F0301.D	Calibration Date:	11/18/15 00:00
Sequence:	5L33701	Injection Date:	11/20/15
Lab Sample ID:	5L33701-CCV2	Injection Time:	18:10

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
1,2-Dibromoethane	A	0.5000	0.4677	14371.43	13442		-6.5	20
1,2-Dibromoethane [2C]	A	0.5000	0.5308	9418.714	9998		6.2	20
1,2-Dibromo-3-chloropropane	A	0.5000	0.4804	18949.67	18208		-3.9	20
1,2-Dibromo-3-chloropropane [2C]	A	0.5000	0.5924	9801.619	11612		18.5	20
1,3-Dibromopropane	A	1.989	1.896	7866.88	7500.251		-4.7	20
1,3-Dibromopropane [2C]	A	1.989	2.230	5839.938	6548.517		12.1	20

FORM X
IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

LCS

Lab Name: Empirical Laboratories, LLC

Lab Sample ID: 5K20003-BS1 Date(s) Analyzed: 11/20/2015 11/20/2015

Instrument ID (1): GL-ECD2 Instrument ID (2): GL-ECD2

GC Column (1): ZB-1 ID: 0.32mm (mm) GC Column (2): ZB-2 ID: 0.32mm (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
1,2-Dibromo-3-chloropropane	1	4.79	4.76	4.82	2.944	
	2	5.18	5.15	5.21	3.489	17
1,2-Dibromoethane	1	2.07	2.04	2.10	2.848	
	2	2.61	2.58	2.64	3.186	11

FORM X
IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

LCS Dup

Lab Name: Empirical Laboratories, LLC

Lab Sample ID: 5K20003-BSD1 Date(s) Analyzed: 11/20/2015 11/20/2015

Instrument ID (1): GL-ECD2 Instrument ID (2): GL-ECD2

GC Column (1): ZB-1 ID: 0.32mm (mm) GC Column (2): ZB-2 ID: 0.32mm (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
1,2-Dibromo-3-chloropropane	1	4.79	4.76	4.82	3.659	
	2	5.18	5.15	5.21	4.579	22
1,2-Dibromoethane	1	2.07	2.04	2.10	3.297	
	2	2.61	2.58	2.64	3.768	13

HOLDING TIME SUMMARY

SW8011

Laboratory: Empirical Laboratories, LLC SDG: 1511180

Client: CB&I Project: Kirtland AFB 2015

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
Initial-Inside-03	11/17/15 08:30	11/18/15 08:50	11/20/15 10:25	N/A	14.00	11/20/15 17:35	3.34	14.00	
Initial-Outside-03	11/17/15 08:30	11/18/15 08:50	11/20/15 10:25	N/A	14.00	11/20/15 17:47	3.35	14.00	
TTS-Rolloff-03	11/17/15 08:30	11/18/15 08:50	11/20/15 10:25	N/A	14.00	11/20/15 17:58	3.35	14.00	

PREPARATION BENCH SHEET

5K20003

Empirical Laboratories, LLC

Printed: 12/4/2015 11:09:33AM

Instrument:

Matrix: Solid **Prepared using: GCLC - EDB_soil** **Surrogate used: 15I0293**

Lab Number	Cont ID	Analysis	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID		ul Spike	ul Surrogate	PH	Comments (Sample; Analysis; Extraction)
1511180-01	A	SGC_EDB_8011	11/20/2015	5.34	35					140	NA	;GoodSurrOrRERUN! DiluteBasedOn8260results!;GoodSurrOrRERUN! DiluteBasedOn8260results!
1511180-02	A	SGC_EDB_8011	11/20/2015	5.31	35					140	NA	;GoodSurrOrRERUN! DiluteBasedOn8260results!;GoodSurrOrRERUN! DiluteBasedOn8260results!
1511180-03	A	SGC_EDB_8011	11/20/2015	5.29	35					140	NA	;GoodSurrOrRERUN! DiluteBasedOn8260results!;GoodSurrOrRERUN! DiluteBasedOn8260results!
5K20003-BLK1		QC	11/20/2015	5	35					140	NA	
5K20003-BS1		QC	11/20/2015	5	35	15K0425			35	140	NA	
5K20003-BSD1		QC	11/20/2015	5	35	15K0425			35	140	NA	

Reagents Used:

Standard	Description
15J0203	95% Hexanes