

**Soil and Groundwater  
Characterization Report – Pit  
CS-47B No. 10501**

Facility ID: 102571  
Rangely Weber Station 47  
Rio Blanco County, Colorado

Colorado Oil and Gas  
Conservation Commission -  
Remediation Project No. 10501



**Submitted to:**

Kris Neidel  
State of Colorado Oil and Gas  
Conservation Commission  
796 Megan Avenue, Suite 201  
Rifle, CO 81650

**Submitted by:**

Stantec Consulting Services Inc.  
2000 South Colorado Blvd.  
Suite 2-300  
Denver, CO 80222

**On Behalf of:**

Adriane Gifford  
Chevron Environmental  
Management Company  
1400 Smith St., Room 07080  
Houston, TX 77002

April 10, 2018

## Table of Contents

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>1.1</b>
1.1	OBJECTIVE .....	1.1
1.2	ORGANIZATION.....	1.1
<b>2.0</b>	<b>SITE BACKGROUND.....</b>	<b>2.1</b>
2.1	PREVIOUS INVESTIGATION AND REMEDIATION .....	2.1
<b>3.0</b>	<b>SITE INVESTIGATION ACTIVITIES .....</b>	<b>3.1</b>
3.1	PRELIMINARY FIELD ACTIVITIES .....	3.1
3.1.1	Permitting .....	3.1
3.1.2	Line Location and Clearance .....	3.1
3.2	SOIL INVESTIGATION ACTIVITIES .....	3.1
3.2.1	Soil Borings.....	3.1
3.2.2	Subsurface Conditions .....	3.2
3.2.3	Soil Analysis.....	3.2
3.3	GROUNDWATER INVESTIGATION ACTIVITIES.....	3.3
3.3.1	Well Installation.....	3.3
3.3.2	Well Development .....	3.3
3.3.3	Groundwater Sampling .....	3.3
3.3.4	Groundwater Analysis .....	3.4
3.4	SURVEYING .....	3.4
3.5	WASTE MANAGEMENT .....	3.4
<b>4.0</b>	<b>ANALYTICAL RESULTS .....</b>	<b>4.1</b>
4.1	SOIL ANALYTICAL RESULTS .....	4.1
4.2	GROUNDWATER ANALYTICAL RESULTS.....	4.2
<b>5.0</b>	<b>CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>5.1</b>
5.1	RECOMMENDATIONS.....	5.1
5.2	PROJECT IMPLEMENTATION SCHEDULE.....	5.2
<b>6.0</b>	<b>LIMITATIONS .....</b>	<b>6.1</b>

## LIST OF FIGURES

Figure 1 .....	Site Plan
Figure 2 .....	Site Plan Showing Soil Analytical Data & Cross-Sections A-A' & B-B'

## LIST OF TABLES

Table 1 .....	Summary of Groundwater Well Construction Details
Table 2 .....	Summary of Depth to Groundwater and LNAPL Thickness
Table 3 .....	Soil Sample Results for Organic Compounds
Table 4 .....	Soil Sample Results for Inorganic Compounds and Metals
Table 5 .....	Groundwater Sample Results

## LIST OF APPENDICES

Appendix A – Well Permits/Notice of Intent
Appendix B – Boring Logs
Appendix C – Analytical Laboratory Reports
Appendix D – Potentiometric Surface and Groundwater Elevations Maps - 3rd and 4th Quarters 2017

April 10, 2018

## 1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec), on behalf of Chevron Environmental Management Company (Chevron), is pleased to provide the Colorado Oil and Gas Conservation Commission (COGCC) with this Soil and Groundwater Characterization Report for the historical pit (Pit CS-47B) at the former Rangely Weber Station 47 in Rio Blanco County, Colorado (the Site). Pit CS-47B was identified during assessment and subsequent closure of collection station 47 pit (Pit CS-47). Pit CS-47 was assigned Remediation Project No. 9141 by the COGCC and has since been closed. The COGCC has assigned the new Remediation Project No. 10501 to Pit CS-47B.

### 1.1 OBJECTIVE

Following discovery of Pit CS-47B through historical aerial photography and original assessment conducted under Remediation Project No. 9141, recommendations were presented in the assessment report titled, *Soil Characterization Report – Pit CS-47*, dated August 17, 2017, and approved by COGCC on September 19, 2017. The objectives of this soil and groundwater investigation were to delineate hydrocarbon impacts at Pit CS-47B and included the following activities:

- Seventeen soil borings (SB-07 and SB-09 through SB-24) were advanced radially around SB-01 through SB-06 to further evaluate and define the lateral and vertical extent of total petroleum hydrocarbons (TPH) in soil; and
- Groundwater monitoring well MW-06 (SB-22) was installed downgradient of MW-01 to delineate the extent of light non-aqueous phase liquid (LNAPL) observed at monitoring well MW-01.

### 1.2 ORGANIZATION

This report is organized into the following sections summarizing:

- Site background;
- Site investigation activities;
- Analytical results; and
- Conclusions and recommendations.

Site Background  
April 10, 2018

## 2.0 SITE BACKGROUND

The Site is an active oil and gas field that is bordered by the town of Rangely, Colorado to the south, the White River (River) to the north and west, and Rangely's waste water treatment ponds to the east. The River is approximately 600 feet to the north and the waste water treatment ponds are approximately 650 feet to the east. Pit CS-47B is located on privately owned land leased by Chevron. The Site lies within a relatively flat river valley at an elevation of approximately 5,200 feet above mean sea level (amsl) with upland areas rising 400 to 500 feet above the valley both north and south of the Site.

### 2.1 PREVIOUS INVESTIGATION AND REMEDIATION

During decommissioning of Pit CS-47 in October 2016, soil impacts were noted below the liner based upon visual observation, odor, and photoionization detector (PID) measurements. Based on these observations, soil was excavated to approximately 10 feet below ground surface (bgs), which was just above the groundwater table. Confirmation soil samples collected from the north (CS47-NW), east (CS47-EW), and west (CS47-WW) sidewalls had concentrations below COGCC Allowable Limits outlined in Table 910-1 (Allowable Limits). Confirmation soil samples collected from the south sidewall (CS47-SW) and excavation floor (CS47-ESB2) had concentrations that exceeded the Allowable Limit for constituent of concern (COC) TPH. Additionally, the concentration of benzo(a) anthracene and the laboratory reporting limit (LRL) for benzene exceeded the Allowable Limit for both samples.

Subsequently, four hand auger borings (CS47-AH1 through CS47-AH4) were advanced south of Pit CS-47 in November 2016 to define the horizontal extent of TPH soil impacts. The soil samples collected from the borings defined the horizontal extent of TPH to below the Allowable Limits. In January 2017, approximately 1,085 cubic yards of impacted soil were excavated from the floor and south sidewall of Pit CS-47. A second confirmation sample collected from the south sidewall (also named CS47-SW) had concentrations below Allowable Limits for TPH and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Because the floor of the excavation consisted of coarse gravel, which was not conducive to soil sampling or analysis, a groundwater sample (CS47-PW) was collected as a confirmation sample (from the floor). Dissolved BTEX concentrations were below the Allowable Limits in the groundwater sample; however, a sheen was observed on the groundwater surface. Groundwater was removed during excavation activities and disposed of at the Chevron treatment plant. All impacted soils were applied to the Chevron-operated landfarm in Rangely, Colorado. With COGCC approval, the Pit CS-47 excavation was backfilled and graded to match the surrounding area.

Monitoring wells MW-01, MW-02, MW-03, MW-04, and MW-05 were installed to delineate the extent of petroleum hydrocarbon impacts. Concentrations of TPH and BTEX were not detected above the Allowable Limits in soil samples collected during the installation of monitoring wells MW-02, MW-03, MW-04, and MW-05. The TPH concentration in the soil sample collected during

## SOIL AND GROUNDWATER CHARACTERIZATION REPORT – PIT CS-47B NO. 10501

Site Background  
April 10, 2018

the installation of monitoring well MW-01 exceeded the Allowable Limit. BTEX concentrations detected in groundwater samples from monitoring wells MW-01, MW-02, MW-03, MW-04, MW-05 and previously installed monitoring well TW-01 were below the Allowable Limits. However, Total TPH at MW-01 was measured at above Allowable Limits and a sheen of Light Non-Aqueous Phase Liquid (LNAPL) was measured in the groundwater at the same location. Soil borings SB-01 through SB-06 were advanced radially around MW-01 to delineate the source mass.

On August 17, 2017, Stantec submitted the *Soil Characterization Report—Pit CS-47* to the COGCC detailing the investigation activities conducted on May 15, 2017, as well as conclusions and recommendations. The COGCC agreed with the recommendations included in the report that hydrocarbon impacts to soil and groundwater identified as part of the closure of Pit CS-47 were from a different source and likely to be attributed to the secondary collection pit identified to the north (Pit CS-47B). The COGCC approved the closure request for Pit CS-47 (Remediation Project No. 9141) on December 18, 2017, and requested additional site characterization activities be conducted at Pit CS-47B under Remediation Project No. 10501 to further delineate hydrocarbon impacts to soil and groundwater.

Based on those approved recommendations, a soil and groundwater investigation was conducted on October 28 and the week of November 6, 2017. The following details the activities, results, and conclusions of that investigation.

Site Investigation Activities  
April 10, 2018

## 3.0 SITE INVESTIGATION ACTIVITIES

Advancement of a total of 17 soil borings (SB-07 and SB-09 through SB-24) and installation of one downgradient groundwater monitoring well MW-06 was completed during the additional investigation. At least one soil sample was submitted for laboratory analysis from each soil boring except SB-24, which was advanced using a hand-auger to 10 feet bgs for qualitative observations only. The locations of the soil borings and monitoring wells are shown on **Figure 1**.

The following sections describe in greater detail the permitting, line location and clearance, soil and groundwater sampling, surveying, and waste management activities completed as part of the additional investigation.

### 3.1 PRELIMINARY FIELD ACTIVITIES

#### 3.1.1 Permitting

Well permits were obtained for the one monitoring well and a Notice of Intent to Construct Monitoring Holes was obtained for the 17 soil borings advanced through groundwater. Stantec submitted a groundwater well installation application and coordinated with the State Engineer to receive the necessary permits prior to mobilization to the Site. Additionally, the Colorado Division of Water Resources (CDWR) was notified three days prior to well installation.

The Notice of Intent to Construct Monitoring Holes (GWS-51), Groundwater Well Installation Applications (GWS-31), and the monitoring well permit can be found in **Appendix A**.

#### 3.1.2 Line Location and Clearance

As required by law, the Utility Notification Center of Colorado (UNCC) was notified 72 hours before intrusive activities. In addition to notifying the UNCC, Stantec reviewed all subsurface assessment and excavation locations with Chevron operations staff prior to breaking ground. No intrusive work (e.g., borings or test pits) was conducted within 5 feet of a known underground utility.

Each soil borehole/monitoring well location was cleared for subsurface utilities from ground surface to a depth of 8 feet bgs using soft digging techniques.

### 3.2 SOIL INVESTIGATION ACTIVITIES

#### 3.2.1 Soil Borings

Following borehole clearance using a hand-auger, SB-07 and SB-09 through SB-23 were advanced to approximately 20 feet bgs using a direct-push Geoprobe® rig between October 28

## SOIL AND GROUNDWATER CHARACTERIZATION REPORT – PIT CS-47B NO. 10501

Site Investigation Activities  
April 10, 2018

and November 7, 2017. During borehole clearance at SB-08, several large rocks were present approximately 3 feet bgs which prevented exploration at greater depths. SB-24 was advanced using a hand-auger to 10 feet bgs for qualitative observations. Monitoring well MW-06 was installed using a hollow stem auger Geoprobe® rig at the same location of soil boring SB-22. Stantec field personnel logged soil cores for lithological content using the Unified Soil Classification System (USCS) as a guide, and included relative moisture content, composition, first-encountered groundwater, PID readings, and other notable field observations on the soil boring logs included in **Appendix B**. Portions of each soil core were placed in a Ziploc® bag and field-screened using a PID to evaluate the presence of volatile organic compounds (VOCs) that may collect in the headspace of the bag.

The Work Plan specified that using standard field screening techniques, a minimum of one soil sample would be collected at each soil boring location. Samples were biased to high PID readings or visual and olfactory observations indicating the potential presence of petroleum hydrocarbons.

Following sample collection, soil borings SB-07 through SB-24 were plugged and abandoned in accordance with CDWR guidelines.

### 3.2.2 Subsurface Conditions

Soils encountered beneath the Site consisted primarily of sand and sand/clay mixtures to a depth of approximately 10 feet bgs, underlain by sandy gravel to the total depth explored of approximately 20 feet bgs. This is consistent with materials previously encountered beneath the Site during the remedial excavation at Pit CS-47 and the installation of monitoring wells MW-01 through MW-05.

Groundwater was initially encountered in the borings advanced during this investigation at depths ranging from approximately 7 to 9 feet bgs. Elevated PID readings (above 50 parts per million [ppm]) were observed in the vadose zone at approximate depth ranges of 2 to 9 feet bgs in borings SB-09, SB-12, SB-15, SB-16, and SB-17. Soil boring logs are included in **Appendix B**.

### 3.2.3 Soil Analysis

At least one soil sample was collected from each soil boring location for delineating the extent of soils exceeding the TPH Allowable Limits except from SB-24. Two or more samples were collected as necessary to further delineate the vertical extent of TPH impacts.

Soil samples were collected in sample containers appropriate for the specified analyses, sealed, labeled, and placed into an ice-filled cooler for preservation. Soil samples were submitted to Test America and analyzed for the following COCs:

- TPH-diesel range organics (DRO) (C10-C28) by U.S. Environmental Protection Agency (EPA) Method 8015C;



Site Investigation Activities  
April 10, 2018

- TPH-gasoline range organics (GRO) (C6-C10) by EPA Method 8015C; and
- BTEX by EPA Method 8260B.

Select soil samples were also analyzed for the following COCs:

- Polycyclic aromatic hydrocarbons (PAHs) (COGCC Table 910) by EPA Method 8270D;
- Electrical conductivity (EC) by U.S. Department of Agriculture (USDA) Method 29B\_EC;
- Sodium adsorption ratio (SAR) by USDA Method 20B
- pH by EPA Method 9045D;
- Metals (COGCC Table 910) by EPA Method 6010C;
  - Mercury by EPA Method 7471B;
  - Hexavalent chromium by EPA Method 7196A; and
  - Trivalent chromium by calculation.

### 3.3 GROUNDWATER INVESTIGATION ACTIVITIES

#### 3.3.1 Well Installation

Monitoring well MW-06 was installed using a Geoprobe® rig with 6.5-inch diameter hollow stem augers. The 2-inch diameter monitoring well was installed downgradient (west) of Pit CS-47B and MW-01 as shown on **Figure 1**. Monitoring well MW-06 was installed to 17 feet bgs, with a 0.01-inch slotted PVC screen from 7 to 17 feet bgs, and Schedule 40 PVC casing from 7 feet bgs to approximately 3.4 feet above ground surface. The well annulus was backfilled with 10/20 silica sand from 6 feet bgs to the total well depth, bentonite pellets from 3 to 6 feet bgs, and hydrated bentonite chips from ground surface to 3 feet bgs. The PVC casing extends above ground surface and is protected with an above grade steel monument with lockable cap. A summary of the monitoring well construction details is shown on **Table 1**.

#### 3.3.2 Well Development

Monitoring well MW-06 was developed the week of November 6, 2017 using surge and purge methods to enhance communication with the water bearing zone. Prior to development, the depth to groundwater and total well depth were measured to determine the quantity of water within the well casing. Well development activities were completed using a surge block and bailer to remove fines from the well screen.

#### 3.3.3 Groundwater Sampling

Comprehensive gauging events of all Site wells, including newly installed well MW-06, were conducted on November 13 and December 12, 2017. Current and historical groundwater elevation data are presented in **Table 2**. Entrada Consulting Group (Former Olsson Associates) generated a groundwater elevation contour map from the December 2017 gauging data, which is presented in **Appendix D**, along with a groundwater elevation contour map based on

## SOIL AND GROUNDWATER CHARACTERIZATION REPORT – PIT CS-47B NO. 10501

Site Investigation Activities  
April 10, 2018

third quarter 2017 data. The groundwater flow direction was primarily to the west towards the River, which is consistent with the previously determined flow direction.

Groundwater samples from all Site wells, including newly installed well MW-06, were collected following the removal of three-well volumes using a disposable bailer on December 12 and 13, 2017 by Entrada Consulting Group. These methods were consistent with COGCC's Model Sampling and Analysis Plan Rules 609 and 318.e (4).

### 3.3.4 Groundwater Analysis

Groundwater samples were collected in sample containers appropriate for the specified analyses, sealed, labeled, and placed into an ice-filled cooler for preservation. Groundwater samples were transported via a lab courier and submitted under chain-of-custody protocol to ALS Environmental for the following analyses:

- TPH-DRO by EPA Method SW8015C
- TPH-GRO by EPA Method SW8015D
- BTEX by EPA Method 8260B; and
- Chloride and sulfate by EPA Method SW9056A.

## 3.4 SURVEYING

Soil boring and monitoring well locations were surveyed on November 8, 2017, and tied into the existing monitoring well coordinates. The monitoring well top of casing (TOC) elevation was also surveyed and tied into the existing well TOC elevations.

## 3.5 WASTE MANAGEMENT

Any non-dedicated or non-disposable sampling equipment that encountered soil or groundwater was decontaminated before and after each use. Sampling implements, such as spatulas, trowels, and pumps (if used) were washed with a Liquinox® water solution and rinsed with distilled water before and after sample collection.

Decontamination and development water were removed following assessment activities and disposed of at the Chevron treatment plant. All impacted soils were applied to the Chevron-operated landfarm in Rangely, Colorado.

Analytical Results  
April 10, 2018

## 4.0 ANALYTICAL RESULTS

Completed certified laboratory analysis reports and chain-of-custody documentation are included in **Appendix C**.

### 4.1 SOIL ANALYTICAL RESULTS

Soil sample analytical results are included in **Table 3** and **Table 4**. Soil analytical results for soil borings SB-07 and SB-09 through SB-23 and from monitoring well MW-06 are compared to Allowable Limits. Soil analytical results for total TPH (TPH-GRO and TPH-DRO) and BTEX at boring locations that exceed Allowable Limits are shown on **Figure 2**.

Soil analytical results are summarized below:

- Concentrations of total TPH (TPH-GRO and TPH-DRO) in soil samples collected from soil borings SB-09, SB-12, SB-15, SB-16, and SB-17 exceeded the Allowable Limit for TPH of 500 milligrams per kilogram (mg/kg).
  - Exceedance concentrations ranged from 2,670 mg/kg in soil boring SB-09-8' to 28,150 mg/kg in soil boring SB-17-6'.
- There were no exceedances of BTEX or PAHs in all soil borings except a slight exceedance of the Allowable Limit of 0.22 mg/kg for benzo(a)anthracene (0.35 mg/kg in SB-12-2').
  - It should be noted that the exceedance of benzo(a)anthracene is associated with a TPH exceedance, similar to analytical data from SB-01 through SB-06.
- There was one soil sample that exceeded the Allowable Limit of <12 milliequivalents (meq/meq) for Sodium Adsorption Ratio (SAR) from soil samples collected within the upper 3 feet bgs (32 (meq/meq) in SB-12-2').
- There was one soil sample that exceeded the Allowable Limit of <4 milli-siemens per centimeter (mmhos/cm) for Electrical Conductivity (EC) from soil samples collected within the upper 3 feet bgs (5.50 (mmhos/cm) in SB-15-2').
- Arsenic concentrations exceeded the Allowable Limit of 0.39 mg/kg in all soil boring locations where it was analyzed. Concentrations ranged from 1.7 mg/kg in SB-03 to 8.9 mg/kg in SB-22-8', however this is less than the average Colorado state background concentration of 11 mg/kg.

Analytical Results  
April 10, 2018

## 4.2 GROUNDWATER ANALYTICAL RESULTS

Current and historical groundwater sample analytical results are summarized in **Table 5**. Groundwater analytical results are compared to the Allowable Limits. The results of the most recent groundwater investigation (December 2017) are summarized below:

- With exception of MW-01, LNAPL was not observed at any of the monitoring wells. At MW-01, LNAPL was observed at a thickness of 0.02 feet.
- BTEX concentrations in all monitoring wells are less than the Allowable Limits.
- TPH-GRO was detected at MW-01 at a concentration of 4.8 mg/L. TPH-DRO was detected at all monitoring wells except MW-05. Concentrations at MW-02 through MW-06 and TW-01 had a maximum concentration of 0.39 milligrams per liter (mg/L). The concentration at MW-01 was detected at 98 mg/L. COGCC does not have any Allowable Limits for TPH in groundwater.
- Chloride concentrations at monitoring wells MW-01 and MW-03 through MW-06 (ranging from 550 mg/L to 1,000 mg/L) exceed the Allowable Limit of 450 mg/L. The Allowable Limit was based on 1.25 times the concentration of chloride at TW-01 on January 16, 2017.
- Sulfate concentrations at monitoring wells MW-05 and MW-06 (1,700 mg/L) slightly exceed the Allowable Limit of 1,625 mg/L. The Allowable Limit was based on 1.25 times the concentration of sulfate at TW-01 on January 16, 2017.

### 5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of soil samples collected at SB-07 and SB-09 through SB-23, vadose zone soil was found to have concentrations of TPH above Allowable Limits at depths ranging from 2 to 8 feet bgs and have been delineated as shown on Figure 2. The results of field observations and samples collected at SB-18, SB-19, and SB-20 indicate that petroleum hydrocarbons do not extend into the saturated zone downgradient to the west of SB-01, SB-16, or SB-17. Results from both the spring and fall 2017 soil and groundwater assessments indicate that Total TPH, BTEX, select PAHs, SAR, and EC are in exceedance of COGCC Table 910-1 criteria in select locations. However, these exceedances were successfully delineated vertically to above 13 feet bgs and horizontally to what appears to be within the general boundary of the suspected secondary production Pit

CS-47B. In addition to **Table 3** and **Table 4** soil analytical data, cross-sections showing lithology and vertical delineation of impacted soils can be found on **Figure 2**.

Based on the predominant groundwater flow direction west from Pit CS-47B (see **Appendix D**) and BTEX and TPH concentrations at downgradient monitoring well MW-06, the data indicates that Pit CS-47 did not adversely impact groundwater above Allowable Limits and LNAPL observed in MW-01 is limited to the area of the Pit CS-47B. In addition, the soil sample collected from MW-06 (SB-22) did not exceed Allowable Limits, and as shown on the soil boring logs, there was no evidence of petroleum hydrocarbon impacts observed visually, olfactory, or elevated PID readings. Chloride and Sulfate concentrations in groundwater that are above Allowable Limits in select groundwater wells will continue to be monitored.

#### 5.1 RECOMMENDATIONS

Based on the data collected within Pit CS-47B, a remedial strategy will be developed, most likely involving remedial excavation of impacted soils and transportation to an off-site facility or the on-site landfarm currently operated by Chevron.

A semiannual groundwater monitoring and sampling program will be conducted in 2018. Groundwater will be analyzed for the following constituents:

- TPH-DRO by EPA Method SW8015C
- TPH-GRO by EPA Method SW8015D
- BTEX by EPA Method 8260B; and
- Chloride and sulfate by EPA Method SW9056A.

Groundwater monitoring results will be included in the Annual 2018 Field Activities Report.

## **5.2 PROJECT IMPLEMENTATION SCHEDULE**

The implementation of the above recommendation is tentative and is contingent on acceptance of the recommendation by the COGCC and acceptance by the third-party property owners.

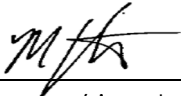
The tentative implementation schedule of the above recommendation is as follows:

- Second Quarter 2018 – Submit Corrective Action Workplan to the COGCC;
- Third Quarter 2018 – Execution of corrective measure; and
- Second and Fourth Quarters 2018 – Groundwater monitoring and sampling.


Limitations  
April 10, 2018

## 6.0 LIMITATIONS


This report was prepared in accordance with the scope of work outlined in Stantec's contract and with generally accepted professional engineering and environmental consulting practices existing at the time this report was prepared and applicable to the location of the site. It was prepared for the exclusive use of Chevron for the express purpose stated above. Any re-use of this report for a different purpose or by others not identified above shall be at the user's sole risk without liability to Stantec. To the extent that this report is based on information provided to Stantec by third parties, Stantec may have made efforts to verify this third party information, but Stantec cannot guarantee the completeness or accuracy of this information. The opinions expressed and data collected are based on the conditions of the site existing at the time of the field investigation. No other warranties, expressed or implied are made by Stantec.

Prepared by   
(signature)

**Mike Stauthamer**  
Project Scientist

Reviewed by   
(signature)

**Brent Lucyk**  
Senior Geologist

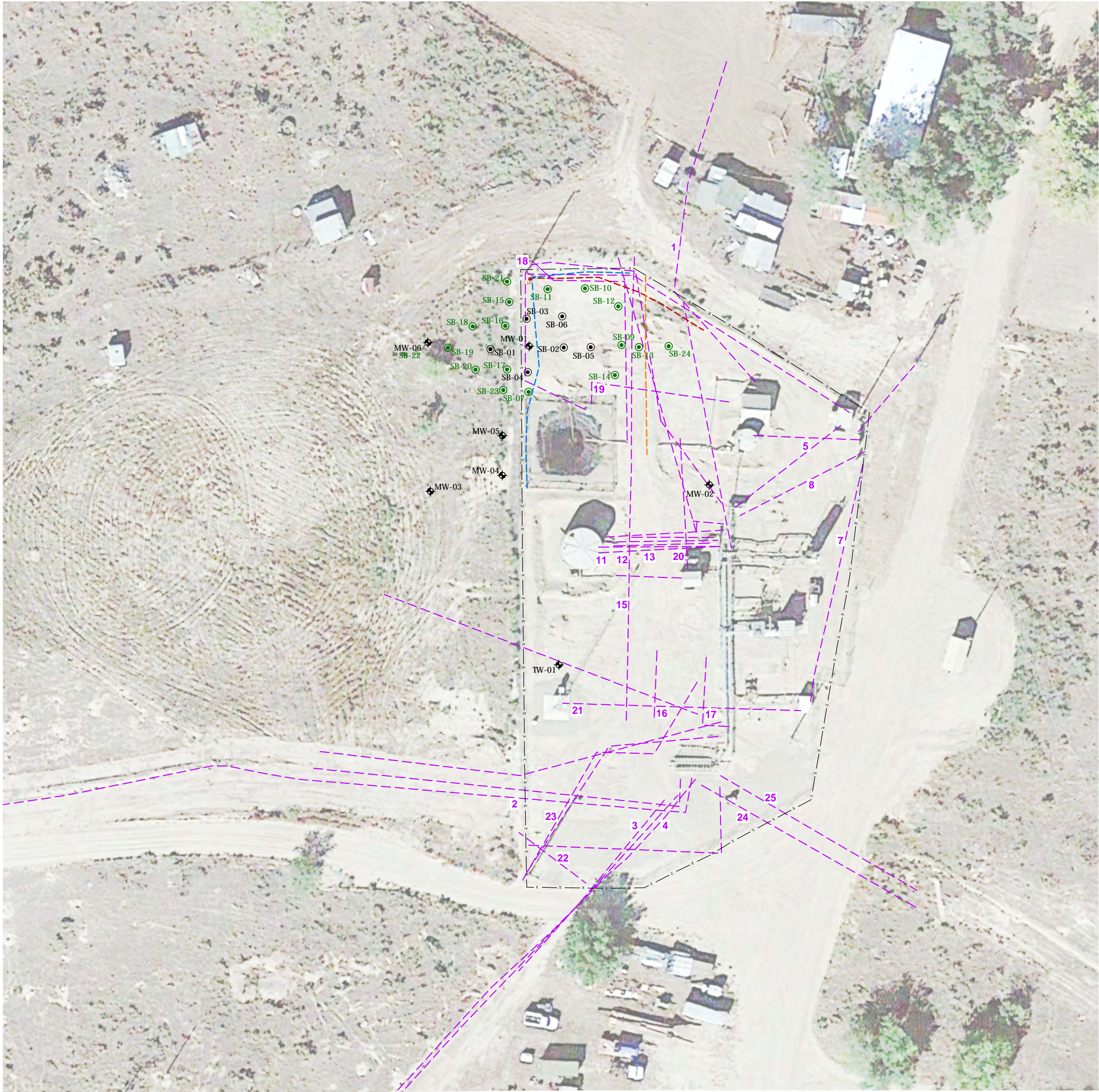
Reviewed by   
(signature)

**Marisa Kaffenberger, PE**  
Senior Engineer

## FIGURES



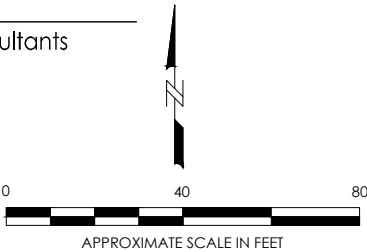
#	LINE	SIZE	TYPE
1	Produce Fluid	6	Fiberglass
2	WHCOL Flowlines	3&4	Fiberglass
3	HEFLEY Header Bulk & Test	3&4	Fiberglass
4	WYCOLTHARP A-6X	3	Fiberglass
5	Instrament Air	2	Galvanized
6	Pipe Rack	Various	SS & CS
7	Electrical 480V	3	Conduit
8	Overflow Pit Fence	NA	Steel & Netting
9	Pit Overflow Line	6	Unknown
10	CS Fence	8	Steel & Chain
11	Pit Tank Inlet	10	CS
12	Pit Tank Reurck	2	CS
13	Bulk Line	3	CS
14	Unknown CS	4	CS
15	CPL	4	CS
16	Electrical Conduit	2	Conduit
17	Gas Outlet	3	SS
18	North Overhead Light	1	Conduit
19	Old Pit Monitor	1	Conduit
20	Electrical to Pit Tank	1	Conduit
21	Comm Tower to Building	NA	Conduit
22	Abandoned Pipes	4	Steel & Cut Off??
23	South Overhead Light	1	Conduit
24	Rodeo Header Bulk & Test	3&4	Fiberglass
25	JCOL,WCOL,&WALU Flowlines	3&4	Fiberglass



- Legend
- FINAL EXCAVATION
  - FENCE LINE
  - SUBSURFACE UTILITIES
  - ELECTRICAL LINE
  - CATHODIC PROTECTION
  - CRUDE OIL PIPELINE
  - MW-01 MONITORING WELL
  - SB-01 SOIL BORING (MAY 2017)
  - SB-07 SOIL BORING (NOVEMBER 2017)

Permit-Seal

Consultants



DRAFT



2000 South Colorado Blvd., Suite 2-300  
Denver, CO 80222  
www.stantec.com

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.  
The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

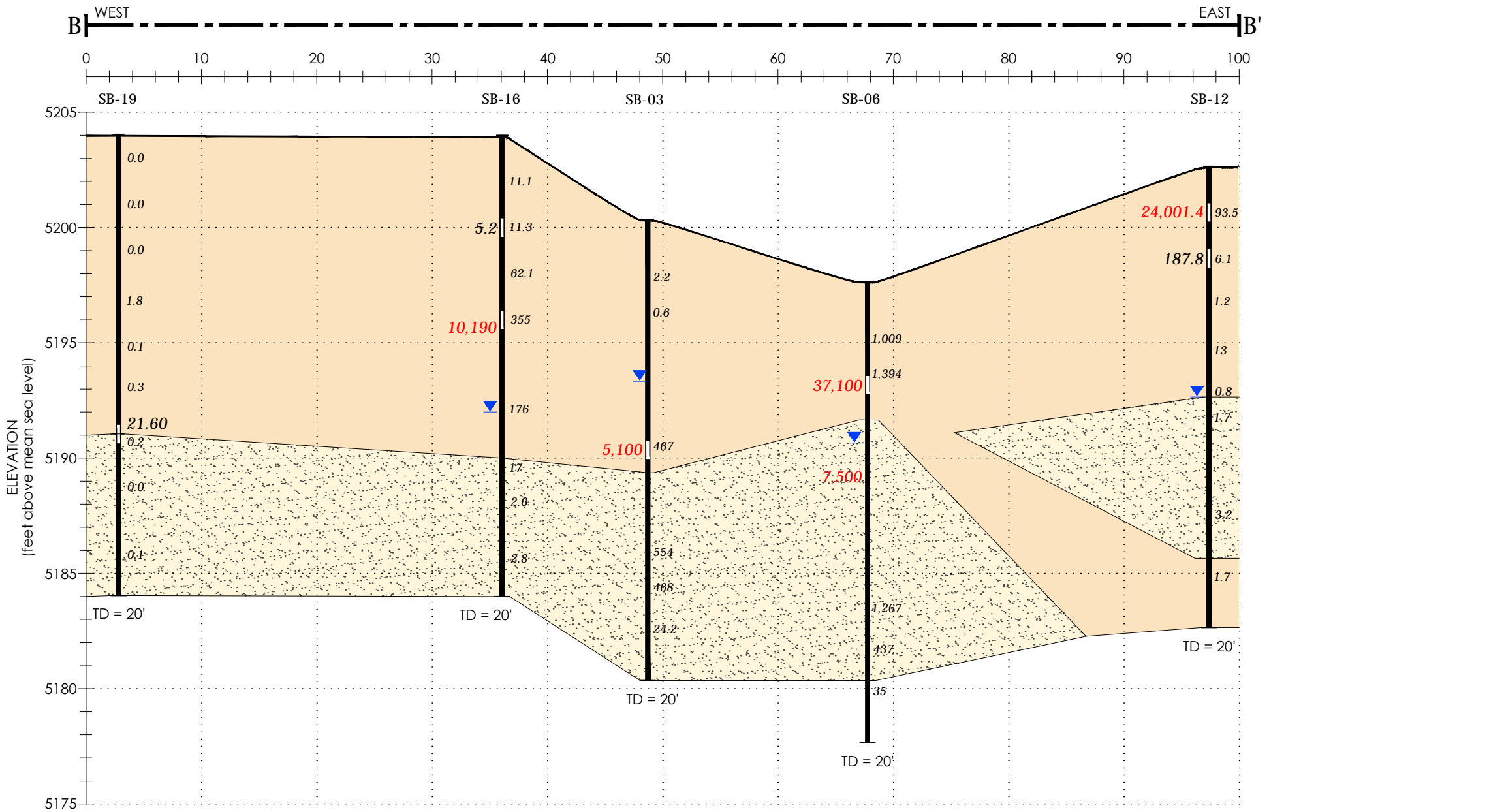
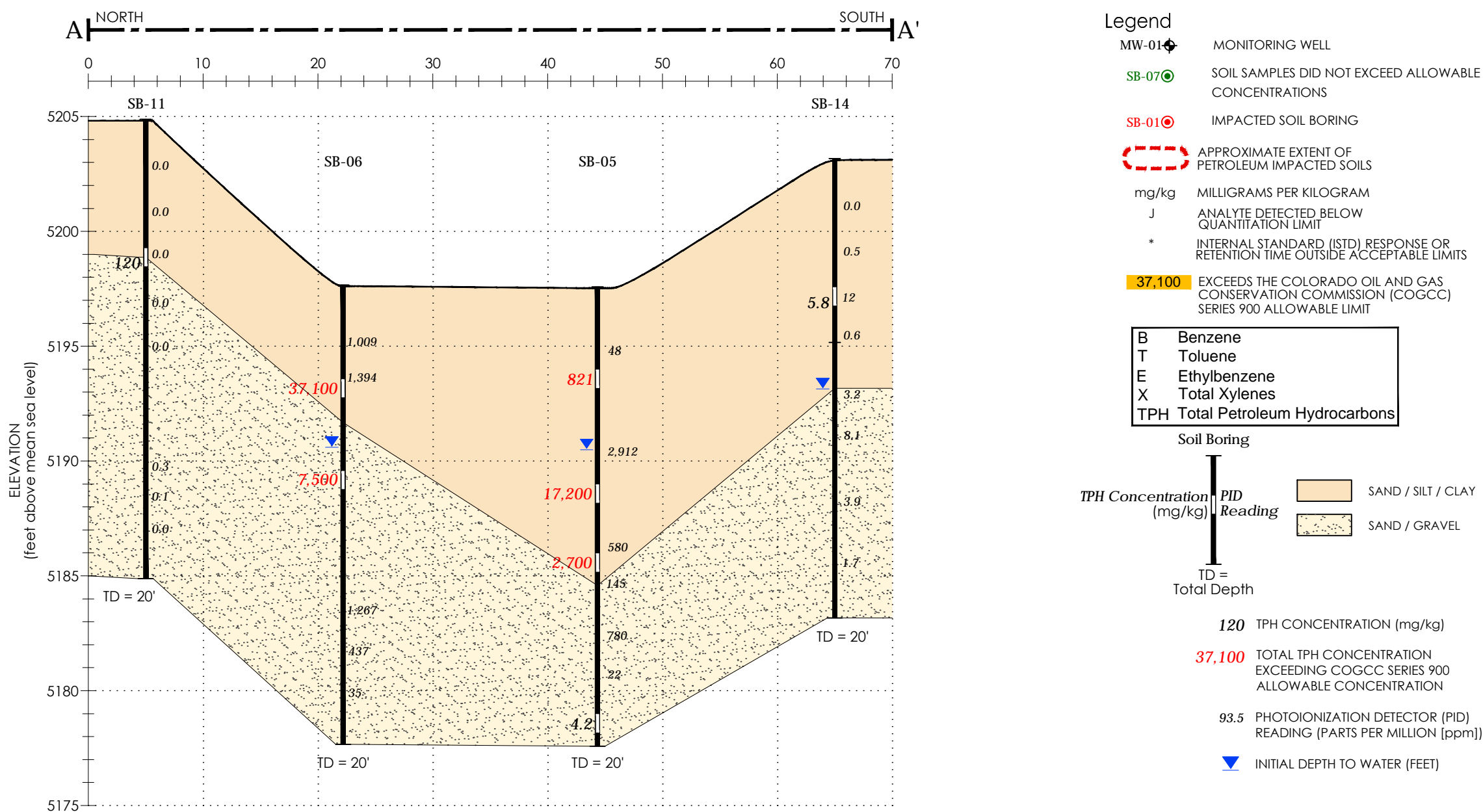
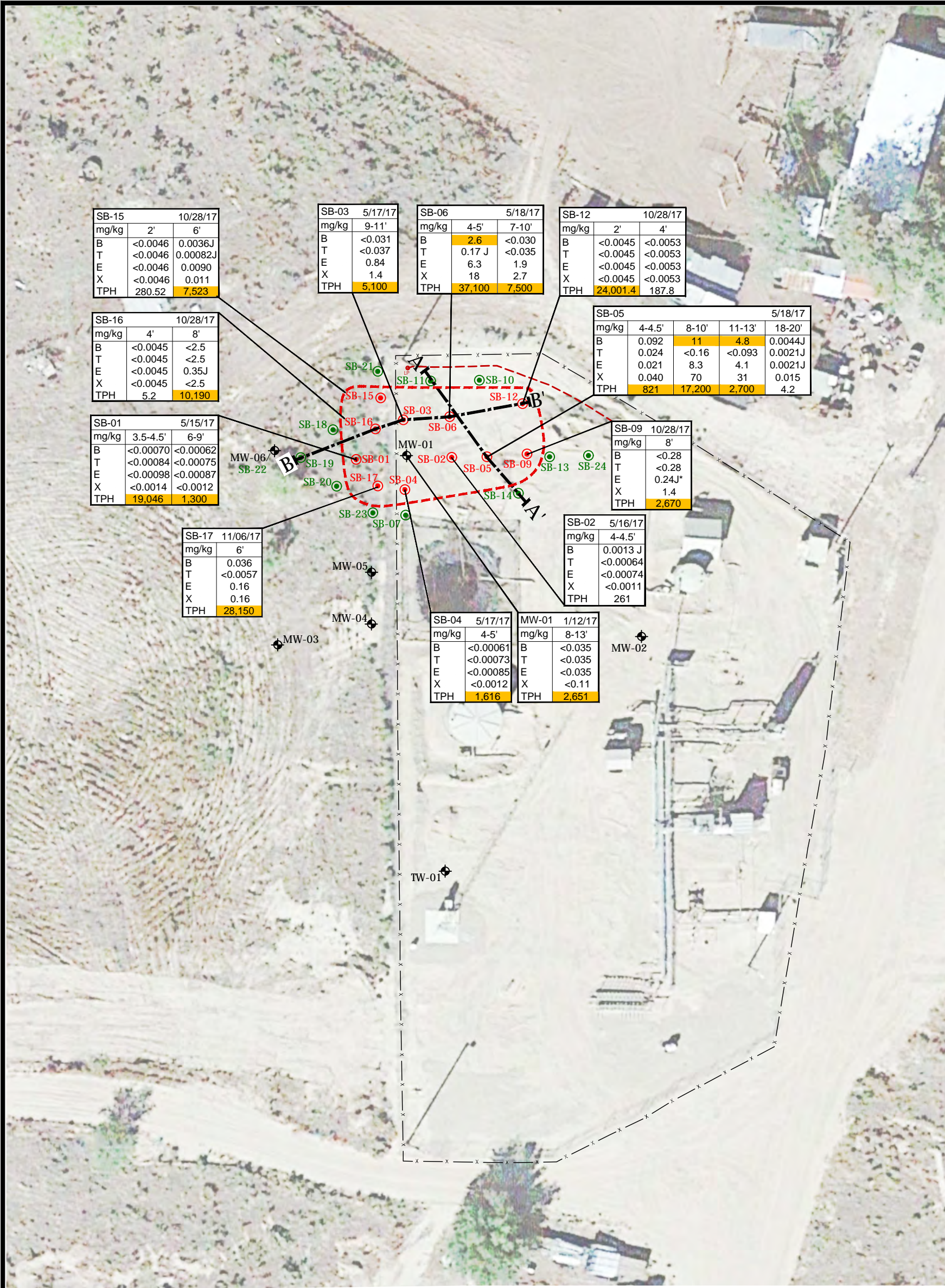
Client/Project  
Chevron EMC  
Rangely CS-47B No. 10501

Title  
SITE PLAN

Project No. 182603866	Scale AS NOTED
Figure 1	Sheet Revision

Issued	By	Appd.	YY.MM.DD





Permit-Seal	Consultants	 2000 South Colorado Blvd., Suite 2-300 Denver, CO 80222 www.stantec.com <small>The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay. The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.</small>	Client/Project Chevron EMC Rangely CS-47B No. 10501	Title SITE PLAN SHOWING SOIL ANALYTICAL DATA & CROSS-SECTIONS A-A' & B-B'			
Issued	By	Appd.	18/03/01 YY.MM.DD	Project No. 182603866	Scale AS NOTED	Figure 2	Sheet Revision



## TABLES

**Table 1**  
**Summary of Groundwater Well Construction Details**  
**Chevron Rangely CS47, Rangely, Colorado**

<b>Well Number</b>	<b>Date Installed</b>	<b>Depth Drilled (feet bgs)</b>	<b>Well Depth (feet below TOC)</b>	<b>TOC Elevation (feet AMSL)</b>	<b>Ground Elevation (feet AMSL)</b>	<b>Casing Stickup (feet)</b>	<b>Screen Interval (feet bgs)</b>
MW-01	1/12/2017	20.0	19.8	5206.71	NM	2.3	3-18
MW-02	1/12/2017	20.0	21.6	5206.43	NM	2.6	4-19
MW-03	1/12/2017	20.0	21.9	5204.41	5202.59	1.8	5-19.5
MW-04	5/16/2017	15.5	17.7	5206.11	5203.06	3.1	5-15
MW-05	5/16/2017	20.0	23.1	5205.70	5203.05	2.7	5-19.5
MW-06	11/6/2017	20.0	20.4	5206.40	5202.96	3.4	7-17
TW-01	9/10/2015	16.5	19.4	5205.79	NM	3.4	1-16

**Notes:**

bgs: Below ground surface

TOC: Top of Casing

AMSL: Above mean sea level

**Table 2**  
**Summary of Depth to Groundwater and LNAPL Thickness**  
**Chevron Rangely CS47, Rangely, Colorado**

Well Number	Date Measured	TOC Elevation (feet AMSL)	Groundwater Elevation (feet AMSL)	Depth to Water (feet below TOC)	PSH Elevation (feet AMSL)	Depth to PSH (feet below TOC)	LNAPL Thickness (feet)	Potentiometric Surface (ASML)
MW-01	1/16/2017	5206.71	5192.92	13.79	5192.97	13.74	0.05	5192.95
	6/12/2017		5193.56	13.15	5193.57	13.14	0.01	5193.56
	9/14/2017		5192.59	14.12	5192.61	14.10	0.02	5192.60
	12/12/2017		5192.46	14.25	5192.48	14.23	0.02	5192.47
MW-02	1/16/2017	5206.43	5193.53	12.90	NA	NA	0.00	5193.53
	6/12/2017		5193.99	12.44	NA	NA	0.00	5193.99
	9/14/2017		5192.82	13.61	NA	NA	0.00	5192.82
	12/12/2017		5192.97	13.46	NA	NA	0.00	5192.97
MW-03	1/16/2017	5204.41	5192.27	12.14	NA	NA	0.00	5192.27
	6/12/2017		5192.98	11.43	NA	NA	0.00	5192.98
	9/14/2017		5192.18	12.23	NA	NA	0.00	5192.18
	12/12/2017		5191.98	12.43	NA	NA	0.00	5191.98
MW-04	5/25/2017	5206.11	5193.20	12.91	NA	NA	0.00	5193.20
	6/12/2017		5193.20	12.91	NA	NA	0.00	5193.20
	9/14/2017		5192.40	13.71	NA	NA	0.00	5192.40
	12/12/2017		5192.32	13.79	NA	NA	0.00	5192.32
MW-05	5/25/2017	5205.70	5193.31	12.39	NA	NA	0.00	5193.31
	6/12/2017		5193.31	12.39	NA	NA	0.00	5193.31
	9/14/2017		5192.18	13.52	NA	NA	0.00	5192.18
	12/12/2017		5192.26	13.44	NA	NA	0.00	5192.26
MW-06	12/12/2017	5206.40	5191.96	14.44	NA	NA	0.00	5191.96
TW-01	1/16/2017	5205.79	5192.77	13.02	NA	NA	0.00	5192.77
	6/12/2017		5193.27	12.52	NA	NA	0.00	5193.27
	9/14/2017		5192.11	13.68	NA	NA	0.00	5192.11
	12/12/2017		5192.26	13.53	NA	NA	0.00	5192.26

**Notes:**

TOC: Top of Casing

AMSL: Above mean sea level

LNAPL: Light non-aqueous phase liquid

Table 3  
Soil Analytical Data (VOCs)  
Chevron Rangely CS47, Rangely, Colorado

Sample ID	Sample Depth (feet bgs)	Sample Date	TPH GRO (C6-C10)	TPH DRO (C10-C28)	Total TPH (C6-C28) <sup>1</sup>	Benzene	Toluene	Ethylbenzene	Total Xylenes	Acenaphthene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-cd) pyrene	Naphthalene	Pyrene
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
COGCC Allowable Limits			--	--	500	0.17	85	100	175	1,000	1,000	0.22	0.022	0.22	2.2	22	0.022	1,000	1,000	0.22	23	1,000
EPA Resident Risk-Based Screening Levels (RSL)			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-01	8-13	01/12/17	51	2,600	2,651	<0.035	<0.035	<0.035	<0.11	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070
MW-02	18-20	01/13/17	<3.5	78	78	<0.041	<0.041	<0.041	<0.12	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
MW-03	8-10	01/12/17	<3.3	68	68	<0.040	<0.040	<0.040	<0.12	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	0.009	<0.0075	<0.0075	<0.0075	0.016
MW-03	13-18	01/12/17	<3.2	90	90	<0.038	<0.038	<0.038	<0.11	0.015	<0.0074	<0.0074	0.013	<0.0074	0.01	<0.0074	<0.0074	0.013	0.016	<0.0074	<0.0074	0.022
MW-04	8-10	05/16/17	0.21	1.5 J	1.7	0.0021 J	<0.00071	<0.00083	<0.0012	<0.00054	0.0050	0.0022 J	<0.0011	<0.0013	<0.00097	0.0044	<0.0017	0.0077	<0.0012	<0.00086	<0.00065	0.0064
MW-05	7-9	05/16/17	0.19	1.6 J	1.8	<0.00076	<0.00091	<0.0011	<0.0015	<0.00067	<0.00067	<0.0021	<0.0013	0.0017 J	0.0018 J	<0.0011	<0.0021	0.0032 J	<0.0015	<0.0011	0.0025 J	0.0032 J
SB-01	3.5-4.5	05/15/17	46	19,000	19,046	<0.00070	<0.00084	<0.00098	<0.0014	<0.027	<0.027	<0.088	1.3	<0.066	<0.049	2.7	<0.088	<0.060	<0.060	<0.044	0.080 J	<0.033
SB-01	6-9	05/15/17	0.064	1,300	1,300	<0.00062	<0.00075	<0.00087	<0.0012	<0.0054	<0.0054	<0.017	0.10	<0.013	<0.0096	0.30	<0.017	0.055	<0.012	<0.0086	<0.0064	0.035 J
SB-02	4-4.5	05/16/17	1.3	260	261	0.0013 J	<0.00064	<0.00074	<0.0011	<0.0062	0.011 J	<0.020	<0.012	<0.015	<0.011	0.048	<0.020	0.017 J	<0.014	<0.010	<0.0075	0.018 J
SB-03	9-11	05/17/17	1,000	4,100	5,100	<0.031	<0.037	0.84	1.4	0.11	0.34	0.18	<0.011	<0.014	<0.010	0.20	<0.018	<0.012	0.095	<0.0090	0.26	<0.0068
SB-04	4-5	05/17/17	16	1,600	1,616	<0.00061	<0.00073	<0.00085	<0.0012	<0.0063	<0.0063	<0.020	<0.013	<0.015	<0.011	0.17	<0.020	<0.014	<0.014	<0.010	<0.0076	<0.0076
SB-05	4-4.5	05/18/17	1.2	820	821	0.092	0.024	0.021	0.040	<0.0060	<0.0060	<0.019	<0.012	<0.014	<0.011	<0.0096	<0.019	<0.013	<0.013	<0.0096	<0.0072	<0.0072
SB-05	8-10	05/18/17	2,200	15,000	17,200	11	<0.16	8.3	70	0.14	0.27	0.41	<0.013	<0.015	<0.011	0.18	<0.020	0.11	0.19	<0.010	0.0080 J	0.11
SB-05	11-13	05/18/17	1,300	1,400	2,700	4.8	<0.093	4.1	31	0.066	0.11	0.12	<0.013	<0.015	<0.011	0.099	<0.020	0.061	0.082	<0.010	0.48	0.075
SB-05	18-20	05/18/17	1.3	2.9	4.2	0.0044 J	0.0021 J	0.0021 J	0.015	0.0020 J	0.0016 J	0.0023 J	0.0014 J	0.0019 J	0.0012 J	0.0033 J	<0.0018	0.0056	0.0025 J	0.0013 J	0.0045	0.0063
SB-06	4-5	05/18/17	1,100	36,000	37,100	2.6	0.17 J	6.3	18	0.44	0.93	1.1	<0.043	<0.051	<0.038	1.1	<0.068	0.27	0.35	<0.034	1.8	0.30
SB-06	7-10	05/18/17	1,300	6,200	7,500	<0.030	<0.035	1.9	2.7	<0.0056	0.21	0.30	<0.011	<0.013	<0.010	<0.0090	<0.018	<0.012	0.17	<0.0090	0.84	<0.0067
SB-07-4'	4	10/28/17	0.62 J B	3.4 J B	4.02	<0.0053	<0.0053	<0.0053	<0.0053	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-09-8'	8	10/28/17	470 B	2,200 B	2,670	<0.28	<0.28	0.24 J*	1.4	<0.13	<0.13	0.058 J	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	0.12 J	<0.13	1.1	0.042 J
SB-10-6'	6	10/28/17	<1.3	61 J B F1 F2	61	<0.0052	<0.0052	<0.0052	<0.0052	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-11-6'	6	10/28/17	<1.4	120 B	120	<0.0060	<0.0060	<0.0060	<0.0060	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-12-2'	2	10/28/17	1.4 B	24,000 B	24,001.4	<0.0045	<0.0045	<0.0045	<0.0045	<0.054	<0.054	0.35	<0.054	<0.054	<0.054	<0.054	<0.054	<0.054	<0.054	<0.054	<0.054	<0.054
SB-12-4'	4	10/28/17	7.8 B	180 B	187.8	<0.0053	<0.0053	<0.0053	<0.0053	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-13-6'	6	10/28/17	<1.4	110 B	110	<0.0051	<0.0051	<0.0051	<0.0051	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-14-6'	6	10/28/17	0.38 J B	5.5 B	5.88	<0.0051	<0.0051	<0.0051	<0.0051	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-15-2'	2	10/28/17	0.52 J B	280 B	280.52	<0.0046	<0.0046	<0.0046	<0.0046	<0.0057	<0.0057	<0.0057	<0.0057	<0.0057	<0.0057	<0.0057	<0.0057	<0.0057	<0.0057	<0.0057	<0.0057	<0.0057
SB-15-6'	6	10/28/17	23 B	7,500 B	7,523	0.0036 J	0.00082 J	0.0090	0.011	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-16-4'	4	10/28/17	0.50 J B	4.7 B	5.2	<0.0045	<0.0045	<0.0045	<0.0045	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-16-8'	8	10/28/17	190 B	10,000 B	10,190	<2.5	<2.5	0.35 J	<2.5	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-17-6'	6	11/06/17	150 B	28,000 B	28,150	0.036	<0.0057	0.16	0.16	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-18-8'	8	11/06/17	1.1 J B	20 B	21.1	<0.0057	<0.0057	<0.0057	<0.0057	<0.0057	<0.0057	<0.0057	<0.0057	<0.0057	<0.0057	0.0014 J	<0.0057	0.0013 J	<0.0057	<0.0057	0.00048 J	<0.0057
SB-19-13'	13	11/06/17	0.60 J B	21 B	21.60	<0.0056	<0.0056	<0.0056	<0.0056	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-20-13'	13	11/06/17	0.54 J B	2.7 J B	3.24	<0.0054	<0.0054	<0.0054	<0.0054	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-21-11'	11	11/07/17	0.60 J B	17 B F2	17.60	<0.0049	<0.0049	<0.0049	<0.0049	--	--	--	--	--	--	--	--	--	--	--	--	--
SB-22-8'	8	11/06/17	0.90 J B	26 B	26.90	<0.0052	<0.0052	<0.0052	<0.0052	<0.0054	<0.0054	<0.0054	<0.0054	0.0061	<0.0054	0.0057	<0.0054	0.0044 J	<0.0054	<0.0054	0.00035 J	0.0033 J
SB-23-6'	6	11/08/17	1.7 B	6.7 B	8.4	<0.0053	<0.0053	<0.0053	<0.0053	--	--	--	--	--	--	--	--	--	--	--	--	--
DUP-01	6	10/28/17	21 B	10,000 B	10,021	0.0043 J	0.00075 J	0.012	0.014	--	--	--	--	--	--	--	--	--	--	--	--	--
DUP-02	6	11/06/17	51 B	42,000 B	42,051	0.016	<0.0052	0.076	0.083	--	--	--	--	--	--	--	--	--	--	--	--	--

**Notes:**  
Concentrations in **BOLD** are above the Colorado Oil and Gas Conservation Commission (COGCC) Series 900 Allowable Limits.  
1: Total of C6-C10 and C10-C28 Hydrocarbons  
bgs: below ground surface  
TPH: total petroleum hydrocarbons  
GRO: gasoline range organics  
C: carbon range  
DRO: diesel range organics  
ORO: motor oil range organics  
mg/kg: milligrams per kilogram  
-- : Not available  
<: represent concentrations below the test method limit unless otherwise noted  
J: analyte detected below quantitation limit  
\*: Internal standard (ISTD) response or retention time outside acceptable limits  
B: Compound was found in the blank and sample  
F1: Matrix spike (MS) and/or matrix spike duplicate (MSD) recovery is outside acceptance limits  
F2: MS/MSD relative percent difference (RPD) exceeds control limits

Table 4 Soil Analytical Data (GeoChemical Parameters and Metals) Chevron Rangely CS47, Rangely, Colorado																							
Sample ID	Sample Depth (feet bgs)	Sample Date	Percent Moisture	Electrical Conductivity	pH	Temp Deg C @pH	Sodium Absorption Ratio	Arsenic <sup>1</sup>	Barium, Total	Cadmium	Calcium	Chromium	Chromium (III)	Chromium (VI)	Copper	Lead	Magnesium	Mercury	Nickel	Selenium	Silver	Sodium	Zinc
			wt (%)	(mmhos/cm @25 <sup>0</sup> C)	(STD Units)	°C	meq/meq	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)
COGCC Allowable Limits			--	<4	6-9	--	<12	0.39	15,000	70	--	120,000	120,000	23	3,100	400	--	23	1,600	390	390	--	23,000
MW-03	8-10	01/12/17	--	5.80	8.48	--	15.0	7.00	68.0	<0.47	--	6.00	6.00	<1.1	5.50	4.00	--	<0.015	9.60	<0.94	<0.47	--	25.0
MW-04	8-10	05/16/17	7.37	11.4	8.42 H	21.7 H	30.0	5.53	147	0.213 J	183	6.32	6.32	<0.321	4.86	6.19	44.0	0.0105	7.56	0.765	<0.0817	1,740	27.9
MW-05	7-9	05/16/17	25.1	11.4	8.11 H	21.8 H	17.8	3.75	112	0.179 J	297	5.97	5.97 J	<0.395	7.07	6.71	64.9	0.00855	7.97	0.750	<0.0992	1,300	31.7
SB-01	3.5-4.5	05/15/17	18.2	14.9	7.57 H	21.9 H	11.6	8.16	167	0.448 J	658	28.1	28.1	<0.359	22.8	148	374	0.337	45.8	1.05	0.0978 J	1,510	131
SB-01	6-9	05/15/17	6.85	5.29	8.67 H	21.9 H	5.89	2.33	27.9	0.108 J	631	4.70	4.70 J	<0.320	5.44	6.20	37.1	0.00563	6.11	0.703	<0.0802	563	27.8
SB-02	4-4.5	05/16/17	20.1	3.34	8.84 H	21.4 H	10.6	5.26	186	0.197 J	134	15.6	15.6	<0.376	10.4	10.2	17.2	0.0121	15.7	1.33	<0.0943	490	43.8
SB-03	9-11	05/17/17	11.4	5.03	8.56 H	21.4 H	5.56	1.70	113	0.124 J	336	6.05	6.05	<0.334	5.15	5.49	178	0.0137	6.11	0.617	<0.0831	507	27.2
SB-04	4-5	05/17/17	20.8	6.13	8.41 H	21.4 H	4.93	5.35	149	0.201 J	575	14.1	14.1	<0.379	10.5	11.1	231	0.0151	13.8	1.32	<0.0964	553	47.5
SB-05	4-4.5	05/18/17	17.3	6.87	8.17 H	21.4 H	17.5	4.21	135	0.247 J	164	8.68	8.68	<0.366	10.6	10.1	57.2	0.0236	11.2	1.16	<0.0918	1,020	48.2
SB-05	8-10	05/18/17	20.6	8.98	7.96 H	21.7 H	19.0	7.07	154	0.294 J	196	8.98	8.98	<0.375	11.6	14.3	114	0.0306	12.9	0.989	<0.0960	1,350	56.1
SB-05	11-13	05/18/17	20.7	6.65	8.29 H	21.4 H	13.0	6.92	229	0.283 J	220	10.8	10.8	<0.370	11.6	36.6	86.2	0.0664	13.3	1.16	<0.0920	895	75.5
SB-05	18-20	05/18/17	13.3	3.51	8.62 H	21.5 H	6.96	5.74	464	0.261 J	191	11.9	11.9	<0.348	13.0	15.1	53.5	0.0280	17.5	1.88	0.100 J	422	82.3
SB-06	4-5	05/18/17	29.7	9.44	9.14 H	21.8 H	19.8	6.79	255	0.397 J	321	21.7	21.8	<0.422	17.0	62.0	47.7	0.139	35.1	1.27	<0.107	1,440	111
SB-06	7-10	05/18/17	11.2	1.98	8.99 H	21.6 H	17.4	2.28	35.6	0.101 J	21.7	4.48	4.48 J	<0.338	5.34	5.10	6.36	0.00767	6.07	0.589	<0.0858	358	24.4
SB-09-8'	8	10/28/17	25.3	12.0	8.4 HF	20.0 HF	85	4.1	96	0.33 J	--	9.3	4.5	4.8	27	10	--	0.058	15	<1.8	<1.2	--	35
SB-12-2'	2	10/28/17	9.9	2.80	8.5 HF	19.9 HF	32	4.5	110	0.29 J	--	9.3	4.4	4.9	53	11	--	0.028	29	<1.5	<0.98	--	77
SB-15-2'	2	10/28/17	14.2	5.50	8.3 HF	19.9 HF	9.4	5.4	160	0.27 J	--	14	9.9	3.9	11	9.3	--	0.024	14	<1.5	<0.99	--	41
SB-18-8'	8	11/06/17	11.6	3.00	8.7 HF	20.2 HF	28	4.4	98	0.13 J	--	6.0	6.0	<1.4	6.1	7.3	--	0.0092 J	7.8	<1.6	<1.1	--	30
SB-22-8'	8	11/06/17	7.8	2.60	9.3 HF	20.1 HF	43	8.9	200	0.39 J	--	9.2	9.2	<1.4	9.1	12	--	0.019 J	14	<1.3	<0.88	--	51

**Notes:**  
Except where otherwise noted, concentrations in **BOLD** are above the Colorado Oil and Gas Conservation Commission (COGCC) Series 900 Allowable Limits.  
bgs: below ground surface  
wt (%): percent weight  
mmhos/cm: millimhos per centimeter  
STD Units: Standard Units  
°C: degrees Celcius  
meq/meq: milliequivalents per milliequivalent  
mg/kg: milligrams per kilogram  
mg/L: milligrams per liter  
-- : Not available  
<: represent concentrations below the test method limit unless otherwise noted  
J: analyte detected below quantitation limit  
H: analyzed outside of holding time  
<sup>1</sup>: For arsenic, concentrations in **BOLD** are above the project-specific target concentration. The default COGCC Series 900 Allowable Limit for arsenic is 0.39 mg/kg.  
HF: Field parameter with a holding time of 15 minutes and test performed by laboratory at client's request

**Table 5**  
**Groundwater Analytical Results**  
**Chevron Rangely CS47, Rangely, Colorado**

Sample Location	Sample Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPH-GRO (C6 - C10)	TPH-DRO (C10 - C28)	Chloride <sup>1</sup>	Sulfate <sup>1</sup>
		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
COGCC Allowable Limits		0.005	1.0	0.7	10	--	--	450	1,625
MW-01	1/16/2017	<0.0050	<0.0050	<0.0050	<0.015	4.8	320	1,200	1,100
	5/25/2017	<0.010	<0.010	<0.010	<0.030	<0.20	38	1,100	1,800
	10/6/2017	<0.00084	<0.00064	<0.00058	<0.0015	1.6 J	18	990	920
	12/13/2017	<0.00042	<0.00032	<0.00029	<0.00074	4.8	98	900	1,400
MW-02	1/16/2017	<0.0010	<0.0010	<0.0010	<0.0030	<0.20	<0.10	340	1,300
	5/25/2017	<0.0010	<0.0010	<0.0010	<0.0030	<0.20	1.6	310	1,500
	10/6/2017	<0.00042	<0.00032	<0.00029	<0.00074	<0.076	0.042 J	320	1,300
	12/13/2017	<0.00042	<0.00032	<0.00029	<0.00074	<0.076	0.13	260	1,200
MW-03	1/16/2017	<0.0010	<0.0010	<0.0010	<0.0030	<0.20	0.65	1,600	1,300
	5/25/2017	<0.0010	<0.0010	<0.0010	<0.0030	<0.20	0.60	750	1,900
	10/6/2017	<0.00042	0.00046 J	<0.00029	<0.00074	<0.076	<0.040	720	1,800
	12/12/2017	<0.00042	0.00034 J	<0.00029	<0.00074	<0.076	0.13	570	1,600
MW-03D	5/25/2017	<0.0010	<0.0010	<0.0010	<0.0030	<0.20	1.2	730	1,700
MW-04	5/25/2017	<0.0010	<0.0010	<0.0010	<0.0030	<0.20	<0.50	1,500	1,600
	10/6/2017	0.00056 J	<0.00032	<0.00029	<0.00074	<0.076	<0.040	1,100	1,700
	12/12/2017	0.00062 J	<0.00032	<0.00029	<0.00074	<0.076	0.058 J	830	1,600
MW-05	5/25/2017	<0.0010	<0.0010	<0.0010	<0.0030	<0.20	0.65	680	2,000
	10/6/2017	<0.00042	<0.00032	<0.00029	<0.00074	<0.076	0.052 J	600	1,800
	12/12/2017	<0.00042	<0.00032	<0.00029	<0.00074	<0.076	<0.040	550	1,700
MW-06	12/13/2017	0.00098 J	0.00056 J	<0.00029	<0.00074	<0.076	0.39	1,000	1,700
TW-01	1/16/2017	<0.0010	<0.0010	<0.0010	<0.0030	<0.20	0.17	360	1,300
	5/25/2017	<0.0010	<0.0010	<0.0010	<0.0030	<0.20	<0.50	320	1,300
	10/6/2017	<0.00042	<0.00032	<0.00029	<0.00074	<0.076	0.099 J	320	1,200
	12/13/2017	0.00065 J	0.00044 J	<0.00029	<0.00074	<0.076	0.28	330	1,200

**Notes:**

Concentrations in **BOLD** are above the Colorado Oil and Gas Conservation Commission (COGCC) Series 900 Allowable Limits

TPH: total petroleum hydrocarbons

GRO: gasoline range organics

DRO: diesel range organics

mg/L: milligrams per liter

-- : Not available

<: represent concentrations below the test method limit unless otherwise noted

<sup>1</sup>: Criteria for chloride and sulfate are based on COGCC Allowable Limits of 1.25 x's background.

Concentrations for up-gradient well TW-01 (1/16/17) used as background concentrations.

J : Analyte is present at an estimated concentration between the MDL and Report Limit



## APPENDIX A

### WELL PERMITS/NOTICE OF INTENT



**ORIGINAL PERMIT APPLICANT(S)**

CHEVRON ENVIRONMENTAL MGMT COMPANY  
VIRGINIA COLTHARP HOUSTON LIMITED PARTNERSHIP

**APPROVED WELL LOCATION**

Water Division: 6      Water District: 43  
Designated Basin: N/A  
Management District: N/A  
County: RIO BLANCO  
Parcel Name: N/A  
Physical Address: N/A

**AUTHORIZED AGENT**

STANTEC CONSULTING SERVICES (BEALL,  
CHRISTOPHER)

SE 1/4 SW 1/4 Section 35 Township 2.0 N Range 102.0 W Sixth P.M.

**UTM COORDINATES (Meters, Zone:13, NAD83)**

Easting: 175004.4      Northing: 4445259.0

**PERMIT TO USE AN EXISTING WELL**

**ISSUANCE OF THIS PERMIT DOES NOT CONFER A WATER RIGHT**

**CONDITIONS OF APPROVAL**

- 1) This well shall be used in such a way as to cause no material injury to existing water rights. The issuance of this permit does not ensure that no injury will occur to another vested water right or preclude another owner of a vested water right from seeking relief in a civil court action.
- 2) The construction of this well shall be in compliance with the Water Well Construction Rules 2 CCR 402-2, unless approval of a variance has been granted by the State Board of Examiners of Water Well Construction and Pump Installation Contractors in accordance with Rule 18.
- 3) Approved pursuant to CRS 37-92-602(3)(b)(I) for uses as described in CRS 37-92-602(1)(f). Use of this well is limited to monitoring water levels and/or water quality sampling.
- 4) Approved for the use of an existing well acknowledged for construction under monitoring hole notice 57286-MH, and known as MW6.
- 5) This well must be equipped with a locking cap or seal to prevent well contamination or possible hazards as an open well. The well must be kept capped and locked at all times except during sampling or measuring.
- 6) Records of water level measurements and water quality analyses shall be maintained by the well owner and submitted to the Division of Water Resources upon request.
- 7) Upon conclusion of the monitoring program the well owner shall plug this well in accordance with Rule 16 of the Water Well Construction Rules. A Well Abandonment Report must be completed and submitted to the Division of Water Resources within 60 days of plugging.
- 8) The owner shall mark the well in a conspicuous location with the well permit number and name of aquifer as appropriate, and shall take necessary means and precautions to preserve these markings.
- 9) This well must have been constructed by or under the supervision of a licensed well driller or other authorized individual according to the Water Well Construction Rules.
- 10) This well must be located not more than 200 feet from the location specified on this permit.

NOTE: Issuance of this permit does not guarantee that this well can be converted to a production well under a future permit. Additionally, pursuant to Rule 14.2 of the Water Well Construction Rules (2 CCR 402-2), monitoring holes constructed pursuant to a monitoring hole notice shall not be converted to a production well. (Upon obtaining a permit from the State Engineer, a monitoring hole may be converted to a monitoring well, recovery well for remediation of the aquifer, or a dewatering system for dewatering the aquifer.)

Issued By GEOFFREY DAVIS

Date Issued: 2/13/2018

Expiration Date: N/A

GWS-51  
02/2017

## NOTICE OF INTENT TO CONSTRUCT MONITORING HOLE(S)

Please type or print legibly in black or blue ink or file online, [dwrpermitsonline@state.co.us](mailto:dwrpermitsonline@state.co.us)

State of Colorado, Office of the State Engineer 1313 Sherman St, Room 821,  
Denver, CO 80203 Phone 303-866-3581 [www.water.state.co.us](http://www.water.state.co.us)

RECEIVED

OCT 24 2017

WATER RESOURCES  
STATE ENGINEER  
COLO

Well Owner Name(s): Chevron Environmental Management Company  
Address: 1400 Smith Street, Room 07084, Houston, TX 77002  
Phone: (713) 372-0289  
Email: bmal@chevron.com  
Landowner's Name: Virginia Coltharp Houston Limited Partnership

Please check one and complete as indicated including contact info:

- ☐ Water Well Driller Licensed in Colorado - Lic. No. \_\_\_\_\_  
☐ Professional Engineer Registered in Colorado - Reg. No. \_\_\_\_\_  
☒ Professional Geologist per C.R.S. 23-41-208(b)  
☐ Other — anyone directly employed by or under the supervision of a licensed driller, registered professional engineer or professional geologist

Contact / Company Christopher Beall/Stantec  
Address 2000 South Colorado Blvd., Suite 2-300  
City, State & Zip Denver, CO 80222  
Phone (970) 214-1126  
Email christopher.beall@stantec.com  
Print Name: Christopher Beall

Signature or enter full name here: Christopher Beall

Location: Section 35  
Township 2 ☒ N ☐ S, Range 102 ☐ E ☒ W, 6 PM  
County: Rio Blanco  
Subdivision: \_\_\_\_\_  
Lot: \_\_\_\_\_ Block: \_\_\_\_\_ Filing: \_\_\_\_\_  
Site/Property Address \_\_\_\_\_

GPS Location in UTM format if known:

Set GPS unit to true north, datum NAD83, and use meters for the distance units, ☐ Zone 12 or ☐ Zone 13.

Easting \_\_\_\_\_ Northing \_\_\_\_\_

# of Monitoring Holes to be constructed in Section: 18

Estimated Depth 20 Ft., Aquifer Unconfined

Purpose of Monitoring Hole(s) Site soil and groundwater investigation.

Anticipated Date of Construction: 10/31/2017

Date Notice Submitted: 10/24/2017  
(Must be at least 3 days prior to construction)

### ACKNOWLEDGEMENT FROM STATE ENGINEER'S OFFICE FOR OFFICE USE ONLY

57286 - MH  
Div. 6 WD 43 BAS \_\_\_\_\_ MD \_\_\_\_\_  
PROCESSED BY KF  
DATE ACKNOWLEDGED 10/25/2017

### CONDITIONS OF MONITORING HOLE ACKNOWLEDGEMENT

A COPY OF THE WRITTEN NOTICE OR ACKNOWLEDGEMENT SHALL BE AVAILABLE AT THE DRILLING SITE.

- 1) Notice was provided to the State Engineer at least 72 hours prior to construction of monitoring & observation hole(s).
- 2) Construction of the hole(s) must be completed within 90 days of the date notice was given to the State Engineer. Testing and/or pumping shall not exceed a total of 200 hours unless prior written approval is obtained from the State Engineer. Water diverted during testing must not be used for beneficial purposes. The owner of the hole(s) is responsible for obtaining permit(s) and complying with all rules and regulations pertaining to the discharge of fluids produced during testing.
- 3) All work must comply with the Water Well Construction Rules, 2 CCR 402-2. Standard permit application and work report forms are found on the DWR website at <http://www.water.state.co.us>. Well Construction and Yield Estimate Reports (GWS-31) must be completed for each hole drilled. The licensed contractor or authorized individual must submit the completed forms to this office within 60 days of monitoring hole completion. Aquifer testing information must be submitted on Well Yield Test Report (GWS-39).
- 4) Unless a well permit is obtained or variance approved, the hole(s) must be plugged and sealed within eighteen (18) months after construction. An Abandonment Report (GWS-09) must be submitted within 60 days of plugging & sealing. The above MH acknowledgement number, owner's structure name, and owner's name and address must be provided on all well permit application(s), well construction and abandonment reports.
- 5) A MONITORING HOLE CANNOT BE CONVERTED TO A PRODUCTION WATER WELL, except for purposes of remediation (recovery) or as a permanent dewatering system, if constructed in accordance with the Water Well Construction Rules and policies of the State Engineer.
- 6) IF HOLES WILL NOT BE CONSTRUCTED UNDER THIS NOTICE WITHIN 90 DAYS, PLEASE WRITE "NO HOLES CONSTRUCTED" ON A COPY OF THE ACKNOWLEDGED NOTICE WITH THE FILE NUMBER AND EMAIL TO THE DIVISION OF WATER RESOURCES AT [DWRpermitsonline@state.co.us](mailto:DWRpermitsonline@state.co.us).

THIS ACKNOWLEDGEMENT OF NOTICE DOES NOT INDICATE THAT WELL PERMIT(S) CAN BE APPROVED.

Incomplete forms or Notice provided less than 72 hours prior to well construction will not be acknowledged

<b>COLORADO DIVISION OF WATER RESOURCES</b> <b>DEPARTMENT OF NATURAL RESOURCES</b> 1313 SHERMAN ST., Ste 821, DENVER CO 80203 Phone: (303) 866-3581 <a href="mailto:dwrpermitsonline@state.co.us">dwrpermitsonline@state.co.us</a>				Office Use Only		Form GWS-46 (11/2011)	
<b>MONITORING/OBSERVATION</b> <b>Water Well Permit Application</b> Review instructions on reverse side prior to completing form. The form must be typed, completed online or in black or blue ink.							
<b>1. Well Owner Information</b>							
Name of well owner							
Mailing address							
City		State		Zip code			
Telephone #			E-Mail (If filing online it is required)				
<b>2. Type Of Application (check applicable boxes)</b>							
<input type="checkbox"/> Use existing well <input type="checkbox"/> Replacement for existing monitoring well: <input type="checkbox"/> Construct new well      Permit no.: <input type="checkbox"/> Other:							
<b>3. Refer To (if applicable)</b>							
Monitoring hole acknowledgment			Well name or #				
MH-							
<b>4. Location Of Proposed Well (Important! See Instructions)</b>							
County			_____ 1/4 of the _____ 1/4				
Section	Township	N or S <input type="checkbox"/> <input type="checkbox"/>	Range	E or W <input type="checkbox"/> <input type="checkbox"/>	Principal Meridian		
Distance of well from section lines (section lines are typically not property lines) Ft. from <input type="checkbox"/> N <input type="checkbox"/> S      Ft. from <input type="checkbox"/> E <input type="checkbox"/> W							
For replacement wells only – distance and direction from old well to new well <div style="display: flex; justify-content: space-between;"> <span>_____ feet</span> <span>_____ direction</span> </div>							
Well location address (Include City, State, Zip) <input type="checkbox"/> Check if well address is same as Item 1.							
<b>Optional:</b> GPS well location information in UTM format You must check GPS unit for required settings as follows:							
Format must be UTM <input type="checkbox"/> Zone 12 or <input type="checkbox"/> Zone 13 Units must be Meters <b>Datum must be NAD83</b> Unit must be set to true north Was GPS unit checked for above? <input type="checkbox"/> YES			Easting _____ Northing _____ <b>Remember to set Datum to NAD83</b>				
<b>5. Property Owner Information</b>							
Name of property owner							
Mailing address							
City		State		Zip Code			
Telephone #							
<b>6. Use Of Well</b>							
<b>Use of this well is limited to monitoring water levels and/or water quality sampling</b>							
<b>7. Well Data (proposed)</b>							
Total depth				Aquifer			
feet							
<b>8. Consultant Information (if applicable)</b>							
Name of contact person							
Company name							
Mailing address							
City			State		Zip Code		
Telephone #							
<b>9. Proposed Well Driller License #(optional):</b>							
<b>10. Name of Well Owner or Authorized Agent</b>							
The making of false statements herein constitutes perjury in the second degree, which is punishable as a class 1 misdemeanor pursuant to C.R.S. 24-4-104 (13)(a). I have read the statements herein, know the contents thereof and state that they are true to my knowledge.							
Sign or enter full name here						Date (mm/dd/yyyy)	
If signing print name. Print title if other than land owner.							
<b>Office Use Only</b>							
USGS map name				DWR map no.		Surface elev.	
<div style="border: 1px solid black; width: 100%; height: 100%;"></div>				Receipt area only			
DIV ____ WD ____ BA ____ MD ____							



## MONITORING/OBSERVATION WELL PERMIT APPLICATION INSTRUCTIONS

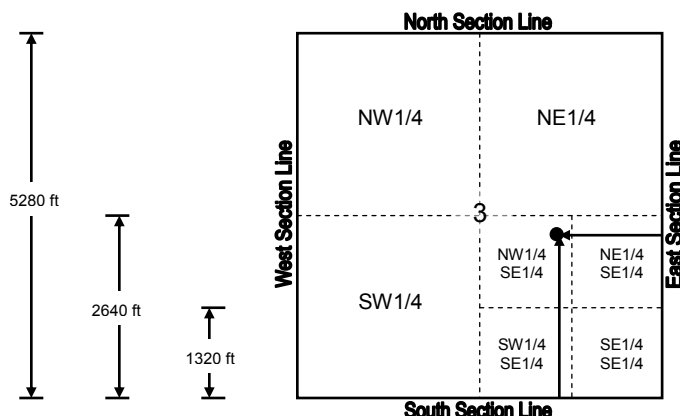
**Applications must be computer generated on-line, typewritten or printed in BLACK or BLUE INK. ALL ITEMS in the application must be completed. Incomplete applications may be returned for more information. Applications are evaluated in chronological order. Please allow approximately six weeks for processing.** This form may be reproduced by photocopying or computer generation. Reproductions must retain margins and print quality of the original form. If filing online, see online filing instructions for further information. You may also save, print, scan and email the completed form to: [dwrpermitsonline@state.co.us](mailto:dwrpermitsonline@state.co.us)

**FEES:** This application must be submitted with a \$100 filing fee. (The fee for an application to replace or deepen an existing permitted monitoring/observation well is \$100 for locations outside Designated Ground Water Basins, and \$60 inside Designated Ground Water Basins.) Acceptable forms of payment are check or money order, payable to the "Colorado Division of Water Resources." Payments made by Visa, MasterCard or Discover card can be accepted by phone through the Records Section at 303.866.3581. **Fees are nonrefundable.**

**USES:** This form (GWS-46) is to be used when applying for a permit where the only uses are monitoring of water levels and/or water quality sampling. For well construction criteria refer to the Colorado Water Well Construction Rules, 2CCR 402-2. A copy of the Rules may be obtained from any Division of Water Resources Office for a fee of \$5, or you may access them online from the State Board of Examiners' (BOE) website at <http://water.state.co.us/dwrpub/documents/constructionrules05.pdf>

### ITEM INSTRUCTIONS: (numbers correspond with those on the front of this form)

1. Provide the name of the well owner and the mailing address where all correspondence will be sent.
2. Check and complete all boxes that apply.
3. Provide the MH number assigned by the Division of Water Resources in response to the notice of intent to construct a monitoring/observation well. Complete the well name if the structure has a name or identifying number.
4. If applying for a permit to **construct a new well**, you **must** provide the county, section #, township, range and principal meridian. You **do not** need to provide the ¼ of the ¼ section designation, distances from section lines or an optional GPS location (UTM coordinates). If a permit is issued and a well constructed, the authorized individual will be required to provide an accurate GPS location (UTM coordinates) of the "as-built" well location. If applying for a permit to **use an existing well** you **must** provide the well location information stated above, as well as either a GPS location (UTM coordinates) of the existing well site, or distances from section lines (**including the ¼ of the ¼ section designation**) as follows: In a typical case, a township is comprised of 36 sections, with each section ideally one mile square, or 5,280 feet on each side. Sections are further divided into quarter sections. Each ¼ Section is 2,640 feet by 2,640 feet and comprises 160 acres. Each ¼ section can be further divided into additional quarters. Each ¼ of the ¼ Section is 1,320 feet by 1,320 feet and comprises 40 acres. The distances are measured from the section lines. In the following example, the well is located 2,500 feet from the South Section line and 1,400 feet from the East Section line:



Well Location Example:  
NW 1/4 of the SE 1/4 of  
Section 3, being 2500 feet  
from the South Section Line  
and 1400 feet from the East  
Section Line.

If providing a GPS location (UTM coordinates), the required GPS unit settings must be as indicated on this form. Colorado contains two UTM zones (12 & 13). Zone 13 covers most of Colorado. The boundary between Zone 12 and Zone 13 is the 108<sup>th</sup> Meridian (longitude). West of the 108<sup>th</sup> Meridian is UTM Zone 12 and east of the 108<sup>th</sup> Meridian is UTM Zone 13. The 108<sup>th</sup> Meridian is approximately 57 miles east of the Colorado-Utah state line. On most GPS units, the UTM zone is given as part of the Easting measurement, e.g. 12T0123456. Check the appropriate box for the zone. Provide the property address of the well location if one exists. If it is the same as the mailing address, check the box next to the well location address.

5. Provide property owner information.
6. Use of this well is limited to monitoring water levels and/or water quality sampling only.
7. The actual or anticipated total depth must be provided. Provide the name of the aquifer in which the well will be completed.
8. Provide consultant information (if applicable). Note: A consultant may sign this application on behalf of their client.
9. Monitoring/observation wells must be constructed by a Colorado licensed well construction contractor or authorized individual, as defined in the Well Construction Rules, 2CCR 402-2. Only a licensed contractor may construct any monitoring/observation well that penetrates a confining layer, or, is to be converted into a future production well. The well must be constructed in compliance with the Well Construction Rules, unless a variance has been approved allowing an alternative construction design.
10. The individual signing the application or entering their name (and title if applicable) must be the applicant or an officer of the corporation/company/agency identified as the applicant, their attorney or consultant. An authorized agent may also sign the application, if a letter signed by the applicant or their attorney is submitted with the application authorizing that agent to sign or enter their name on the applicant's behalf. Payment must be received via phone, fax or mail prior to processing the application. If filing online please call the Records Section at 303.866.3581 to pay via credit card.

**IF YOU HAVE ANY QUESTIONS** regarding any item on the application form, please call the Division of Water Resources Ground Water Information Desk (303-866-3587), or the nearest Division of Water Resources Field Office located in Greeley (970-352-8712), Pueblo (719-542-3368), Alamosa (719-589-6683), Montrose (970-249-6622), Glenwood Springs (970-945-5665), Steamboat Springs (970-879-0272), or Durango (970-247-1845), or refer to CDWR web site at <http://www.water.state.co.us> for general information.

Form No. GWS-31 02/2017		<b>WELL CONSTRUCTION AND YIELD ESTIMATE REPORT</b> State of Colorado, Office of the State Engineer 1313 Sherman St., Room 821, Denver, CO 80203 303.866.3581 <a href="http://www.water.state.co.us">www.water.state.co.us</a> and <a href="mailto:dwrpermitsonline@state.co.us">dwrpermitsonline@state.co.us</a>			For Office Use Only	
1. Well Permit Number:		Receipt Number:				
2. Owner's Well Designation:						
3. Well Owner Name:						
4. Well Location Street Address:						
5. GPS Well Location <input type="checkbox"/> Zone 12 <input type="checkbox"/> Zone 13 Easting: _____ Northing: _____						
6. Legal Well Location: _____ 1/4, _____ 1/4, Sec., _____ Twp., _____ N or S _____, Range _____, _____ E or W _____, _____ P.M. County: _____ Subdivision: _____, Lot _____, Block _____, Filing (Unit) _____						
7. Ground Surface Elevation: _____ feet Date Completed: _____ Drilling Method: _____						
8. Completed Aquifer Name : _____ Total Depth: _____ feet Depth Completed: _____ feet						
9. Advance Notification: Was Notification Required Prior to Construction? <input type="checkbox"/> Yes <input type="checkbox"/> No, Date Notification Given: _____						
10. Aquifer Type: <input type="checkbox"/> Type I (One Confining Layer) <input type="checkbox"/> Type I (Multiple Confining Layers) <input type="checkbox"/> Laramie-Fox Hills (Check one) <input type="checkbox"/> Type II (Not overlain by Type III) <input type="checkbox"/> Type II (Overlain by Type III) <input type="checkbox"/> Type III (alluvial/colluvial)						
11. Geologic Log:					12. Hole Diameter (in.) From (ft) To (ft)	
Depth	Type	Grain Size	Color	Water Loc.		
Remarks:					13. Plain Casing	
					OD (in) Kind Wall Size (in) From (ft) To (ft)	
					Perforated Casing Screen Slot Size (in): _____	
					OD (in) Kind Wall Size (in) From (ft) To (ft)	
					14. Filter Pack:	
					Material _____	
					Size _____	
					15. Packer Placement:	
					Type _____	
					Depth _____	
					16. Grouting Record	
					Material Amount Density Interval Method	
17. Disinfection: Type _____ Amt. Used _____						
18. Well Yield Estimate Data: <input type="checkbox"/> Check box if Test Data is submitted on Form Number GWS-39, Well Yield Test Report						
Well Yield Estimate Method: _____						
Static Level: _____				Estimated Yield (gpm) _____		
Date/Time measured: _____				Estimate Length (hrs) _____		
Remarks:						
19. I have read the statements made herein and know the contents thereof, and they are true to my knowledge. This document is signed (or name entered if filing online) and certified in accordance with Rule 17.4 of the Water Well Construction Rules, 2 CCR 402.2. The filing of a document that contains false statements is a violation of section 37-91-108(1)(e), C.R.S., and is punishable by fines up to \$1,000 and/or revocation of the contracting license. If filing online the State Engineer considers the entry of the licensed contractor's name to be compliance with Rule 17.4.						
Company Name:		Email:		Phone w/area code:		License Number:
Mailing Address:						
Sign (or enter name if filing online)			Print Name and Title			Date:

## INSTRUCTIONS FOR WELL CONSTRUCTION AND YIELD ESTIMATE REPORT

This report must be computer generated online, typed or printed in **BLACK OR BLUE INK** and may be reproduced by photocopy or computer generation. Photocopy reproductions must retain margins and print quality. Attach additional sheets if more space is required. Each additional sheet must be identified at the top by the well owner's name, the permit number, form name/number and a sequential page number. Report depths in feet below ground surface. If filing online please see online form submittal instructions at <http://water.state.co.us/groundwater/wellpermit/onlineformsubmittal/Pages/DWRSite1.aspx>. You may also save, print and email the completed form to: [dwrpermitsonline@state.co.us](mailto:dwrpermitsonline@state.co.us)

The form must be submitted to the State Engineer's Office within 60 days after completing the well or 7 days after the permit expiration date, whichever is earlier. A copy of the form must be provided to the well owner.

### Item Instructions: (numbers correspond with those on the front of this form)

1. Complete the well permit and receipt number.
2. Provide the identification (owner's well designation) for the well.
3. Fill in well owner name.
4. Provide the street address where the well is located.
5. Provide the GPS location where the well was drilled (required field).

Colorado contains two (2) UTM zones. Zone 13 covers most of Colorado. The boundary between Zone 12 and Zone 13 is the 108<sup>th</sup> Meridian (longitude). West of the 108<sup>th</sup> Meridian is UTM Zone 12 and east of the 108<sup>th</sup> Meridian is UTM Zone 13. The 108<sup>th</sup> Meridian is approximately 57 miles east of the Colorado-Utah state line. On most GPS units, the UTM zone is given as part of the Easting measurement, e.g. 12T0123456. Check the appropriate box for the zone.
6. Complete the legal description location of the well and county. For wells located in subdivisions, the name, lot, block, and filing, must be provided.
7. Report the ground surface elevation in feet above sea level if available. This value may be obtained from a topographic map. Provide the date the well was completed and describe the drilling method used to construct the well.
8. Indicate the aquifer in which the well was completed, the total depth drilled, and the actual completed depth of the well.
9. Indicate whether or not the well inspection team was required to be notified prior to construction. If required, provide the date notification was given. See <http://water.state.co.us/groundwater/BOE/Pages/VariancesWaivers.aspx> for more information on Notifications.
10. Check the box indicating the type aquifer in which the well is completed (See Rule 5.2.2 Well Construction Rules).
11. Fully describe the materials encountered in drilling. Do not use formation names unless they are in conjunction with a description of materials. Examples of descriptive terms include:

**Type** - sandstone, sand, etc.  
**Grain size** - Boulders, gravel, sand, silt, clay, etc.  
**Color** - Denote for all materials, most critical in sedimentary rock  
**Water Location** - Depth where water is encountered (if it can be determined)
12. Provide the diameters of the drilled borehole.
13. The outside diameter, type, wall thickness, and interval of plain and perforated casing lengths must be indicated. For perforated casing, the screen size must be indicated.
14. Indicate the material and size of filter pack (e.g. sand, gravel, etc.) and the interval where placed.
15. Indicate the type and setting depth for any packers installed.
16. The material, amount, and interval of the grout slurry must be reported. Density may be indicated as pounds per gallon, gallons of water per sack, total gallons of water used, or number of sacks used, etc. Specify the grout placement method, i.e. tremie pipe or positive placement. The percentage of additives mixed with the grout should be reported under remarks.
17. Record the type and the amount of disinfection used, how placed, and the length of time left in the hole.
18. Report Well Yield Estimate data as required by Rule 17.1.1. Spaces are provided to report all estimates made during the assessment. The report should show that the estimate complied with the provisions of the rules. If available, report clock time when measurements were taken. If an estimate was not performed, explain when it will be done. A full Well Yield Test may be performed instead of an estimate; if so, check the appropriate box and submit the data on form GWS-39.
19. Fill in Company Name, Email, and Address and License Number (or PE/PG) of the Individual who is responsible for the well construction. The licensed contractor or authorized individual responsible for the construction of the well must sign or if filing online, enter his/her name on the report. If filing online the State Engineer considers the entering of the licensed contractors name on the form to be a certification of accuracy and truthfulness in compliance with Rule 17.4 of the Water Well Construction Rules and Regulations, 2 CCR 402-2.

**Rule 17.4 Certification** - Work reports must be signed and certified as to accuracy and truthfulness of the information on the report by the well construction or pump installation contractors or authorized individuals responsible for the work performed by them or under their direction or supervision, or by the private driller or private pump installer if the work was performed by them. Such reports are deemed to be completed, signed and certified under oath.

Submit completed report to: State of Colorado, Office of the State Engineer, 1313 Sherman St, Room 821, Denver, CO 80203. You may also save, print, scan and email the completed form to [dwrpermitsonline@state.co.us](mailto:dwrpermitsonline@state.co.us)

**IF YOU HAVE ANY QUESTIONS** regarding any item on this form, please call the Division of Water Resources Ground Water Information Desk (303-866-3587), or the nearest Division of Water Resources Field Office located in Greeley (970-352-8712), Pueblo (719-542-3368), Alamosa (719-589-6683), Montrose (970-249-6622), Glenwood Springs (970-945-5665), Steamboat Springs (970-879-0272), or Durango (970-247-1845), or refer to our web site at [www.water.state.co.us](http://www.water.state.co.us) for general information, forms, online filing instructions and access to state rules and statutes.


**APPENDIX B**  
**BORING LOGS**




PROJECT: <b>Chevron-Rangely</b>		WELL / PROBEHOLE / BOREHOLE NO:	
LOCATION: <b>CS-47</b>		<b>SB-7</b>	
PROJECT NUMBER: <b>182603866</b>		PAGE 1 OF 1	
DRILLING: STARTED: <b>10/28/17</b>	COMPLETED: <b>11/6/17</b>	NORTHING (ft): <b>1294693.991</b>	EASTING (ft): <b>2073647.148</b>
INSTALLATION: STARTED: <b>NA</b>	COMPLETED: <b>NA</b>	GROUND ELEV (ft): <b>5203.44</b>	TOC ELEV (ft): <b>NA</b>
DRILLING COMPANY: <b>Stantec/Cascade</b>		INITIAL DTW (ft): <b>9.5</b>	BOREHOLE DEPTH (ft): <b>20</b>
DRILLING EQUIPMENT: <b>Hand Auger/Geoprobe 7822DT</b>		STATIC DTW (ft): <b>Not Encountered</b>	WELL DEPTH (ft): <b>NA</b>
DRILLING METHOD: <b>Hand Auger/Direct Push Rig</b>		WELL CASING DIA. (in): <b>---</b>	BOREHOLE DIA.(in): <b>2.25</b>
SAMPLING EQUIPMENT: <b>Hand Auger/Macro-Core</b>		LOGGED BY: <b>BL/MS</b>	CHECKED BY: <b>CAB</b>







Depth (feet)	Graphic Log	USCS	Description	Sample	Soil Sample	Measured Recovery (feet)	Headspace PID (units)	Depth (feet)
5		SC	CLAYEY SAND ; SC; brown; dry; no odor; no staining		SB7-4'		0.0	
							0.4	5
							0.2	
10		SP	SAND ; SP; brown; fine-grained; no odor; no staining				0.2	
							0.1	10
							3.2	
15		SW	SAND WITH GRAVEL ; SW; gray; fine to coarse-grained; wet; slight odor					
							0.2	15
20		SW	SAND WITH GRAVEL ; SW; gray; fine to coarse-grained; wet; no odor					
								20
Borehole terminated at 20 feet.								


PROJECT: <b>Chevron-Rangely</b>		WELL / PROBEHOLE / BOREHOLE NO:	
LOCATION: <b>CS-47</b>		PAGE 1 OF 1 <b>SB-9</b>	
PROJECT NUMBER: <b>182603866</b>			
DRILLING: STARTED: <b>10/28/17</b>	COMPLETED: <b>11/6/17</b>	NORTHING (ft): <b>1294719.499</b>	EASTING (ft): <b>2073697.808</b>
INSTALLATION: STARTED: <b>NA</b>	COMPLETED: <b>NA</b>	GROUND ELEV (ft): <b>5202.474</b>	TOC ELEV (ft): <b>NA</b>
DRILLING COMPANY: <b>Stantec/Cascade</b>		INITIAL DTW (ft): <b>9.5</b>	BOREHOLE DEPTH (ft): <b>20</b>
DRILLING EQUIPMENT: <b>Hand Auger/Geoprobe 7822DT</b>		STATIC DTW (ft): <b>Not Encountered</b>	WELL DEPTH (ft): <b>NA</b>
DRILLING METHOD: <b>Hand Auger/Direct Push Rig</b>		WELL CASING DIA. (in): <b>---</b>	BOREHOLE DIA.(in): <b>2.25</b>
SAMPLING EQUIPMENT: <b>Hand Auger/Macro-Core</b>		LOGGED BY: <b>BL/MS</b>	CHECKED BY: <b>CAB</b>

Depth (feet)	Graphic Log	USCS	Description	Sample	Soil Sample	Measured Recovery (feet)	Headspace PID (units)	Depth (feet)
		SP	<b>SAND</b> ; SP; brown; fine-grained; dry; no odor; no staining					
		SC	<b>CLAYEY SAND</b> ; SC; brown; petroleum odor; black staining				4.3	
5							138.3	5
							391.6	
10					SB9-8'		982.6	10
							896.3	
		SW	<b>SAND WITH GRAVEL</b> ; SW; gray; fine to coarse-grained; wet; hydrocarbon odor				340.5	
15			No Recovery					15
		SW	<b>SAND WITH GRAVEL</b> ; SW; gray; coarse-grained; wet				7.1	
20			Borehole terminated at 20 feet.					20


PROJECT: <b>Chevron-Rangely</b>		WELL / PROBEHOLE / BOREHOLE NO:	
LOCATION: <b>CS-47</b>		PAGE 1 OF 1 <b>SB-10</b>	
PROJECT NUMBER: <b>182603866</b>			
DRILLING: STARTED: <b>10/28/17</b>	COMPLETED: <b>11/6/17</b>	NORTHING (ft): <b>1294750.3</b>	EASTING (ft): <b>2073677.919</b>
INSTALLATION: STARTED: <b>NA</b>	COMPLETED: <b>NA</b>	GROUND ELEV (ft): <b>5202.865</b>	TOC ELEV (ft): <b>NA</b>
DRILLING COMPANY: <b>Stantec/Cascade</b>		INITIAL DTW (ft): <b>9.5</b>	BOREHOLE DEPTH (ft): <b>19</b>
DRILLING EQUIPMENT: <b>Hand Auger/Geoprobe 7822DT</b>		STATIC DTW (ft): <b>Not Encountered</b>	WELL DEPTH (ft): <b>NA</b>
DRILLING METHOD: <b>Hand Auger/Direct Push Rig</b>		WELL CASING DIA. (in): <b>---</b>	BOREHOLE DIA.(in): <b>2.25</b>
SAMPLING EQUIPMENT: <b>Hand Auger/Macro-Core</b>		LOGGED BY: <b>BL/MS</b>	CHECKED BY: <b>CAB</b>

Depth (feet)	Graphic Log	USCS	Description	Sample	Soil Sample	Measured Recovery (feet)	Headspace PID (units)	Depth (feet)
5		SC	CLAYEY SAND TRACE COBBLES ; SC; brown; dry; no odor; no staining		SB10-6'			0.0
								0.0
		SP	SAND ; SP; brown; fine-grained; no odor; no staining					0.0
10								0.2
		SP	SAND WITH GRAVEL ; SP; gray; coarse-grained; wet; no odor; no staining					1.8
15		ML	SILT ; ML; dark gray; low plasticity; dry; cemented					1.5
								1.2

Refusal at 19 feet. Borehole terminated at 19 feet.


PROJECT: <b>Chevron-Rangely</b>		WELL / PROBEHOLE / BOREHOLE NO:	
LOCATION: <b>CS-47</b>		PAGE 1 OF 1 <b>SB-11</b>	
PROJECT NUMBER: <b>182603866</b>			
DRILLING: STARTED: <b>10/28/17</b>	COMPLETED: <b>11/6/17</b>	NORTHING (ft): <b>1294749.908</b>	EASTING (ft): <b>2073657.55</b>
INSTALLATION: STARTED: <b>NA</b>	COMPLETED: <b>NA</b>	GROUND ELEV (ft): <b>5204.873</b>	TOC ELEV (ft): <b>NA</b>
DRILLING COMPANY: <b>Stantec/Cascade</b>		INITIAL DTW (ft): <b>Not Encountered</b>	BOREHOLE DEPTH (ft): <b>20</b>
DRILLING EQUIPMENT: <b>Hand Auger/Geoprobe 7822DT</b>		STATIC DTW (ft): <b>Not Encountered</b>	WELL DEPTH (ft): <b>NA</b>
DRILLING METHOD: <b>Hand Auger/Direct Push Rig</b>		WELL CASING DIA. (in): <b>---</b>	BOREHOLE DIA.(in): <b>2.25</b>
SAMPLING EQUIPMENT: <b>Hand Auger/Macro-Core</b>		LOGGED BY: <b>BL/MS</b>	CHECKED BY: <b>CAB</b>

Depth (feet)	Graphic Log	USCS	Description	Sample	Soil Sample	Measured Recovery (feet)	Headspace PID (units)	Depth (feet)
		SC	CLAYEY SAND TRACE COBBLES ; SC; brown; dry; no odor; no staining					
5							0.0	5
		SP	SAND ; SP; brown; fine-grained; dry; no odor; no staining		SB11-6'		0.0	
10							0.0	10
		SP	SAND WITH GRAVEL ; SP; gray; fine to coarse-grained; wet				0.3	15
15							0.1	
		ML	CLAY ; ML; dark gray; wet; strong cementation				0.0	
20			Borehole terminated at 20 feet.					20


PROJECT: <b>Chevron-Rangely</b>		WELL / PROBEHOLE / BOREHOLE NO:	
LOCATION: <b>CS-47</b>		PAGE 1 OF 1 <b>SB-12</b>	
PROJECT NUMBER: <b>182603866</b>			
DRILLING: STARTED: <b>10/28/17</b>	COMPLETED: <b>11/6/17</b>	NORTHING (ft): <b>1294740.492</b>	EASTING (ft): <b>2073695.974</b>
INSTALLATION: STARTED: <b>NA</b>	COMPLETED: <b>NA</b>	GROUND ELEV (ft): <b>5202.612</b>	TOC ELEV (ft): <b>NA</b>
DRILLING COMPANY: <b>Stantec/Cascade</b>		INITIAL DTW (ft): <b>10.5</b>	BOREHOLE DEPTH (ft): <b>19</b>
DRILLING EQUIPMENT: <b>Hand Auger/Geoprobe 7822DT</b>		STATIC DTW (ft): <b>Not Encountered</b>	WELL DEPTH (ft): <b>NA</b>
DRILLING METHOD: <b>Hand Auger/Direct Push Rig</b>		WELL CASING DIA. (in): <b>---</b>	BOREHOLE DIA.(in): <b>2.25</b>
SAMPLING EQUIPMENT: <b>Hand Auger/Macro-Core</b>		LOGGED BY: <b>BL/MS</b>	CHECKED BY: <b>CAB</b>

Depth (feet)	Graphic Log	USCS	Description	Sample	Soil Sample	Measured Recovery (feet)	Headspace PID (units)	Depth (feet)
		SP	<b>SAND</b> ; SP; brown; fine-grained; dry; no odor; no staining					
		SC	<b>CLAYEY SAND</b> ; SC; dark brown; dry; hydrocarbon odor; hydrocarbon staining		SB12-2'		93.5	
		SC	<b>CLAYEY SAND</b> ; SC; brown / tan; no odor; no staining		SB12-4'		6.1	
5		SP	<b>SAND</b> ; SP; tan; fine-grained; loose; dry; no odor; no staining				1.2	5
							13	
10		SW	<b>SAND WITH GRAVEL</b> ; SW; gray; fine to coarse-grained; no odor; no staining				0.8	10
							1.7	
15							3.2	15
		ML	<b>SILT</b> ; ML; dark gray; cemented				1.7	


Refusal at 19 feet. Borehole terminated at 19 feet.

PROJECT: <b>Chevron-Rangely</b>		WELL / PROBEHOLE / BOREHOLE NO:	
LOCATION: <b>CS-47</b>		PAGE 1 OF 1 <b>SB-13</b>	
PROJECT NUMBER: <b>182603866</b>			
DRILLING: STARTED: <b>10/28/17</b>	COMPLETED: <b>11/6/17</b>	NORTHING (ft): <b>1294718.346</b>	EASTING (ft): <b>2073707.19</b>
INSTALLATION: STARTED: <b>NA</b>	COMPLETED: <b>NA</b>	GROUND ELEV (ft): <b>5202.361</b>	TOC ELEV (ft): <b>NA</b>
DRILLING COMPANY: <b>Stantec/Cascade</b>		INITIAL DTW (ft): <b>9.5</b>	BOREHOLE DEPTH (ft): <b>20</b>
DRILLING EQUIPMENT: <b>Hand Auger/Geoprobe 7822DT</b>		STATIC DTW (ft): <b>Not Encountered</b>	WELL DEPTH (ft): <b>NA</b>
DRILLING METHOD: <b>Hand Auger/Direct Push Rig</b>		WELL CASING DIA. (in): <b>---</b>	BOREHOLE DIA.(in): <b>2.25</b>
SAMPLING EQUIPMENT: <b>Hand Auger/Macro-Core</b>		LOGGED BY: <b>BL/MS</b>	CHECKED BY: <b>CAB</b>

Depth (feet)	Graphic Log	USCS	Description	Sample	Soil Sample	Measured Recovery (feet)	Headspace PID (units)	Depth (feet)
		SC	CLAYEY SAND ; SC; brown; dry; no odor; no staining				0.0	
			@ 4' moist				0.4	
5		SP	SAND ; SP; brown; fine-grained; no odor; no staining		SB13-6'		13	5
			@ 7' moist to wet on 11/6/17				10	
			@ 8-10' fine grains increase				1.4	10
10							5.7	
			@ 15' light grey; wet; some staining				1.4	15
15			@17.5-20' dominant black staining				1.3	
20			Borehole terminated at 20 feet.					20


PROJECT: <b>Chevron-Rangely</b>		WELL / PROBEHOLE / BOREHOLE NO:	
LOCATION: <b>CS-47</b>		PAGE 1 OF 1 <b>SB-14</b>	
PROJECT NUMBER: <b>182603866</b>			
DRILLING: STARTED: <b>10/28/17</b>	COMPLETED: <b>11/6/17</b>	NORTHING (ft): <b>1294703.126</b>	EASTING (ft): <b>2073694.205</b>
INSTALLATION: STARTED: <b>NA</b>	COMPLETED: <b>NA</b>	GROUND ELEV (ft): <b>5203.167</b>	TOC ELEV (ft): <b>NA</b>
DRILLING COMPANY: <b>Stantec/Cascade</b>		INITIAL DTW (ft): <b>9.5</b>	BOREHOLE DEPTH (ft): <b>20</b>
DRILLING EQUIPMENT: <b>Hand Auger/Geoprobe 7822DT</b>		STATIC DTW (ft): <b>Not Encountered</b>	WELL DEPTH (ft): <b>NA</b>
DRILLING METHOD: <b>Hand Auger/Direct Push Rig</b>		WELL CASING DIA. (in): <b>---</b>	BOREHOLE DIA.(in): <b>2.25</b>
SAMPLING EQUIPMENT: <b>Hand Auger/Macro-Core</b>		LOGGED BY: <b>BL/MS</b>	CHECKED BY: <b>CAB</b>





Depth (feet)	Graphic Log	USCS	Description	Sample	Soil Sample	Measured Recovery (feet)	Headspace PID (units)	Depth (feet)
		SM	<b>SILTY SAND</b> ; SM; brown; loose; dry; no odor; no staining					
							0.0	
							0.5	
5			@ 4' fine grained; dense				12	5
					SB14-6'			
		SC	<b>CLAYEY SAND</b> ; SC; brown; medium plasticity				0.6	
							3.2	10
10		SW	<b>SAND WITH GRAVEL</b> ; SW; brown; fine to coarse-grained; wet; hydrocarbon odor; black staining					
							8.1	
							3.9	15
15								
			@ 17' no odor				1.7	
20			Borehole terminated at 20 feet.					20


PROJECT: <b>Chevron-Rangely</b>		WELL / PROBEHOLE / BOREHOLE NO:	
LOCATION: <b>CS-47</b>		PAGE 1 OF 1 <b>SB-15</b>	
PROJECT NUMBER: <b>182603866</b>			
DRILLING: STARTED: <b>10/28/17</b>	COMPLETED: <b>11/6/17</b>	NORTHING (ft): <b>1294742.943</b>	EASTING (ft): <b>2073636.661</b>
INSTALLATION: STARTED: <b>NA</b>	COMPLETED: <b>NA</b>	GROUND ELEV (ft): <b>5204.411</b>	TOC ELEV (ft): <b>NA</b>
DRILLING COMPANY: <b>Stantec/Cascade</b>		INITIAL DTW (ft): <b>11.5</b>	BOREHOLE DEPTH (ft): <b>20</b>
DRILLING EQUIPMENT: <b>Hand Auger/Geoprobe 7822DT</b>		STATIC DTW (ft): <b>Not Encountered</b>	WELL DEPTH (ft): <b>NA</b>
DRILLING METHOD: <b>Hand Auger/Direct Push Rig</b>		WELL CASING DIA. (in): <b>---</b>	BOREHOLE DIA.(in): <b>2.25</b>
SAMPLING EQUIPMENT: <b>Hand Auger/Macro-Core</b>		LOGGED BY: <b>BL/MS</b>	CHECKED BY: <b>CAB</b>

Depth (feet)	Graphic Log	USCS	Description	Sample	Soil Sample	Measured Recovery (feet)	Headspace PID (units)	Depth (feet)
		SM	<b>SILTY SAND</b> ; SM; brown; loose; dry; no odor; no staining					
					SB15-2'		2.2	
5		SM	<b>SILTY SAND</b> ; SM; dark brown; dry; slight odor; no staining				144	5
		SP	<b>FINE SAND</b> ; SP; light brown; no odor; no staining		SB15-6' -DUP01		50.9	
10							341	
							0.3	10
		SW	<b>FINE SAND WITH GRAVEL</b> ; SW; light brown; fine to coarse-grained; wet				1.5	
15		SP	<b>SAND WITH GRAVEL</b> ; SP; gray; coarse-grained; wet					15
							1.2	
20			Borehole terminated at 20 feet.					20




PROJECT: <b>Chevron-Rangely</b>		WELL / PROBEHOLE / BOREHOLE NO:	
LOCATION: <b>CS-47</b>		PAGE 1 OF 1 <b>SB-16</b>	
PROJECT NUMBER: <b>182603866</b>			
DRILLING: STARTED: <b>10/28/17</b>	COMPLETED: <b>11/6/17</b>	NORTHING (ft): <b>1294729.97</b>	EASTING (ft): <b>2073634.497</b>
INSTALLATION: STARTED: <b>NA</b>	COMPLETED: <b>NA</b>	GROUND ELEV (ft): <b>5203.981</b>	TOC ELEV (ft): <b>NA</b>
DRILLING COMPANY: <b>Stantec/Cascade</b>		INITIAL DTW (ft): <b>12</b>	BOREHOLE DEPTH (ft): <b>20</b>
DRILLING EQUIPMENT: <b>Hand Auger/Geoprobe 7822DT</b>		STATIC DTW (ft): <b>Not Encountered</b>	WELL DEPTH (ft): <b>NA</b>
DRILLING METHOD: <b>Hand Auger/Direct Push Rig</b>		WELL CASING DIA. (in): <b>---</b>	BOREHOLE DIA.(in): <b>2.25</b>
SAMPLING EQUIPMENT: <b>Hand Auger/Macro-Core</b>		LOGGED BY: <b>BL/MS</b>	CHECKED BY: <b>CAB</b>


Depth (feet)	Graphic Log	USCS	Description	Sample	Soil Sample	Measured Recovery (feet)	Headspace PID (units)	Depth (feet)
5		SM	<b>SILTY SAND</b> ; SM; brown; dry; no odor; no staining					
					SB16-4'		11.1	
							11.3	
10		CL	<b>SANDY CLAY</b> ; CL; brown; moist; strong odor; hydrocarbon staining					
			@ 7.5 black granular material				62.1	
					SB16-8'		355	
15		SP	<b>SAND</b> ; SP; fine-grained; strong odor; black staining					
							176	
							17	
20		SP	<b>SAND WITH GRAVEL</b> ; SP; brown / gray; fine to coarse-grained; wet; slight odor; no staining					
			@ 15' no odor				2.6	
							2.8	
20			Borehole terminated at 20 feet.					20

PROJECT: <b>Chevron-Rangely</b>		WELL / PROBEHOLE / BOREHOLE NO:	
LOCATION: <b>CS-47</b>		PAGE 1 OF 1 <b>SB-17</b>	
PROJECT NUMBER: <b>182603866</b>			
DRILLING: STARTED: <b>11/6/17</b>	COMPLETED: <b>11/7/17</b>	NORTHING (ft): <b>1294706.198</b>	EASTING (ft): <b>2073635.529</b>
INSTALLATION: STARTED: <b>NA</b>	COMPLETED: <b>NA</b>	GROUND ELEV (ft):	TOC ELEV (ft): <b>NA</b>
DRILLING COMPANY: <b>Stantec/Cascade</b>		INITIAL DTW (ft): <b>10.5</b>	BOREHOLE DEPTH (ft): <b>20</b>
DRILLING EQUIPMENT: <b>Hand Auger/Geoprobe 7822DT</b>		STATIC DTW (ft): <b>Not Encountered</b>	WELL DEPTH (ft): <b>NA</b>
DRILLING METHOD: <b>Hand Auger/Direct Push Rig</b>		WELL CASING DIA. (in): ---	BOREHOLE DIA.(in): <b>2.25</b>
SAMPLING EQUIPMENT: <b>Hand Auger/Macro-Core</b>		LOGGED BY: <b>BL/MS</b>	CHECKED BY: <b>CAB</b>


Depth (feet)	Graphic Log	USCS	Description	Sample	Soil Sample	Measured Recovery (feet)	Headspace PID (units)	Depth (feet)
		SP-SM	FINE SAND WITH SILT ; SP-SM				0.0	
							0.0	
5		CL	SILTY CLAY WITH FINE SAND ; CL; black staining				156.2	5
		SP-SM	SAND WITH SILT ; SP-SM; brown; fine-grained		SB17-6' -DUP02		20.1	
10			@ 10-12' slight black staining				2.1	10
							1.8	
		SW	SAND WITH GRAVEL ; SW; fine to coarse-grained				2.2	
15							5.0	15
							1.4	
20			Borehole terminated at 20 feet.					20

PROJECT: <b>Chevron-Rangely</b>		WELL / PROBEHOLE / BOREHOLE NO:	
LOCATION: <b>CS-47</b>		PAGE 1 OF 1 <b>SB-18</b>	
PROJECT NUMBER: <b>182603866</b>			
DRILLING: STARTED: <b>11/6/17</b>	COMPLETED: <b>11/6/17</b>	NORTHING (ft): <b>1294729.646</b>	EASTING (ft): <b>2073616.844</b>
INSTALLATION: STARTED: <b>NA</b>	COMPLETED: <b>NA</b>	GROUND ELEV (ft):	TOC ELEV (ft): <b>NA</b>
DRILLING COMPANY: <b>Stantec/Cascade</b>		INITIAL DTW (ft): <b>Not Encountered</b>	BOREHOLE DEPTH (ft): <b>20</b>
DRILLING EQUIPMENT: <b>Hand Auger/Geoprobe 7822DT</b>		STATIC DTW (ft): <b>Not Encountered</b>	WELL DEPTH (ft): <b>NA</b>
DRILLING METHOD: <b>Hand Auger/Direct Push Rig</b>		WELL CASING DIA. (in): ---	BOREHOLE DIA.(in): <b>2.25</b>
SAMPLING EQUIPMENT: <b>Hand Auger/Macro-Core</b>		LOGGED BY: <b>BL/MS</b>	CHECKED BY: <b>CAB</b>


Depth (feet)	Graphic Log	USCS	Description	Sample	Soil Sample	Measured Recovery (feet)	Headspace PID (units)	Depth (feet)
		ML	SILT WITH SOME SAND ; ML; brown				0.0	
5							0.0	5
		ML	SANDY SILT ; ML; brown to light gray				0.0	
		SW	FINE TO COARSE SAND WITH GRAVEL ; SW; brown		SB18-8'		0.0	
10							0.8	10
		SP	SAND WITH SOME GRAVEL ; SP; gray; coarse-grained				0.0	
15								15
20			Borehole terminated at 20 feet.					20

PROJECT: <b>Chevron-Rangely</b>		WELL / PROBEHOLE / BOREHOLE NO:	
LOCATION: <b>CS-47</b>		PAGE 1 OF 1 <b>SB-19</b>	
PROJECT NUMBER: <b>182603866</b>			
DRILLING: STARTED: <b>11/6/17</b>	COMPLETED: <b>11/6/17</b>	NORTHING (ft): <b>1294718.035</b>	EASTING (ft): <b>2073603.339</b>
INSTALLATION: STARTED: <b>NA</b>	COMPLETED: <b>NA</b>	GROUND ELEV (ft):	TOC ELEV (ft): <b>NA</b>
DRILLING COMPANY: <b>Stantec/Cascade</b>		INITIAL DTW (ft): <b>Not Encountered</b>	BOREHOLE DEPTH (ft): <b>20</b>
DRILLING EQUIPMENT: <b>Hand Auger/Geoprobe 7822DT</b>		STATIC DTW (ft): <b>Not Encountered</b>	WELL DEPTH (ft): <b>NA</b>
DRILLING METHOD: <b>Hand Auger/Direct Push Rig</b>		WELL CASING DIA. (in): ---	BOREHOLE DIA.(in): <b>2.25</b>
SAMPLING EQUIPMENT: <b>Hand Auger/Macro-Core</b>		LOGGED BY: <b>BL/MS</b>	CHECKED BY: <b>CAB</b>

Depth (feet)	Graphic Log	USCS	Description	Sample	Soil Sample	Measured Recovery (feet)	Headspace PID (units)	Depth (feet)
		ML	SILT WITH SOME SAND ; ML; brown				0.0	
		ML	SANDY SILT ; ML				0.0	
5							0.0	5
		SP-SM	FINE SAND WITH TRACE SILT ; SP-SM				1.8	
10							0.1	10
							0.3	
		SW	FINE TO COARSE SAND AND GRAVEL ; SW; gray		SB19-13'		0.2	
15		SW	FINE TO MEDIUM SAND AND GRAVEL ; SW; brown				0.0	15
		SW	FINE TO COARSE SAND AND GRAVEL ; SW; gray					
							0.1	
20			Borehole terminated at 20 feet.					20

PROJECT: <b>Chevron-Rangely</b>		WELL / PROBEHOLE / BOREHOLE NO:	
LOCATION: <b>CS-47</b>		PAGE 1 OF 1 <b>SB-20</b>	
PROJECT NUMBER: <b>182603866</b>			
DRILLING: STARTED: <b>11/6/17</b>	COMPLETED: <b>11/6/17</b>	NORTHING (ft): <b>1294706.076</b>	EASTING (ft): <b>2073618.338</b>
INSTALLATION: STARTED: <b>NA</b>	COMPLETED: <b>NA</b>	GROUND ELEV (ft):	TOC ELEV (ft): <b>NA</b>
DRILLING COMPANY: <b>Stantec/Cascade</b>		INITIAL DTW (ft): <b>13</b>	BOREHOLE DEPTH (ft): <b>20</b>
DRILLING EQUIPMENT: <b>Hand Auger/Geoprobe 7822DT</b>		STATIC DTW (ft): <b>Not Encountered</b>	WELL DEPTH (ft): <b>NA</b>
DRILLING METHOD: <b>Hand Auger/Direct Push Rig</b>		WELL CASING DIA. (in): ---	BOREHOLE DIA.(in): <b>2.25</b>
SAMPLING EQUIPMENT: <b>Hand Auger/Macro-Core</b>		LOGGED BY: <b>BL/MS</b>	CHECKED BY: <b>CAB</b>

Depth (feet)	Graphic Log	USCS	Description	Sample	Soil Sample	Measured Recovery (feet)	Headspace PID (units)	Depth (feet)
		ML	SILT WITH SOME SAND ; ML				0.0	
5		ML	SANDY SILT ; ML				0.0	5
		SW	SAND ; SW; coarse-grained				0.0	
10		SW	SANDY GRAVEL SUBGRADE ; SW; brown; fine to coarse-grained				0.0	10
		CL	LEAN CLAY ; CL; brown				3.2	
15			No Recovery		SB20-13'		3.4	15
		SC	CLAYEY SAND AND GRAVEL ; SC; gray; wet				2.9	
20			Borehole terminated at 20 feet.					20

PROJECT: <b>Chevron-Rangely</b>		WELL / PROBEHOLE / BOREHOLE NO:	
LOCATION: <b>CS-47</b>		PAGE 1 OF 1 <b>SB-21</b>	
PROJECT NUMBER: <b>182603866</b>			
DRILLING: STARTED: <b>11/6/17</b>	COMPLETED: <b>11/7/17</b>	NORTHING (ft): <b>1294753.989</b>	EASTING (ft): <b>2073635.507</b>
INSTALLATION: STARTED: <b>NA</b>	COMPLETED: <b>NA</b>	GROUND ELEV (ft): <b>5204.042</b>	TOC ELEV (ft): <b>NA</b>
DRILLING COMPANY: <b>Stantec/Cascade</b>		INITIAL DTW (ft): <b>Not Encountered</b>	BOREHOLE DEPTH (ft): <b>20</b>
DRILLING EQUIPMENT: <b>Hand Auger/Geoprobe 7822DT</b>		STATIC DTW (ft): <b>Not Encountered</b>	WELL DEPTH (ft): <b>NA</b>
DRILLING METHOD: <b>Hand Auger/Direct Push Rig</b>		WELL CASING DIA. (in): <b>---</b>	BOREHOLE DIA.(in): <b>2.25</b>
SAMPLING EQUIPMENT: <b>Hand Auger/Macro-Core</b>		LOGGED BY: <b>BL/MS</b>	CHECKED BY: <b>CAB</b>

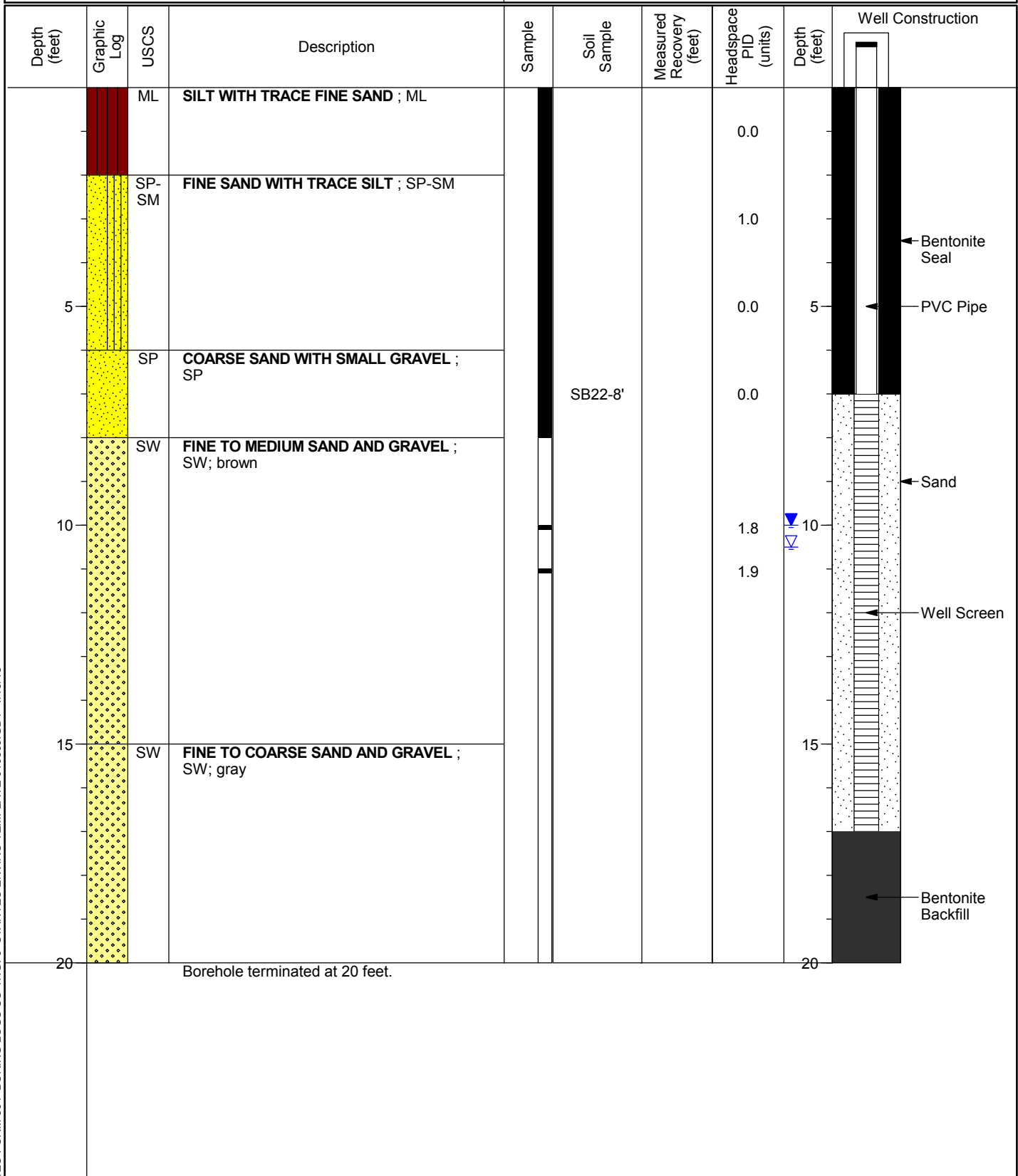
Depth (feet)	Graphic Log	USCS	Description	Sample	Soil Sample	Measured Recovery (feet)	Headspace PID (units)	Depth (feet)
		ML	SILT WITH SOME SAND ; ML; fine-grained				0.0	
		ML	SANDY SILT ; ML; brown				0.0	
5							0.0	5
							0.0	
		SP-SM	FINE SAND WITH SILT ; SP-SM; brown				1.4	10
10					SB21-11'			
		SW	FINE TO COARSE SAND WITH GRAVEL ; SW; brown				1.6	
15							1.1	15
20			Borehole terminated at 20 feet.					20


PROJECT: **Chevron-Rangely**LOCATION: **CS-47**PROJECT NUMBER: **182603866**

WELL / PROBEHOLE / BOREHOLE NO:



PAGE 1 OF 1

**SB-22/MW-6**DRILLING: STARTED: **11/6/17** COMPLETED: **11/6/17**INSTALLATION: STARTED: **11/6/17** COMPLETED: **11/6/17**DRILLING COMPANY: **Stantec/Cascade**DRILLING EQUIPMENT: **Hand Auger/Geoprobe 7822DT**DRILLING METHOD: **Hand Auger/Direct Push Rig**SAMPLING EQUIPMENT: **Hand Auger/Macro-Core**NORTHING (ft): **1294720.203**EASTING (ft): **2073592.223**GROUND ELEV (ft): **5202.962**TOC ELEV (ft): **NA**INITIAL DTW (ft): **10.5**BOREHOLE DEPTH (ft): **20**STATIC DTW (ft): **10**WELL DEPTH (ft): **17**WELL CASING DIA. (in): **2**BOREHOLE DIA.(in): **2.25**LOGGED BY: **BL/MS**CHECKED BY: **CAB**

PROJECT: <b>Chevron-Rangely</b>		WELL / PROBEHOLE / BOREHOLE NO:	
LOCATION: <b>CS-47</b>		PAGE 1 OF 1 <b>SB-23</b>	
PROJECT NUMBER: <b>182603866</b>			
DRILLING: STARTED: <b>11/6/17</b>	COMPLETED: <b>11/8/17</b>	NORTHING (ft): <b>1294694.957</b>	EASTING (ft): <b>2073633.472</b>
INSTALLATION: STARTED: <b>NA</b>	COMPLETED: <b>NA</b>	GROUND ELEV (ft): <b>5203.06</b>	TOC ELEV (ft): <b>NA</b>
DRILLING COMPANY: <b>Stantec</b>		INITIAL DTW (ft): <b>Not Encountered</b>	BOREHOLE DEPTH (ft): <b>6</b>
DRILLING EQUIPMENT: <b>Hand Auger</b>		STATIC DTW (ft): <b>Not Encountered</b>	WELL DEPTH (ft): <b>NA</b>
DRILLING METHOD: <b>Hand Auger</b>		WELL CASING DIA. (in): <b>---</b>	BOREHOLE DIA.(in):
SAMPLING EQUIPMENT: <b>Hand Auger</b>		LOGGED BY: <b>BL/MS</b>	CHECKED BY: <b>CAB</b>

Depth (feet)	Graphic Log	USCS	Description	Sample	Soil Sample	Measured Recovery (feet)	Headspace PID (units)	Depth (feet)
		SM	<b>SILTY SAND</b> ; SM; brown				0.0	
		SM	<b>SAND AND SILT</b> ; SM; brown				0.0	
5		SM	<b>SAND WITH TRACE SILT</b> ; SM; brown with gray		SB23-6'		0.0	5

Borehole terminated at 6 feet.





## APPENDIX C

### ANALYTICAL LABORATORY REPORTS

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Denver

4955 Yarrow Street

Arvada, CO 80002

Tel: (303)736-0100

TestAmerica Job ID: 280-102984-1

Client Project/Site: Chevron Rangely, CO CS-47

Revision: 1

For:

Stantec Consulting Corp.

2000 South Colorado Blvd

Suite 2-300

Denver, Colorado 80222

Attn: Christopher Beall



Authorized for release by:

1/12/2018 12:47:59 PM

Jamie Ide, Project Manager I

(303)736-0126

[jamie.ide@testamericainc.com](mailto:jamie.ide@testamericainc.com)

### LINKS

Review your project  
results through

**TotalAccess**

Have a Question?



Visit us at:

[www.testamericainc.com](http://www.testamericainc.com)

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Definitions . . . . .	3
Case Narrative . . . . .	5
Detection Summary . . . . .	8
Method Summary . . . . .	12
Sample Summary . . . . .	13
Client Sample Results . . . . .	14
Surrogate Summary . . . . .	29
QC Sample Results . . . . .	32
QC Association . . . . .	41
Chronicle . . . . .	48
Certification Summary . . . . .	55
Chain of Custody . . . . .	57
Receipt Checklists . . . . .	60

# Definitions/Glossary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
*	ISTD response or retention time outside acceptable limits
X	Surrogate is outside control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.

### GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
X	Surrogate is outside control limits

### GC VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.
X	Surrogate is outside control limits

### GC Semi VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.
X	Surrogate is outside control limits
F1	MS and/or MSD Recovery is outside acceptance limits.
F2	MS/MSD RPD exceeds control limits

## Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

## General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)

TestAmerica Denver

## Definitions/Glossary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

### Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

**Job ID: 280-102984-1**

**Laboratory: TestAmerica Denver**

## Narrative

### CASE NARRATIVE

**Client: Stantec Consulting Corp.**  
**Project: Chevron Rangely, CO CS-47**  
**Report Number: 280-102984-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

#### **REVISION - 1/12/18**

Per client request 1/11/18, the DRO Carbon range reported was changed from C10-C36 to C10-C28. The data has been reviewed and the QC sample results revised; the associated case narrative has been revised accordingly.

#### **RECEIPT**

The samples were received on 10/30/2017 12:15 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.5°C and 0.8°C.

#### **Receipt Exceptions**

The following samples were received after the 48 hour holding time for 8260 BTEX (DI+MeOH Terracore) analysis: SB-07-4' (280-102984-1), SB-09-8' (280-102984-2), and SB-10-6' (280-102984-3). The Terracores were collected on 10/28/17 before 12:00, but were received on 10/30/17 at 12:15; therefore, the samples were not placed in a freezer within 48 hours of collection. The client was notified on 10/31/17.

#### **VOLATILE ORGANIC COMPOUNDS (GC-MS)**

Internal standard (ISTD) responses were outside of acceptance limits for the following sample: SB-09-8' (280-102984-2). The sample shows evidence of matrix interference. In order to protect the VOA instrumentation, this sample will not be re-analyzed, and the data will be qualified and reported.

Internal standard (ISTD) TBA-d9 response for sample SB-11-6' (280-102984-4) was outside acceptance criteria. This ISTD does not correspond to any of the requested target compounds; therefore, the data have been reported.

Internal standard (ISTD) 1,4-Dichlorobenzene-d4 responses for the following samples were outside control limits: SB-15-6' (280-102984-10) and DUP-01 (280-102984-13). The samples were re-analyzed with concurring results, and the original set of data has been reported

4-Bromofluorobenzene (Surr) failed the surrogate recovery criteria high for SB-12-4' (280-102984-6). This sample did not contain any target analytes associated with this surrogate; therefore, re-extraction and/or re-analysis was not performed.

4-Bromofluorobenzene (Surr) and Toluene-d8 (Surr) failed the surrogate recovery criteria high for SB-15-6' (280-102984-10). Evidence of matrix interference due to non-target analytes is present; therefore, re-extraction and/or re-analysis was not performed.

4-Bromofluorobenzene (Surr) and Toluene-d8 (Surr) failed the surrogate recovery criteria high for DUP-01 (280-102984-13). Evidence of matrix interference due to non-target analytes is present; therefore, re-extraction and/or re-analysis was not performed.

Sample SB-16-8' (280-102984-12)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

## Case Narrative

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

### Job ID: 280-102984-1 (Continued)

#### Laboratory: TestAmerica Denver (Continued)

##### SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM)

The following sample could not be thoroughly homogenized before sub-sampling was performed due to sample matrix: SB-12-2' (280-102984-5).

Due to the matrix, the following samples could not be concentrated to the final method required volume: SB-12-2' (280-102984-5), SB-16-8' (280-102984-12) and DUP-01 (280-102984-13). The extracts were concentrated to 2 mL or 10 mL final volume rather than the SOP specified volume of 1 mL. The extracts were dark and viscous. The reporting limits (RLs) are elevated proportionately.

Sample SB-09-8' (280-102984-2)[20X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Terphenyl-d14 failed the surrogate recovery criteria low for SB-09-8' (280-102984-2). Nitrobenzene-d5 failed the surrogate recovery criteria high. The sample was analyzed at a dilution where surrogate recoveries could not be accurately calculated.

2-Fluorobiphenyl and Nitrobenzene-d5 failed the surrogate recovery criteria low for SB-12-2' (280-102984-5). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

A continuing calibration verification (CCV) associated with batch 280-396137 recovered above the upper control limit for the following compounds: Benzo[a]pyrene, Benzo[g,h,i]perylene, Dibenzo(a,h)anthracene, and Indeno[1,2,3-cd]pyrene. The sample associated with this CCV was non-detect for the affected analytes; therefore, the data have been reported. The following samples were impacted: SB-09-8' (280-102984-2) and (CCV 280-396137/2).

A continuing calibration verification (CCV) associated with batch 280-395962 recovered above the upper control limit for the following compounds: Benzo[a]pyrene, Dibenzo(a,h)anthracene, and Indeno[1,2,3-cd]pyrene. The samples associated with this CCV were non-detect for the affected analytes; therefore, the data have been reported. The following samples were impacted: SB-12-2' (280-102984-5), SB-15-2' (280-102984-9) and (CCV 280-395962/2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

##### GASOLINE RANGE ORGANICS (GRO)

GRO (C6-C10) was detected in method blank MB 280-394139/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

GRO (C6-C10) was detected in method blank MB 280-394265/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Samples SB-09-8' (280-102984-2)[20X] and SB-16-8' (280-102984-12)[5X] required dilution prior to analysis. Because of this dilution, the surrogate spike and concentration in the sample was reduced to a level where the recovery calculation does not provide useful information. The reporting limits have been adjusted accordingly.

a,a,a-Trifluorotoluene failed the surrogate recovery criteria high for SB-09-8' (280-102984-2) and SB-16-8' (280-102984-12). The samples were analyzed at a dilution where surrogate recoveries could not be accurately calculated.

a,a,a-Trifluorotoluene failed the surrogate recovery criteria low for SB-12-4' (280-102984-6). Evidence of matrix interference is present due to abundance of target analytes and their interaction/co-elution with surrogate; therefore, re-extraction and/or re-analysis was not performed. Additionally, the sample was analyzed at dilution.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

##### DIESEL RANGE ORGANICS

Diesel Range Organics [C10-C28] was detected in method blank MB 280-394261/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.



# Case Narrative

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Job ID: 280-102984-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

o-Terphenyl (Surr) failed the surrogate recovery criteria high for the following samples: SB-10-6'MS (280-102984-3MS), SB-11-6' (280-102984-4), SB-12-2' (280-102984-5), SB-16-8' (280-102984-12), DUP-01 (280-102984-13). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Diesel Range Organics [C10-C28] failed the recovery criteria high for the MS and MSD of sample SB-10-6' (280-102984-3) in batch 280-395812.. Diesel Range Organics [C10-C28] exceeded the RPD limit. Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Samples SB-09-8' (280-102984-2)[20X], SB-10-6' (280-102984-3)[20X], SB-11-6' (280-102984-4)[20X], SB-12-2' (280-102984-5)[20X], SB-12-4' (280-102984-6)[20X], SB-13-6' (280-102984-7)[20X], SB-15-2' (280-102984-9)[20X], SB-15-6' (280-102984-10)[20X], SB-16-8' (280-102984-12)[20X] and DUP-01 (280-102984-13)[20X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### SODIUM ABSORPTION RATIO

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### TOTAL METALS (ICP)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### METALS (ICPMS)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### TOTAL MERCURY (CVAA)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### ELECTRICAL CONDUCTIVITY

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### HEXAVALENT CHROMIUM

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### TRIVALENT CHROMIUM

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### CORROSIVITY (PH)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### PERCENT SOLIDS

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Detection Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Client Sample ID: SB-07-4'

## Lab Sample ID: 280-102984-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (C6-C10)	0.62	J B	1.5	0.40	mg/Kg	1	☼	8015C	Total/NA
Diesel Range Organics [C10-C28]	3.4	J B	4.7	0.80	mg/Kg	1	☼	8015C	Total/NA

## Client Sample ID: SB-09-8'

## Lab Sample ID: 280-102984-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	0.24	J *	0.28	0.038	mg/Kg	1	☼	8260B	Total/NA
m-Xylene & p-Xylene	1.1	*	0.28	0.088	mg/Kg	1	☼	8260B	Total/NA
o-Xylene	0.27	*	0.14	0.040	mg/Kg	1	☼	8260B	Total/NA
Xylenes, Total	1.4		0.28	0.040	mg/Kg	1	☼	8260B	Total/NA
Benzo[a]anthracene	0.058	J	0.13	0.023	mg/Kg	20	☼	8270D SIM	Total/NA
Fluorene	0.12	J	0.13	0.012	mg/Kg	20	☼	8270D SIM	Total/NA
1-Methylnaphthalene	1.2		0.13	0.0068	mg/Kg	20	☼	8270D SIM	Total/NA
2-Methylnaphthalene	1.1		0.13	0.0081	mg/Kg	20	☼	8270D SIM	Total/NA
Naphthalene	1.1		0.13	0.0085	mg/Kg	20	☼	8270D SIM	Total/NA
Phenanthrene	0.22		0.13	0.029	mg/Kg	20	☼	8270D SIM	Total/NA
Pyrene	0.042	J	0.13	0.029	mg/Kg	20	☼	8270D SIM	Total/NA
GRO (C6-C10)	470	B	50	14	mg/Kg	20	☼	8015C	Total/NA
Diesel Range Organics [C10-C28]	2200	B	110	18	mg/Kg	20	☼	8015C	Total/NA
Sodium Adsorption Ratio	85		1.2	1.2	No Unit	10		20B	Soluble
Barium	96		1.2	0.12	mg/Kg	1	☼	6010C	Total/NA
Boron	28		12	1.2	mg/Kg	1	☼	6010C	Total/NA
Cadmium	0.33	J	0.59	0.048	mg/Kg	1	☼	6010C	Total/NA
Chromium	9.3		1.8	0.068	mg/Kg	1	☼	6010C	Total/NA
Copper	27		2.4	0.26	mg/Kg	1	☼	6010C	Total/NA
Lead	10		1.1	0.37	mg/Kg	1	☼	6010C	Total/NA
Nickel	15		4.7	0.16	mg/Kg	1	☼	6010C	Total/NA
Zinc	35		3.5	0.47	mg/Kg	1	☼	6010C	Total/NA
Arsenic	4.1		0.79	0.067	mg/Kg	1	☼	6020A	Total/NA
Mercury	0.058		0.024	0.0077	mg/Kg	1	☼	7471B	Total/NA
Chromium (hexavalent)	4.8	J	6.6	2.6	mg/Kg	1	☼	7196A	Total/NA
Chromium, trivalent	4.5		2.0	2.0	mg/Kg	1		7196A	Total/NA
Cr	9.3		2.0	2.0	mg/Kg	1		7196A	Total/NA
Cr (VI)	4.8		1.4	1.4	mg/Kg	1		7196A	Total/NA
Specific Conductance	12000		10	10	umhos/cm	1		29B_EC	Soluble
Saturation Percentage	1.0		0.10	0.10	%	1		29B_EC	Soluble
Electrical Conductivity at Saturation	12000		10	10	umhos/cm	1		29B_EC	Soluble
pH adj. to 25 deg C	8.4	HF	0.1	0.1	SU	1		9045D	Soluble
Temperature	20.0	HF	1.0	1.0	Degrees C	1		9045D	Soluble

## Client Sample ID: SB-10-6'

## Lab Sample ID: 280-102984-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diesel Range Organics [C10-C28]	61	J F1 F2 B	91	15	mg/Kg	20	☼	8015C	Total/NA

## Client Sample ID: SB-11-6'

## Lab Sample ID: 280-102984-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diesel Range Organics [C10-C28]	120	B	94	16	mg/Kg	20	☼	8015C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

# Detection Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Client Sample ID: SB-12-2'

## Lab Sample ID: 280-102984-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzo[a]anthracene	0.35		0.054	0.0097	mg/Kg	1	☼	8270D SIM	Total/NA
GRO (C6-C10)	1.4	B	1.3	0.36	mg/Kg	1	☼	8015C	Total/NA
Diesel Range Organics [C10-C28]	24000	B	870	150	mg/Kg	20	☼	8015C	Total/NA
Sodium Adsorption Ratio	32		1.2	1.2	No Unit	10		20B	Soluble
Barium	110		0.98	0.10	mg/Kg	1	☼	6010C	Total/NA
Boron	13		9.8	0.96	mg/Kg	1	☼	6010C	Total/NA
Cadmium	0.29	J	0.49	0.040	mg/Kg	1	☼	6010C	Total/NA
Chromium	9.3		1.5	0.057	mg/Kg	1	☼	6010C	Total/NA
Copper	53		2.0	0.21	mg/Kg	1	☼	6010C	Total/NA
Lead	11		0.88	0.30	mg/Kg	1	☼	6010C	Total/NA
Nickel	29		3.9	0.13	mg/Kg	1	☼	6010C	Total/NA
Zinc	77		2.9	0.39	mg/Kg	1	☼	6010C	Total/NA
Arsenic	4.5		0.58	0.049	mg/Kg	1	☼	6020A	Total/NA
Mercury	0.028		0.021	0.0067	mg/Kg	1	☼	7471B	Total/NA
Chromium (hexavalent)	4.9	J	5.5	2.2	mg/Kg	1	☼	7196A	Total/NA
Chromium, trivalent	4.4		2.0	2.0	mg/Kg	1		7196A	Total/NA
Cr	9.3		2.0	2.0	mg/Kg	1		7196A	Total/NA
Cr (VI)	4.9		1.4	1.4	mg/Kg	1		7196A	Total/NA
Specific Conductance	2800		10	10	umhos/cm	1		29B_EC	Soluble
Saturation Percentage	1.0		0.10	0.10	%	1		29B_EC	Soluble
Electrical Conductivity at Saturation	2800		10	10	umhos/cm	1		29B_EC	Soluble
pH adj. to 25 deg C	8.5	HF	0.1	0.1	SU	1		9045D	Soluble
Temperature	19.9	HF	1.0	1.0	Degrees C	1		9045D	Soluble

## Client Sample ID: SB-12-4'

## Lab Sample ID: 280-102984-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (C6-C10)	7.8	B	1.5	0.40	mg/Kg	1	☼	8015C	Total/NA
Diesel Range Organics [C10-C28]	180	B	92	16	mg/Kg	20	☼	8015C	Total/NA

## Client Sample ID: SB-13-6'

## Lab Sample ID: 280-102984-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diesel Range Organics [C10-C28]	110	B	98	17	mg/Kg	20	☼	8015C	Total/NA

## Client Sample ID: SB-14-6'

## Lab Sample ID: 280-102984-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (C6-C10)	0.38	J B	1.3	0.36	mg/Kg	1	☼	8015C	Total/NA
Diesel Range Organics [C10-C28]	5.5	B	4.8	0.82	mg/Kg	1	☼	8015C	Total/NA

## Client Sample ID: SB-15-2'

## Lab Sample ID: 280-102984-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1-Methylnaphthalene	0.00045	J	0.0057	0.00029	mg/Kg	1	☼	8270D SIM	Total/NA
2-Methylnaphthalene	0.00047	J	0.0057	0.00035	mg/Kg	1	☼	8270D SIM	Total/NA
GRO (C6-C10)	0.52	J B	1.2	0.33	mg/Kg	1	☼	8015C	Total/NA
Diesel Range Organics [C10-C28]	280	B	91	15	mg/Kg	20	☼	8015C	Total/NA
Sodium Adsorption Ratio	9.4		1.2	1.2	No Unit	10		20B	Soluble
Barium	160		0.99	0.10	mg/Kg	1	☼	6010C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

# Detection Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Client Sample ID: SB-15-2' (Continued)

## Lab Sample ID: 280-102984-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	12		9.9	0.97	mg/Kg	1	☼	6010C	Total/NA
Cadmium	0.27	J	0.49	0.040	mg/Kg	1	☼	6010C	Total/NA
Chromium	14		1.5	0.057	mg/Kg	1	☼	6010C	Total/NA
Copper	11		2.0	0.21	mg/Kg	1	☼	6010C	Total/NA
Lead	9.3		0.89	0.31	mg/Kg	1	☼	6010C	Total/NA
Nickel	14		3.9	0.13	mg/Kg	1	☼	6010C	Total/NA
Zinc	41		3.0	0.39	mg/Kg	1	☼	6010C	Total/NA
Arsenic	5.4		0.62	0.052	mg/Kg	1	☼	6020A	Total/NA
Mercury	0.024		0.021	0.0068	mg/Kg	1	☼	7471B	Total/NA
Chromium (hexavalent)	3.9	J	5.7	2.3	mg/Kg	1	☼	7196A	Total/NA
Chromium, trivalent	9.9		2.0	2.0	mg/Kg	1		7196A	Total/NA
Cr	14		2.0	2.0	mg/Kg	1		7196A	Total/NA
Cr (VI)	3.9		1.4	1.4	mg/Kg	1		7196A	Total/NA
Specific Conductance	5500		10	10	umhos/cm	1		29B_EC	Soluble
Saturation Percentage	1.0		0.10	0.10	%	1		29B_EC	Soluble
Electrical Conductivity at Saturation	5500		10	10	umhos/cm	1		29B_EC	Soluble
pH adj. to 25 deg C	8.3	HF	0.1	0.1	SU	1		9045D	Soluble
Temperature	19.9	HF	1.0	1.0	Degrees C	1		9045D	Soluble

## Client Sample ID: SB-15-6'

## Lab Sample ID: 280-102984-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	0.0036	J	0.0054	0.00051	mg/Kg	1	☼	8260B	Total/NA
Ethylbenzene	0.0090		0.0054	0.00072	mg/Kg	1	☼	8260B	Total/NA
Toluene	0.00082	J	0.0054	0.00075	mg/Kg	1	☼	8260B	Total/NA
m-Xylene & p-Xylene	0.011		0.0027	0.0011	mg/Kg	1	☼	8260B	Total/NA
Xylenes, Total	0.011		0.0054	0.00066	mg/Kg	1	☼	8260B	Total/NA
GRO (C6-C10)	23	B	1.4	0.39	mg/Kg	1	☼	8015C	Total/NA
Diesel Range Organics [C10-C28]	7500	B	94	16	mg/Kg	20	☼	8015C	Total/NA

## Client Sample ID: SB-16-4'

## Lab Sample ID: 280-102984-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (C6-C10)	0.50	J B	1.2	0.32	mg/Kg	1	☼	8015C	Total/NA
Diesel Range Organics [C10-C28]	4.7	B	4.6	0.77	mg/Kg	1	☼	8015C	Total/NA

## Client Sample ID: SB-16-8'

## Lab Sample ID: 280-102984-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	0.35	J	2.5	0.35	mg/Kg	10	☼	8260B	Total/NA
GRO (C6-C10)	190	B	6.4	1.7	mg/Kg	5	☼	8015C	Total/NA
Diesel Range Organics [C10-C28]	10000	B	160	28	mg/Kg	20	☼	8015C	Total/NA

## Client Sample ID: DUP-01

## Lab Sample ID: 280-102984-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	0.0043	J	0.0048	0.00045	mg/Kg	1	☼	8260B	Total/NA
Ethylbenzene	0.012		0.0048	0.00064	mg/Kg	1	☼	8260B	Total/NA
Toluene	0.00075	J	0.0048	0.00066	mg/Kg	1	☼	8260B	Total/NA
m-Xylene & p-Xylene	0.014		0.0024	0.00099	mg/Kg	1	☼	8260B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

## Detection Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

**Client Sample ID: DUP-01 (Continued)**

**Lab Sample ID: 280-102984-13**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Xylenes, Total	0.014		0.0048	0.00058	mg/Kg	1	☼	8260B	Total/NA
GRO (C6-C10)	21	B	1.2	0.31	mg/Kg	1	☼	8015C	Total/NA
Diesel Range Organics [C10-C28]	10000	B	900	150	mg/Kg	20	☼	8015C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

## Method Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL DEN
8270D SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	TAL DEN
8015C	Nonhalogenated Organics using GC/FID -Modified (Gasoline Range Organics)	SW846	TAL DEN
8015C	Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)	SW846	TAL DEN
20B	Sodium Adsorption Ratio	USDA	TAL DEN
6010C	Metals (ICP)	SW846	TAL DEN
6020A	Metals (ICP/MS)	SW846	TAL DEN
7471B	Mercury (CVAA)	SW846	TAL DEN
29B_EC	Conductivity, Electrical	LA	TAL NSH
7196A	Chromium, Hexavalent	SW846	TAL NSH
7196A	Chromium, Trivalent (Colorimetric)	SW846	TAL DEN
9045D	pH	SW846	TAL DEN
Moisture	Percent Moisture	EPA	TAL DEN

### Protocol References:

EPA = US Environmental Protection Agency

LA = Statewide Order No. 29-B, State Of Louisiana

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

USDA = "USDA Agriculture Handbook 60, section 20B".

### Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

## Sample Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-102984-1	SB-07-4'	Solid	10/28/17 10:00	10/30/17 12:15
280-102984-2	SB-09-8'	Solid	10/28/17 11:30	10/30/17 12:15
280-102984-3	SB-10-6'	Solid	10/28/17 12:00	10/30/17 12:15
280-102984-4	SB-11-6'	Solid	10/28/17 12:45	10/30/17 12:15
280-102984-5	SB-12-2'	Solid	10/28/17 13:00	10/30/17 12:15
280-102984-6	SB-12-4'	Solid	10/28/17 13:15	10/30/17 12:15
280-102984-7	SB-13-6'	Solid	10/28/17 13:30	10/30/17 12:15
280-102984-8	SB-14-6'	Solid	10/28/17 13:45	10/30/17 12:15
280-102984-9	SB-15-2'	Solid	10/28/17 16:00	10/30/17 12:15
280-102984-10	SB-15-6'	Solid	10/28/17 16:15	10/30/17 12:15
280-102984-11	SB-16-4'	Solid	10/28/17 16:30	10/30/17 12:15
280-102984-12	SB-16-8'	Solid	10/28/17 17:00	10/30/17 12:15
280-102984-13	DUP-01	Solid	10/28/17 00:00	10/30/17 12:15

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

**Client Sample ID: SB-07-4'**  
**Date Collected: 10/28/17 10:00**  
**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-1**  
**Matrix: Solid**  
**Percent Solids: 83.9**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0053	0.00050	mg/Kg	☼	10/28/17 10:00	11/03/17 21:43	1
Ethylbenzene	ND		0.0053	0.00071	mg/Kg	☼	10/28/17 10:00	11/03/17 21:43	1
Toluene	ND		0.0053	0.00073	mg/Kg	☼	10/28/17 10:00	11/03/17 21:43	1
m-Xylene & p-Xylene	ND		0.0026	0.0011	mg/Kg	☼	10/28/17 10:00	11/03/17 21:43	1
o-Xylene	ND		0.0026	0.00064	mg/Kg	☼	10/28/17 10:00	11/03/17 21:43	1
Xylenes, Total	ND		0.0053	0.00064	mg/Kg	☼	10/28/17 10:00	11/03/17 21:43	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	91		58 - 140	10/28/17 10:00	11/03/17 21:43	1
Toluene-d8 (Surr)	95		80 - 126	10/28/17 10:00	11/03/17 21:43	1
4-Bromofluorobenzene (Surr)	104		76 - 127	10/28/17 10:00	11/03/17 21:43	1
Dibromofluoromethane (Surr)	101		75 - 121	10/28/17 10:00	11/03/17 21:43	1

**Client Sample ID: SB-09-8'**  
**Date Collected: 10/28/17 11:30**  
**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-2**  
**Matrix: Solid**  
**Percent Solids: 74.7**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.28	0.051	mg/Kg	☼	10/28/17 11:30	11/04/17 18:58	1
Ethylbenzene	0.24	J *	0.28	0.038	mg/Kg	☼	10/28/17 11:30	11/04/17 18:58	1
Toluene	ND		0.28	0.044	mg/Kg	☼	10/28/17 11:30	11/04/17 18:58	1
m-Xylene & p-Xylene	1.1	*	0.28	0.088	mg/Kg	☼	10/28/17 11:30	11/04/17 18:58	1
o-Xylene	0.27	*	0.14	0.040	mg/Kg	☼	10/28/17 11:30	11/04/17 18:58	1
Xylenes, Total	1.4		0.28	0.040	mg/Kg	☼	10/28/17 11:30	11/04/17 18:58	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	109		52 - 135	10/28/17 11:30	11/04/17 18:58	1
Toluene-d8 (Surr)	99		65 - 135	10/28/17 11:30	11/04/17 18:58	1
4-Bromofluorobenzene (Surr)	117		65 - 135	10/28/17 11:30	11/04/17 18:58	1
Dibromofluoromethane (Surr)	115		65 - 135	10/28/17 11:30	11/04/17 18:58	1

**Client Sample ID: SB-10-6'**  
**Date Collected: 10/28/17 12:00**  
**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-3**  
**Matrix: Solid**  
**Percent Solids: 86.9**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0052	0.00049	mg/Kg	☼	10/28/17 12:00	11/03/17 22:25	1
Ethylbenzene	ND		0.0052	0.00070	mg/Kg	☼	10/28/17 12:00	11/03/17 22:25	1
Toluene	ND		0.0052	0.00072	mg/Kg	☼	10/28/17 12:00	11/03/17 22:25	1
m-Xylene & p-Xylene	ND		0.0026	0.0011	mg/Kg	☼	10/28/17 12:00	11/03/17 22:25	1
o-Xylene	ND		0.0026	0.00063	mg/Kg	☼	10/28/17 12:00	11/03/17 22:25	1
Xylenes, Total	ND		0.0052	0.00063	mg/Kg	☼	10/28/17 12:00	11/03/17 22:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	94		58 - 140	10/28/17 12:00	11/03/17 22:25	1
Toluene-d8 (Surr)	95		80 - 126	10/28/17 12:00	11/03/17 22:25	1
4-Bromofluorobenzene (Surr)	102		76 - 127	10/28/17 12:00	11/03/17 22:25	1
Dibromofluoromethane (Surr)	100		75 - 121	10/28/17 12:00	11/03/17 22:25	1

TestAmerica Denver



# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Client Sample ID: SB-11-6'  
Date Collected: 10/28/17 12:45  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-4  
Matrix: Solid  
Percent Solids: 83.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0060	0.00057	mg/Kg	☼	10/28/17 12:45	11/03/17 22:46	1
Ethylbenzene	ND		0.0060	0.00081	mg/Kg	☼	10/28/17 12:45	11/03/17 22:46	1
Toluene	ND		0.0060	0.00083	mg/Kg	☼	10/28/17 12:45	11/03/17 22:46	1
m-Xylene & p-Xylene	ND		0.0030	0.0013	mg/Kg	☼	10/28/17 12:45	11/03/17 22:46	1
o-Xylene	ND		0.0030	0.00074	mg/Kg	☼	10/28/17 12:45	11/03/17 22:46	1
Xylenes, Total	ND		0.0060	0.00074	mg/Kg	☼	10/28/17 12:45	11/03/17 22:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		58 - 140	10/28/17 12:45	11/03/17 22:46	1
Toluene-d8 (Surr)	107		80 - 126	10/28/17 12:45	11/03/17 22:46	1
4-Bromofluorobenzene (Surr)	116		76 - 127	10/28/17 12:45	11/03/17 22:46	1
Dibromofluoromethane (Surr)	108		75 - 121	10/28/17 12:45	11/03/17 22:46	1

Client Sample ID: SB-12-2'  
Date Collected: 10/28/17 13:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-5  
Matrix: Solid  
Percent Solids: 90.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0045	0.00042	mg/Kg	☼	10/28/17 13:00	11/03/17 23:06	1
Ethylbenzene	ND		0.0045	0.00060	mg/Kg	☼	10/28/17 13:00	11/03/17 23:06	1
Toluene	ND		0.0045	0.00062	mg/Kg	☼	10/28/17 13:00	11/03/17 23:06	1
m-Xylene & p-Xylene	ND		0.0023	0.00094	mg/Kg	☼	10/28/17 13:00	11/03/17 23:06	1
o-Xylene	ND		0.0023	0.00055	mg/Kg	☼	10/28/17 13:00	11/03/17 23:06	1
Xylenes, Total	ND		0.0045	0.00055	mg/Kg	☼	10/28/17 13:00	11/03/17 23:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	90		58 - 140	10/28/17 13:00	11/03/17 23:06	1
Toluene-d8 (Surr)	99		80 - 126	10/28/17 13:00	11/03/17 23:06	1
4-Bromofluorobenzene (Surr)	121		76 - 127	10/28/17 13:00	11/03/17 23:06	1
Dibromofluoromethane (Surr)	101		75 - 121	10/28/17 13:00	11/03/17 23:06	1

Client Sample ID: SB-12-4'  
Date Collected: 10/28/17 13:15  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-6  
Matrix: Solid  
Percent Solids: 82.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0053	0.00050	mg/Kg	☼	10/28/17 13:15	11/03/17 23:27	1
Ethylbenzene	ND		0.0053	0.00071	mg/Kg	☼	10/28/17 13:15	11/03/17 23:27	1
Toluene	ND		0.0053	0.00073	mg/Kg	☼	10/28/17 13:15	11/03/17 23:27	1
m-Xylene & p-Xylene	ND		0.0026	0.0011	mg/Kg	☼	10/28/17 13:15	11/03/17 23:27	1
o-Xylene	ND		0.0026	0.00065	mg/Kg	☼	10/28/17 13:15	11/03/17 23:27	1
Xylenes, Total	ND		0.0053	0.00065	mg/Kg	☼	10/28/17 13:15	11/03/17 23:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		58 - 140	10/28/17 13:15	11/03/17 23:27	1
Toluene-d8 (Surr)	100		80 - 126	10/28/17 13:15	11/03/17 23:27	1
4-Bromofluorobenzene (Surr)	144	X	76 - 127	10/28/17 13:15	11/03/17 23:27	1
Dibromofluoromethane (Surr)	103		75 - 121	10/28/17 13:15	11/03/17 23:27	1

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Client Sample ID: SB-13-6'

Date Collected: 10/28/17 13:30

Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-7

Matrix: Solid

Percent Solids: 80.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0051	0.00048	mg/Kg	☼	10/28/17 13:30	11/03/17 23:48	1
Ethylbenzene	ND		0.0051	0.00068	mg/Kg	☼	10/28/17 13:30	11/03/17 23:48	1
Toluene	ND		0.0051	0.00070	mg/Kg	☼	10/28/17 13:30	11/03/17 23:48	1
m-Xylene & p-Xylene	ND		0.0025	0.0011	mg/Kg	☼	10/28/17 13:30	11/03/17 23:48	1
o-Xylene	ND		0.0025	0.00062	mg/Kg	☼	10/28/17 13:30	11/03/17 23:48	1
Xylenes, Total	ND		0.0051	0.00062	mg/Kg	☼	10/28/17 13:30	11/03/17 23:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	91		58 - 140	10/28/17 13:30	11/03/17 23:48	1
Toluene-d8 (Surr)	89		80 - 126	10/28/17 13:30	11/03/17 23:48	1
4-Bromofluorobenzene (Surr)	91		76 - 127	10/28/17 13:30	11/03/17 23:48	1
Dibromofluoromethane (Surr)	98		75 - 121	10/28/17 13:30	11/03/17 23:48	1

Client Sample ID: SB-14-6'

Date Collected: 10/28/17 13:45

Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-8

Matrix: Solid

Percent Solids: 82.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0051	0.00048	mg/Kg	☼	10/28/17 13:45	11/04/17 00:09	1
Ethylbenzene	ND		0.0051	0.00068	mg/Kg	☼	10/28/17 13:45	11/04/17 00:09	1
Toluene	ND		0.0051	0.00071	mg/Kg	☼	10/28/17 13:45	11/04/17 00:09	1
m-Xylene & p-Xylene	ND		0.0026	0.0011	mg/Kg	☼	10/28/17 13:45	11/04/17 00:09	1
o-Xylene	ND		0.0026	0.00062	mg/Kg	☼	10/28/17 13:45	11/04/17 00:09	1
Xylenes, Total	ND		0.0051	0.00062	mg/Kg	☼	10/28/17 13:45	11/04/17 00:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	88		58 - 140	10/28/17 13:45	11/04/17 00:09	1
Toluene-d8 (Surr)	92		80 - 126	10/28/17 13:45	11/04/17 00:09	1
4-Bromofluorobenzene (Surr)	100		76 - 127	10/28/17 13:45	11/04/17 00:09	1
Dibromofluoromethane (Surr)	97		75 - 121	10/28/17 13:45	11/04/17 00:09	1

Client Sample ID: SB-15-2'

Date Collected: 10/28/17 16:00

Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-9

Matrix: Solid

Percent Solids: 85.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0046	0.00043	mg/Kg	☼	10/28/17 16:00	11/04/17 00:30	1
Ethylbenzene	ND		0.0046	0.00061	mg/Kg	☼	10/28/17 16:00	11/04/17 00:30	1
Toluene	ND		0.0046	0.00063	mg/Kg	☼	10/28/17 16:00	11/04/17 00:30	1
m-Xylene & p-Xylene	ND		0.0023	0.00095	mg/Kg	☼	10/28/17 16:00	11/04/17 00:30	1
o-Xylene	ND		0.0023	0.00056	mg/Kg	☼	10/28/17 16:00	11/04/17 00:30	1
Xylenes, Total	ND		0.0046	0.00056	mg/Kg	☼	10/28/17 16:00	11/04/17 00:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	83		58 - 140	10/28/17 16:00	11/04/17 00:30	1
Toluene-d8 (Surr)	94		80 - 126	10/28/17 16:00	11/04/17 00:30	1
4-Bromofluorobenzene (Surr)	101		76 - 127	10/28/17 16:00	11/04/17 00:30	1
Dibromofluoromethane (Surr)	94		75 - 121	10/28/17 16:00	11/04/17 00:30	1

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Client Sample ID: SB-15-6'  
Date Collected: 10/28/17 16:15  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-10  
Matrix: Solid  
Percent Solids: 84.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0036	J	0.0054	0.00051	mg/Kg	☼	10/28/17 16:15	11/04/17 00:51	1
Ethylbenzene	0.0090		0.0054	0.00072	mg/Kg	☼	10/28/17 16:15	11/04/17 00:51	1
Toluene	0.00082	J	0.0054	0.00075	mg/Kg	☼	10/28/17 16:15	11/04/17 00:51	1
m-Xylene & p-Xylene	0.011		0.0027	0.0011	mg/Kg	☼	10/28/17 16:15	11/04/17 00:51	1
o-Xylene	ND		0.0027	0.00066	mg/Kg	☼	10/28/17 16:15	11/04/17 00:51	1
Xylenes, Total	0.011		0.0054	0.00066	mg/Kg	☼	10/28/17 16:15	11/04/17 00:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	104		58 - 140	10/28/17 16:15	11/04/17 00:51	1
Toluene-d8 (Surr)	191	X	80 - 126	10/28/17 16:15	11/04/17 00:51	1
4-Bromofluorobenzene (Surr)	205	*X	76 - 127	10/28/17 16:15	11/04/17 00:51	1
Dibromofluoromethane (Surr)	112		75 - 121	10/28/17 16:15	11/04/17 00:51	1

Client Sample ID: SB-16-4'  
Date Collected: 10/28/17 16:30  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-11  
Matrix: Solid  
Percent Solids: 85.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0045	0.00042	mg/Kg	☼	10/28/17 16:30	11/04/17 01:12	1
Ethylbenzene	ND		0.0045	0.00060	mg/Kg	☼	10/28/17 16:30	11/04/17 01:12	1
Toluene	ND		0.0045	0.00062	mg/Kg	☼	10/28/17 16:30	11/04/17 01:12	1
m-Xylene & p-Xylene	ND		0.0022	0.00093	mg/Kg	☼	10/28/17 16:30	11/04/17 01:12	1
o-Xylene	ND		0.0022	0.00055	mg/Kg	☼	10/28/17 16:30	11/04/17 01:12	1
Xylenes, Total	ND		0.0045	0.00055	mg/Kg	☼	10/28/17 16:30	11/04/17 01:12	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	83		58 - 140	10/28/17 16:30	11/04/17 01:12	1
Toluene-d8 (Surr)	92		80 - 126	10/28/17 16:30	11/04/17 01:12	1
4-Bromofluorobenzene (Surr)	89		76 - 127	10/28/17 16:30	11/04/17 01:12	1
Dibromofluoromethane (Surr)	94		75 - 121	10/28/17 16:30	11/04/17 01:12	1

Client Sample ID: SB-16-8'  
Date Collected: 10/28/17 17:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-12  
Matrix: Solid  
Percent Solids: 93.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.5	0.46	mg/Kg	☼	10/28/17 17:00	11/04/17 21:33	10
Ethylbenzene	0.35	J	2.5	0.35	mg/Kg	☼	10/28/17 17:00	11/04/17 21:33	10
Toluene	ND		2.5	0.40	mg/Kg	☼	10/28/17 17:00	11/04/17 21:33	10
m-Xylene & p-Xylene	ND		2.5	0.79	mg/Kg	☼	10/28/17 17:00	11/04/17 21:33	10
o-Xylene	ND		1.3	0.36	mg/Kg	☼	10/28/17 17:00	11/04/17 21:33	10
Xylenes, Total	ND		2.5	0.36	mg/Kg	☼	10/28/17 17:00	11/04/17 21:33	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	117	D	52 - 135	10/28/17 17:00	11/04/17 21:33	10
Toluene-d8 (Surr)	107	D	65 - 135	10/28/17 17:00	11/04/17 21:33	10
4-Bromofluorobenzene (Surr)	117	D	65 - 135	10/28/17 17:00	11/04/17 21:33	10
Dibromofluoromethane (Surr)	121	D	65 - 135	10/28/17 17:00	11/04/17 21:33	10

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Client Sample ID: DUP-01

Date Collected: 10/28/17 00:00

Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-13

Matrix: Solid

Percent Solids: 85.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0043	J	0.0048	0.00045	mg/Kg	☼	10/28/17 00:00	11/04/17 01:53	1
Ethylbenzene	0.012		0.0048	0.00064	mg/Kg	☼	10/28/17 00:00	11/04/17 01:53	1
Toluene	0.00075	J	0.0048	0.00066	mg/Kg	☼	10/28/17 00:00	11/04/17 01:53	1
m-Xylene & p-Xylene	0.014		0.0024	0.00099	mg/Kg	☼	10/28/17 00:00	11/04/17 01:53	1
o-Xylene	ND		0.0024	0.00058	mg/Kg	☼	10/28/17 00:00	11/04/17 01:53	1
Xylenes, Total	0.014		0.0048	0.00058	mg/Kg	☼	10/28/17 00:00	11/04/17 01:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	110		58 - 140	10/28/17 00:00	11/04/17 01:53	1
Toluene-d8 (Surr)	186	X	80 - 126	10/28/17 00:00	11/04/17 01:53	1
4-Bromofluorobenzene (Surr)	356	*X	76 - 127	10/28/17 00:00	11/04/17 01:53	1
Dibromofluoromethane (Surr)	114		75 - 121	10/28/17 00:00	11/04/17 01:53	1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Client Sample ID: SB-09-8'

Date Collected: 10/28/17 11:30

Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-2

Matrix: Solid

Percent Solids: 74.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.13	0.0042	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20
Acenaphthylene	ND		0.13	0.0044	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20
Anthracene	ND		0.13	0.019	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20
Benzo[a]anthracene	0.058	J	0.13	0.023	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20
Benzo[a]pyrene	ND		0.13	0.019	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20
Benzo[b]fluoranthene	ND		0.13	0.031	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20
Benzo[g,h,i]perylene	ND		0.13	0.029	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20
Benzo[k]fluoranthene	ND		0.13	0.026	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20
Chrysene	ND		0.13	0.026	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20
Dibenz(a,h)anthracene	ND		0.13	0.034	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20
Fluoranthene	ND		0.13	0.026	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20
Fluorene	0.12	J	0.13	0.012	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20
Indeno[1,2,3-cd]pyrene	ND		0.13	0.029	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20
1-Methylnaphthalene	1.2		0.13	0.0068	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20
2-Methylnaphthalene	1.1		0.13	0.0081	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20
Naphthalene	1.1		0.13	0.0085	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20
Phenanthrene	0.22		0.13	0.029	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20
Pyrene	0.042	J	0.13	0.029	mg/Kg	☼	11/06/17 09:22	11/22/17 00:59	20

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl	63		39 - 120	11/06/17 09:22	11/22/17 00:59	20
Nitrobenzene-d5	3056	X	42 - 120	11/06/17 09:22	11/22/17 00:59	20
Terphenyl-d14	0	X	35 - 124	11/06/17 09:22	11/22/17 00:59	20

Client Sample ID: SB-12-2'

Date Collected: 10/28/17 13:00

Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-5

Matrix: Solid

Percent Solids: 90.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.054	0.0017	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1
Acenaphthylene	ND		0.054	0.0018	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1
Anthracene	ND		0.054	0.0077	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Client Sample ID: SB-12-2'  
Date Collected: 10/28/17 13:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-5  
Matrix: Solid  
Percent Solids: 90.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	0.35		0.054	0.0097	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1
Benzo[a]pyrene	ND		0.054	0.0080	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1
Benzo[b]fluoranthene	ND		0.054	0.013	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1
Benzo[g,h,i]perylene	ND		0.054	0.012	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1
Benzo[k]fluoranthene	ND		0.054	0.011	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1
Chrysene	ND		0.054	0.011	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1
Dibenz(a,h)anthracene	ND		0.054	0.014	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1
Fluoranthene	ND		0.054	0.011	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1
Fluorene	ND		0.054	0.0051	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1
Indeno[1,2,3-cd]pyrene	ND		0.054	0.012	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1
1-Methylnaphthalene	ND		0.054	0.0028	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1
2-Methylnaphthalene	ND		0.054	0.0033	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1
Naphthalene	ND		0.054	0.0035	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1
Phenanthrene	ND		0.054	0.012	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1
Pyrene	ND		0.054	0.012	mg/Kg	☼	11/06/17 09:22	11/21/17 04:06	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl	19	X	39 - 120				11/06/17 09:22	11/21/17 04:06	1
Nitrobenzene-d5	0	X	42 - 120				11/06/17 09:22	11/21/17 04:06	1
Terphenyl-d14	86		35 - 124				11/06/17 09:22	11/21/17 04:06	1

Client Sample ID: SB-15-2'  
Date Collected: 10/28/17 16:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-9  
Matrix: Solid  
Percent Solids: 85.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.0057	0.00018	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
Acenaphthylene	ND		0.0057	0.00019	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
Anthracene	ND		0.0057	0.00081	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
Benzo[a]anthracene	ND		0.0057	0.0010	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
Benzo[a]pyrene	ND		0.0057	0.00084	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
Benzo[b]fluoranthene	ND		0.0057	0.0014	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
Benzo[g,h,i]perylene	ND		0.0057	0.0012	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
Benzo[k]fluoranthene	ND		0.0057	0.0011	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
Chrysene	ND		0.0057	0.0011	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
Dibenz(a,h)anthracene	ND		0.0057	0.0015	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
Fluoranthene	ND		0.0057	0.0011	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
Fluorene	ND		0.0057	0.00053	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
Indeno[1,2,3-cd]pyrene	ND		0.0057	0.0012	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
1-Methylnaphthalene	0.00045	J	0.0057	0.00029	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
2-Methylnaphthalene	0.00047	J	0.0057	0.00035	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
Naphthalene	ND		0.0057	0.00037	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
Phenanthrene	ND		0.0057	0.0012	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
Pyrene	ND		0.0057	0.0012	mg/Kg	☼	11/06/17 09:22	11/21/17 04:31	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl	65		39 - 120				11/06/17 09:22	11/21/17 04:31	1
Nitrobenzene-d5	66		42 - 120				11/06/17 09:22	11/21/17 04:31	1
Terphenyl-d14	73		35 - 124				11/06/17 09:22	11/21/17 04:31	1

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Gasoline Range Organics)

Client Sample ID: SB-07-4'  
Date Collected: 10/28/17 10:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-1  
Matrix: Solid  
Percent Solids: 83.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	0.62	J B	1.5	0.40	mg/Kg	☼	10/28/17 10:00	11/07/17 03:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	96		77 - 123				10/28/17 10:00	11/07/17 03:47	1

Client Sample ID: SB-09-8'  
Date Collected: 10/28/17 11:30  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-2  
Matrix: Solid  
Percent Solids: 74.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	470	B	50	14	mg/Kg	☼	10/28/17 11:30	11/07/17 04:11	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	294	X D	77 - 123				10/28/17 11:30	11/07/17 04:11	20

Client Sample ID: SB-10-6'  
Date Collected: 10/28/17 12:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-3  
Matrix: Solid  
Percent Solids: 86.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	ND		1.3	0.36	mg/Kg	☼	10/28/17 12:00	11/07/17 04:35	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	92		77 - 123				10/28/17 12:00	11/07/17 04:35	1

Client Sample ID: SB-11-6'  
Date Collected: 10/28/17 12:45  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-4  
Matrix: Solid  
Percent Solids: 83.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	ND		1.4	0.37	mg/Kg	☼	10/28/17 12:46	11/07/17 05:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	94		77 - 123				10/28/17 12:46	11/07/17 05:00	1

Client Sample ID: SB-12-2'  
Date Collected: 10/28/17 13:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-5  
Matrix: Solid  
Percent Solids: 90.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	1.4	B	1.3	0.36	mg/Kg	☼	10/28/17 13:00	11/07/17 05:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	89		77 - 123				10/28/17 13:00	11/07/17 05:24	1

Client Sample ID: SB-12-4'  
Date Collected: 10/28/17 13:15  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-6  
Matrix: Solid  
Percent Solids: 82.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	7.8	B	1.5	0.40	mg/Kg	☼	10/28/17 13:15	11/07/17 17:50	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	45	X	77 - 123				10/28/17 13:15	11/07/17 17:50	1

TestAmerica Denver



# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Gasoline Range Organics)

Client Sample ID: SB-13-6'  
Date Collected: 10/28/17 13:30  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-7  
Matrix: Solid  
Percent Solids: 80.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	ND		1.4	0.37	mg/Kg	☼	10/28/17 13:30	11/07/17 06:12	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	88		77 - 123				10/28/17 13:30	11/07/17 06:12	1

Client Sample ID: SB-14-6'  
Date Collected: 10/28/17 13:45  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-8  
Matrix: Solid  
Percent Solids: 82.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	0.38	J B	1.3	0.36	mg/Kg	☼	10/28/17 13:45	11/07/17 06:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	98		77 - 123				10/28/17 13:45	11/07/17 06:37	1

Client Sample ID: SB-15-2'  
Date Collected: 10/28/17 16:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-9  
Matrix: Solid  
Percent Solids: 85.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	0.52	J B	1.2	0.33	mg/Kg	☼	10/28/17 16:00	11/07/17 21:05	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	84		77 - 123				10/28/17 16:00	11/07/17 21:05	1

Client Sample ID: SB-15-6'  
Date Collected: 10/28/17 16:15  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-10  
Matrix: Solid  
Percent Solids: 84.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	23	B	1.4	0.39	mg/Kg	☼	10/28/17 16:15	11/07/17 21:29	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	99		77 - 123				10/28/17 16:15	11/07/17 21:29	1

Client Sample ID: SB-16-4'  
Date Collected: 10/28/17 16:30  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-11  
Matrix: Solid  
Percent Solids: 85.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	0.50	J B	1.2	0.32	mg/Kg	☼	10/28/17 16:30	11/07/17 21:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	85		77 - 123				10/28/17 16:30	11/07/17 21:53	1

Client Sample ID: SB-16-8'  
Date Collected: 10/28/17 17:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-12  
Matrix: Solid  
Percent Solids: 93.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	190	B	6.4	1.7	mg/Kg	☼	10/28/17 17:00	11/10/17 03:44	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	168	D X	77 - 123				10/28/17 17:00	11/10/17 03:44	5

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Gasoline Range Organics)

Client Sample ID: DUP-01

Date Collected: 10/28/17 00:00

Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-13

Matrix: Solid

Percent Solids: 85.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	21	B	1.2	0.31	mg/Kg	☼	10/28/17 00:00	11/07/17 22:41	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	97		77 - 123				10/28/17 00:00	11/07/17 22:41	1

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

Client Sample ID: SB-07-4'

Date Collected: 10/28/17 10:00

Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-1

Matrix: Solid

Percent Solids: 83.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	3.4	J B	4.7	0.80	mg/Kg	☼	11/07/17 10:18	11/19/17 17:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	81		49 - 115				11/07/17 10:18	11/19/17 17:53	1

Client Sample ID: SB-09-8'

Date Collected: 10/28/17 11:30

Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-2

Matrix: Solid

Percent Solids: 74.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	2200	B	110	18	mg/Kg	☼	11/07/17 10:18	11/19/17 18:17	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	66	D	49 - 115				11/07/17 10:18	11/19/17 18:17	20

Client Sample ID: SB-10-6'

Date Collected: 10/28/17 12:00

Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-3

Matrix: Solid

Percent Solids: 86.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	61	J F1 F2 B	91	15	mg/Kg	☼	11/07/17 10:18	11/19/17 18:41	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	105	D	49 - 115				11/07/17 10:18	11/19/17 18:41	20

Client Sample ID: SB-11-6'

Date Collected: 10/28/17 12:45

Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-4

Matrix: Solid

Percent Solids: 83.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	120	B	94	16	mg/Kg	☼	11/07/17 10:18	11/19/17 19:54	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	121	D X	49 - 115				11/07/17 10:18	11/19/17 19:54	20

Client Sample ID: SB-12-2'

Date Collected: 10/28/17 13:00

Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-5

Matrix: Solid

Percent Solids: 90.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	24000	B	870	150	mg/Kg	☼	11/07/17 10:18	11/19/17 20:43	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	1110	D X	49 - 115				11/07/17 10:18	11/19/17 20:43	20

TestAmerica Denver



# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

Client Sample ID: SB-12-4'  
Date Collected: 10/28/17 13:15  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-6  
Matrix: Solid  
Percent Solids: 82.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	180	B	92	16	mg/Kg	☼	11/07/17 10:18	11/19/17 21:07	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	98	D	49 - 115				11/07/17 10:18	11/19/17 21:07	20

Client Sample ID: SB-13-6'  
Date Collected: 10/28/17 13:30  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-7  
Matrix: Solid  
Percent Solids: 80.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	110	B	98	17	mg/Kg	☼	11/07/17 10:18	11/19/17 21:31	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	99	D	49 - 115				11/07/17 10:18	11/19/17 21:31	20

Client Sample ID: SB-14-6'  
Date Collected: 10/28/17 13:45  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-8  
Matrix: Solid  
Percent Solids: 82.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	5.5	B	4.8	0.82	mg/Kg	☼	11/07/17 10:18	11/19/17 21:56	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	69		49 - 115				11/07/17 10:18	11/19/17 21:56	1

Client Sample ID: SB-15-2'  
Date Collected: 10/28/17 16:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-9  
Matrix: Solid  
Percent Solids: 85.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	280	B	91	15	mg/Kg	☼	11/07/17 10:18	11/19/17 22:20	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	101	D	49 - 115				11/07/17 10:18	11/19/17 22:20	20

Client Sample ID: SB-15-6'  
Date Collected: 10/28/17 16:15  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-10  
Matrix: Solid  
Percent Solids: 84.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	7500	B	94	16	mg/Kg	☼	11/07/17 10:18	11/19/17 22:44	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	58	D	49 - 115				11/07/17 10:18	11/19/17 22:44	20

Client Sample ID: SB-16-4'  
Date Collected: 10/28/17 16:30  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-11  
Matrix: Solid  
Percent Solids: 85.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	4.7	B	4.6	0.77	mg/Kg	☼	11/07/17 10:18	11/19/17 23:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	81		49 - 115				11/07/17 10:18	11/19/17 23:08	1

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

Client Sample ID: SB-16-8'  
Date Collected: 10/28/17 17:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-12  
Matrix: Solid  
Percent Solids: 93.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	10000	B	160	28	mg/Kg	☼	11/07/17 10:18	11/19/17 23:32	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	1407	D X	49 - 115				11/07/17 10:18	11/19/17 23:32	20

Client Sample ID: DUP-01  
Date Collected: 10/28/17 00:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-13  
Matrix: Solid  
Percent Solids: 85.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	10000	B	900	150	mg/Kg	☼	11/07/17 10:18	11/19/17 23:56	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	305	D X	49 - 115				11/07/17 10:18	11/19/17 23:56	20

## Method: 20B - Sodium Adsorption Ratio - Soluble

Client Sample ID: SB-09-8'  
Date Collected: 10/28/17 11:30  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-2  
Matrix: Solid  
Percent Solids: 74.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium Adsorption Ratio	85		1.2	1.2	No Unit	—	11/06/17 18:30	11/08/17 10:06	10

Client Sample ID: SB-12-2'  
Date Collected: 10/28/17 13:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-5  
Matrix: Solid  
Percent Solids: 90.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium Adsorption Ratio	32		1.2	1.2	No Unit	—	11/06/17 18:30	11/08/17 10:09	10

Client Sample ID: SB-15-2'  
Date Collected: 10/28/17 16:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-9  
Matrix: Solid  
Percent Solids: 85.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium Adsorption Ratio	9.4		1.2	1.2	No Unit	—	11/06/17 18:30	11/08/17 10:11	10

## Method: 6010C - Metals (ICP)

Client Sample ID: SB-09-8'  
Date Collected: 10/28/17 11:30  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-2  
Matrix: Solid  
Percent Solids: 74.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	96		1.2	0.12	mg/Kg	☼	11/03/17 07:25	11/03/17 22:41	1
Boron	28		12	1.2	mg/Kg	☼	11/03/17 07:25	11/03/17 22:41	1
Cadmium	0.33	J	0.59	0.048	mg/Kg	☼	11/03/17 07:25	11/03/17 22:41	1
Chromium	9.3		1.8	0.068	mg/Kg	☼	11/03/17 07:25	11/03/17 22:41	1
Copper	27		2.4	0.26	mg/Kg	☼	11/03/17 07:25	11/03/17 22:41	1
Lead	10		1.1	0.37	mg/Kg	☼	11/03/17 07:25	11/03/17 22:41	1
Nickel	15		4.7	0.16	mg/Kg	☼	11/03/17 07:25	11/03/17 22:41	1
Selenium	ND		1.8	1.0	mg/Kg	☼	11/03/17 07:25	11/03/17 22:41	1
Silver	ND		1.2	0.19	mg/Kg	☼	11/03/17 07:25	11/03/17 22:41	1
Zinc	35		3.5	0.47	mg/Kg	☼	11/03/17 07:25	11/03/17 22:41	1

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 6010C - Metals (ICP)

Client Sample ID: SB-12-2'  
Date Collected: 10/28/17 13:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-5  
Matrix: Solid  
Percent Solids: 90.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	110		0.98	0.10	mg/Kg	☼	11/03/17 07:25	11/03/17 22:43	1
Boron	13		9.8	0.96	mg/Kg	☼	11/03/17 07:25	11/03/17 22:43	1
Cadmium	0.29	J	0.49	0.040	mg/Kg	☼	11/03/17 07:25	11/03/17 22:43	1
Chromium	9.3		1.5	0.057	mg/Kg	☼	11/03/17 07:25	11/03/17 22:43	1
Copper	53		2.0	0.21	mg/Kg	☼	11/03/17 07:25	11/03/17 22:43	1
Lead	11		0.88	0.30	mg/Kg	☼	11/03/17 07:25	11/03/17 22:43	1
Nickel	29		3.9	0.13	mg/Kg	☼	11/03/17 07:25	11/03/17 22:43	1
Selenium	ND		1.5	0.84	mg/Kg	☼	11/03/17 07:25	11/03/17 22:43	1
Silver	ND		0.98	0.16	mg/Kg	☼	11/03/17 07:25	11/03/17 22:43	1
Zinc	77		2.9	0.39	mg/Kg	☼	11/03/17 07:25	11/03/17 22:43	1

Client Sample ID: SB-15-2'  
Date Collected: 10/28/17 16:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-9  
Matrix: Solid  
Percent Solids: 85.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	160		0.99	0.10	mg/Kg	☼	11/03/17 07:25	11/03/17 22:46	1
Boron	12		9.9	0.97	mg/Kg	☼	11/03/17 07:25	11/03/17 22:46	1
Cadmium	0.27	J	0.49	0.040	mg/Kg	☼	11/03/17 07:25	11/03/17 22:46	1
Chromium	14		1.5	0.057	mg/Kg	☼	11/03/17 07:25	11/03/17 22:46	1
Copper	11		2.0	0.21	mg/Kg	☼	11/03/17 07:25	11/03/17 22:46	1
Lead	9.3		0.89	0.31	mg/Kg	☼	11/03/17 07:25	11/03/17 22:46	1
Nickel	14		3.9	0.13	mg/Kg	☼	11/03/17 07:25	11/03/17 22:46	1
Selenium	ND		1.5	0.85	mg/Kg	☼	11/03/17 07:25	11/03/17 22:46	1
Silver	ND		0.99	0.16	mg/Kg	☼	11/03/17 07:25	11/03/17 22:46	1
Zinc	41		3.0	0.39	mg/Kg	☼	11/03/17 07:25	11/03/17 22:46	1

## Method: 6020A - Metals (ICP/MS)

Client Sample ID: SB-09-8'  
Date Collected: 10/28/17 11:30  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-2  
Matrix: Solid  
Percent Solids: 74.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.1		0.79	0.067	mg/Kg	☼	11/03/17 07:25	11/03/17 15:05	1

Client Sample ID: SB-12-2'  
Date Collected: 10/28/17 13:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-5  
Matrix: Solid  
Percent Solids: 90.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.5		0.58	0.049	mg/Kg	☼	11/03/17 07:25	11/03/17 15:09	1

Client Sample ID: SB-15-2'  
Date Collected: 10/28/17 16:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-9  
Matrix: Solid  
Percent Solids: 85.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.4		0.62	0.052	mg/Kg	☼	11/03/17 07:25	11/03/17 15:13	1

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 7471B - Mercury (CVAA)

Client Sample ID: SB-09-8'  
Date Collected: 10/28/17 11:30  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-2  
Matrix: Solid  
Percent Solids: 74.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.058		0.024	0.0077	mg/Kg	☼	11/03/17 12:28	11/03/17 17:57	1

Client Sample ID: SB-12-2'  
Date Collected: 10/28/17 13:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-5  
Matrix: Solid  
Percent Solids: 90.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.028		0.021	0.0067	mg/Kg	☼	11/03/17 12:28	11/03/17 17:59	1

Client Sample ID: SB-15-2'  
Date Collected: 10/28/17 16:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-9  
Matrix: Solid  
Percent Solids: 85.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.024		0.021	0.0068	mg/Kg	☼	11/03/17 12:28	11/03/17 18:02	1

## General Chemistry

Client Sample ID: SB-07-4'  
Date Collected: 10/28/17 10:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-1  
Matrix: Solid  
Percent Solids: 83.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	16.1		0.1	0.1	%	—		10/31/17 10:18	1

Client Sample ID: SB-09-8'  
Date Collected: 10/28/17 11:30  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-2  
Matrix: Solid  
Percent Solids: 74.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	4.8	J	6.6	2.6	mg/Kg	☼	11/08/17 18:10	11/09/17 14:23	1
Chromium, trivalent	4.5		2.0	2.0	mg/Kg			11/10/17 14:07	1
Cr	9.3		2.0	2.0	mg/Kg			11/10/17 14:07	1
Cr (VI)	4.8		1.4	1.4	mg/Kg			11/10/17 14:07	1
Percent Moisture	25.3		0.1	0.1	%			10/31/17 10:18	1

Client Sample ID: SB-10-6'  
Date Collected: 10/28/17 12:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-3  
Matrix: Solid  
Percent Solids: 86.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	13.1		0.1	0.1	%	—		10/31/17 10:18	1

Client Sample ID: SB-11-6'  
Date Collected: 10/28/17 12:45  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-4  
Matrix: Solid  
Percent Solids: 83.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	16.1		0.1	0.1	%	—		10/31/17 10:18	1

Client Sample ID: SB-12-2'  
Date Collected: 10/28/17 13:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-5  
Matrix: Solid  
Percent Solids: 90.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	4.9	J	5.5	2.2	mg/Kg	☼	11/08/17 18:10	11/09/17 14:23	1
Chromium, trivalent	4.4		2.0	2.0	mg/Kg			11/10/17 14:07	1
Cr	9.3		2.0	2.0	mg/Kg			11/10/17 14:07	1

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## General Chemistry (Continued)

Client Sample ID: SB-12-2'  
Date Collected: 10/28/17 13:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-5  
Matrix: Solid  
Percent Solids: 90.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cr (VI)	4.9		1.4	1.4	mg/Kg			11/10/17 14:07	1
Percent Moisture	9.9		0.1	0.1	%			10/31/17 10:18	1

Client Sample ID: SB-12-4'  
Date Collected: 10/28/17 13:15  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-6  
Matrix: Solid  
Percent Solids: 82.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	17.5		0.1	0.1	%			10/31/17 10:18	1

Client Sample ID: SB-13-6'  
Date Collected: 10/28/17 13:30  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-7  
Matrix: Solid  
Percent Solids: 80.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	19.6		0.1	0.1	%			10/31/17 12:02	1

Client Sample ID: SB-14-6'  
Date Collected: 10/28/17 13:45  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-8  
Matrix: Solid  
Percent Solids: 82.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	17.9		0.1	0.1	%			10/31/17 12:02	1

Client Sample ID: SB-15-2'  
Date Collected: 10/28/17 16:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-9  
Matrix: Solid  
Percent Solids: 85.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	3.9	J	5.7	2.3	mg/Kg	☼	11/08/17 18:10	11/09/17 14:23	1
Chromium, trivalent	9.9		2.0	2.0	mg/Kg			11/10/17 14:07	1
Cr	14		2.0	2.0	mg/Kg			11/10/17 14:07	1
Cr (VI)	3.9		1.4	1.4	mg/Kg			11/10/17 14:07	1
Percent Moisture	14.2		0.1	0.1	%			10/31/17 12:02	1

Client Sample ID: SB-15-6'  
Date Collected: 10/28/17 16:15  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-10  
Matrix: Solid  
Percent Solids: 84.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	15.3		0.1	0.1	%			10/31/17 12:02	1

Client Sample ID: SB-16-4'  
Date Collected: 10/28/17 16:30  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-11  
Matrix: Solid  
Percent Solids: 85.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	14.3		0.1	0.1	%			10/31/17 12:02	1

Client Sample ID: SB-16-8'  
Date Collected: 10/28/17 17:00  
Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-12  
Matrix: Solid  
Percent Solids: 93.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	6.5		0.1	0.1	%			10/31/17 12:02	1

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## General Chemistry

Client Sample ID: DUP-01

Date Collected: 10/28/17 00:00

Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-13

Matrix: Solid

Percent Solids: 85.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	14.9		0.1	0.1	%			10/31/17 12:02	1

## General Chemistry - Soluble

Client Sample ID: SB-09-8'

Date Collected: 10/28/17 11:30

Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-2

Matrix: Solid

Percent Solids: 74.7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	12000		10	10	umhos/cm		11/02/17 16:22	11/03/17 11:00	1
Saturation Percentage	1.0		0.10	0.10	%		11/02/17 16:22	11/03/17 11:00	1
Electrical Conductivity at Saturation	12000		10	10	umhos/cm		11/02/17 16:22	11/03/17 11:00	1
pH adj. to 25 deg C	8.4	HF	0.1	0.1	SU			11/07/17 08:54	1
Temperature	20.0	HF	1.0	1.0	Degrees C			11/07/17 08:54	1

Client Sample ID: SB-12-2'

Date Collected: 10/28/17 13:00

Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-5

Matrix: Solid

Percent Solids: 90.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	2800		10	10	umhos/cm		11/02/17 16:22	11/03/17 11:00	1
Saturation Percentage	1.0		0.10	0.10	%		11/02/17 16:22	11/03/17 11:00	1
Electrical Conductivity at Saturation	2800		10	10	umhos/cm		11/02/17 16:22	11/03/17 11:00	1
pH adj. to 25 deg C	8.5	HF	0.1	0.1	SU			11/07/17 08:54	1
Temperature	19.9	HF	1.0	1.0	Degrees C			11/07/17 08:54	1

Client Sample ID: SB-15-2'

Date Collected: 10/28/17 16:00

Date Received: 10/30/17 12:15

Lab Sample ID: 280-102984-9

Matrix: Solid

Percent Solids: 85.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	5500		10	10	umhos/cm		11/02/17 16:22	11/03/17 11:00	1
Saturation Percentage	1.0		0.10	0.10	%		11/02/17 16:22	11/03/17 11:00	1
Electrical Conductivity at Saturation	5500		10	10	umhos/cm		11/02/17 16:22	11/03/17 11:00	1
pH adj. to 25 deg C	8.3	HF	0.1	0.1	SU			11/07/17 08:54	1
Temperature	19.9	HF	1.0	1.0	Degrees C			11/07/17 08:54	1

TestAmerica Denver

# Surrogate Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DCA (58-140)	TOL (80-126)	BFB (76-127)	DBFM (75-121)
280-102984-1	SB-07-4'	91	95	104	101
280-102984-3	SB-10-6'	94	95	102	100
280-102984-4	SB-11-6'	101	107	116	108
280-102984-5	SB-12-2'	90	99	121	101
280-102984-6	SB-12-4'	97	100	144 X	103
280-102984-7	SB-13-6'	91	89	91	98
280-102984-8	SB-14-6'	88	92	100	97
280-102984-9	SB-15-2'	83	94	101	94
280-102984-10	SB-15-6'	104	191 X	205 * X	112
280-102984-11	SB-16-4'	83	92	89	94
280-102984-13	DUP-01	110	186 X	356 * X	114
LCS 280-394010/4	Lab Control Sample	99	97	98	108
LCSD 280-394010/5	Lab Control Sample Dup	93	92	90	97
MB 280-394010/6	Method Blank	96	86	93	103

### Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)  
TOL = Toluene-d8 (Surr)  
BFB = 4-Bromofluorobenzene (Surr)  
DBFM = Dibromofluoromethane (Surr)

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DCA (52-135)	TOL (65-135)	BFB (65-135)	DBFM (65-135)
280-102984-2	SB-09-8'	109	99	117	115
280-102984-12	SB-16-8'	117 D	107 D	117 D	121 D
LCS 280-394045/2-A	Lab Control Sample	110	104	105	116
LCSD 280-394045/3-A	Lab Control Sample Dup	114	109	112	119
MB 280-394045/1-A	Method Blank	110	103	113	119

### Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)  
TOL = Toluene-d8 (Surr)  
BFB = 4-Bromofluorobenzene (Surr)  
DBFM = Dibromofluoromethane (Surr)

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		FBP (39-120)	NBZ (42-120)	TPHL (35-124)
280-102984-2	SB-09-8'	63	3056 X	0 X
280-102984-5	SB-12-2'	19 X	0 X	86
280-102984-9	SB-15-2'	65	66	73
LCS 280-394080/2-A	Lab Control Sample	60	75	72
MB 280-394080/1-A	Method Blank	67	85	68

TestAmerica Denver



# Surrogate Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Surrogate Legend

FBP = 2-Fluorobiphenyl  
NBZ = Nitrobenzene-d5  
TPHL = Terphenyl-d14

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Gasoline Range Organics)

Matrix: Solid

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TFT1 (77-123)
280-102984-1	SB-07-4'	96
280-102984-2	SB-09-8'	294 X D
280-102984-3	SB-10-6'	92
280-102984-4	SB-11-6'	94
280-102984-5	SB-12-2'	89
280-102984-6	SB-12-4'	45 X
280-102984-7	SB-13-6'	88
280-102984-8	SB-14-6'	98
280-102984-9	SB-15-2'	84
280-102984-10	SB-15-6'	99
280-102984-11	SB-16-4'	85
280-102984-12	SB-16-8'	168 D X
280-102984-13	DUP-01	97
LCS 280-394139/2-A	Lab Control Sample	97
LCS 280-394265/2-A	Lab Control Sample	93
LCSD 280-394139/3-A	Lab Control Sample Dup	98
LCSD 280-394265/3-A	Lab Control Sample Dup	94
MB 280-394139/1-A	Method Blank	103
MB 280-394265/1-A	Method Blank	99

## Surrogate Legend

TFT = a,a,a-Trifluorotoluene

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

Matrix: Solid

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	OTPH1 (49-115)
280-102984-1	SB-07-4'	81
280-102984-2	SB-09-8'	66 D
280-102984-3	SB-10-6'	105 D
280-102984-3 MS	SB-10-6'	117 D X
280-102984-3 MSD	SB-10-6'	110 D
280-102984-4	SB-11-6'	121 D X
280-102984-5	SB-12-2'	1110 D X
280-102984-6	SB-12-4'	98 D
280-102984-7	SB-13-6'	99 D
280-102984-8	SB-14-6'	69
280-102984-9	SB-15-2'	101 D
280-102984-10	SB-15-6'	58 D
280-102984-11	SB-16-4'	81
280-102984-12	SB-16-8'	1407 D X
280-102984-13	DUP-01	305 D X

TestAmerica Denver



# Surrogate Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

**Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)**  
**(Continued)**

**Matrix: Solid**

**Prep Type: Total/NA**

## Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	OTPH1 (49-115)
LCS 280-394261/2-A	Lab Control Sample	93
MB 280-394261/1-A	Method Blank	79

### Surrogate Legend

OTPH = o-Terphenyl (Surr)

# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 280-394010/6

Matrix: Solid

Analysis Batch: 394010

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0050	0.00047	mg/Kg			11/03/17 21:22	1
Ethylbenzene	ND		0.0050	0.00067	mg/Kg			11/03/17 21:22	1
Toluene	ND		0.0050	0.00069	mg/Kg			11/03/17 21:22	1
m-Xylene & p-Xylene	ND		0.0025	0.0010	mg/Kg			11/03/17 21:22	1
o-Xylene	ND		0.0025	0.00061	mg/Kg			11/03/17 21:22	1
Xylenes, Total	ND		0.0050	0.00061	mg/Kg			11/03/17 21:22	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	96		58 - 140		11/03/17 21:22	1
Toluene-d8 (Surr)	86		80 - 126		11/03/17 21:22	1
4-Bromofluorobenzene (Surr)	93		76 - 127		11/03/17 21:22	1
Dibromofluoromethane (Surr)	103		75 - 121		11/03/17 21:22	1

Lab Sample ID: LCS 280-394010/4

Matrix: Solid

Analysis Batch: 394010

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	0.0500	0.0566		mg/Kg		113	75 - 135
Ethylbenzene	0.0500	0.0512		mg/Kg		102	73 - 125
Toluene	0.0500	0.0555		mg/Kg		111	77 - 122
m-Xylene & p-Xylene	0.0500	0.0519		mg/Kg		104	77 - 135
o-Xylene	0.0500	0.0508		mg/Kg		102	75 - 135
Xylenes, Total	0.100	0.103		mg/Kg		103	76 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	99		58 - 140
Toluene-d8 (Surr)	97		80 - 126
4-Bromofluorobenzene (Surr)	98		76 - 127
Dibromofluoromethane (Surr)	108		75 - 121

Lab Sample ID: LCSD 280-394010/5

Matrix: Solid

Analysis Batch: 394010

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	0.0500	0.0548		mg/Kg		110	75 - 135	3	20
Ethylbenzene	0.0500	0.0510		mg/Kg		102	73 - 125	0	20
Toluene	0.0500	0.0521		mg/Kg		104	77 - 122	6	20
m-Xylene & p-Xylene	0.0500	0.0510		mg/Kg		102	77 - 135	2	20
o-Xylene	0.0500	0.0518		mg/Kg		104	75 - 135	2	20
Xylenes, Total	0.100	0.103		mg/Kg		103	76 - 135	0	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	93		58 - 140
Toluene-d8 (Surr)	92		80 - 126
4-Bromofluorobenzene (Surr)	90		76 - 127

TestAmerica Denver

# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 280-394010/5

Matrix: Solid

Analysis Batch: 394010

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
Dibromofluoromethane (Surr)	97		75 - 121

Lab Sample ID: MB 280-394045/1-A

Matrix: Solid

Analysis Batch: 394041

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 394045

Analyte	MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Benzene	ND		0.25	0.045	mg/Kg		11/04/17 11:14	11/04/17 12:00	1
Ethylbenzene	ND		0.25	0.034	mg/Kg		11/04/17 11:14	11/04/17 12:00	1
Toluene	ND		0.25	0.039	mg/Kg		11/04/17 11:14	11/04/17 12:00	1
m-Xylene & p-Xylene	ND		0.25	0.078	mg/Kg		11/04/17 11:14	11/04/17 12:00	1
o-Xylene	ND		0.12	0.035	mg/Kg		11/04/17 11:14	11/04/17 12:00	1
Xylenes, Total	ND		0.25	0.035	mg/Kg		11/04/17 11:14	11/04/17 12:00	1

Surrogate	MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	110		52 - 135	11/04/17 11:14	11/04/17 12:00	1
Toluene-d8 (Surr)	103		65 - 135	11/04/17 11:14	11/04/17 12:00	1
4-Bromofluorobenzene (Surr)	113		65 - 135	11/04/17 11:14	11/04/17 12:00	1
Dibromofluoromethane (Surr)	119		65 - 135	11/04/17 11:14	11/04/17 12:00	1

Lab Sample ID: LCS 280-394045/2-A

Matrix: Solid

Analysis Batch: 394041

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 394045

Analyte	Spike Added	LCS		Unit	D	%Rec	Limits
		Result	Qualifier				
Benzene	2.00	2.19		mg/Kg		110	65 - 135
Ethylbenzene	2.00	2.05		mg/Kg		103	65 - 135
Toluene	2.00	2.34		mg/Kg		117	65 - 135
m-Xylene & p-Xylene	2.00	2.07		mg/Kg		104	65 - 135
o-Xylene	2.00	1.96		mg/Kg		98	65 - 135
Xylenes, Total	3.99	4.03		mg/Kg		101	65 - 135

Surrogate	LCS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	110		52 - 135
Toluene-d8 (Surr)	104		65 - 135
4-Bromofluorobenzene (Surr)	105		65 - 135
Dibromofluoromethane (Surr)	116		65 - 135

Lab Sample ID: LCSD 280-394045/3-A

Matrix: Solid

Analysis Batch: 394041

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 394045

Analyte	Spike Added	LCSD Result	LCSD		Unit	D	%Rec	Limits	RPD	
			Qualifier						RPD	Limit
Benzene	2.01	2.22			mg/Kg		110	65 - 135	2	20
Ethylbenzene	2.01	2.16			mg/Kg		107	65 - 135	5	20
Toluene	2.01	2.43			mg/Kg		121	65 - 135	4	20
m-Xylene & p-Xylene	2.01	2.17			mg/Kg		108	65 - 135	5	23

TestAmerica Denver

# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 280-394045/3-A

Matrix: Solid

Analysis Batch: 394041

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 394045

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
o-Xylene	2.01	2.05		mg/Kg		102	65 - 135	5	20
Xylenes, Total	4.03	4.22		mg/Kg		105	65 - 135	5	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	114		52 - 135
Toluene-d8 (Surr)	109		65 - 135
4-Bromofluorobenzene (Surr)	112		65 - 135
Dibromofluoromethane (Surr)	119		65 - 135

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 280-394080/1-A

Matrix: Solid

Analysis Batch: 395962

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 394080

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.0048	0.00015	mg/Kg		11/06/17 09:22	11/20/17 19:05	1
Acenaphthylene	ND		0.0048	0.00016	mg/Kg		11/06/17 09:22	11/20/17 19:05	1
Anthracene	ND		0.0048	0.00069	mg/Kg		11/06/17 09:22	11/20/17 19:05	1
Benzo[a]anthracene	ND		0.0048	0.00087	mg/Kg		11/06/17 09:22	11/20/17 19:05	1
Benzo[a]pyrene	ND		0.0048	0.00071	mg/Kg		11/06/17 09:22	11/20/17 19:05	1
Benzo[b]fluoranthene	ND		0.0048	0.0012	mg/Kg		11/06/17 09:22	11/20/17 19:05	1
Benzo[g,h,i]perylene	ND		0.0048	0.0011	mg/Kg		11/06/17 09:22	11/20/17 19:05	1
Benzo[k]fluoranthene	ND		0.0048	0.00096	mg/Kg		11/06/17 09:22	11/20/17 19:05	1
Chrysene	ND		0.0048	0.00096	mg/Kg		11/06/17 09:22	11/20/17 19:05	1
Dibenz(a,h)anthracene	ND		0.0048	0.0013	mg/Kg		11/06/17 09:22	11/20/17 19:05	1
Fluoranthene	ND		0.0048	0.00096	mg/Kg		11/06/17 09:22	11/20/17 19:05	1
Fluorene	ND		0.0048	0.00045	mg/Kg		11/06/17 09:22	11/20/17 19:05	1
Indeno[1,2,3-cd]pyrene	ND		0.0048	0.0011	mg/Kg		11/06/17 09:22	11/20/17 19:05	1
1-Methylnaphthalene	ND		0.0048	0.00025	mg/Kg		11/06/17 09:22	11/20/17 19:05	1
2-Methylnaphthalene	ND		0.0048	0.00030	mg/Kg		11/06/17 09:22	11/20/17 19:05	1
Naphthalene	ND		0.0048	0.00031	mg/Kg		11/06/17 09:22	11/20/17 19:05	1
Phenanthrene	ND		0.0048	0.0011	mg/Kg		11/06/17 09:22	11/20/17 19:05	1
Pyrene	ND		0.0048	0.0011	mg/Kg		11/06/17 09:22	11/20/17 19:05	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl	67		39 - 120	11/06/17 09:22	11/20/17 19:05	1
Nitrobenzene-d5	85		42 - 120	11/06/17 09:22	11/20/17 19:05	1
Terphenyl-d14	68		35 - 124	11/06/17 09:22	11/20/17 19:05	1

Lab Sample ID: LCS 280-394080/2-A

Matrix: Solid

Analysis Batch: 395962

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 394080

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	0.0288	0.0169		mg/Kg		59	35 - 120
Acenaphthylene	0.0288	0.0172		mg/Kg		60	41 - 120

TestAmerica Denver

# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 280-394080/2-A

Matrix: Solid

Analysis Batch: 395962

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 394080

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Anthracene	0.0288	0.0210		mg/Kg		73	43 - 120
Benzo[a]anthracene	0.0288	0.0254		mg/Kg		88	36 - 120
Benzo[a]pyrene	0.0288	0.0283		mg/Kg		99	20 - 120
Benzo[b]fluoranthene	0.0288	0.0256		mg/Kg		89	37 - 120
Benzo[g,h,i]perylene	0.0288	0.0305		mg/Kg		106	20 - 123
Benzo[k]fluoranthene	0.0288	0.0276		mg/Kg		96	46 - 120
Chrysene	0.0288	0.0263		mg/Kg		92	34 - 120
Dibenz(a,h)anthracene	0.0288	0.0328		mg/Kg		114	20 - 120
Fluoranthene	0.0288	0.0224		mg/Kg		78	45 - 120
Fluorene	0.0288	0.0174		mg/Kg		61	44 - 120
Indeno[1,2,3-cd]pyrene	0.0288	0.0313		mg/Kg		109	20 - 127
Naphthalene	0.0288	0.0175		mg/Kg		61	44 - 120
Phenanthrene	0.0288	0.0179		mg/Kg		62	44 - 120
Pyrene	0.0288	0.0230		mg/Kg		80	43 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl	60		39 - 120
Nitrobenzene-d5	75		42 - 120
Terphenyl-d14	72		35 - 124

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Gasoline Range Organics)

Lab Sample ID: MB 280-394139/1-A

Matrix: Solid

Analysis Batch: 394239

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 394139

Print Date: 06/12/20									
Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	0.337	J	1.2	0.33	mg/Kg	-	11/06/17 11:50	11/06/17 21:16	1
Print Date: 06/12/20									
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	103		77 - 123				11/06/17 11:50	11/06/17 21:16	1

Lab Sample ID: LCS 280-394139/2-A

Matrix: Solid

Analysis Batch: 394239

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 394139

			Spike	LCS	LCS				
Analyte			Added	Result	Qualifier	Unit	D	%Rec	%Rec. Limits
GRO (C6-C10)			5.50	5.30		mg/Kg	-	96	85 - 153
Surrogate	LCS %Recovery	LCS Qualifier	Limits						
a.a.a-Trifluorotoluene	97		77 - 123						

TestAmerica Denver

# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Gasoline Range Organics) (Continued)

Lab Sample ID: LCSD 280-394139/3-A

Matrix: Solid

Analysis Batch: 394239

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 394139

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (C6-C10)	5.50	5.30		mg/Kg	-	96	85 - 153	0	30
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
a,a,a-Trifluorotoluene	98		77 - 123						

Lab Sample ID: MB 280-394265/1-A

Matrix: Solid

Analysis Batch: 394506

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 394265

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	0.498	J	1.2	0.33	mg/Kg	-	11/07/17 10:01	11/09/17 06:46	1
Surrogate	MB %Recovery	MB Qualifier	Limits						
a,a,a-Trifluorotoluene	99		77 - 123						

Lab Sample ID: LCS 280-394265/2-A

Matrix: Solid

Analysis Batch: 394338

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 394265

Report Date: 05/15/20							Report Date: 05/15/20				
Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C6-C10)			5.50	5.40		mg/Kg	-	98	85 - 153		
Surrogate	LCS %Recovery	LCS Qualifier	Limits								
a,a,a-Trifluorotoluene	93		77 - 123								

Lab Sample ID: LCSD 280-394265/3-A

Matrix: Solid

Analysis Batch: 394338

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 394265

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (C6-C10)	5.50	5.43		mg/Kg	-	99	85 - 153	1	30
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
a,a,a-Trifluorotoluene	94		77 - 123						

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

Lab Sample ID: MB 280-394261/1-A

Matrix: Solid

Analysis Batch: 395812

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 394261

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	0.774	J	3.9	0.67	mg/Kg	-	11/07/17 10:18	11/19/17 17:04	1

TestAmerica Denver

# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics) (Continued)

Lab Sample ID: MB 280-394261/1-A

Matrix: Solid

Analysis Batch: 395812

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 394261

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	79		49 - 115	11/07/17 10:18	11/19/17 17:04	1

Lab Sample ID: LCS 280-394261/2-A

Matrix: Solid

Analysis Batch: 395812

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 394261

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Diesel Range Organics [C10-C28]	63.9	47.7		mg/Kg		75	53 - 115
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
o-Terphenyl (Surr)	93		49 - 115				

Lab Sample ID: 280-102984-3 MS

Matrix: Solid

Analysis Batch: 395812

Client Sample ID: SB-10-6'

Prep Type: Total/NA

Prep Batch: 394261

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Diesel Range Organics [C10-C28]	61	J F1 F2 B	73.5	169	F1	mg/Kg	☼	147	56 - 115
Surrogate	MS %Recovery	MS Qualifier	Limits						
o-Terphenyl (Surr)	117	D X	49 - 115						

Lab Sample ID: 280-102984-3 MSD

Matrix: Solid

Analysis Batch: 395812

Client Sample ID: SB-10-6'

Prep Type: Total/NA

Prep Batch: 394261

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD Limit
Diesel Range Organics [C10-C28]	61	J F1 F2 B	76.5	247	F1 F2	mg/Kg	☼	244	56 - 115	38 23
Surrogate	MSD %Recovery	MSD Qualifier	Limits							
o-Terphenyl (Surr)	110	D	49 - 115							

## Method: 20B - Sodium Adsorption Ratio

Lab Sample ID: MB 280-393633/1-A

Matrix: Solid

Analysis Batch: 394627

Client Sample ID: Method Blank

Prep Type: Soluble

Prep Batch: 393633

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium Adsorption Ratio	ND		1.2	1.2	No Unit		11/06/17 18:30	11/08/17 09:27	10

TestAmerica Denver

# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 20B - Sodium Adsorption Ratio (Continued)

Lab Sample ID: 280-102984-9 DU  
Matrix: Solid  
Analysis Batch: 394627

Client Sample ID: SB-15-2'  
Prep Type: Soluble  
Prep Batch: 393633

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Sodium Adsorption Ratio	9.4		10.4		No Unit		9	20

## Method: 6010C - Metals (ICP)

Lab Sample ID: MB 280-393637/1-A  
Matrix: Solid  
Analysis Batch: 394031

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 393637

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		1.0	0.10	mg/Kg		11/03/17 07:25	11/03/17 21:30	1
Boron	ND		10	0.98	mg/Kg		11/03/17 07:25	11/03/17 21:30	1
Cadmium	ND		0.50	0.041	mg/Kg		11/03/17 07:25	11/03/17 21:30	1
Chromium	ND		1.5	0.058	mg/Kg		11/03/17 07:25	11/03/17 21:30	1
Copper	ND		2.0	0.22	mg/Kg		11/03/17 07:25	11/03/17 21:30	1
Lead	ND		0.90	0.31	mg/Kg		11/03/17 07:25	11/03/17 21:30	1
Nickel	ND		4.0	0.13	mg/Kg		11/03/17 07:25	11/03/17 21:30	1
Selenium	ND		1.5	0.86	mg/Kg		11/03/17 07:25	11/03/17 21:30	1
Silver	ND		1.0	0.16	mg/Kg		11/03/17 07:25	11/03/17 21:30	1
Zinc	ND		3.0	0.40	mg/Kg		11/03/17 07:25	11/03/17 21:30	1

Lab Sample ID: LCS 280-393637/2-A  
Matrix: Solid  
Analysis Batch: 394031

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 393637

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	200	186		mg/Kg		93	87 - 112
Boron	100	91.3		mg/Kg		91	80 - 120
Cadmium	10.0	9.42		mg/Kg		94	87 - 110
Chromium	20.0	18.6		mg/Kg		93	84 - 114
Copper	25.0	23.2		mg/Kg		93	88 - 110
Lead	50.0	47.2		mg/Kg		94	86 - 110
Nickel	50.0	46.4		mg/Kg		93	87 - 110
Selenium	200	178		mg/Kg		89	83 - 110
Silver	5.00	4.72		mg/Kg		94	87 - 114
Zinc	50.0	45.6		mg/Kg		91	76 - 114

## Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 280-393640/1-A  
Matrix: Solid  
Analysis Batch: 394114

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 393640

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.60	0.051	mg/Kg		11/03/17 07:25	11/03/17 14:27	1

TestAmerica Denver



# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 280-393640/2-A  
Matrix: Solid  
Analysis Batch: 394114

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 393640

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	20.0	17.8		mg/Kg		89	83 - 111

## Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 280-393594/1-A  
Matrix: Solid  
Analysis Batch: 394083

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 393594

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.017	0.0055	mg/Kg		11/03/17 12:28	11/03/17 17:10	1

Lab Sample ID: LCS 280-393594/2-A  
Matrix: Solid  
Analysis Batch: 394083

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 393594

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	0.333	0.354		mg/Kg		106	87 - 111

## Method: 29B\_EC - Conductivity, Electrical

Lab Sample ID: 280-102984-2 DU  
Matrix: Solid  
Analysis Batch: 473878

Client Sample ID: SB-09-8'  
Prep Type: Soluble  
Prep Batch: 472570

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Specific Conductance	12000		11600		umhos/cm		0.2	20
Saturation Percentage	1.0		1.00		%		0	20
Electrical Conductivity at Saturation	12000		11600		umhos/cm		0.2	20

Lab Sample ID: 280-102984-5 DU  
Matrix: Solid  
Analysis Batch: 473878

Client Sample ID: SB-12-2'  
Prep Type: Soluble  
Prep Batch: 472570

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Specific Conductance	2800		2790		umhos/cm		0.4	20
Saturation Percentage	1.0		1.00		%		0	20
Electrical Conductivity at Saturation	2800		2790		umhos/cm		0.4	20

## Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 490-474593/1-A  
Matrix: Solid  
Analysis Batch: 474655

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 474593

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		4.8	1.9	mg/Kg		11/08/17 18:10	11/09/17 14:23	1

TestAmerica Denver

# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Method: 7196A - Chromium, Hexavalent (Continued)

Lab Sample ID: LCS1 490-474593/3-A  
Matrix: Solid  
Analysis Batch: 474655

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 474593

Analyte	Spike Added	LCSI Result	LCSI Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium (hexavalent)	64.5	56.1		mg/Kg		87	80 - 120

Lab Sample ID: LCSS 490-474593/2-A  
Matrix: Solid  
Analysis Batch: 474655

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 474593

Analyte	Spike Added	LCSS Result	LCSS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium (hexavalent)	39.5	35.8		mg/Kg		91	80 - 120

## Method: 7196A - Chromium, Trivalent (Colorimetric)

Lab Sample ID: MB 280-394883/1  
Matrix: Solid  
Analysis Batch: 394883

Client Sample ID: Method Blank  
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, trivalent	ND		2.0	2.0	mg/Kg			11/10/17 14:07	1
Cr	ND		2.0	2.0	mg/Kg			11/10/17 14:07	1
Cr (VI)	ND		1.4	1.4	mg/Kg			11/10/17 14:07	1

## Method: 9045D - pH

Lab Sample ID: LCS 280-394238/1-A  
Matrix: Solid  
Analysis Batch: 394252

Client Sample ID: Lab Control Sample  
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	97 - 103

## Method: Moisture - Percent Moisture

Lab Sample ID: 280-102984-11 DU  
Matrix: Solid  
Analysis Batch: 393385

Client Sample ID: SB-16-4'  
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	14.3		13.7		%		4	20

TestAmerica Denver

# QC Association Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## GC/MS VOA

### Analysis Batch: 394010

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-1	SB-07-4'	Total/NA	Solid	8260B	394013
280-102984-3	SB-10-6'	Total/NA	Solid	8260B	394013
280-102984-4	SB-11-6'	Total/NA	Solid	8260B	394013
280-102984-5	SB-12-2'	Total/NA	Solid	8260B	394013
280-102984-6	SB-12-4'	Total/NA	Solid	8260B	394013
280-102984-7	SB-13-6'	Total/NA	Solid	8260B	394013
280-102984-8	SB-14-6'	Total/NA	Solid	8260B	394013
280-102984-9	SB-15-2'	Total/NA	Solid	8260B	394013
280-102984-10	SB-15-6'	Total/NA	Solid	8260B	394013
280-102984-11	SB-16-4'	Total/NA	Solid	8260B	394013
280-102984-13	DUP-01	Total/NA	Solid	8260B	394013
MB 280-394010/6	Method Blank	Total/NA	Solid	8260B	
LCS 280-394010/4	Lab Control Sample	Total/NA	Solid	8260B	
LCSD 280-394010/5	Lab Control Sample Dup	Total/NA	Solid	8260B	

### Prep Batch: 394013

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-1	SB-07-4'	Total/NA	Solid	5035	
280-102984-3	SB-10-6'	Total/NA	Solid	5035	
280-102984-4	SB-11-6'	Total/NA	Solid	5035	
280-102984-5	SB-12-2'	Total/NA	Solid	5035	
280-102984-6	SB-12-4'	Total/NA	Solid	5035	
280-102984-7	SB-13-6'	Total/NA	Solid	5035	
280-102984-8	SB-14-6'	Total/NA	Solid	5035	
280-102984-9	SB-15-2'	Total/NA	Solid	5035	
280-102984-10	SB-15-6'	Total/NA	Solid	5035	
280-102984-11	SB-16-4'	Total/NA	Solid	5035	
280-102984-13	DUP-01	Total/NA	Solid	5035	

### Analysis Batch: 394041

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Total/NA	Solid	8260B	394045
280-102984-12	SB-16-8'	Total/NA	Solid	8260B	394045
MB 280-394045/1-A	Method Blank	Total/NA	Solid	8260B	394045
LCS 280-394045/2-A	Lab Control Sample	Total/NA	Solid	8260B	394045
LCSD 280-394045/3-A	Lab Control Sample Dup	Total/NA	Solid	8260B	394045

### Prep Batch: 394045

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Total/NA	Solid	5035	
280-102984-12	SB-16-8'	Total/NA	Solid	5035	
MB 280-394045/1-A	Method Blank	Total/NA	Solid	5035	
LCS 280-394045/2-A	Lab Control Sample	Total/NA	Solid	5035	
LCSD 280-394045/3-A	Lab Control Sample Dup	Total/NA	Solid	5035	

## GC/MS Semi VOA

### Prep Batch: 394080

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Total/NA	Solid	3546	

TestAmerica Denver

# QC Association Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## GC/MS Semi VOA (Continued)

### Prep Batch: 394080 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-5	SB-12-2'	Total/NA	Solid	3546	
280-102984-9	SB-15-2'	Total/NA	Solid	3546	
MB 280-394080/1-A	Method Blank	Total/NA	Solid	3546	
LCS 280-394080/2-A	Lab Control Sample	Total/NA	Solid	3546	

### Analysis Batch: 395962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-5	SB-12-2'	Total/NA	Solid	8270D SIM	394080
280-102984-9	SB-15-2'	Total/NA	Solid	8270D SIM	394080
MB 280-394080/1-A	Method Blank	Total/NA	Solid	8270D SIM	394080
LCS 280-394080/2-A	Lab Control Sample	Total/NA	Solid	8270D SIM	394080

### Analysis Batch: 396137

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Total/NA	Solid	8270D SIM	394080

## GC VOA

### Prep Batch: 394139

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-1	SB-07-4'	Total/NA	Solid	5035	
280-102984-2	SB-09-8'	Total/NA	Solid	5035	
280-102984-3	SB-10-6'	Total/NA	Solid	5035	
280-102984-4	SB-11-6'	Total/NA	Solid	5035	
280-102984-5	SB-12-2'	Total/NA	Solid	5035	
280-102984-6	SB-12-4'	Total/NA	Solid	5035	
280-102984-7	SB-13-6'	Total/NA	Solid	5035	
280-102984-8	SB-14-6'	Total/NA	Solid	5035	
MB 280-394139/1-A	Method Blank	Total/NA	Solid	5035	
LCS 280-394139/2-A	Lab Control Sample	Total/NA	Solid	5035	
LCSD 280-394139/3-A	Lab Control Sample Dup	Total/NA	Solid	5035	

### Analysis Batch: 394239

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-1	SB-07-4'	Total/NA	Solid	8015C	394139
280-102984-2	SB-09-8'	Total/NA	Solid	8015C	394139
280-102984-3	SB-10-6'	Total/NA	Solid	8015C	394139
280-102984-4	SB-11-6'	Total/NA	Solid	8015C	394139
280-102984-5	SB-12-2'	Total/NA	Solid	8015C	394139
280-102984-7	SB-13-6'	Total/NA	Solid	8015C	394139
280-102984-8	SB-14-6'	Total/NA	Solid	8015C	394139
MB 280-394139/1-A	Method Blank	Total/NA	Solid	8015C	394139
LCS 280-394139/2-A	Lab Control Sample	Total/NA	Solid	8015C	394139
LCSD 280-394139/3-A	Lab Control Sample Dup	Total/NA	Solid	8015C	394139

### Prep Batch: 394265

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-9	SB-15-2'	Total/NA	Solid	5035	
280-102984-10	SB-15-6'	Total/NA	Solid	5035	
280-102984-11	SB-16-4'	Total/NA	Solid	5035	

TestAmerica Denver

# QC Association Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## GC VOA (Continued)

### Prep Batch: 394265 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-12	SB-16-8'	Total/NA	Solid	5035	
280-102984-13	DUP-01	Total/NA	Solid	5035	
MB 280-394265/1-A	Method Blank	Total/NA	Solid	5035	
LCS 280-394265/2-A	Lab Control Sample	Total/NA	Solid	5035	
LCSD 280-394265/3-A	Lab Control Sample Dup	Total/NA	Solid	5035	

### Analysis Batch: 394337

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-6	SB-12-4'	Total/NA	Solid	8015C	394139

### Analysis Batch: 394338

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-9	SB-15-2'	Total/NA	Solid	8015C	394265
280-102984-10	SB-15-6'	Total/NA	Solid	8015C	394265
280-102984-11	SB-16-4'	Total/NA	Solid	8015C	394265
280-102984-13	DUP-01	Total/NA	Solid	8015C	394265
LCS 280-394265/2-A	Lab Control Sample	Total/NA	Solid	8015C	394265
LCSD 280-394265/3-A	Lab Control Sample Dup	Total/NA	Solid	8015C	394265

### Analysis Batch: 394506

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 280-394265/1-A	Method Blank	Total/NA	Solid	8015C	394265

### Analysis Batch: 394734

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-12	SB-16-8'	Total/NA	Solid	8015C	394265

## GC Semi VOA

### Prep Batch: 394261

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-1	SB-07-4'	Total/NA	Solid	3546	
280-102984-2	SB-09-8'	Total/NA	Solid	3546	
280-102984-3	SB-10-6'	Total/NA	Solid	3546	
280-102984-4	SB-11-6'	Total/NA	Solid	3546	
280-102984-5	SB-12-2'	Total/NA	Solid	3546	
280-102984-6	SB-12-4'	Total/NA	Solid	3546	
280-102984-7	SB-13-6'	Total/NA	Solid	3546	
280-102984-8	SB-14-6'	Total/NA	Solid	3546	
280-102984-9	SB-15-2'	Total/NA	Solid	3546	
280-102984-10	SB-15-6'	Total/NA	Solid	3546	
280-102984-11	SB-16-4'	Total/NA	Solid	3546	
280-102984-12	SB-16-8'	Total/NA	Solid	3546	
280-102984-13	DUP-01	Total/NA	Solid	3546	
MB 280-394261/1-A	Method Blank	Total/NA	Solid	3546	
LCS 280-394261/2-A	Lab Control Sample	Total/NA	Solid	3546	
280-102984-3 MS	SB-10-6'	Total/NA	Solid	3546	
280-102984-3 MSD	SB-10-6'	Total/NA	Solid	3546	

TestAmerica Denver

# QC Association Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## GC Semi VOA (Continued)

### Analysis Batch: 395812

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-1	SB-07-4'	Total/NA	Solid	8015C	394261
280-102984-2	SB-09-8'	Total/NA	Solid	8015C	394261
280-102984-3	SB-10-6'	Total/NA	Solid	8015C	394261
280-102984-4	SB-11-6'	Total/NA	Solid	8015C	394261
280-102984-5	SB-12-2'	Total/NA	Solid	8015C	394261
280-102984-6	SB-12-4'	Total/NA	Solid	8015C	394261
280-102984-7	SB-13-6'	Total/NA	Solid	8015C	394261
280-102984-8	SB-14-6'	Total/NA	Solid	8015C	394261
280-102984-9	SB-15-2'	Total/NA	Solid	8015C	394261
280-102984-10	SB-15-6'	Total/NA	Solid	8015C	394261
280-102984-11	SB-16-4'	Total/NA	Solid	8015C	394261
280-102984-12	SB-16-8'	Total/NA	Solid	8015C	394261
280-102984-13	DUP-01	Total/NA	Solid	8015C	394261
MB 280-394261/1-A	Method Blank	Total/NA	Solid	8015C	394261
LCS 280-394261/2-A	Lab Control Sample	Total/NA	Solid	8015C	394261
280-102984-3 MS	SB-10-6'	Total/NA	Solid	8015C	394261
280-102984-3 MSD	SB-10-6'	Total/NA	Solid	8015C	394261

## Metals

### Prep Batch: 393594

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Total/NA	Solid	7471B	
280-102984-5	SB-12-2'	Total/NA	Solid	7471B	
280-102984-9	SB-15-2'	Total/NA	Solid	7471B	
MB 280-393594/1-A	Method Blank	Total/NA	Solid	7471B	
LCS 280-393594/2-A	Lab Control Sample	Total/NA	Solid	7471B	

### Prep Batch: 393633

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Soluble	Solid	20B	
280-102984-5	SB-12-2'	Soluble	Solid	20B	
280-102984-9	SB-15-2'	Soluble	Solid	20B	
MB 280-393633/1-A	Method Blank	Soluble	Solid	20B	
280-102984-9 DU	SB-15-2'	Soluble	Solid	20B	

### Prep Batch: 393637

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Total/NA	Solid	3050B	
280-102984-5	SB-12-2'	Total/NA	Solid	3050B	
280-102984-9	SB-15-2'	Total/NA	Solid	3050B	
MB 280-393637/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 280-393637/2-A	Lab Control Sample	Total/NA	Solid	3050B	

### Prep Batch: 393640

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Total/NA	Solid	3050B	
280-102984-5	SB-12-2'	Total/NA	Solid	3050B	
280-102984-9	SB-15-2'	Total/NA	Solid	3050B	
MB 280-393640/1-A	Method Blank	Total/NA	Solid	3050B	

TestAmerica Denver



# QC Association Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Metals (Continued)

### Prep Batch: 393640 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 280-393640/2-A	Lab Control Sample	Total/NA	Solid	3050B	

### Analysis Batch: 394031

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Total/NA	Solid	6010C	393637
280-102984-5	SB-12-2'	Total/NA	Solid	6010C	393637
280-102984-9	SB-15-2'	Total/NA	Solid	6010C	393637
MB 280-393637/1-A	Method Blank	Total/NA	Solid	6010C	393637
LCS 280-393637/2-A	Lab Control Sample	Total/NA	Solid	6010C	393637

### Analysis Batch: 394083

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Total/NA	Solid	7471B	393594
280-102984-5	SB-12-2'	Total/NA	Solid	7471B	393594
280-102984-9	SB-15-2'	Total/NA	Solid	7471B	393594
MB 280-393594/1-A	Method Blank	Total/NA	Solid	7471B	393594
LCS 280-393594/2-A	Lab Control Sample	Total/NA	Solid	7471B	393594

### Analysis Batch: 394114

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Total/NA	Solid	6020A	393640
280-102984-5	SB-12-2'	Total/NA	Solid	6020A	393640
280-102984-9	SB-15-2'	Total/NA	Solid	6020A	393640
MB 280-393640/1-A	Method Blank	Total/NA	Solid	6020A	393640
LCS 280-393640/2-A	Lab Control Sample	Total/NA	Solid	6020A	393640

### Analysis Batch: 394627

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Soluble	Solid	20B	393633
280-102984-5	SB-12-2'	Soluble	Solid	20B	393633
280-102984-9	SB-15-2'	Soluble	Solid	20B	393633
MB 280-393633/1-A	Method Blank	Soluble	Solid	20B	393633
280-102984-9 DU	SB-15-2'	Soluble	Solid	20B	393633

## General Chemistry

### Analysis Batch: 393385

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-1	SB-07-4'	Total/NA	Solid	Moisture	
280-102984-2	SB-09-8'	Total/NA	Solid	Moisture	
280-102984-3	SB-10-6'	Total/NA	Solid	Moisture	
280-102984-4	SB-11-6'	Total/NA	Solid	Moisture	
280-102984-5	SB-12-2'	Total/NA	Solid	Moisture	
280-102984-6	SB-12-4'	Total/NA	Solid	Moisture	
280-102984-7	SB-13-6'	Total/NA	Solid	Moisture	
280-102984-8	SB-14-6'	Total/NA	Solid	Moisture	
280-102984-9	SB-15-2'	Total/NA	Solid	Moisture	
280-102984-10	SB-15-6'	Total/NA	Solid	Moisture	
280-102984-11	SB-16-4'	Total/NA	Solid	Moisture	
280-102984-12	SB-16-8'	Total/NA	Solid	Moisture	

TestAmerica Denver

# QC Association Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## General Chemistry (Continued)

### Analysis Batch: 393385 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-13	DUP-01	Total/NA	Solid	Moisture	
280-102984-11 DU	SB-16-4'	Total/NA	Solid	Moisture	

### Leach Batch: 394238

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Soluble	Solid	DI Leach	
280-102984-5	SB-12-2'	Soluble	Solid	DI Leach	
280-102984-9	SB-15-2'	Soluble	Solid	DI Leach	
LCS 280-394238/1-A	Lab Control Sample	Soluble	Solid	DI Leach	

### Analysis Batch: 394252

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Soluble	Solid	9045D	394238
280-102984-5	SB-12-2'	Soluble	Solid	9045D	394238
280-102984-9	SB-15-2'	Soluble	Solid	9045D	394238
LCS 280-394238/1-A	Lab Control Sample	Soluble	Solid	9045D	394238

### Analysis Batch: 394883

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Total/NA	Solid	7196A	
280-102984-5	SB-12-2'	Total/NA	Solid	7196A	
280-102984-9	SB-15-2'	Total/NA	Solid	7196A	
MB 280-394883/1	Method Blank	Total/NA	Solid	7196A	

### Prep Batch: 472570

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Soluble	Solid	Sat Paste Ext	
280-102984-5	SB-12-2'	Soluble	Solid	Sat Paste Ext	
280-102984-9	SB-15-2'	Soluble	Solid	Sat Paste Ext	
280-102984-2 DU	SB-09-8'	Soluble	Solid	Sat Paste Ext	
280-102984-5 DU	SB-12-2'	Soluble	Solid	Sat Paste Ext	

### Analysis Batch: 473878

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Soluble	Solid	29B_EC	472570
280-102984-5	SB-12-2'	Soluble	Solid	29B_EC	472570
280-102984-9	SB-15-2'	Soluble	Solid	29B_EC	472570
LCS 490-473878/3	Lab Control Sample	Total/NA	Solid	29B_EC	
LCSD 490-473878/4	Lab Control Sample Dup	Total/NA	Solid	29B_EC	
280-102984-2 DU	SB-09-8'	Soluble	Solid	29B_EC	472570
280-102984-5 DU	SB-12-2'	Soluble	Solid	29B_EC	472570

### Prep Batch: 474593

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Total/NA	Solid	3060A	
280-102984-5	SB-12-2'	Total/NA	Solid	3060A	
280-102984-9	SB-15-2'	Total/NA	Solid	3060A	
MB 490-474593/1-A	Method Blank	Total/NA	Solid	3060A	
LCSI 490-474593/3-A	Lab Control Sample	Total/NA	Solid	3060A	
LCSS 490-474593/2-A	Lab Control Sample	Total/NA	Solid	3060A	

TestAmerica Denver

## QC Association Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

### General Chemistry (Continued)

#### Analysis Batch: 474655

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-102984-2	SB-09-8'	Total/NA	Solid	7196A	474593
280-102984-5	SB-12-2'	Total/NA	Solid	7196A	474593
280-102984-9	SB-15-2'	Total/NA	Solid	7196A	474593
MB 490-474593/1-A	Method Blank	Total/NA	Solid	7196A	474593
LCSI 490-474593/3-A	Lab Control Sample	Total/NA	Solid	7196A	474593
LCSS 490-474593/2-A	Lab Control Sample	Total/NA	Solid	7196A	474593

# Lab Chronicle

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

**Client Sample ID: SB-07-4'**

**Date Collected: 10/28/17 10:00**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-1**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			393385	10/31/17 10:18	PAH	TAL DEN

**Client Sample ID: SB-07-4'**

**Date Collected: 10/28/17 10:00**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-1**

**Matrix: Solid**

**Percent Solids: 83.9**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			5.659 g	5 mL	394013	10/28/17 10:00	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	394010	11/03/17 21:43	RSN	TAL DEN
Total/NA	Prep	5035			4.894 g	5 mL	394139	10/28/17 10:00	KDK	TAL DEN
Total/NA	Analysis	8015C		1	0.1 mL	5 mL	394239	11/07/17 03:47	KDK	TAL DEN
Total/NA	Prep	3546			30.2 g	1 mL	394261	11/07/17 10:18	TEB	TAL DEN
Total/NA	Analysis	8015C		1			395812	11/19/17 17:53	AFB	TAL DEN

**Client Sample ID: SB-09-8'**

**Date Collected: 10/28/17 11:30**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-2**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Prep	20B			101.924 g	50 mL	393633	11/06/17 18:30	MLS	TAL DEN
Soluble	Analysis	20B		10			394627	11/08/17 10:06	SJS	TAL DEN
Soluble	Prep	Sat Paste Ext			1 g	1 mL	472570	11/02/17 16:22	BAA	TAL NSH
Soluble	Analysis	29B_EC		1			473878	11/03/17 11:00	JAB	TAL NSH
Total/NA	Analysis	7196A		1			394883	11/10/17 14:07	DEG	TAL DEN
Soluble	Leach	DI Leach			40.16 g	40 mL	394238	11/07/17 07:32	JAP	TAL DEN
Soluble	Analysis	9045D		1			394252	11/07/17 08:54	JAP	TAL DEN
Total/NA	Analysis	Moisture		1			393385	10/31/17 10:18	PAH	TAL DEN

**Client Sample ID: SB-09-8'**

**Date Collected: 10/28/17 11:30**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-2**

**Matrix: Solid**

**Percent Solids: 74.7**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			5.927 g	1000 mL	394045	10/28/17 11:30	JLS	TAL DEN
Total/NA	Analysis	8260B		1	20 mL	20 mL	394041	11/04/17 18:58	JLS	TAL DEN
Total/NA	Prep	3546			30.8 g	1 mL	394080	11/06/17 09:22	TEB	TAL DEN
Total/NA	Analysis	8270D SIM		20			396137	11/22/17 00:59	MKW	TAL DEN
Total/NA	Prep	5035			3.187 g	5 mL	394139	10/28/17 11:30	KDK	TAL DEN
Total/NA	Analysis	8015C		20	0.1 mL	5 mL	394239	11/07/17 04:11	KDK	TAL DEN
Total/NA	Prep	3546			30.5 g	1 mL	394261	11/07/17 10:18	TEB	TAL DEN
Total/NA	Analysis	8015C		20			395812	11/19/17 18:17	AFB	TAL DEN
Total/NA	Prep	3050B			1.135 g	100 mL	393637	11/03/17 07:25	TEB	TAL DEN
Total/NA	Analysis	6010C		1			394031	11/03/17 22:41	CRR	TAL DEN

TestAmerica Denver

# Lab Chronicle

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.015 g	100 mL	393640	11/03/17 07:25	TEB	TAL DEN
Total/NA	Analysis	6020A		1			394114	11/03/17 15:05	LMT	TAL DEN
Total/NA	Prep	7471B			0.58 g	50 mL	393594	11/03/17 12:28	CDH	TAL DEN
Total/NA	Analysis	7471B		1			394083	11/03/17 17:57	CDH	TAL DEN
Total/NA	Prep	3060A			2.5272 g	500 mL	474593	11/08/17 18:10	BMC	TAL NSH
Total/NA	Analysis	7196A		1	50 mL	50 mL	474655	11/09/17 14:23	BMC	TAL NSH

**Client Sample ID: SB-10-6'**

**Date Collected: 10/28/17 12:00**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-3**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			393385	10/31/17 10:18	PAH	TAL DEN

**Client Sample ID: SB-10-6'**

**Date Collected: 10/28/17 12:00**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-3**

**Matrix: Solid**

**Percent Solids: 86.9**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			5.544 g	5 mL	394013	10/28/17 12:00	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	394010	11/03/17 22:25	RSN	TAL DEN
Total/NA	Prep	5035			5.147 g	5 mL	394139	10/28/17 12:00	KDK	TAL DEN
Total/NA	Analysis	8015C		1	0.1 mL	5 mL	394239	11/07/17 04:35	KDK	TAL DEN
Total/NA	Prep	3546			30.3 g	1 mL	394261	11/07/17 10:18	TEB	TAL DEN
Total/NA	Analysis	8015C		20			395812	11/19/17 18:41	AFB	TAL DEN

**Client Sample ID: SB-11-6'**

**Date Collected: 10/28/17 12:45**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-4**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			393385	10/31/17 10:18	PAH	TAL DEN

**Client Sample ID: SB-11-6'**

**Date Collected: 10/28/17 12:45**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-4**

**Matrix: Solid**

**Percent Solids: 83.9**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			4.935 g	5 mL	394013	10/28/17 12:45	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	394010	11/03/17 22:46	RSN	TAL DEN
Total/NA	Prep	5035			5.254 g	5 mL	394139	10/28/17 12:46	KDK	TAL DEN
Total/NA	Analysis	8015C		1	0.1 mL	5 mL	394239	11/07/17 05:00	KDK	TAL DEN
Total/NA	Prep	3546			30.4 g	1 mL	394261	11/07/17 10:18	TEB	TAL DEN
Total/NA	Analysis	8015C		20			395812	11/19/17 19:54	AFB	TAL DEN

TestAmerica Denver

# Lab Chronicle

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

**Client Sample ID: SB-12-2'**

**Date Collected: 10/28/17 13:00**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-5**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Prep	20B			100.196 g	50 mL	393633	11/06/17 18:30	MLS	TAL DEN
Soluble	Analysis	20B		10			394627	11/08/17 10:09	SJS	TAL DEN
Soluble	Prep	Sat Paste Ext			1 g	1 mL	472570	11/02/17 16:22	BAA	TAL NSH
Soluble	Analysis	29B_EC		1			473878	11/03/17 11:00	JAB	TAL NSH
Total/NA	Analysis	7196A		1			394883	11/10/17 14:07	DEG	TAL DEN
Soluble	Leach	DI Leach			40.46 g	40 mL	394238	11/07/17 07:32	JAP	TAL DEN
Soluble	Analysis	9045D		1			394252	11/07/17 08:54	JAP	TAL DEN
Total/NA	Analysis	Moisture		1			393385	10/31/17 10:18	PAH	TAL DEN

**Client Sample ID: SB-12-2'**

**Date Collected: 10/28/17 13:00**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-5**

**Matrix: Solid**

**Percent Solids: 90.1**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			6.167 g	5 mL	394013	10/28/17 13:00	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	394010	11/03/17 23:06	RSN	TAL DEN
Total/NA	Prep	3546			31.0 g	10 mL	394080	11/06/17 09:22	TEB	TAL DEN
Total/NA	Analysis	8270D SIM		1			395962	11/21/17 04:06	MKW	TAL DEN
Total/NA	Prep	5035			5.07 g	5 mL	394139	10/28/17 13:00	KDK	TAL DEN
Total/NA	Analysis	8015C		1	0.1 mL	5 mL	394239	11/07/17 05:24	KDK	TAL DEN
Total/NA	Prep	3546			30.6 g	10 mL	394261	11/07/17 10:18	TEB	TAL DEN
Total/NA	Analysis	8015C		20			395812	11/19/17 20:43	AFB	TAL DEN
Total/NA	Prep	3050B			1.137 g	100 mL	393637	11/03/17 07:25	TEB	TAL DEN
Total/NA	Analysis	6010C		1			394031	11/03/17 22:43	CRR	TAL DEN
Total/NA	Prep	3050B			1.144 g	100 mL	393640	11/03/17 07:25	TEB	TAL DEN
Total/NA	Analysis	6020A		1			394114	11/03/17 15:09	LMT	TAL DEN
Total/NA	Prep	7471B			0.55 g	50 mL	393594	11/03/17 12:28	CDH	TAL DEN
Total/NA	Analysis	7471B		1			394083	11/03/17 17:59	CDH	TAL DEN
Total/NA	Prep	3060A			2.5092 g	500 mL	474593	11/08/17 18:10	BMC	TAL NSH
Total/NA	Analysis	7196A		1	50 mL	50 mL	474655	11/09/17 14:23	BMC	TAL NSH

**Client Sample ID: SB-12-4'**

**Date Collected: 10/28/17 13:15**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-6**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			393385	10/31/17 10:18	PAH	TAL DEN

TestAmerica Denver



# Lab Chronicle

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

**Client Sample ID: SB-12-4'**

**Date Collected: 10/28/17 13:15**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-6**

**Matrix: Solid**

**Percent Solids: 82.5**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			5.732 g	5 mL	394013	10/28/17 13:15	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	394010	11/03/17 23:27	RSN	TAL DEN
Total/NA	Prep	5035			4.888 g	5 mL	394139	10/28/17 13:15	KDK	TAL DEN
Total/NA	Analysis	8015C		1	0.1 mL	5 mL	394337	11/07/17 17:50	KDK	TAL DEN
Total/NA	Prep	3546			31.5 g	1 mL	394261	11/07/17 10:18	TEB	TAL DEN
Total/NA	Analysis	8015C		20			395812	11/19/17 21:07	AFB	TAL DEN

**Client Sample ID: SB-13-6'**

**Date Collected: 10/28/17 13:30**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-7**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			393385	10/31/17 12:02	PAH	TAL DEN

**Client Sample ID: SB-13-6'**

**Date Collected: 10/28/17 13:30**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-7**

**Matrix: Solid**

**Percent Solids: 80.4**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			6.111 g	5 mL	394013	10/28/17 13:30	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	394010	11/03/17 23:48	RSN	TAL DEN
Total/NA	Prep	5035			5.468 g	5 mL	394139	10/28/17 13:30	KDK	TAL DEN
Total/NA	Analysis	8015C		1	0.1 mL	5 mL	394239	11/07/17 06:12	KDK	TAL DEN
Total/NA	Prep	3546			30.5 g	1 mL	394261	11/07/17 10:18	TEB	TAL DEN
Total/NA	Analysis	8015C		20			395812	11/19/17 21:31	AFB	TAL DEN

**Client Sample ID: SB-14-6'**

**Date Collected: 10/28/17 13:45**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-8**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			393385	10/31/17 12:02	PAH	TAL DEN

**Client Sample ID: SB-14-6'**

**Date Collected: 10/28/17 13:45**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-8**

**Matrix: Solid**

**Percent Solids: 82.1**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			5.96 g	5 mL	394013	10/28/17 13:45	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	394010	11/04/17 00:09	RSN	TAL DEN
Total/NA	Prep	5035			5.487 g	5 mL	394139	10/28/17 13:45	KDK	TAL DEN
Total/NA	Analysis	8015C		1	0.1 mL	5 mL	394239	11/07/17 06:37	KDK	TAL DEN
Total/NA	Prep	3546			30.3 g	1 mL	394261	11/07/17 10:18	TEB	TAL DEN

TestAmerica Denver

# Lab Chronicle

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

**Client Sample ID: SB-14-6'**

**Date Collected: 10/28/17 13:45**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-8**

**Matrix: Solid**

**Percent Solids: 82.1**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8015C		1			395812	11/19/17 21:56	AFB	TAL DEN

**Client Sample ID: SB-15-2'**

**Date Collected: 10/28/17 16:00**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-9**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Prep	20B			101.715 g	50 mL	393633	11/06/17 18:30	MLS	TAL DEN
Soluble	Analysis	20B		10			394627	11/08/17 10:11	SJS	TAL DEN
Soluble	Prep	Sat Paste Ext			1 g	1 mL	472570	11/02/17 16:22	BAA	TAL NSH
Soluble	Analysis	29B_EC		1			473878	11/03/17 11:00	JAB	TAL NSH
Total/NA	Analysis	7196A		1			394883	11/10/17 14:07	DEG	TAL DEN
Soluble	Leach	DI Leach			40.40 g	40 mL	394238	11/07/17 07:32	JAP	TAL DEN
Soluble	Analysis	9045D		1			394252	11/07/17 08:54	JAP	TAL DEN
Total/NA	Analysis	Moisture		1			393385	10/31/17 12:02	PAH	TAL DEN

**Client Sample ID: SB-15-2'**

**Date Collected: 10/28/17 16:00**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-9**

**Matrix: Solid**

**Percent Solids: 85.8**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			6.35 g	5 mL	394013	10/28/17 16:00	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	394010	11/04/17 00:30	RSN	TAL DEN
Total/NA	Prep	3546			30.9 g	1 mL	394080	11/06/17 09:22	TEB	TAL DEN
Total/NA	Analysis	8270D SIM		1			395962	11/21/17 04:31	MKW	TAL DEN
Total/NA	Prep	5035			5.76 g	5 mL	394265	10/28/17 16:00	KDK	TAL DEN
Total/NA	Analysis	8015C		1	0.1 mL	5 mL	394338	11/07/17 21:05	KDK	TAL DEN
Total/NA	Prep	3546			30.6 g	1 mL	394261	11/07/17 10:18	TEB	TAL DEN
Total/NA	Analysis	8015C		20			395812	11/19/17 22:20	AFB	TAL DEN
Total/NA	Prep	3050B			1.183 g	100 mL	393637	11/03/17 07:25	TEB	TAL DEN
Total/NA	Analysis	6010C		1			394031	11/03/17 22:46	CRR	TAL DEN
Total/NA	Prep	3050B			1.126 g	100 mL	393640	11/03/17 07:25	TEB	TAL DEN
Total/NA	Analysis	6020A		1			394114	11/03/17 15:13	LMT	TAL DEN
Total/NA	Prep	7471B			0.57 g	50 mL	393594	11/03/17 12:28	CDH	TAL DEN
Total/NA	Analysis	7471B		1			394083	11/03/17 18:02	CDH	TAL DEN
Total/NA	Prep	3060A			2.5461 g	500 mL	474593	11/08/17 18:10	BMC	TAL NSH
Total/NA	Analysis	7196A		1	50 mL	50 mL	474655	11/09/17 14:23	BMC	TAL NSH

TestAmerica Denver

# Lab Chronicle

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

**Client Sample ID: SB-15-6'**

**Date Collected: 10/28/17 16:15**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-10**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			393385	10/31/17 12:02	PAH	TAL DEN

**Client Sample ID: SB-15-6'**

**Date Collected: 10/28/17 16:15**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-10**

**Matrix: Solid**

**Percent Solids: 84.7**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			5.459 g	5 mL	394013	10/28/17 16:15	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	394010	11/04/17 00:51	RSN	TAL DEN
Total/NA	Prep	5035			4.891 g	5 mL	394265	10/28/17 16:15	KDK	TAL DEN
Total/NA	Analysis	8015C		1	0.1 mL	5 mL	394338	11/07/17 21:29	KDK	TAL DEN
Total/NA	Prep	3546			30.1 g	1 mL	394261	11/07/17 10:18	TEB	TAL DEN
Total/NA	Analysis	8015C		20			395812	11/19/17 22:44	AFB	TAL DEN

**Client Sample ID: SB-16-4'**

**Date Collected: 10/28/17 16:30**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-11**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			393385	10/31/17 12:02	PAH	TAL DEN

**Client Sample ID: SB-16-4'**

**Date Collected: 10/28/17 16:30**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-11**

**Matrix: Solid**

**Percent Solids: 85.7**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			6.502 g	5 mL	394013	10/28/17 16:30	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	394010	11/04/17 01:12	RSN	TAL DEN
Total/NA	Prep	5035			5.844 g	5 mL	394265	10/28/17 16:30	KDK	TAL DEN
Total/NA	Analysis	8015C		1	0.1 mL	5 mL	394338	11/07/17 21:53	KDK	TAL DEN
Total/NA	Prep	3546			30.7 g	1 mL	394261	11/07/17 10:18	TEB	TAL DEN
Total/NA	Analysis	8015C		1			395812	11/19/17 23:08	AFB	TAL DEN

**Client Sample ID: SB-16-8'**

**Date Collected: 10/28/17 17:00**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-12**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			393385	10/31/17 12:02	PAH	TAL DEN

TestAmerica Denver

# Lab Chronicle

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

**Client Sample ID: SB-16-8'**

**Date Collected: 10/28/17 17:00**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-12**

**Matrix: Solid**

**Percent Solids: 93.5**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			5.248 g	1000 mL	394045	10/28/17 17:00	JLS	TAL DEN
Total/NA	Analysis	8260B		10	20 mL	20 mL	394041	11/04/17 21:33	JLS	TAL DEN
Total/NA	Prep	5035			5.031 g	5 mL	394265	10/28/17 17:00	KDK	TAL DEN
Total/NA	Analysis	8015C		5	0.1 mL	5 mL	394734	11/10/17 03:44	KDK	TAL DEN
Total/NA	Prep	3546			31.3 g	2 mL	394261	11/07/17 10:18	TEB	TAL DEN
Total/NA	Analysis	8015C		20			395812	11/19/17 23:32	AFB	TAL DEN

**Client Sample ID: DUP-01**

**Date Collected: 10/28/17 00:00**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-13**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			393385	10/31/17 12:02	PAH	TAL DEN

**Client Sample ID: DUP-01**

**Date Collected: 10/28/17 00:00**

**Date Received: 10/30/17 12:15**

**Lab Sample ID: 280-102984-13**

**Matrix: Solid**

**Percent Solids: 85.1**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			6.163 g	5 mL	394013	10/28/17 00:00	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	394010	11/04/17 01:53	RSN	TAL DEN
Total/NA	Prep	5035			6.104 g	5 mL	394265	10/28/17 00:00	KDK	TAL DEN
Total/NA	Analysis	8015C		1	0.1 mL	5 mL	394338	11/07/17 22:41	KDK	TAL DEN
Total/NA	Prep	3546			31.3 g	10 mL	394261	11/07/17 10:18	TEB	TAL DEN
Total/NA	Analysis	8015C		20			395812	11/19/17 23:56	AFB	TAL DEN

## Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

# Accreditation/Certification Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Laboratory: TestAmerica Denver

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19 *
A2LA	ISO/IEC 17025		2907.01	10-31-19
Alabama	State Program	4	40730	09-30-12 *
Alaska (UST)	State Program	10	UST-30	04-05-18
Arizona	State Program	9	AZ0713	12-20-18
Arkansas DEQ	State Program	6	88-0687	06-01-18
California	State Program	9	2513	01-08-18 *
Connecticut	State Program	1	PH-0686	09-30-18
Florida	NELAP	4	E87667	06-30-18
Georgia	State Program	4	N/A	01-08-18
Illinois	NELAP	5	200017	04-30-18
Iowa	State Program	7	370	12-01-18
Kansas	NELAP	7	E-10166	04-30-18
Louisiana	NELAP	6	02096	06-30-18
Maine	State Program	1	CO0002	03-03-19
Minnesota	NELAP	5	8-999-405	12-31-17 *
Nevada	State Program	9	CO0026	07-31-18
New Hampshire	NELAP	1	205310	04-28-18
New Jersey	NELAP	2	CO004	06-30-18
New York	NELAP	2	11964	04-01-18
North Carolina (WW/SW)	State Program	4	358	12-31-18
North Dakota	State Program	8	R-034	01-09-18
Oklahoma	State Program	6	8614	08-31-18
Oregon	NELAP	10	4025	01-08-19
Pennsylvania	NELAP	3	68-00664	07-31-18
South Carolina	State Program	4	72002001	01-08-18
Texas	NELAP	6	T104704183-17-14	09-30-18
USDA	Federal		P330-16-00397	12-15-19
Utah	NELAP	8	CO00026	07-31-18
Virginia	NELAP	3	460232	06-14-18
Washington	State Program	10	C583	08-03-18
West Virginia DEP	State Program	3	354	12-31-17 *
Wisconsin	State Program	5	999615430	08-31-18
Wyoming (UST)	A2LA	8	2907.01	10-31-19

## Laboratory: TestAmerica Nashville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	A2LA		NA: NELAP & A2LA	12-31-19
A2LA	ISO/IEC 17025		0453.07	12-31-19
Alaska (UST)	State Program	10	UST-087	01-01-18 *
Arizona	State Program	9	AZ0473	05-05-18
Arkansas DEQ	State Program	6	88-0737	04-25-18
California	State Program	9	2938	10-31-18
Connecticut	State Program	1	PH-0220	12-31-19
Florida	NELAP	4	E87358	06-30-18
Georgia	State Program	4	E87358(FL)/453.07(A2LA)	06-30-18
Illinois	NELAP	5	200010	12-09-18
Iowa	State Program	7	131	04-01-18

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Denver

# Accreditation/Certification Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-102984-1

## Laboratory: TestAmerica Nashville (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Kansas	NELAP	7	E-10229	12-31-17 *
Kentucky (UST)	State Program	4	19	06-30-18
Kentucky (WW)	State Program	4	90038	12-31-18
Louisiana	NELAP	6	30613	06-30-18
Maine	State Program	1	TN00032	11-03-19
Maryland	State Program	3	316	03-31-18
Massachusetts	State Program	1	M-TN032	06-30-18
Minnesota	NELAP	5	047-999-345	12-31-18
Mississippi	State Program	4	N/A	06-30-18
Montana (UST)	State Program	8	NA	02-24-20
Nevada	State Program	9	TN00032	07-31-18
New Hampshire	NELAP	1	2963	10-09-18
New Jersey	NELAP	2	TN965	06-30-18
New York	NELAP	2	11342	03-31-18
North Carolina (WW/SW)	State Program	4	387	12-31-18
North Dakota	State Program	8	R-146	06-30-18
Ohio VAP	State Program	5	CL0033	07-06-19
Oklahoma	State Program	6	9412	08-31-18
Oregon	NELAP	10	TN200001	04-27-18
Pennsylvania	NELAP	3	68-00585	06-30-18
Rhode Island	State Program	1	LAO00268	12-30-17 *
South Carolina	State Program	4	84009 (001)	02-28-18
South Carolina (Do Not Use - DW)	State Program	4	84009 (002)	12-16-17
Tennessee	State Program	4	2008	02-23-20
Texas	NELAP	6	T104704077	08-31-18
USDA	Federal		P330-13-00306	12-01-19
Utah	NELAP	8	TN00032	07-31-18
Virginia	NELAP	3	460152	06-14-18
Washington	State Program	10	C789	07-19-18
West Virginia DEP	State Program	3	219	02-28-18
Wisconsin	State Program	5	998020430	08-31-18
Wyoming (UST)	A2LA	8	453.07	12-31-19

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Denver



# Chain of Custody Record

**Denver**  
4955 Yarrow Street  
Arvada, CO 80002  
phone 303.736.0100 fax 303.431.7171

TestAmerica Laboratories, Inc.

<b>Client Contact</b> Stanlec Consulting Corporation 2000 South Colorado Boulevard Suite 2-300 Denver, CO (517) 749-9405 Phone (xxx) xxx-xxxx FAX Project Name: Rangely Site: CS-47 P O #		<b>Project Manager: Brent Lucyk</b> Tel/Fax:		<b>Site Contact:</b> Lab Contact: <u>Janice Lee</u>		<b>Date:</b> Carrier:		COC No. <u>1</u> of <u>1</u> COCs Job No. _____ SDG No. _____			
<b>Analysis Turnaround Time</b> Calendar (C) or Work Days (W) <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day		<b>Sample Date</b>		<b>Sample Time</b>		<b>Sample Type</b>		<b>Matrix</b>		<b># of Cont.</b>	
TAT if different from Below		28-Oct		11:00		grab		soil		6	
28-Oct		11:30		grab		soil		10		6	
28-Oct		12:00		grab		soil		6		6	
28-Oct		12:45		grab		soil		6		6	
28-Oct		13:00		grab		soil		10		6	
28-Oct		13:15		grab		soil		6		6	
28-Oct		13:30		grab		soil		6		6	
28-Oct		13:45		grab		soil		6		6	
28-Oct		16:00		grab		soil		10		6	
28-Oct		16:15		grab		soil		6		6	
28-Oct		16:30		grab		soil		6		6	
28-Oct		17:00		grab		soil		6		6	
28-Oct		---		grab		soil		6		6	

**Sample Identification**

SB-07-4'

SB-09-8'

SB-10-6'

SB-11-6'

SB-12-2'

SB-12-4'

SB-13-6'

SB-14-6'

SB-15-2'

SB-15-6'

SB-16-4'

SB-16-8'

DUP-01

**Sample Specific Notes:**

Moisture

PH 904SD

SAR 20B

Electrical Conductivity 29B

CVI & CIII 7196A

COGCC Metals (6010C, 6020A, 7471B)


PAHs 8270D SIM

DRO 801SC

GRO 801SC

BTEX 8260B

Filtered Sample



280-102984 Chain of Custody

**Preservation Used:** 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other

**Possible Hazard Identification**  
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

**Special Instructions/QC Requirements & Comments:**  
 1,0,0,74-0.2 IR#5 55 10-30-17

Relinquished by:	Company: <u>Stanlec</u>	Date/Time: <u>10/28/17</u>	Received by:	Company: <u>Stanlec</u>	Date/Time: <u>10/29/17 1500</u>
Relinquished by:	Company: <u>Stanlec</u>	Date/Time: <u>10/30/17 11:40</u>	Received by:	Company: <u>Stanlec</u>	Date/Time: <u>10/30/17 1140</u>
Relinquished by:	Company: <u>Stanlec</u>	Date/Time: <u>10/30/17 12:15</u>	Received by:	Company: <u>TAD</u>	Date/Time: <u>10-30-17 5:12:5</u>



280-102984 Chain of Custody

## COOLER RECEIPT FORM

Cooler Received/Opened On 11/1/2017 @ 1005

Time Samples Removed From Cooler \_\_\_\_\_ Time Samples Placed In Storage \_\_\_\_\_ (2 Hour Window)

1. Tracking # 2793 (last 4 digits, FedEx) Courier: FedEx

IR Gun ID Raynger pH Strip Lot \_\_\_\_\_ Chlorine Strip Lot \_\_\_\_\_

2. Temperature of rep. sample or temp blank when opened: 4.5 Degrees Celsius

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: 1 Front

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) AOH

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

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

8. Packing mat'l used? Bubblewrap 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

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

b. Was there any observable headspace present in any VOA vial? YES...NO...NA



Larger than this.

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # \_\_\_\_\_

I certify that I unloaded the cooler and answered questions 7-14 (initial) es

15a. 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) es

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

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) es

I certify that I attached a label with the unique LIMS number to each container (initial) es

21. Were there Non-Conformance issues at login? YES...NO... Was a NCM generated? YES...NO...# es

# TestAmerica Denver

4955 Yarrow Street  
Arvada, CO 80002  
Phone (303) 736-0100 Fax (303) 431-7171

## Chain of Custody Record

280-102984  
TestAmerica  
LABORATORY TESTING

<b>Client Information (Sub Contract Lab)</b> Client Contact: _____ Shipping/Receiving: _____ Company: _____ Address: _____ City: _____ State, Zip: _____ Phone: _____ Email: _____ Project Name: _____ Site: _____		Lab PM: _____ Ide, Jamie N E-Mail: _____ jamie.ide@testamericainc.com Accreditations Required (See note): _____	
Due Date Requested: 11/9/2017 TAT Requested (days): _____		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other: _____	
Sample Date: 10/28/17 Sample Time: 11:30 Mountain Sample Type (C=Comp, G=grab): _____ Matrix (V=water, S=solid, O=waste/soil, BT=tissue, A=air): _____		Total Number of Containers: _____ Special Instructions/Note: _____	
Sample Identification - Client ID (Lab ID) SB-09-8 (280-102984-2) SB-12-2 (280-102984-5) SB-15-2 (280-102984-9)		298 EC/Sa/Paste Prep 7196A/3060A Hexavalent Chromium (CrVI) Perform MS/MSD (Yes or No) Field Filled Sample (Yes or No)	
Date: 11/17/17 Time: 15:50 Relinquished by: _____ Relinquished by: _____ Relinquished by: _____		Date: 11-17-17 Time: 10:25 Relinquished by: _____ Relinquished by: _____ Relinquished by: _____	
Custody Seals Intact: _____ Δ Yes Δ No		Cooler Temperature(s) °C and Other Remarks: 4.5	

## Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 280-102984-1

Login Number: 102984

List Source: TestAmerica Denver

List Number: 1

Creator: True, Joshua A

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	False	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 280-102984-1

**Login Number: 102984**

**List Number: 2**

**Creator: Stewart, Eric S**

**List Source: TestAmerica Nashville**

**List Creation: 11/01/17 12:31 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 280-102984-1

**Login Number: 102984**

**List Number: 3**

**Creator: Stewart, Eric S**

**List Source: TestAmerica Nashville**

**List Creation: 11/01/17 01:37 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Denver

4955 Yarrow Street

Arvada, CO 80002

Tel: (303)736-0100

TestAmerica Job ID: 280-103410-1

Client Project/Site: Chevron Rangely, CO CS-47

Revision: 1

For:

Stantec Consulting Corp.

2000 South Colorado Blvd

Suite 2-300

Denver, Colorado 80222

Attn: Christopher Beall



Authorized for release by:

1/12/2018 1:05:25 PM

Jamie Ide, Project Manager I

(303)736-0126

[jamie.ide@testamericainc.com](mailto:jamie.ide@testamericainc.com)

### LINKS

Review your project  
results through

**TotalAccess**

Have a Question?



Visit us at:

[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Definitions . . . . .	3
Case Narrative . . . . .	5
Detection Summary . . . . .	9
Method Summary . . . . .	12
Sample Summary . . . . .	13
Client Sample Results . . . . .	14
Surrogate Summary . . . . .	24
QC Sample Results . . . . .	26
QC Association . . . . .	36
Chronicle . . . . .	42
Certification Summary . . . . .	47
Chain of Custody . . . . .	49
Receipt Checklists . . . . .	52

## Definitions/Glossary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

### Qualifiers

#### GC/MS VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits

#### GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

#### GC VOA

Qualifier	Qualifier Description
D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.
X	Surrogate is outside control limits
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

#### GC Semi VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.
X	Surrogate is outside control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F2	MS/MSD RPD exceeds control limits

#### Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

#### General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

### Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control

TestAmerica Denver

## Definitions/Glossary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

### Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

**Job ID: 280-103410-1**

**Laboratory: TestAmerica Denver**

## Narrative

### CASE NARRATIVE

**Client: Stantec Consulting Corp.**  
**Project: Chevron Rangely, CO CS-47**  
**Report Number: 280-103410-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

#### **REVISION - 1/12/18**

Per client request 1/11/18, the DRO Carbon range reported was changed from C10-C36 to C10-C28. The data has been reviewed and the QC sample results revised; the associated case narrative has been revised accordingly.

#### **RECEIPT**

The samples were received on 11/10/2017 7:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.3° C.

One 8oz soil jar label for the following sample did not match the information listed on the Chain-of-Custody (COC): SB-19-13' (280-103410-3). The container label lists sample collection time at "16" which is not a complete time. The COC lists sample collection time at 16:00. The sample was logged per the collection time listed on the COC; therefore, the laboratory will proceed with the requested analyses unless instructed otherwise by the client. The client was notified on 11/13/17.

The following samples were received outside of freezing time for DI preserved Terracores: SB-17-6' (280-103410-1), SB18-8' (280-103410-2), SB-19-13' (280-103410-3), SB-20-13' (280-103410-4), SB-21-11' (280-103410-5), SB-22-8' (280-103410-6), and DUP-02 (280-103410-8). The samples were collected in Terracore containers on 11/06/17 and received on 11/10/17; as such, the laboratory was unable to freeze the DI vials within 48 hours of collection. The samples were logged, and the laboratory will proceed with the requested 8260 BTEX analysis unless otherwise notified by the client. The client was notified on 11/13/17.

Sample SB-21-11' (280-103410-5) was received with no liquid in 1 of 2 Terracores + DI H<sub>2</sub>O and in 2 of 3 Terracores + MeOH. It can be noted that the soil matrix may have absorbed the DI H<sub>2</sub>O and MeOH, or the container was not sealed properly leading to possible contamination of the sample. Sufficient non-biased sample volume was received to perform the requested 8260 BTEX analysis. However, re-analysis may be biased low if requested or required. The client was notified on 11/13/17.

Sample SB-23-6' (280-103410-7) was received with no liquid in 1 of 2 Terracores + DI H<sub>2</sub>O and in 2 of 3 Terracores + MeOH. It can be noted that the soil matrix may have absorbed the DI H<sub>2</sub>O and MeOH, or the container was not sealed properly leading to possible contamination of the sample. Sufficient non-biased sample volume was received to perform the requested 8260 BTEX analysis. However, re-analysis may be biased low if requested or required. The client was notified on 11/13/17.

Sample SB-22-8' (280-103410-6) was received with no liquid in 1 of 3 Terracores + MeOH. It can be noted that the soil matrix may have absorbed the MeOH, or the container was not sealed properly leading to possible contamination of the sample. Sufficient non-biased sample volume was received to perform the requested analysis. However, re-analysis may be biased low if requested or required. The client was notified on 11/13/17.

#### **VOLATILE ORGANIC COMPOUNDS (GC/MS)**

Sample SB-23-6' (280-103410-7) was analyzed for Volatile organic compounds (GC/MS) in accordance with EPA SW-846 Method 8260B. The samples were prepared and analyzed on 11/21/2017.

# Case Narrative

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Job ID: 280-103410-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

Samples SB-17-6' (280-103410-1), SB-18-8' (280-103410-2), SB-19-13' (280-103410-3), SB-20-13' (280-103410-4), SB-21-11' (280-103410-5), SB-22-8' (280-103410-6) and DUP-02 (280-103410-8) were analyzed for volatile organic compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were prepared on 11/06/2017 and 11/07/2017 and analyzed on 11/14/2017.

4-Bromofluorobenzene (Surr) and Toluene-d8 (Surr) failed the surrogate recovery criteria high for SB-17-6' (280-103410-1). Evidence of matrix interference due to non-target analytes (possible hydrocarbons) is present; therefore, re-analysis was not performed.

4-Bromofluorobenzene (Surr) and Toluene-d8 (Surr) failed the surrogate recovery criteria high for DUP-02 (280-103410-8). Evidence of matrix interference is present in the chromatogram; therefore, re-analysis was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM)

Samples SB-18-8' (280-103410-2) and SB-22-8' (280-103410-6) were analyzed for Semivolatile organic compounds - Selected Ion Mode (SIM) in accordance with EPA SW-846 Method 8270D SIM. The samples were prepared on 11/13/2017 and analyzed on 11/28/2017.

The following samples could not be brought to a final volume of 1mL due to matrix interference. They were instead brought to final volume of 10mL: SB-17-6' (280-103410-1) and DUP-02 (280-103410-8).

Acenaphthylene was detected in method blank MB 280-395024/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### GASOLINE RANGE ORGANICS (GRO)

Samples SB-17-6' (280-103410-1), SB-18-8' (280-103410-2), SB-19-13' (280-103410-3), SB-20-13' (280-103410-4), SB-21-11' (280-103410-5), SB-22-8' (280-103410-6), SB-23-6' (280-103410-7) and DUP-02 (280-103410-8) were analyzed for Gasoline Range Organics (GRO) in accordance with EPA SW-846 Method 8015C - GRO. The samples were prepared on 11/06/2017 and analyzed on 11/16/2017 and 11/17/2017.

GRO (C6-C10) was detected in method blank MB 280-395505/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

a,a,a-Trifluorotoluene failed the surrogate recovery criteria high for SB-17-6' (280-103410-1) and DUP-02 (280-103410-8). Samples SB-17-6' (280-103410-1)[5X] and DUP-02 (280-103410-8)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

a,a,a-Trifluorotoluene failed the surrogate recovery criteria high for SB-21-11' (280-103410-5), and SB-23-6' (280-103410-7). There was insufficient sample to perform re-extraction; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### DIESEL RANGE ORGANICS

Samples SB-17-6' (280-103410-1), SB-18-8' (280-103410-2), SB-19-13' (280-103410-3), SB-20-13' (280-103410-4), SB-21-11' (280-103410-5), SB-22-8' (280-103410-6), SB-23-6' (280-103410-7) and DUP-02 (280-103410-8) were analyzed for diesel range organics in accordance with EPA SW-846 Method 8015C - DRO. The samples were prepared on 11/13/2017 and analyzed on 11/22/2017.

The following samples could not be thoroughly homogenized before sub-sampling was performed due to sample matrix: SB-17-6' (280-103410-1), SB-20-13' (280-103410-4) and DUP-02 (280-103410-8). The sample was clay.

The following samples could not be brought to a final volume of 1mL due to matrix interference. They were instead brought to final volume of 10mL: SB-17-6' (280-103410-1) and DUP-02 (280-103410-8).



# Case Narrative

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Job ID: 280-103410-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

Diesel Range Organics [C10-C28] was detected in method blank MB 280-394990/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

o-Terphenyl (Surr) failed the surrogate recovery criteria high for SB-17-6' (280-103410-1) and DUP-02 (280-103410-8). Evidence of matrix interference is present.

Diesel Range Organics [C10-C28] failed the RPD limit for the MSD of sample SB-21-11' MSD (280-103410-5) in batch 280-396206. The associated LCS was in control.

Samples SB-17-6' (280-103410-1)[20X] and DUP-02 (280-103410-8)[20X] required dilution prior to analysis due to the nature of the sample matrix. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### SODIUM ABSORPTION RATIO

Samples SB-18-8' (280-103410-2) and SB-22-8' (280-103410-6) were analyzed for Sodium Absorption Ratio in accordance with USDA Handbook 60 - 20B. The samples were prepared on 11/20/2017 and analyzed on 11/27/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### TOTAL METALS (ICP)

Samples SB-18-8' (280-103410-2) and SB-22-8' (280-103410-6) were analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/16/2017 and analyzed on 11/17/2017 and 11/21/2017.

Chromium was detected in method blank MB 280-395146/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### METALS (ICPMS)

Samples SB-18-8' (280-103410-2) and SB-22-8' (280-103410-6) were analyzed for metals (ICPMS) in accordance with SW 846 6020A. The samples were prepared and analyzed on 11/15/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### TOTAL MERCURY (CVAA)

Samples SB-18-8' (280-103410-2) and SB-22-8' (280-103410-6) were analyzed for total mercury (CVAA) in accordance with EPA SW-846 Method 7471B. The samples were prepared and analyzed on 11/14/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### ELECTRICAL CONDUCTIVITY

Samples SB-18-8' (280-103410-2) and SB-22-8' (280-103410-6) were analyzed for Electrical Conductivity in accordance with 29B\_EC. The samples were prepared on 11/20/2017 and analyzed on 11/21/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### HEXAVALENT CHROMIUM

Samples SB-18-8' (280-103410-2) and SB-22-8' (280-103410-6) were analyzed for hexavalent chromium in accordance with EPA SW-846 Method 3060A/7196A. The samples were prepared on 11/18/2017 and analyzed on 11/19/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

## Case Narrative

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

### Job ID: 280-103410-1 (Continued)

#### Laboratory: TestAmerica Denver (Continued)

##### TRIVALENT CHROMIUM

Samples SB-18-8' (280-103410-2) and SB-22-8' (280-103410-6) were analyzed for Trivalent Chromium in accordance with SW-846 7196A\_CR3. The samples were analyzed on 11/22/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

##### CORROSIVITY (PH)

Samples SB-18-8' (280-103410-2) and SB-22-8' (280-103410-6) were analyzed for Corrosivity (pH) in accordance with EPA SW-846 Method 9045D. The samples were leached on 11/15/2017 and analyzed on 11/15/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

##### PERCENT SOLIDS

Samples SB-17-6' (280-103410-1), SB-18-8' (280-103410-2), SB-19-13' (280-103410-3), SB-20-13' (280-103410-4), SB-21-11' (280-103410-5), SB-22-8' (280-103410-6), SB-23-6' (280-103410-7) and DUP-02 (280-103410-8) were analyzed for percent solids in accordance with ASTM D2216-90. The samples were analyzed on 11/13/2017 and 11/14/2017.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Detection Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Client Sample ID: SB-17-6'

## Lab Sample ID: 280-103410-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Benzene	0.036		0.0057	0.00053	mg/Kg	1		✖	8260B	Total/NA
Ethylbenzene	0.16		0.0057	0.00076	mg/Kg	1		✖	8260B	Total/NA
m-Xylene & p-Xylene	0.16		0.0028	0.0012	mg/Kg	1		✖	8260B	Total/NA
Xylenes, Total	0.16		0.0057	0.00069	mg/Kg	1		✖	8260B	Total/NA
GRO (C6-C10)	150	B	7.4	2.0	mg/Kg	5		✖	8015C	Total/NA
Diesel Range Organics [C10-C28]	28000	B	980	170	mg/Kg	20		✖	8015C	Total/NA

## Client Sample ID: SB-18-8'

## Lab Sample ID: 280-103410-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Acenaphthylene	0.00071	J B	0.0057	0.00019	mg/Kg	1		✖	8270D SIM	Total/NA
Chrysene	0.0014	J	0.0057	0.0011	mg/Kg	1		✖	8270D SIM	Total/NA
Fluoranthene	0.0013	J	0.0057	0.0011	mg/Kg	1		✖	8270D SIM	Total/NA
2-Methylnaphthalene	0.00059	J	0.0057	0.00035	mg/Kg	1		✖	8270D SIM	Total/NA
Naphthalene	0.00048	J	0.0057	0.00037	mg/Kg	1		✖	8270D SIM	Total/NA
Phenanthrene	0.0016	J	0.0057	0.0012	mg/Kg	1		✖	8270D SIM	Total/NA
GRO (C6-C10)	1.1	J B	1.5	0.40	mg/Kg	1		✖	8015C	Total/NA
Diesel Range Organics [C10-C28]	20	B	4.4	0.74	mg/Kg	1		✖	8015C	Total/NA
Sodium Adsorption Ratio	28		1.2	1.2	No Unit	10			20B	Soluble
Barium	98		1.1	0.11	mg/Kg	1		✖	6010C	Total/NA
Boron	5.6	J	11	1.1	mg/Kg	1		✖	6010C	Total/NA
Cadmium	0.13	J	0.54	0.044	mg/Kg	1		✖	6010C	Total/NA
Chromium	6.0	B	1.6	0.062	mg/Kg	1		✖	6010C	Total/NA
Copper	6.1		2.1	0.23	mg/Kg	1		✖	6010C	Total/NA
Lead	7.3		0.97	0.33	mg/Kg	1		✖	6010C	Total/NA
Nickel	7.8		4.3	0.14	mg/Kg	1		✖	6010C	Total/NA
Zinc	30		3.2	0.43	mg/Kg	1		✖	6010C	Total/NA
Arsenic	4.4		0.64	0.054	mg/Kg	1		✖	6020A	Total/NA
Mercury	0.0092	J	0.022	0.0071	mg/Kg	1		✖	7471B	Total/NA
Chromium, trivalent	6.0		2.0	2.0	mg/Kg	1			7196A	Total/NA
Cr	6.0		2.0	2.0	mg/Kg	1			7196A	Total/NA
Specific Conductance	3000		10	10	umhos/cm	1			29B_EC	Soluble
Saturation Percentage	1.0		0.10	0.10	%	1			29B_EC	Soluble
Electrical Conductivity at Saturation	3000		10	10	umhos/cm	1			29B_EC	Soluble
pH adj. to 25 deg C	8.7	HF	0.1	0.1	SU	1			9045D	Soluble
Temperature	20.2	HF	1.0	1.0	Degrees C	1			9045D	Soluble

## Client Sample ID: SB-19-13'

## Lab Sample ID: 280-103410-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
GRO (C6-C10)	0.60	J B	1.5	0.39	mg/Kg	1		✖	8015C	Total/NA
Diesel Range Organics [C10-C28]	21	B	4.2	0.72	mg/Kg	1		✖	8015C	Total/NA

## Client Sample ID: SB-20-13'

## Lab Sample ID: 280-103410-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
GRO (C6-C10)	0.54	J B	1.1	0.30	mg/Kg	1		✖	8015C	Total/NA
Diesel Range Organics [C10-C28]	2.7	J B	5.0	0.84	mg/Kg	1		✖	8015C	Total/NA

## Client Sample ID: SB-21-11'

## Lab Sample ID: 280-103410-5

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

# Detection Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Client Sample ID: SB-21-11' (Continued)

## Lab Sample ID: 280-103410-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
GRO (C6-C10)	0.60	J B	1.3	0.36	mg/Kg	1		✖	8015C	Total/NA
Diesel Range Organics [C10-C28]	17	F2 B	4.6	0.78	mg/Kg	1		✖	8015C	Total/NA

## Client Sample ID: SB-22-8'

## Lab Sample ID: 280-103410-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Acenaphthylene	0.00032	J B	0.0054	0.00018	mg/Kg	1		✖	8270D SIM	Total/NA
Benzo[b]fluoranthene	0.0061		0.0054	0.0013	mg/Kg	1		✖	8270D SIM	Total/NA
Benzo[g,h,i]perylene	0.0018	J	0.0054	0.0012	mg/Kg	1		✖	8270D SIM	Total/NA
Chrysene	0.0057		0.0054	0.0011	mg/Kg	1		✖	8270D SIM	Total/NA
Fluoranthene	0.0044	J	0.0054	0.0011	mg/Kg	1		✖	8270D SIM	Total/NA
1-Methylnaphthalene	0.00061	J	0.0054	0.00028	mg/Kg	1		✖	8270D SIM	Total/NA
2-Methylnaphthalene	0.00062	J	0.0054	0.00033	mg/Kg	1		✖	8270D SIM	Total/NA
Naphthalene	0.00035	J	0.0054	0.00035	mg/Kg	1		✖	8270D SIM	Total/NA
Phenanthrene	0.0051	J	0.0054	0.0012	mg/Kg	1		✖	8270D SIM	Total/NA
Pyrene	0.0033	J	0.0054	0.0012	mg/Kg	1		✖	8270D SIM	Total/NA
GRO (C6-C10)	0.90	J B	1.3	0.34	mg/Kg	1		✖	8015C	Total/NA
Diesel Range Organics [C10-C28]	26	B	4.3	0.72	mg/Kg	1		✖	8015C	Total/NA
Sodium Adsorption Ratio	43		1.2	1.2	No Unit	10			20B	Soluble
Barium	200		0.88	0.091	mg/Kg	1		✖	6010C	Total/NA
Boron	8.6	J	8.8	0.86	mg/Kg	1		✖	6010C	Total/NA
Cadmium	0.39	J	0.44	0.036	mg/Kg	1		✖	6010C	Total/NA
Chromium	9.2	B	1.3	0.051	mg/Kg	1		✖	6010C	Total/NA
Copper	9.1		1.8	0.19	mg/Kg	1		✖	6010C	Total/NA
Lead	12		0.79	0.27	mg/Kg	1		✖	6010C	Total/NA
Nickel	14		3.5	0.12	mg/Kg	1		✖	6010C	Total/NA
Zinc	51		2.6	0.35	mg/Kg	1		✖	6010C	Total/NA
Arsenic	8.9		0.57	0.048	mg/Kg	1		✖	6020A	Total/NA
Mercury	0.019	J	0.020	0.0065	mg/Kg	1		✖	7471B	Total/NA
Chromium, trivalent	9.2		2.0	2.0	mg/Kg	1			7196A	Total/NA
Cr	9.2		2.0	2.0	mg/Kg	1			7196A	Total/NA
Specific Conductance	2600		10	10	umhos/cm	1			29B_EC	Soluble
Saturation Percentage	1.0		0.10	0.10	%	1			29B_EC	Soluble
Electrical Conductivity at Saturation	2600		10	10	umhos/cm	1			29B_EC	Soluble
pH adj. to 25 deg C	9.3	HF	0.1	0.1	SU	1			9045D	Soluble
Temperature	20.1	HF	1.0	1.0	Degrees C	1			9045D	Soluble

## Client Sample ID: SB-23-6'

## Lab Sample ID: 280-103410-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
GRO (C6-C10)	1.7	B	1.5	0.40	mg/Kg	1		✖	8015C	Total/NA
Diesel Range Organics [C10-C28]	6.7	B	4.1	0.69	mg/Kg	1		✖	8015C	Total/NA

## Client Sample ID: DUP-02

## Lab Sample ID: 280-103410-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Benzene	0.016		0.0052	0.00049	mg/Kg	1		✖	8260B	Total/NA
Ethylbenzene	0.076		0.0052	0.00069	mg/Kg	1		✖	8260B	Total/NA
m-Xylene & p-Xylene	0.083		0.0026	0.0011	mg/Kg	1		✖	8260B	Total/NA
Xylenes, Total	0.083		0.0052	0.00063	mg/Kg	1		✖	8260B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

## Detection Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

**Client Sample ID: DUP-02 (Continued)**

**Lab Sample ID: 280-103410-8**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
GRO (C6-C10)	51	B	2.1	0.58	mg/Kg	2	☼	8015C	Total/NA
Diesel Range Organics [C10-C28]	42000	B	950	160	mg/Kg	20	☼	8015C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

## Method Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL DEN
8270D SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	TAL DEN
8015C	Nonhalogenated Organics using GC/FID -Modified (Gasoline Range Organics)	SW846	TAL DEN
8015C	Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)	SW846	TAL DEN
20B	Sodium Adsorption Ratio	USDA	TAL DEN
6010C	Metals (ICP)	SW846	TAL DEN
6020A	Metals (ICP/MS)	SW846	TAL DEN
7471B	Mercury (CVAA)	SW846	TAL DEN
29B_EC	Conductivity, Electrical	LA	TAL NSH
7196A	Chromium, Hexavalent	SW846	TAL NSH
7196A	Chromium, Trivalent (Colorimetric)	SW846	TAL DEN
9045D	pH	SW846	TAL DEN
Moisture	Percent Moisture	EPA	TAL DEN

### Protocol References:

EPA = US Environmental Protection Agency

LA = Statewide Order No. 29-B, State Of Louisiana

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

USDA = "USDA Agriculture Handbook 60, section 20B".

### Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177



# Sample Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-103410-1	SB-17-6'	Solid	11/06/17 09:30	11/10/17 07:30
280-103410-2	SB-18-8'	Solid	11/06/17 15:30	11/10/17 07:30
280-103410-3	SB-19-13'	Solid	11/06/17 16:00	11/10/17 07:30
280-103410-4	SB-20-13'	Solid	11/06/17 14:50	11/10/17 07:30
280-103410-5	SB-21-11'	Solid	11/07/17 10:15	11/10/17 07:30
280-103410-6	SB-22-8'	Solid	11/06/17 15:00	11/10/17 07:30
280-103410-7	SB-23-6'	Solid	11/08/17 09:30	11/10/17 07:30
280-103410-8	DUP-02	Solid	11/06/17 00:00	11/10/17 07:30

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Client Sample ID: SB-17-6'

Date Collected: 11/06/17 09:30

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-1

Matrix: Solid

Percent Solids: 81.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.036		0.0057	0.00053	mg/Kg	☼	11/06/17 09:30	11/14/17 00:35	1
Ethylbenzene	0.16		0.0057	0.00076	mg/Kg	☼	11/06/17 09:30	11/14/17 00:35	1
Toluene	ND		0.0057	0.00078	mg/Kg	☼	11/06/17 09:30	11/14/17 00:35	1
m-Xylene & p-Xylene	0.16		0.0028	0.0012	mg/Kg	☼	11/06/17 09:30	11/14/17 00:35	1
o-Xylene	ND		0.0028	0.00069	mg/Kg	☼	11/06/17 09:30	11/14/17 00:35	1
Xylenes, Total	0.16		0.0057	0.00069	mg/Kg	☼	11/06/17 09:30	11/14/17 00:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	130		58 - 140	11/06/17 09:30	11/14/17 00:35	1
Toluene-d8 (Surr)	264	X	80 - 126	11/06/17 09:30	11/14/17 00:35	1
4-Bromofluorobenzene (Surr)	259	X	76 - 127	11/06/17 09:30	11/14/17 00:35	1
Dibromofluoromethane (Surr)	119		75 - 121	11/06/17 09:30	11/14/17 00:35	1

Client Sample ID: SB-18-8'

Date Collected: 11/06/17 15:30

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-2

Matrix: Solid

Percent Solids: 88.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0057	0.00054	mg/Kg	☼	11/06/17 15:30	11/14/17 00:56	1
Ethylbenzene	ND		0.0057	0.00077	mg/Kg	☼	11/06/17 15:30	11/14/17 00:56	1
Toluene	ND		0.0057	0.00079	mg/Kg	☼	11/06/17 15:30	11/14/17 00:56	1
m-Xylene & p-Xylene	ND		0.0029	0.0012	mg/Kg	☼	11/06/17 15:30	11/14/17 00:56	1
o-Xylene	ND		0.0029	0.00070	mg/Kg	☼	11/06/17 15:30	11/14/17 00:56	1
Xylenes, Total	ND		0.0057	0.00070	mg/Kg	☼	11/06/17 15:30	11/14/17 00:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		58 - 140	11/06/17 15:30	11/14/17 00:56	1
Toluene-d8 (Surr)	96		80 - 126	11/06/17 15:30	11/14/17 00:56	1
4-Bromofluorobenzene (Surr)	101		76 - 127	11/06/17 15:30	11/14/17 00:56	1
Dibromofluoromethane (Surr)	104		75 - 121	11/06/17 15:30	11/14/17 00:56	1

Client Sample ID: SB-19-13'

Date Collected: 11/06/17 16:00

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-3

Matrix: Solid

Percent Solids: 93.6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0056	0.00052	mg/Kg	☼	11/06/17 16:00	11/14/17 01:17	1
Ethylbenzene	ND		0.0056	0.00074	mg/Kg	☼	11/06/17 16:00	11/14/17 01:17	1
Toluene	ND		0.0056	0.00077	mg/Kg	☼	11/06/17 16:00	11/14/17 01:17	1
m-Xylene & p-Xylene	ND		0.0028	0.0012	mg/Kg	☼	11/06/17 16:00	11/14/17 01:17	1
o-Xylene	ND		0.0028	0.00068	mg/Kg	☼	11/06/17 16:00	11/14/17 01:17	1
Xylenes, Total	ND		0.0056	0.00068	mg/Kg	☼	11/06/17 16:00	11/14/17 01:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	95		58 - 140	11/06/17 16:00	11/14/17 01:17	1
Toluene-d8 (Surr)	106		80 - 126	11/06/17 16:00	11/14/17 01:17	1
4-Bromofluorobenzene (Surr)	92		76 - 127	11/06/17 16:00	11/14/17 01:17	1
Dibromofluoromethane (Surr)	103		75 - 121	11/06/17 16:00	11/14/17 01:17	1

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Client Sample ID: SB-20-13'  
Date Collected: 11/06/17 14:50  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-4  
Matrix: Solid  
Percent Solids: 80.0

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0054	0.00051	mg/Kg	☼	11/06/17 14:50	11/14/17 01:38	1
Ethylbenzene	ND		0.0054	0.00073	mg/Kg	☼	11/06/17 14:50	11/14/17 01:38	1
Toluene	ND		0.0054	0.00075	mg/Kg	☼	11/06/17 14:50	11/14/17 01:38	1
m-Xylene & p-Xylene	ND		0.0027	0.0011	mg/Kg	☼	11/06/17 14:50	11/14/17 01:38	1
o-Xylene	ND		0.0027	0.00066	mg/Kg	☼	11/06/17 14:50	11/14/17 01:38	1
Xylenes, Total	ND		0.0054	0.00066	mg/Kg	☼	11/06/17 14:50	11/14/17 01:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		58 - 140	11/06/17 14:50	11/14/17 01:38	1
Toluene-d8 (Surr)	100		80 - 126	11/06/17 14:50	11/14/17 01:38	1
4-Bromofluorobenzene (Surr)	97		76 - 127	11/06/17 14:50	11/14/17 01:38	1
Dibromofluoromethane (Surr)	103		75 - 121	11/06/17 14:50	11/14/17 01:38	1

Client Sample ID: SB-21-11'  
Date Collected: 11/07/17 10:15  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-5  
Matrix: Solid  
Percent Solids: 86.3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0049	0.00046	mg/Kg	☼	11/07/17 10:15	11/14/17 01:59	1
Ethylbenzene	ND		0.0049	0.00066	mg/Kg	☼	11/07/17 10:15	11/14/17 01:59	1
Toluene	ND		0.0049	0.00068	mg/Kg	☼	11/07/17 10:15	11/14/17 01:59	1
m-Xylene & p-Xylene	ND		0.0025	0.0010	mg/Kg	☼	11/07/17 10:15	11/14/17 01:59	1
o-Xylene	ND		0.0025	0.00060	mg/Kg	☼	11/07/17 10:15	11/14/17 01:59	1
Xylenes, Total	ND		0.0049	0.00060	mg/Kg	☼	11/07/17 10:15	11/14/17 01:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		58 - 140	11/07/17 10:15	11/14/17 01:59	1
Toluene-d8 (Surr)	104		80 - 126	11/07/17 10:15	11/14/17 01:59	1
4-Bromofluorobenzene (Surr)	102		76 - 127	11/07/17 10:15	11/14/17 01:59	1
Dibromofluoromethane (Surr)	104		75 - 121	11/07/17 10:15	11/14/17 01:59	1

Client Sample ID: SB-22-8'  
Date Collected: 11/06/17 15:00  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-6  
Matrix: Solid  
Percent Solids: 92.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0052	0.00049	mg/Kg	☼	11/06/17 15:00	11/14/17 02:19	1
Ethylbenzene	ND		0.0052	0.00069	mg/Kg	☼	11/06/17 15:00	11/14/17 02:19	1
Toluene	ND		0.0052	0.00071	mg/Kg	☼	11/06/17 15:00	11/14/17 02:19	1
m-Xylene & p-Xylene	ND		0.0026	0.0011	mg/Kg	☼	11/06/17 15:00	11/14/17 02:19	1
o-Xylene	ND		0.0026	0.00063	mg/Kg	☼	11/06/17 15:00	11/14/17 02:19	1
Xylenes, Total	ND		0.0052	0.00063	mg/Kg	☼	11/06/17 15:00	11/14/17 02:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		58 - 140	11/06/17 15:00	11/14/17 02:19	1
Toluene-d8 (Surr)	106		80 - 126	11/06/17 15:00	11/14/17 02:19	1
4-Bromofluorobenzene (Surr)	98		76 - 127	11/06/17 15:00	11/14/17 02:19	1
Dibromofluoromethane (Surr)	101		75 - 121	11/06/17 15:00	11/14/17 02:19	1

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Client Sample ID: SB-23-6'

Date Collected: 11/08/17 09:30

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-7

Matrix: Solid

Percent Solids: 95.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0053	0.00050	mg/Kg	☼	11/21/17 20:45	11/21/17 21:40	1
Ethylbenzene	ND		0.0053	0.00072	mg/Kg	☼	11/21/17 20:45	11/21/17 21:40	1
Toluene	ND		0.0053	0.00074	mg/Kg	☼	11/21/17 20:45	11/21/17 21:40	1
m-Xylene & p-Xylene	ND		0.0027	0.0011	mg/Kg	☼	11/21/17 20:45	11/21/17 21:40	1
o-Xylene	ND		0.0027	0.00065	mg/Kg	☼	11/21/17 20:45	11/21/17 21:40	1
Xylenes, Total	ND		0.0053	0.00065	mg/Kg	☼	11/21/17 20:45	11/21/17 21:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		58 - 140	11/21/17 20:45	11/21/17 21:40	1
Toluene-d8 (Surr)	100		80 - 126	11/21/17 20:45	11/21/17 21:40	1
4-Bromofluorobenzene (Surr)	101		76 - 127	11/21/17 20:45	11/21/17 21:40	1
Dibromofluoromethane (Surr)	94		75 - 121	11/21/17 20:45	11/21/17 21:40	1

Client Sample ID: DUP-02

Date Collected: 11/06/17 00:00

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-8

Matrix: Solid

Percent Solids: 83.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.016		0.0052	0.00049	mg/Kg	☼	11/06/17 00:00	11/14/17 03:01	1
Ethylbenzene	0.076		0.0052	0.00069	mg/Kg	☼	11/06/17 00:00	11/14/17 03:01	1
Toluene	ND		0.0052	0.00071	mg/Kg	☼	11/06/17 00:00	11/14/17 03:01	1
m-Xylene & p-Xylene	0.083		0.0026	0.0011	mg/Kg	☼	11/06/17 00:00	11/14/17 03:01	1
o-Xylene	ND		0.0026	0.00063	mg/Kg	☼	11/06/17 00:00	11/14/17 03:01	1
Xylenes, Total	0.083		0.0052	0.00063	mg/Kg	☼	11/06/17 00:00	11/14/17 03:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	118		58 - 140	11/06/17 00:00	11/14/17 03:01	1
Toluene-d8 (Surr)	195	X	80 - 126	11/06/17 00:00	11/14/17 03:01	1
4-Bromofluorobenzene (Surr)	265	X	76 - 127	11/06/17 00:00	11/14/17 03:01	1
Dibromofluoromethane (Surr)	112		75 - 121	11/06/17 00:00	11/14/17 03:01	1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Client Sample ID: SB-18-8'

Date Collected: 11/06/17 15:30

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-2

Matrix: Solid

Percent Solids: 88.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.0057	0.00018	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1
Acenaphthylene	0.00071	J B	0.0057	0.00019	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1
Anthracene	ND		0.0057	0.00081	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1
Benzo[a]anthracene	ND		0.0057	0.0010	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1
Benzo[a]pyrene	ND		0.0057	0.00084	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1
Benzo[b]fluoranthene	ND		0.0057	0.0014	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1
Benzo[g,h,i]perylene	ND		0.0057	0.0012	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1
Benzo[k]fluoranthene	ND		0.0057	0.0011	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1
Chrysene	0.0014	J	0.0057	0.0011	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1
Dibenz(a,h)anthracene	ND		0.0057	0.0015	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1
Fluoranthene	0.0013	J	0.0057	0.0011	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1
Fluorene	ND		0.0057	0.00053	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1
Indeno[1,2,3-cd]pyrene	ND		0.0057	0.0012	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1
1-Methylnaphthalene	ND		0.0057	0.00029	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Client Sample ID: SB-18-8'

Date Collected: 11/06/17 15:30

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-2

Matrix: Solid

Percent Solids: 88.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylnaphthalene	0.00059	J	0.0057	0.00035	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1
Naphthalene	0.00048	J	0.0057	0.00037	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1
Phenanthrene	0.0016	J	0.0057	0.0012	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1
Pyrene	ND		0.0057	0.0012	mg/Kg	☼	11/13/17 11:32	11/28/17 00:16	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl	61		39 - 120				11/13/17 11:32	11/28/17 00:16	1
Nitrobenzene-d5	60		42 - 120				11/13/17 11:32	11/28/17 00:16	1
Terphenyl-d14	67		35 - 124				11/13/17 11:32	11/28/17 00:16	1

Client Sample ID: SB-22-8'

Date Collected: 11/06/17 15:00

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-6

Matrix: Solid

Percent Solids: 92.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.0054	0.00017	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
Acenaphthylene	0.00032	J B	0.0054	0.00018	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
Anthracene	ND		0.0054	0.00077	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
Benzo[a]anthracene	ND		0.0054	0.00097	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
Benzo[a]pyrene	ND		0.0054	0.00079	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
Benzo[b]fluoranthene	0.0061		0.0054	0.0013	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
Benzo[g,h,i]perylene	0.0018	J	0.0054	0.0012	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
Benzo[k]fluoranthene	ND		0.0054	0.0011	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
Chrysene	0.0057		0.0054	0.0011	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
Dibenz(a,h)anthracene	ND		0.0054	0.0014	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
Fluoranthene	0.0044	J	0.0054	0.0011	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
Fluorene	ND		0.0054	0.00050	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
Indeno[1,2,3-cd]pyrene	ND		0.0054	0.0012	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
1-Methylnaphthalene	0.00061	J	0.0054	0.00028	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
2-Methylnaphthalene	0.00062	J	0.0054	0.00033	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
Naphthalene	0.00035	J	0.0054	0.00035	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
Phenanthrene	0.0051	J	0.0054	0.0012	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
Pyrene	0.0033	J	0.0054	0.0012	mg/Kg	☼	11/13/17 11:32	11/28/17 01:40	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl	63		39 - 120				11/13/17 11:32	11/28/17 01:40	1
Nitrobenzene-d5	56		42 - 120				11/13/17 11:32	11/28/17 01:40	1
Terphenyl-d14	71		35 - 124				11/13/17 11:32	11/28/17 01:40	1

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Gasoline Range Organics)

Client Sample ID: SB-17-6'

Date Collected: 11/06/17 09:30

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-1

Matrix: Solid

Percent Solids: 81.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	150	B	7.4	2.0	mg/Kg	☼	11/06/17 09:30	11/17/17 12:30	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	470	X D	77 - 123				11/06/17 09:30	11/17/17 12:30	5

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Gasoline Range Organics)

Client Sample ID: SB-18-8'  
Date Collected: 11/06/17 15:30  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-2  
Matrix: Solid  
Percent Solids: 88.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	1.1	J B	1.5	0.40	mg/Kg	☼	11/06/17 15:30	11/16/17 13:07	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	107		77 - 123				11/06/17 15:30	11/16/17 13:07	1

Client Sample ID: SB-19-13'  
Date Collected: 11/06/17 16:00  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-3  
Matrix: Solid  
Percent Solids: 93.6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	0.60	J B	1.5	0.39	mg/Kg	☼	11/06/17 16:00	11/16/17 13:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	121		77 - 123				11/06/17 16:00	11/16/17 13:32	1

Client Sample ID: SB-20-13'  
Date Collected: 11/06/17 14:50  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-4  
Matrix: Solid  
Percent Solids: 80.0

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	0.54	J B	1.1	0.30	mg/Kg	☼	11/06/17 14:50	11/16/17 13:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	107		77 - 123				11/06/17 14:50	11/16/17 13:57	1

Client Sample ID: SB-21-11'  
Date Collected: 11/07/17 10:15  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-5  
Matrix: Solid  
Percent Solids: 86.3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	0.60	J B	1.3	0.36	mg/Kg	☼	11/06/17 10:15	11/16/17 14:22	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	124	X	77 - 123				11/06/17 10:15	11/16/17 14:22	1

Client Sample ID: SB-22-8'  
Date Collected: 11/06/17 15:00  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-6  
Matrix: Solid  
Percent Solids: 92.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	0.90	J B	1.3	0.34	mg/Kg	☼	11/06/17 15:00	11/16/17 14:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	100		77 - 123				11/06/17 15:00	11/16/17 14:47	1

Client Sample ID: SB-23-6'  
Date Collected: 11/08/17 09:30  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-7  
Matrix: Solid  
Percent Solids: 95.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	1.7	B	1.5	0.40	mg/Kg	☼	11/06/17 09:30	11/16/17 15:12	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	139	X	77 - 123				11/06/17 09:30	11/16/17 15:12	1

TestAmerica Denver



# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Gasoline Range Organics)

Client Sample ID: DUP-02

Date Collected: 11/06/17 00:00

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-8

Matrix: Solid

Percent Solids: 83.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	51	B	2.1	0.58	mg/Kg	☼	11/06/17 00:00	11/17/17 12:55	2
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	250	X D	77 - 123				11/06/17 00:00	11/17/17 12:55	2

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

Client Sample ID: SB-17-6'

Date Collected: 11/06/17 09:30

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-1

Matrix: Solid

Percent Solids: 81.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	28000	B	980	170	mg/Kg	☼	11/13/17 07:59	11/22/17 16:46	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	4894	D X	49 - 115				11/13/17 07:59	11/22/17 16:46	20

Client Sample ID: SB-18-8'

Date Collected: 11/06/17 15:30

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-2

Matrix: Solid

Percent Solids: 88.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	20	B	4.4	0.74	mg/Kg	☼	11/13/17 07:59	11/22/17 17:10	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	81		49 - 115				11/13/17 07:59	11/22/17 17:10	1

Client Sample ID: SB-19-13'

Date Collected: 11/06/17 16:00

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-3

Matrix: Solid

Percent Solids: 93.6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	21	B	4.2	0.72	mg/Kg	☼	11/13/17 07:59	11/22/17 17:34	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	91		49 - 115				11/13/17 07:59	11/22/17 17:34	1

Client Sample ID: SB-20-13'

Date Collected: 11/06/17 14:50

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-4

Matrix: Solid

Percent Solids: 80.0

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	2.7	J B	5.0	0.84	mg/Kg	☼	11/13/17 07:59	11/22/17 17:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	77		49 - 115				11/13/17 07:59	11/22/17 17:59	1

Client Sample ID: SB-21-11'

Date Collected: 11/07/17 10:15

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-5

Matrix: Solid

Percent Solids: 86.3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	17	F2 B	4.6	0.78	mg/Kg	☼	11/13/17 07:59	11/22/17 18:23	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	84		49 - 115				11/13/17 07:59	11/22/17 18:23	1

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

Client Sample ID: SB-22-8'  
Date Collected: 11/06/17 15:00  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-6  
Matrix: Solid  
Percent Solids: 92.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	26	B	4.3	0.72	mg/Kg	☼	11/13/17 07:59	11/22/17 19:35	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	90		49 - 115				11/13/17 07:59	11/22/17 19:35	1

Client Sample ID: SB-23-6'  
Date Collected: 11/08/17 09:30  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-7  
Matrix: Solid  
Percent Solids: 95.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	6.7	B	4.1	0.69	mg/Kg	☼	11/13/17 07:59	11/22/17 19:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	85		49 - 115				11/13/17 07:59	11/22/17 19:59	1

Client Sample ID: DUP-02  
Date Collected: 11/06/17 00:00  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-8  
Matrix: Solid  
Percent Solids: 83.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	42000	B	950	160	mg/Kg	☼	11/13/17 07:59	11/22/17 20:23	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	6673	D X	49 - 115				11/13/17 07:59	11/22/17 20:23	20

## Method: 20B - Sodium Adsorption Ratio - Soluble

Client Sample ID: SB-18-8'  
Date Collected: 11/06/17 15:30  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-2  
Matrix: Solid  
Percent Solids: 88.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium Adsorption Ratio	28		1.2	1.2	No Unit	—	11/20/17 16:30	11/27/17 15:48	10

Client Sample ID: SB-22-8'  
Date Collected: 11/06/17 15:00  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-6  
Matrix: Solid  
Percent Solids: 92.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium Adsorption Ratio	43		1.2	1.2	No Unit	—	11/20/17 16:30	11/27/17 15:51	10

## Method: 6010C - Metals (ICP)

Client Sample ID: SB-18-8'  
Date Collected: 11/06/17 15:30  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-2  
Matrix: Solid  
Percent Solids: 88.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	98		1.1	0.11	mg/Kg	☼	11/16/17 07:27	11/17/17 17:50	1
Boron	5.6	J	11	1.1	mg/Kg	☼	11/16/17 07:27	11/17/17 17:50	1
Cadmium	0.13	J	0.54	0.044	mg/Kg	☼	11/16/17 07:27	11/17/17 17:50	1
Chromium	6.0	B	1.6	0.062	mg/Kg	☼	11/16/17 07:27	11/17/17 17:50	1
Copper	6.1		2.1	0.23	mg/Kg	☼	11/16/17 07:27	11/17/17 17:50	1
Lead	7.3		0.97	0.33	mg/Kg	☼	11/16/17 07:27	11/21/17 15:40	1
Nickel	7.8		4.3	0.14	mg/Kg	☼	11/16/17 07:27	11/17/17 17:50	1
Selenium	ND		1.6	0.92	mg/Kg	☼	11/16/17 07:27	11/17/17 17:50	1

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 6010C - Metals (ICP) (Continued)

Client Sample ID: SB-18-8'

Date Collected: 11/06/17 15:30

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-2

Matrix: Solid

Percent Solids: 88.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.1	0.17	mg/Kg	☼	11/16/17 07:27	11/17/17 17:50	1
Zinc	30		3.2	0.43	mg/Kg	☼	11/16/17 07:27	11/17/17 17:50	1

Client Sample ID: SB-22-8'

Date Collected: 11/06/17 15:00

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-6

Matrix: Solid

Percent Solids: 92.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	200		0.88	0.091	mg/Kg	☼	11/16/17 07:27	11/17/17 17:53	1
Boron	8.6	J	8.8	0.86	mg/Kg	☼	11/16/17 07:27	11/17/17 17:53	1
Cadmium	0.39	J	0.44	0.036	mg/Kg	☼	11/16/17 07:27	11/17/17 17:53	1
Chromium	9.2	B	1.3	0.051	mg/Kg	☼	11/16/17 07:27	11/17/17 17:53	1
Copper	9.1		1.8	0.19	mg/Kg	☼	11/16/17 07:27	11/17/17 17:53	1
Lead	12		0.79	0.27	mg/Kg	☼	11/16/17 07:27	11/21/17 15:43	1
Nickel	14		3.5	0.12	mg/Kg	☼	11/16/17 07:27	11/17/17 17:53	1
Selenium	ND		1.3	0.76	mg/Kg	☼	11/16/17 07:27	11/17/17 17:53	1
Silver	ND		0.88	0.14	mg/Kg	☼	11/16/17 07:27	11/17/17 17:53	1
Zinc	51		2.6	0.35	mg/Kg	☼	11/16/17 07:27	11/17/17 17:53	1

## Method: 6020A - Metals (ICP/MS)

Client Sample ID: SB-18-8'

Date Collected: 11/06/17 15:30

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-2

Matrix: Solid

Percent Solids: 88.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.4		0.64	0.054	mg/Kg	☼	11/15/17 08:09	11/15/17 19:25	1

Client Sample ID: SB-22-8'

Date Collected: 11/06/17 15:00

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-6

Matrix: Solid

Percent Solids: 92.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	8.9		0.57	0.048	mg/Kg	☼	11/15/17 08:09	11/15/17 19:44	1

## Method: 7471B - Mercury (CVAA)

Client Sample ID: SB-18-8'

Date Collected: 11/06/17 15:30

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-2

Matrix: Solid

Percent Solids: 88.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0092	J	0.022	0.0071	mg/Kg	☼	11/14/17 12:40	11/14/17 21:35	1

Client Sample ID: SB-22-8'

Date Collected: 11/06/17 15:00

Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-6

Matrix: Solid

Percent Solids: 92.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.019	J	0.020	0.0065	mg/Kg	☼	11/14/17 12:40	11/14/17 21:37	1

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## General Chemistry

Client Sample ID: SB-17-6'  
Date Collected: 11/06/17 09:30  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-1  
Matrix: Solid  
Percent Solids: 81.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	18.5		0.1	0.1	%			11/14/17 13:15	1

Client Sample ID: SB-18-8'  
Date Collected: 11/06/17 15:30  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-2  
Matrix: Solid  
Percent Solids: 88.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		5.6	2.2	mg/Kg	☼	11/18/17 11:46	11/19/17 12:49	1
Chromium, trivalent	6.0		2.0	2.0	mg/Kg			11/22/17 14:04	1
Cr	6.0		2.0	2.0	mg/Kg			11/22/17 14:04	1
Cr (VI)	ND		1.4	1.4	mg/Kg			11/22/17 14:04	1
Percent Moisture	11.6		0.1	0.1	%			11/13/17 14:36	1

Client Sample ID: SB-19-13'  
Date Collected: 11/06/17 16:00  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-3  
Matrix: Solid  
Percent Solids: 93.6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	6.4		0.1	0.1	%			11/14/17 13:15	1

Client Sample ID: SB-20-13'  
Date Collected: 11/06/17 14:50  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-4  
Matrix: Solid  
Percent Solids: 80.0

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	20.0		0.1	0.1	%			11/14/17 13:15	1

Client Sample ID: SB-21-11'  
Date Collected: 11/07/17 10:15  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-5  
Matrix: Solid  
Percent Solids: 86.3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	13.7		0.1	0.1	%			11/14/17 13:15	1

Client Sample ID: SB-22-8'  
Date Collected: 11/06/17 15:00  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-6  
Matrix: Solid  
Percent Solids: 92.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		5.2	2.1	mg/Kg	☼	11/18/17 11:46	11/19/17 12:49	1
Chromium, trivalent	9.2		2.0	2.0	mg/Kg			11/22/17 14:04	1
Cr	9.2		2.0	2.0	mg/Kg			11/22/17 14:04	1
Cr (VI)	ND		1.4	1.4	mg/Kg			11/22/17 14:04	1
Percent Moisture	7.8		0.1	0.1	%			11/13/17 14:36	1

Client Sample ID: SB-23-6'  
Date Collected: 11/08/17 09:30  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-7  
Matrix: Solid  
Percent Solids: 95.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.6		0.1	0.1	%			11/14/17 13:15	1

Client Sample ID: DUP-02  
Date Collected: 11/06/17 00:00  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-8  
Matrix: Solid  
Percent Solids: 83.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	16.2		0.1	0.1	%			11/14/17 13:15	1

TestAmerica Denver

# Client Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## General Chemistry - Soluble

Client Sample ID: SB-18-8'  
Date Collected: 11/06/17 15:30  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-2  
Matrix: Solid  
Percent Solids: 88.4

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	3000		10	10	umhos/cm		11/20/17 13:01	11/21/17 11:30	1
Saturation Percentage	1.0		0.10	0.10	%		11/20/17 13:01	11/21/17 11:30	1
Electrical Conductivity at Saturation	3000		10	10	umhos/cm		11/20/17 13:01	11/21/17 11:30	1
pH adj. to 25 deg C	8.7	HF	0.1	0.1	SU			11/15/17 13:31	1
Temperature	20.2	HF	1.0	1.0	Degrees C			11/15/17 13:31	1

Client Sample ID: SB-22-8'  
Date Collected: 11/06/17 15:00  
Date Received: 11/10/17 07:30

Lab Sample ID: 280-103410-6  
Matrix: Solid  
Percent Solids: 92.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	2600		10	10	umhos/cm		11/20/17 13:01	11/21/17 11:30	1
Saturation Percentage	1.0		0.10	0.10	%		11/20/17 13:01	11/21/17 11:30	1
Electrical Conductivity at Saturation	2600		10	10	umhos/cm		11/20/17 13:01	11/21/17 11:30	1
pH adj. to 25 deg C	9.3	HF	0.1	0.1	SU			11/15/17 13:31	1
Temperature	20.1	HF	1.0	1.0	Degrees C			11/15/17 13:31	1

# Surrogate Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DCA (58-140)	TOL (80-126)	BFB (76-127)	DBFM (75-121)
280-103410-1	SB-17-6'	130	264 X	259 X	119
280-103410-2	SB-18-8'	98	96	101	104
280-103410-3	SB-19-13'	95	106	92	103
280-103410-4	SB-20-13'	100	100	97	103
280-103410-5	SB-21-11'	98	104	102	104
280-103410-6	SB-22-8'	98	106	98	101
280-103410-7	SB-23-6'	86	100	101	94
280-103410-8	DUP-02	118	195 X	265 X	112
LCS 280-395122/1-A	Lab Control Sample	102	102	97	106
LCS 280-396139/1-A	Lab Control Sample	89	107	96	95
LCSD 280-395122/2-A	Lab Control Sample Dup	98	101	86	104
LCSD 280-396139/2-A	Lab Control Sample Dup	88	102	98	94
MB 280-395122/3-A	Method Blank	96	104	98	104
MB 280-396139/3-A	Method Blank	88	93	96	96

### Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)  
TOL = Toluene-d8 (Surr)  
BFB = 4-Bromofluorobenzene (Surr)  
DBFM = Dibromofluoromethane (Surr)

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		FBP (39-120)	NBZ (42-120)	TPHL (35-124)
280-103410-2	SB-18-8'	61	60	67
280-103410-2 MS	SB-18-8'	61	64	62
280-103410-2 MSD	SB-18-8'	56	60	60
280-103410-6	SB-22-8'	63	56	71
LCS 280-395024/2-A	Lab Control Sample	83	86	83
MB 280-395024/1-A	Method Blank	92	95	86

### Surrogate Legend

FBP = 2-Fluorobiphenyl  
NBZ = Nitrobenzene-d5  
TPHL = Terphenyl-d14

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Gasoline Range Organics)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	TFT1 (77-123)			
280-103410-1	SB-17-6'	470 X D			
280-103410-2	SB-18-8'	107			
280-103410-3	SB-19-13'	121			
280-103410-4	SB-20-13'	107			
280-103410-5	SB-21-11'	124 X			

TestAmerica Denver

# Surrogate Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Gasoline Range Organics) (Continued)

Matrix: Solid

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TFT1 (77-123)
280-103410-6	SB-22-8'	100
280-103410-7	SB-23-6'	139 X
280-103410-8	DUP-02	250 X D
LCS 280-395505/2-A	Lab Control Sample	104
LCSD 280-395505/3-A	Lab Control Sample Dup	104
MB 280-395505/1-A	Method Blank	104

#### Surrogate Legend

TFT = a,a,a-Trifluorotoluene

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

Matrix: Solid

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	OTPH1 (49-115)
280-103410-1	SB-17-6'	4894 D X
280-103410-2	SB-18-8'	81
280-103410-3	SB-19-13'	91
280-103410-4	SB-20-13'	77
280-103410-5	SB-21-11'	84
280-103410-5 MS	SB-21-11'	76
280-103410-5 MSD	SB-21-11'	77
280-103410-6	SB-22-8'	90
280-103410-7	SB-23-6'	85
280-103410-8	DUP-02	6673 D X
LCS 280-394990/2-A	Lab Control Sample	98
MB 280-394990/1-A	Method Blank	103

#### Surrogate Legend

OTPH = o-Terphenyl (Surr)



# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 280-395122/3-A

Matrix: Solid

Analysis Batch: 395130

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 395122

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0050	0.00047	mg/Kg		11/13/17 18:00	11/13/17 19:39	1
Ethylbenzene	ND		0.0050	0.00067	mg/Kg		11/13/17 18:00	11/13/17 19:39	1
Toluene	ND		0.0050	0.00069	mg/Kg		11/13/17 18:00	11/13/17 19:39	1
m-Xylene & p-Xylene	ND		0.0025	0.0010	mg/Kg		11/13/17 18:00	11/13/17 19:39	1
o-Xylene	ND		0.0025	0.00061	mg/Kg		11/13/17 18:00	11/13/17 19:39	1
Xylenes, Total	ND		0.0050	0.00061	mg/Kg		11/13/17 18:00	11/13/17 19:39	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	96		58 - 140	11/13/17 18:00	11/13/17 19:39	1
Toluene-d8 (Surr)	104		80 - 126	11/13/17 18:00	11/13/17 19:39	1
4-Bromofluorobenzene (Surr)	98		76 - 127	11/13/17 18:00	11/13/17 19:39	1
Dibromofluoromethane (Surr)	104		75 - 121	11/13/17 18:00	11/13/17 19:39	1

Lab Sample ID: LCS 280-395122/1-A

Matrix: Solid

Analysis Batch: 395130

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 395122

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Benzene	0.0500	0.0497		mg/Kg		99	75 - 135
Ethylbenzene	0.0500	0.0459		mg/Kg		92	73 - 125
Toluene	0.0500	0.0498		mg/Kg		100	77 - 122
m-Xylene & p-Xylene	0.0500	0.0444		mg/Kg		89	77 - 135
o-Xylene	0.0500	0.0439		mg/Kg		88	75 - 135
Xylenes, Total	0.100	0.0883		mg/Kg		88	76 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	102		58 - 140
Toluene-d8 (Surr)	102		80 - 126
4-Bromofluorobenzene (Surr)	97		76 - 127
Dibromofluoromethane (Surr)	106		75 - 121

Lab Sample ID: LCSD 280-395122/2-A

Matrix: Solid

Analysis Batch: 395130

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 395122

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	0.0500	0.0512		mg/Kg		102	75 - 135	3	20
Ethylbenzene	0.0500	0.0470		mg/Kg		94	73 - 125	2	20
Toluene	0.0500	0.0527		mg/Kg		105	77 - 122	6	20
m-Xylene & p-Xylene	0.0500	0.0459		mg/Kg		92	77 - 135	3	20
o-Xylene	0.0500	0.0486		mg/Kg		97	75 - 135	10	20
Xylenes, Total	0.100	0.0945		mg/Kg		95	76 - 135	7	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	98		58 - 140
Toluene-d8 (Surr)	101		80 - 126
4-Bromofluorobenzene (Surr)	86		76 - 127

TestAmerica Denver

# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 280-395122/2-A

Matrix: Solid

Analysis Batch: 395130

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 395122

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
Dibromofluoromethane (Surr)	104		75 - 121

Lab Sample ID: MB 280-396139/3-A

Matrix: Solid

Analysis Batch: 396133

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 396139

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Benzene	ND		0.0050	0.00047	mg/Kg		11/21/17 17:00	11/21/17 21:19	1
Ethylbenzene	ND		0.0050	0.00067	mg/Kg		11/21/17 17:00	11/21/17 21:19	1
Toluene	ND		0.0050	0.00069	mg/Kg		11/21/17 17:00	11/21/17 21:19	1
m-Xylene & p-Xylene	ND		0.0025	0.0010	mg/Kg		11/21/17 17:00	11/21/17 21:19	1
o-Xylene	ND		0.0025	0.00061	mg/Kg		11/21/17 17:00	11/21/17 21:19	1
Xylenes, Total	ND		0.0050	0.00061	mg/Kg		11/21/17 17:00	11/21/17 21:19	1
Surrogate	MB MB		Limits				Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier							
1,2-Dichloroethane-d4 (Surr)	88		58 - 140				11/21/17 17:00	11/21/17 21:19	1
Toluene-d8 (Surr)	93		80 - 126				11/21/17 17:00	11/21/17 21:19	1
4-Bromofluorobenzene (Surr)	96		76 - 127				11/21/17 17:00	11/21/17 21:19	1
Dibromofluoromethane (Surr)	96		75 - 121				11/21/17 17:00	11/21/17 21:19	1

Lab Sample ID: LCS 280-396139/1-A

Matrix: Solid

Analysis Batch: 396133

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 396139

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	Limits
		Result	Qualifier				
Benzene	0.0500	0.0489		mg/Kg		98	75 - 135
Ethylbenzene	0.0500	0.0496		mg/Kg		99	73 - 125
Toluene	0.0500	0.0476		mg/Kg		95	77 - 122
m-Xylene & p-Xylene	0.0500	0.0483		mg/Kg		97	77 - 135
o-Xylene	0.0500	0.0511		mg/Kg		102	75 - 135
Xylenes, Total	0.100	0.0994		mg/Kg		99	76 - 135
Surrogate	LCS LCS		Limits				%Rec.
	%Recovery	Qualifier					
1,2-Dichloroethane-d4 (Surr)	89		58 - 140				
Toluene-d8 (Surr)	107		80 - 126				
4-Bromofluorobenzene (Surr)	96		76 - 127				
Dibromofluoromethane (Surr)	95		75 - 121				

Lab Sample ID: LCSD 280-396139/2-A

Matrix: Solid

Analysis Batch: 396133

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 396139

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	Limits	RPD	
		Result	Qualifier					RPD	Limit
Benzene	0.0500	0.0477		mg/Kg		95	75 - 135	2	20
Ethylbenzene	0.0500	0.0451		mg/Kg		90	73 - 125	10	20
Toluene	0.0500	0.0474		mg/Kg		95	77 - 122	1	20
m-Xylene & p-Xylene	0.0500	0.0444		mg/Kg		89	77 - 135	8	20

TestAmerica Denver

# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 280-396139/2-A

Matrix: Solid

Analysis Batch: 396133

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 396139

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
o-Xylene	0.0500	0.0469		mg/Kg		94	75 - 135	9	20
Xylenes, Total	0.100	0.0913		mg/Kg		91	76 - 135	8	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	88		58 - 140
Toluene-d8 (Surr)	102		80 - 126
4-Bromofluorobenzene (Surr)	98		76 - 127
Dibromofluoromethane (Surr)	94		75 - 121

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 280-395024/1-A

Matrix: Solid

Analysis Batch: 396646

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 395024

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.0047	0.00015	mg/Kg		11/13/17 11:32	11/27/17 23:19	1
Acenaphthylene	0.000288	J	0.0047	0.00016	mg/Kg		11/13/17 11:32	11/27/17 23:19	1
Anthracene	ND		0.0047	0.00068	mg/Kg		11/13/17 11:32	11/27/17 23:19	1
Benzo[a]anthracene	ND		0.0047	0.00085	mg/Kg		11/13/17 11:32	11/27/17 23:19	1
Benzo[a]pyrene	ND		0.0047	0.00070	mg/Kg		11/13/17 11:32	11/27/17 23:19	1
Benzo[b]fluoranthene	ND		0.0047	0.0011	mg/Kg		11/13/17 11:32	11/27/17 23:19	1
Benzo[g,h,i]perylene	ND		0.0047	0.0010	mg/Kg		11/13/17 11:32	11/27/17 23:19	1
Benzo[k]fluoranthene	ND		0.0047	0.00095	mg/Kg		11/13/17 11:32	11/27/17 23:19	1
Chrysene	ND		0.0047	0.00095	mg/Kg		11/13/17 11:32	11/27/17 23:19	1
Dibenz(a,h)anthracene	ND		0.0047	0.0012	mg/Kg		11/13/17 11:32	11/27/17 23:19	1
Fluoranthene	ND		0.0047	0.00095	mg/Kg		11/13/17 11:32	11/27/17 23:19	1
Fluorene	ND		0.0047	0.00044	mg/Kg		11/13/17 11:32	11/27/17 23:19	1
Indeno[1,2,3-cd]pyrene	ND		0.0047	0.0010	mg/Kg		11/13/17 11:32	11/27/17 23:19	1
1-Methylnaphthalene	ND		0.0047	0.00025	mg/Kg		11/13/17 11:32	11/27/17 23:19	1
2-Methylnaphthalene	ND		0.0047	0.00029	mg/Kg		11/13/17 11:32	11/27/17 23:19	1
Naphthalene	ND		0.0047	0.00031	mg/Kg		11/13/17 11:32	11/27/17 23:19	1
Phenanthrene	ND		0.0047	0.0010	mg/Kg		11/13/17 11:32	11/27/17 23:19	1
Pyrene	ND		0.0047	0.0010	mg/Kg		11/13/17 11:32	11/27/17 23:19	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl	92		39 - 120	11/13/17 11:32	11/27/17 23:19	1
Nitrobenzene-d5	95		42 - 120	11/13/17 11:32	11/27/17 23:19	1
Terphenyl-d14	86		35 - 124	11/13/17 11:32	11/27/17 23:19	1

Lab Sample ID: LCS 280-395024/2-A

Matrix: Solid

Analysis Batch: 396646

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 395024

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	0.0296	0.0228		mg/Kg		77	35 - 120
Acenaphthylene	0.0296	0.0219		mg/Kg		74	41 - 120

TestAmerica Denver

# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 280-395024/2-A

Matrix: Solid

Analysis Batch: 396646

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 395024

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Anthracene	0.0296	0.0231		mg/Kg		78	43 - 120
Benzo[a]anthracene	0.0296	0.0248		mg/Kg		84	36 - 120
Benzo[a]pyrene	0.0296	0.0246		mg/Kg		83	20 - 120
Benzo[b]fluoranthene	0.0296	0.0248		mg/Kg		84	37 - 120
Benzo[g,h,i]perylene	0.0296	0.0255		mg/Kg		86	20 - 123
Benzo[k]fluoranthene	0.0296	0.0254		mg/Kg		86	46 - 120
Chrysene	0.0296	0.0258		mg/Kg		87	34 - 120
Dibenz(a,h)anthracene	0.0296	0.0247		mg/Kg		83	20 - 120
Fluoranthene	0.0296	0.0231		mg/Kg		78	45 - 120
Fluorene	0.0296	0.0238		mg/Kg		81	44 - 120
Indeno[1,2,3-cd]pyrene	0.0296	0.0240		mg/Kg		81	20 - 127
Naphthalene	0.0296	0.0245		mg/Kg		83	44 - 120
Phenanthrene	0.0296	0.0221		mg/Kg		74	44 - 120
Pyrene	0.0296	0.0236		mg/Kg		80	43 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl	83		39 - 120
Nitrobenzene-d5	86		42 - 120
Terphenyl-d14	83		35 - 124

Lab Sample ID: 280-103410-2 MS

Matrix: Solid

Analysis Batch: 396646

Client Sample ID: SB-18-8'

Prep Type: Total/NA

Prep Batch: 395024

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	ND		0.0333	0.0188		mg/Kg	✱	57	35 - 120
Acenaphthylene	0.00071	J B	0.0333	0.0180		mg/Kg	✱	52	41 - 120
Anthracene	ND		0.0333	0.0201		mg/Kg	✱	60	43 - 120
Benzo[a]anthracene	ND		0.0333	0.0215		mg/Kg	✱	65	36 - 120
Benzo[a]pyrene	ND		0.0333	0.0211		mg/Kg	✱	64	20 - 120
Benzo[b]fluoranthene	ND		0.0333	0.0210		mg/Kg	✱	63	37 - 120
Benzo[g,h,i]perylene	ND		0.0333	0.0197		mg/Kg	✱	59	20 - 123
Benzo[k]fluoranthene	ND		0.0333	0.0204		mg/Kg	✱	61	46 - 120
Chrysene	0.0014	J	0.0333	0.0207		mg/Kg	✱	58	34 - 120
Dibenz(a,h)anthracene	ND		0.0333	0.0190		mg/Kg	✱	57	20 - 120
Fluoranthene	0.0013	J	0.0333	0.0198		mg/Kg	✱	56	45 - 120
Fluorene	ND		0.0333	0.0196		mg/Kg	✱	59	44 - 120
Indeno[1,2,3-cd]pyrene	ND		0.0333	0.0195		mg/Kg	✱	59	20 - 127
Naphthalene	0.00048	J	0.0333	0.0202		mg/Kg	✱	59	44 - 120
Phenanthrene	0.0016	J	0.0333	0.0190		mg/Kg	✱	52	44 - 120
Pyrene	ND		0.0333	0.0201		mg/Kg	✱	60	43 - 120

Surrogate	MS %Recovery	MS Qualifier	Limits
2-Fluorobiphenyl	61		39 - 120
Nitrobenzene-d5	64		42 - 120
Terphenyl-d14	62		35 - 124

TestAmerica Denver

# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: 280-103410-2 MSD

Matrix: Solid

Analysis Batch: 396646

Client Sample ID: SB-18-8'

Prep Type: Total/NA

Prep Batch: 395024

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Acenaphthene	ND		0.0336	0.0177		mg/Kg	☼	53	35 - 120	6	50
Acenaphthylene	0.00071	J B	0.0336	0.0169		mg/Kg	☼	48	41 - 120	6	50
Anthracene	ND		0.0336	0.0196		mg/Kg	☼	58	43 - 120	3	50
Benzo[a]anthracene	ND		0.0336	0.0213		mg/Kg	☼	63	36 - 120	1	40
Benzo[a]pyrene	ND		0.0336	0.0209		mg/Kg	☼	62	20 - 120	1	30
Benzo[b]fluoranthene	ND		0.0336	0.0213		mg/Kg	☼	63	37 - 120	1	28
Benzo[g,h,i]perylene	ND		0.0336	0.0196		mg/Kg	☼	58	20 - 123	1	30
Benzo[k]fluoranthene	ND		0.0336	0.0209		mg/Kg	☼	62	46 - 120	2	28
Chrysene	0.0014	J	0.0336	0.0208		mg/Kg	☼	58	34 - 120	1	41
Dibenz(a,h)anthracene	ND		0.0336	0.0192		mg/Kg	☼	57	20 - 120	1	25
Fluoranthene	0.0013	J	0.0336	0.0189		mg/Kg	☼	53	45 - 120	5	30
Fluorene	ND		0.0336	0.0184		mg/Kg	☼	55	44 - 120	6	50
Indeno[1,2,3-cd]pyrene	ND		0.0336	0.0197		mg/Kg	☼	58	20 - 127	1	50
Naphthalene	0.00048	J	0.0336	0.0192		mg/Kg	☼	56	44 - 120	5	50
Phenanthrene	0.0016	J	0.0336	0.0184		mg/Kg	☼	50	44 - 120	3	42
Pyrene	ND		0.0336	0.0194		mg/Kg	☼	58	43 - 120	4	30

Surrogate	MSD %Recovery	MSD Qualifier	Limits
2-Fluorobiphenyl	56		39 - 120
Nitrobenzene-d5	60		42 - 120
Terphenyl-d14	60		35 - 124

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Gasoline Range Organics)

Lab Sample ID: MB 280-395505/1-A

Matrix: Solid

Analysis Batch: 395529

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 395505

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C10)	0.513	J	1.2	0.33	mg/Kg		11/16/17 08:50	11/16/17 11:04	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene	104		77 - 123	11/16/17 08:50	11/16/17 11:04	1

Lab Sample ID: LCS 280-395505/2-A

Matrix: Solid

Analysis Batch: 395529

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 395505

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
GRO (C6-C10)	5.50	5.62		mg/Kg		102	85 - 153

Surrogate	LCS %Recovery	LCS Qualifier	Limits
a,a,a-Trifluorotoluene	104		77 - 123

TestAmerica Denver

# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Gasoline Range Organics) (Continued)

Lab Sample ID: LCSD 280-395505/3-A

Matrix: Solid

Analysis Batch: 395529

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 395505

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (C6-C10)	5.50	5.53		mg/Kg		101	85 - 153	2	30
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
a,a,a-Trifluorotoluene	104		77 - 123						

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics)

Lab Sample ID: MB 280-394990/1-A

Matrix: Solid

Analysis Batch: 396206

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 394990

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics [C10-C28]	1.11	J	3.9	0.66	mg/Kg		11/13/17 07:59	11/22/17 13:55	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl (Surr)	103		49 - 115				11/13/17 07:59	11/22/17 13:55	1

Lab Sample ID: LCS 280-394990/2-A

Matrix: Solid

Analysis Batch: 396206

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 394990

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Diesel Range Organics [C10-C28]	62.7	58.2		mg/Kg		93	53 - 115		
Surrogate	LCS %Recovery	LCS Qualifier	Limits						
o-Terphenyl (Surr)	98		49 - 115						

Lab Sample ID: 280-103410-5 MS

Matrix: Solid

Analysis Batch: 396206

Client Sample ID: SB-21-11'

Prep Type: Total/NA

Prep Batch: 394990

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Diesel Range Organics [C10-C28]	17	F2 B	75.8	65.0		mg/Kg	☼	63	56 - 115		
Surrogate	MS %Recovery	MS Qualifier	Limits								
o-Terphenyl (Surr)	76		49 - 115								

Lab Sample ID: 280-103410-5 MSD

Matrix: Solid

Analysis Batch: 396206

Client Sample ID: SB-21-11'

Prep Type: Total/NA

Prep Batch: 394990

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Diesel Range Organics [C10-C28]	17	F2 B	76.5	97.3	F2	mg/Kg	☼	105	56 - 115	40	23

TestAmerica Denver

# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 8015C - Nonhalogenated Organics using GC/FID -Modified (Diesel Range Organics) (Continued)

Lab Sample ID: 280-103410-5 MSD

Matrix: Solid

Analysis Batch: 396206

Client Sample ID: SB-21-11'

Prep Type: Total/NA

Prep Batch: 394990

Surrogate	MSD %Recovery	MSD Qualifier	Limits
o-Terphenyl (Surr)	77		49 - 115

## Method: 20B - Sodium Adsorption Ratio

Lab Sample ID: MB 280-395198/1-A

Matrix: Solid

Analysis Batch: 396650

Client Sample ID: Method Blank

Prep Type: Soluble

Prep Batch: 395198

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium Adsorption Ratio	ND		1.2	1.2	No Unit		11/20/17 16:30	11/27/17 15:45	10

Lab Sample ID: 280-103410-6 DU

Matrix: Solid

Analysis Batch: 396650

Client Sample ID: SB-22-8'

Prep Type: Soluble

Prep Batch: 395198

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Sodium Adsorption Ratio	43		42.6		No Unit		1	20

## Method: 6010C - Metals (ICP)

Lab Sample ID: MB 280-395146/1-A

Matrix: Solid

Analysis Batch: 395786

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 395146

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND		1.0	0.10	mg/Kg		11/16/17 07:27	11/17/17 16:32	1
Boron	ND		10	0.98	mg/Kg		11/16/17 07:27	11/17/17 16:32	1
Cadmium	ND		0.50	0.041	mg/Kg		11/16/17 07:27	11/17/17 16:32	1
Chromium	0.0651	J	1.5	0.058	mg/Kg		11/16/17 07:27	11/17/17 16:32	1
Copper	ND		2.0	0.22	mg/Kg		11/16/17 07:27	11/17/17 16:32	1
Nickel	ND		4.0	0.13	mg/Kg		11/16/17 07:27	11/17/17 16:32	1
Selenium	ND		1.5	0.86	mg/Kg		11/16/17 07:27	11/17/17 16:32	1
Silver	ND		1.0	0.16	mg/Kg		11/16/17 07:27	11/17/17 16:32	1
Zinc	ND		3.0	0.40	mg/Kg		11/16/17 07:27	11/17/17 16:32	1

Lab Sample ID: MB 280-395146/1-A

Matrix: Solid

Analysis Batch: 396210

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 395146

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		0.90	0.31	mg/Kg		11/16/17 07:27	11/21/17 14:37	1

TestAmerica Denver



# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 280-395146/2-A

Matrix: Solid

Analysis Batch: 395786

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 395146

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Barium	200	186		mg/Kg		93	87 - 112
Boron	100	94.5		mg/Kg		95	80 - 120
Cadmium	10.0	10.1		mg/Kg		101	87 - 110
Chromium	20.0	20.6		mg/Kg		103	84 - 114
Copper	25.0	24.5		mg/Kg		98	88 - 110
Nickel	50.0	48.7		mg/Kg		97	87 - 110
Selenium	200	185		mg/Kg		92	83 - 110
Silver	5.00	4.99		mg/Kg		100	87 - 114
Zinc	50.0	50.1		mg/Kg		100	76 - 114

Lab Sample ID: LCS 280-395146/2-A

Matrix: Solid

Analysis Batch: 396210

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 395146

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Lead	50.0	47.4		mg/Kg		95	86 - 110

## Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 280-395144/1-A

Matrix: Solid

Analysis Batch: 395475

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 395144

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.60	0.051	mg/Kg		11/15/17 08:09	11/15/17 19:17	1

Lab Sample ID: LCS 280-395144/2-A

Matrix: Solid

Analysis Batch: 395475

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 395144

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	20.0	18.2		mg/Kg		91	83 - 111

Lab Sample ID: 280-103410-2 MS

Matrix: Solid

Analysis Batch: 395475

Client Sample ID: SB-18-8'

Prep Type: Total/NA

Prep Batch: 395144

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Arsenic	4.4		21.2	23.6		mg/Kg	☼	91	83 - 111

Lab Sample ID: 280-103410-2 MSD

Matrix: Solid

Analysis Batch: 395475

Client Sample ID: SB-18-8'

Prep Type: Total/NA

Prep Batch: 395144

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Arsenic	4.4		21.1	24.1		mg/Kg	☼	93	83 - 111	2	20

TestAmerica Denver

# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 280-395177/1-A  
Matrix: Solid  
Analysis Batch: 395334

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 395177

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.017	0.0055	mg/Kg		11/14/17 12:40	11/14/17 20:46	1

Lab Sample ID: LCS 280-395177/2-A  
Matrix: Solid  
Analysis Batch: 395334

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 395177

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.333	0.350		mg/Kg		105	87 - 111

## Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 490-477143/1-A  
Matrix: Solid  
Analysis Batch: 477322

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 477143

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium (hexavalent)	ND		5.0	2.0	mg/Kg		11/18/17 11:46	11/19/17 12:49	1

Lab Sample ID: LCS 490-477143/3-A  
Matrix: Solid  
Analysis Batch: 477322

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 477143

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium (hexavalent)	65.0	73.6		mg/Kg		113	80 - 120

Lab Sample ID: LCSS 490-477143/2-A  
Matrix: Solid  
Analysis Batch: 477322

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 477143

Analyte	Spike Added	LCSS Result	LCSS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium (hexavalent)	39.7	35.7		mg/Kg		90	80 - 120

Lab Sample ID: 280-103410-2 MSI  
Matrix: Solid  
Analysis Batch: 477322

Client Sample ID: SB-18-8'  
Prep Type: Total/NA  
Prep Batch: 477143

Analyte	Sample Result	Sample Qualifier	Spike Added	MSI Result	MSI Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium (hexavalent)	ND		73.2	69.1		mg/Kg	☼	94	75 - 125

Lab Sample ID: 280-103410-2 MSS  
Matrix: Solid  
Analysis Batch: 477322

Client Sample ID: SB-18-8'  
Prep Type: Total/NA  
Prep Batch: 477143

Analyte	Sample Result	Sample Qualifier	Spike Added	MSS Result	MSS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium (hexavalent)	ND		44.5	39.9		mg/Kg	☼	90	75 - 125

TestAmerica Denver

# QC Sample Results

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Method: 7196A - Chromium, Hexavalent (Continued)

Lab Sample ID: 280-103410-2 DU  
Matrix: Solid  
Analysis Batch: 477322

Client Sample ID: SB-18-8'  
Prep Type: Total/NA  
Prep Batch: 477143

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Chromium (hexavalent)	ND		ND		mg/Kg	✖	NC	20

## Method: 7196A - Chromium, Trivalent (Colorimetric)

Lab Sample ID: MB 280-396252/1  
Matrix: Solid  
Analysis Batch: 396252

Client Sample ID: Method Blank  
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, trivalent	ND		2.0	2.0	mg/Kg			11/22/17 14:04	1
Cr	ND		2.0	2.0	mg/Kg			11/22/17 14:04	1
Cr (VI)	ND		1.4	1.4	mg/Kg			11/22/17 14:04	1

## Method: 9045D - pH

Lab Sample ID: LCS 280-395339/1-A  
Matrix: Solid  
Analysis Batch: 395400

Client Sample ID: Lab Control Sample  
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	97 - 103

# QC Association Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## GC/MS VOA

### Prep Batch: 395122

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-1	SB-17-6'	Total/NA	Solid	5035	
280-103410-2	SB-18-8'	Total/NA	Solid	5035	
280-103410-3	SB-19-13'	Total/NA	Solid	5035	
280-103410-4	SB-20-13'	Total/NA	Solid	5035	
280-103410-5	SB-21-11'	Total/NA	Solid	5035	
280-103410-6	SB-22-8'	Total/NA	Solid	5035	
280-103410-8	DUP-02	Total/NA	Solid	5035	
MB 280-395122/3-A	Method Blank	Total/NA	Solid	5035	
LCS 280-395122/1-A	Lab Control Sample	Total/NA	Solid	5035	
LCSD 280-395122/2-A	Lab Control Sample Dup	Total/NA	Solid	5035	

### Analysis Batch: 395130

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-1	SB-17-6'	Total/NA	Solid	8260B	395122
280-103410-2	SB-18-8'	Total/NA	Solid	8260B	395122
280-103410-3	SB-19-13'	Total/NA	Solid	8260B	395122
280-103410-4	SB-20-13'	Total/NA	Solid	8260B	395122
280-103410-5	SB-21-11'	Total/NA	Solid	8260B	395122
280-103410-6	SB-22-8'	Total/NA	Solid	8260B	395122
280-103410-8	DUP-02	Total/NA	Solid	8260B	395122
MB 280-395122/3-A	Method Blank	Total/NA	Solid	8260B	395122
LCS 280-395122/1-A	Lab Control Sample	Total/NA	Solid	8260B	395122
LCSD 280-395122/2-A	Lab Control Sample Dup	Total/NA	Solid	8260B	395122

### Analysis Batch: 396133

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-7	SB-23-6'	Total/NA	Solid	8260B	396139
MB 280-396139/3-A	Method Blank	Total/NA	Solid	8260B	396139
LCS 280-396139/1-A	Lab Control Sample	Total/NA	Solid	8260B	396139
LCSD 280-396139/2-A	Lab Control Sample Dup	Total/NA	Solid	8260B	396139

### Prep Batch: 396139

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-7	SB-23-6'	Total/NA	Solid	5030A	
MB 280-396139/3-A	Method Blank	Total/NA	Solid	5030A	
LCS 280-396139/1-A	Lab Control Sample	Total/NA	Solid	5030A	
LCSD 280-396139/2-A	Lab Control Sample Dup	Total/NA	Solid	5030A	

## GC/MS Semi VOA

### Prep Batch: 395024

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Total/NA	Solid	3546	
280-103410-6	SB-22-8'	Total/NA	Solid	3546	
MB 280-395024/1-A	Method Blank	Total/NA	Solid	3546	
LCS 280-395024/2-A	Lab Control Sample	Total/NA	Solid	3546	
280-103410-2 MS	SB-18-8'	Total/NA	Solid	3546	
280-103410-2 MSD	SB-18-8'	Total/NA	Solid	3546	

TestAmerica Denver

# QC Association Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## GC/MS Semi VOA (Continued)

### Analysis Batch: 396646

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Total/NA	Solid	8270D SIM	395024
280-103410-6	SB-22-8'	Total/NA	Solid	8270D SIM	395024
MB 280-395024/1-A	Method Blank	Total/NA	Solid	8270D SIM	395024
LCS 280-395024/2-A	Lab Control Sample	Total/NA	Solid	8270D SIM	395024
280-103410-2 MS	SB-18-8'	Total/NA	Solid	8270D SIM	395024
280-103410-2 MSD	SB-18-8'	Total/NA	Solid	8270D SIM	395024

## GC VOA

### Prep Batch: 395505

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-1	SB-17-6'	Total/NA	Solid	5035	
280-103410-2	SB-18-8'	Total/NA	Solid	5035	
280-103410-3	SB-19-13'	Total/NA	Solid	5035	
280-103410-4	SB-20-13'	Total/NA	Solid	5035	
280-103410-5	SB-21-11'	Total/NA	Solid	5035	
280-103410-6	SB-22-8'	Total/NA	Solid	5035	
280-103410-7	SB-23-6'	Total/NA	Solid	5035	
280-103410-8	DUP-02	Total/NA	Solid	5035	
MB 280-395505/1-A	Method Blank	Total/NA	Solid	5035	
LCS 280-395505/2-A	Lab Control Sample	Total/NA	Solid	5035	
LCSD 280-395505/3-A	Lab Control Sample Dup	Total/NA	Solid	5035	

### Analysis Batch: 395529

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Total/NA	Solid	8015C	395505
280-103410-3	SB-19-13'	Total/NA	Solid	8015C	395505
280-103410-4	SB-20-13'	Total/NA	Solid	8015C	395505
280-103410-5	SB-21-11'	Total/NA	Solid	8015C	395505
280-103410-6	SB-22-8'	Total/NA	Solid	8015C	395505
280-103410-7	SB-23-6'	Total/NA	Solid	8015C	395505
MB 280-395505/1-A	Method Blank	Total/NA	Solid	8015C	395505
LCS 280-395505/2-A	Lab Control Sample	Total/NA	Solid	8015C	395505
LCSD 280-395505/3-A	Lab Control Sample Dup	Total/NA	Solid	8015C	395505

### Analysis Batch: 395718

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-1	SB-17-6'	Total/NA	Solid	8015C	395505
280-103410-8	DUP-02	Total/NA	Solid	8015C	395505

## GC Semi VOA

### Prep Batch: 394990

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-1	SB-17-6'	Total/NA	Solid	3546	
280-103410-2	SB-18-8'	Total/NA	Solid	3546	
280-103410-3	SB-19-13'	Total/NA	Solid	3546	
280-103410-4	SB-20-13'	Total/NA	Solid	3546	
280-103410-5	SB-21-11'	Total/NA	Solid	3546	
280-103410-6	SB-22-8'	Total/NA	Solid	3546	

TestAmerica Denver

# QC Association Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## GC Semi VOA (Continued)

### Prep Batch: 394990 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-7	SB-23-6'	Total/NA	Solid	3546	
280-103410-8	DUP-02	Total/NA	Solid	3546	
MB 280-394990/1-A	Method Blank	Total/NA	Solid	3546	
LCS 280-394990/2-A	Lab Control Sample	Total/NA	Solid	3546	
280-103410-5 MS	SB-21-11'	Total/NA	Solid	3546	
280-103410-5 MSD	SB-21-11'	Total/NA	Solid	3546	

### Analysis Batch: 396206

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-1	SB-17-6'	Total/NA	Solid	8015C	394990
280-103410-2	SB-18-8'	Total/NA	Solid	8015C	394990
280-103410-3	SB-19-13'	Total/NA	Solid	8015C	394990
280-103410-4	SB-20-13'	Total/NA	Solid	8015C	394990
280-103410-5	SB-21-11'	Total/NA	Solid	8015C	394990
280-103410-6	SB-22-8'	Total/NA	Solid	8015C	394990
280-103410-7	SB-23-6'	Total/NA	Solid	8015C	394990
280-103410-8	DUP-02	Total/NA	Solid	8015C	394990
MB 280-394990/1-A	Method Blank	Total/NA	Solid	8015C	394990
LCS 280-394990/2-A	Lab Control Sample	Total/NA	Solid	8015C	394990
280-103410-5 MS	SB-21-11'	Total/NA	Solid	8015C	394990
280-103410-5 MSD	SB-21-11'	Total/NA	Solid	8015C	394990

## Metals

### Prep Batch: 395144

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Total/NA	Solid	3050B	
280-103410-6	SB-22-8'	Total/NA	Solid	3050B	
MB 280-395144/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 280-395144/2-A	Lab Control Sample	Total/NA	Solid	3050B	
280-103410-2 MS	SB-18-8'	Total/NA	Solid	3050B	
280-103410-2 MSD	SB-18-8'	Total/NA	Solid	3050B	

### Prep Batch: 395146

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Total/NA	Solid	3050B	
280-103410-6	SB-22-8'	Total/NA	Solid	3050B	
MB 280-395146/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 280-395146/2-A	Lab Control Sample	Total/NA	Solid	3050B	

### Prep Batch: 395177

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Total/NA	Solid	7471B	
280-103410-6	SB-22-8'	Total/NA	Solid	7471B	
MB 280-395177/1-A	Method Blank	Total/NA	Solid	7471B	
LCS 280-395177/2-A	Lab Control Sample	Total/NA	Solid	7471B	

### Prep Batch: 395198

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Soluble	Solid	20B	

TestAmerica Denver

# QC Association Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Metals (Continued)

### Prep Batch: 395198 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-6	SB-22-8'	Soluble	Solid	20B	
MB 280-395198/1-A	Method Blank	Soluble	Solid	20B	
280-103410-6 DU	SB-22-8'	Soluble	Solid	20B	

### Analysis Batch: 395334

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Total/NA	Solid	7471B	395177
280-103410-6	SB-22-8'	Total/NA	Solid	7471B	395177
MB 280-395177/1-A	Method Blank	Total/NA	Solid	7471B	395177
LCS 280-395177/2-A	Lab Control Sample	Total/NA	Solid	7471B	395177

### Analysis Batch: 395475

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Total/NA	Solid	6020A	395144
280-103410-6	SB-22-8'	Total/NA	Solid	6020A	395144
MB 280-395144/1-A	Method Blank	Total/NA	Solid	6020A	395144
LCS 280-395144/2-A	Lab Control Sample	Total/NA	Solid	6020A	395144
280-103410-2 MS	SB-18-8'	Total/NA	Solid	6020A	395144
280-103410-2 MSD	SB-18-8'	Total/NA	Solid	6020A	395144

### Analysis Batch: 395786

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Total/NA	Solid	6010C	395146
280-103410-6	SB-22-8'	Total/NA	Solid	6010C	395146
MB 280-395146/1-A	Method Blank	Total/NA	Solid	6010C	395146
LCS 280-395146/2-A	Lab Control Sample	Total/NA	Solid	6010C	395146

### Analysis Batch: 396210

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Total/NA	Solid	6010C	395146
280-103410-6	SB-22-8'	Total/NA	Solid	6010C	395146
MB 280-395146/1-A	Method Blank	Total/NA	Solid	6010C	395146
LCS 280-395146/2-A	Lab Control Sample	Total/NA	Solid	6010C	395146

### Analysis Batch: 396650

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Soluble	Solid	20B	395198
280-103410-6	SB-22-8'	Soluble	Solid	20B	395198
MB 280-395198/1-A	Method Blank	Soluble	Solid	20B	395198
280-103410-6 DU	SB-22-8'	Soluble	Solid	20B	395198

## General Chemistry

### Analysis Batch: 395078

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Total/NA	Solid	Moisture	
280-103410-6	SB-22-8'	Total/NA	Solid	Moisture	

TestAmerica Denver



# QC Association Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## General Chemistry (Continued)

### Analysis Batch: 395252

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-1	SB-17-6'	Total/NA	Solid	Moisture	
280-103410-3	SB-19-13'	Total/NA	Solid	Moisture	
280-103410-4	SB-20-13'	Total/NA	Solid	Moisture	
280-103410-5	SB-21-11'	Total/NA	Solid	Moisture	
280-103410-7	SB-23-6'	Total/NA	Solid	Moisture	
280-103410-8	DUP-02	Total/NA	Solid	Moisture	

### Leach Batch: 395339

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Soluble	Solid	DI Leach	
280-103410-6	SB-22-8'	Soluble	Solid	DI Leach	
LCS 280-395339/1-A	Lab Control Sample	Soluble	Solid	DI Leach	

### Analysis Batch: 395400

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Soluble	Solid	9045D	395339
280-103410-6	SB-22-8'	Soluble	Solid	9045D	395339
LCS 280-395339/1-A	Lab Control Sample	Soluble	Solid	9045D	395339

### Analysis Batch: 396252

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Total/NA	Solid	7196A	
280-103410-6	SB-22-8'	Total/NA	Solid	7196A	
MB 280-396252/1	Method Blank	Total/NA	Solid	7196A	

### Prep Batch: 476423

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Soluble	Solid	Sat Paste Ext	
280-103410-6	SB-22-8'	Soluble	Solid	Sat Paste Ext	

### Prep Batch: 477143

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Total/NA	Solid	3060A	
280-103410-6	SB-22-8'	Total/NA	Solid	3060A	
MB 490-477143/1-A	Method Blank	Total/NA	Solid	3060A	
LCSI 490-477143/3-A	Lab Control Sample	Total/NA	Solid	3060A	
LCSS 490-477143/2-A	Lab Control Sample	Total/NA	Solid	3060A	
280-103410-2 MSI	SB-18-8'	Total/NA	Solid	3060A	
280-103410-2 MSS	SB-18-8'	Total/NA	Solid	3060A	
280-103410-2 DU	SB-18-8'	Total/NA	Solid	3060A	

### Analysis Batch: 477322

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Total/NA	Solid	7196A	477143
280-103410-6	SB-22-8'	Total/NA	Solid	7196A	477143
MB 490-477143/1-A	Method Blank	Total/NA	Solid	7196A	477143
LCSI 490-477143/3-A	Lab Control Sample	Total/NA	Solid	7196A	477143
LCSS 490-477143/2-A	Lab Control Sample	Total/NA	Solid	7196A	477143
280-103410-2 MSI	SB-18-8'	Total/NA	Solid	7196A	477143
280-103410-2 MSS	SB-18-8'	Total/NA	Solid	7196A	477143
280-103410-2 DU	SB-18-8'	Total/NA	Solid	7196A	477143

TestAmerica Denver

## QC Association Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

### Analysis Batch: 477886

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-103410-2	SB-18-8'	Soluble	Solid	29B_EC	476423
280-103410-6	SB-22-8'	Soluble	Solid	29B_EC	
LCS 490-477886/3	Lab Control Sample	Total/NA	Solid	29B_EC	
LCSD 490-477886/4	Lab Control Sample Dup	Total/NA	Solid	29B_EC	

# Lab Chronicle

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

**Client Sample ID: SB-17-6'**

**Date Collected: 11/06/17 09:30**

**Date Received: 11/10/17 07:30**

**Lab Sample ID: 280-103410-1**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			395252	11/14/17 13:15	PAH	TAL DEN

**Client Sample ID: SB-17-6'**

**Date Collected: 11/06/17 09:30**

**Date Received: 11/10/17 07:30**

**Lab Sample ID: 280-103410-1**

**Matrix: Solid**

**Percent Solids: 81.5**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			5.406 g	5 mL	395122	11/06/17 09:30	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	395130	11/14/17 00:35	RSN	TAL DEN
Total/NA	Prep	5035			5.002 g	5 mL	395505	11/06/17 09:30	KDK	TAL DEN
Total/NA	Analysis	8015C		5	0.1 mL	5 mL	395718	11/17/17 12:30	KDK	TAL DEN
Total/NA	Prep	3546			30.2 g	10 mL	394990	11/13/17 07:59	TEB	TAL DEN
Total/NA	Analysis	8015C		20			396206	11/22/17 16:46	AFB	TAL DEN

**Client Sample ID: SB-18-8'**

**Date Collected: 11/06/17 15:30**

**Date Received: 11/10/17 07:30**

**Lab Sample ID: 280-103410-2**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Prep	20B			100.026 g	25 mL	395198	11/20/17 16:30	CDH	TAL DEN
Soluble	Analysis	20B		10			396650	11/27/17 15:48	CML	TAL DEN
Soluble	Prep	Sat Paste Ext			1 g	1 mL	476423	11/20/17 13:01	BAA	TAL NSH
Soluble	Analysis	29B_EC		1			477886	11/21/17 11:30	JAB	TAL NSH
Total/NA	Analysis	7196A		1			396252	11/22/17 14:04	DEG	TAL DEN
Soluble	Leach	DI Leach			40.10 g	40 mL	395339	11/15/17 09:09	A1D	TAL DEN
Soluble	Analysis	9045D		1			395400	11/15/17 13:31	A1D	TAL DEN
Total/NA	Analysis	Moisture		1			395078	11/13/17 14:36	PAH	TAL DEN

**Client Sample ID: SB-18-8'**

**Date Collected: 11/06/17 15:30**

**Date Received: 11/10/17 07:30**

**Lab Sample ID: 280-103410-2**

**Matrix: Solid**

**Percent Solids: 88.4**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			4.919 g	5 mL	395122	11/06/17 15:30	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	395130	11/14/17 00:56	RSN	TAL DEN
Total/NA	Prep	3546			30.0 g	1 mL	395024	11/13/17 11:32	TEB	TAL DEN
Total/NA	Analysis	8270D SIM		1			396646	11/28/17 00:16	MKW	TAL DEN
Total/NA	Prep	5035			4.56 g	5 mL	395505	11/06/17 15:30	KDK	TAL DEN
Total/NA	Analysis	8015C		1	0.1 mL	5 mL	395529	11/16/17 13:07	KDK	TAL DEN
Total/NA	Prep	3546			31.0 g	1 mL	394990	11/13/17 07:59	TEB	TAL DEN
Total/NA	Analysis	8015C		1			396206	11/22/17 17:10	AFB	TAL DEN
Total/NA	Prep	3050B			1.053 g	100 mL	395146	11/16/17 07:27	TEB	TAL DEN
Total/NA	Analysis	6010C		1			395786	11/17/17 17:50	CML	TAL DEN

TestAmerica Denver

# Lab Chronicle

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.053 g	100 mL	395146	11/16/17 07:27	TEB	TAL DEN
Total/NA	Analysis	6010C		1			396210	11/21/17 15:40	CML	TAL DEN
Total/NA	Prep	3050B			1.062 g	100 mL	395144	11/15/17 08:09	CDH	TAL DEN
Total/NA	Analysis	6020A		1			395475	11/15/17 19:25	LMT	TAL DEN
Total/NA	Prep	7471B			0.53 g	50 mL	395177	11/14/17 12:40	CDH	TAL DEN
Total/NA	Analysis	7471B		1			395334	11/14/17 21:35	CDH	TAL DEN
Total/NA	Prep	3060A			2.5414 g	500 mL	477143	11/18/17 11:46	BLM	TAL NSH
Total/NA	Analysis	7196A		1	50 mL	50 mL	477322	11/19/17 12:49	BLM	TAL NSH

Client Sample ID: SB-19-13'

Lab Sample ID: 280-103410-3

Date Collected: 11/06/17 16:00

Matrix: Solid

Date Received: 11/10/17 07:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			395252	11/14/17 13:15	PAH	TAL DEN

Client Sample ID: SB-19-13'

Lab Sample ID: 280-103410-3

Date Collected: 11/06/17 16:00

Matrix: Solid

Date Received: 11/10/17 07:30

Percent Solids: 93.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			4.813 g	5 mL	395122	11/06/17 16:00	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	395130	11/14/17 01:17	RSN	TAL DEN
Total/NA	Prep	5035			4.414 g	5 mL	395505	11/06/17 16:00	KDK	TAL DEN
Total/NA	Analysis	8015C		1	0.1 mL	5 mL	395529	11/16/17 13:32	KDK	TAL DEN
Total/NA	Prep	3546			30.2 g	1 mL	394990	11/13/17 07:59	TEB	TAL DEN
Total/NA	Analysis	8015C		1			396206	11/22/17 17:34	AFB	TAL DEN

Client Sample ID: SB-20-13'

Lab Sample ID: 280-103410-4

Date Collected: 11/06/17 14:50

Matrix: Solid

Date Received: 11/10/17 07:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			395252	11/14/17 13:15	PAH	TAL DEN

Client Sample ID: SB-20-13'

Lab Sample ID: 280-103410-4

Date Collected: 11/06/17 14:50

Matrix: Solid

Date Received: 11/10/17 07:30

Percent Solids: 80.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			5.759 g	5 mL	395122	11/06/17 14:50	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	395130	11/14/17 01:38	RSN	TAL DEN
Total/NA	Prep	5035			6.698 g	5 mL	395505	11/06/17 14:50	KDK	TAL DEN
Total/NA	Analysis	8015C		1	0.1 mL	5 mL	395529	11/16/17 13:57	KDK	TAL DEN
Total/NA	Prep	3546			30.2 g	1 mL	394990	11/13/17 07:59	TEB	TAL DEN
Total/NA	Analysis	8015C		1			396206	11/22/17 17:59	AFB	TAL DEN

TestAmerica Denver

# Lab Chronicle

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

**Client Sample ID: SB-21-11'**

**Date Collected: 11/07/17 10:15**

**Date Received: 11/10/17 07:30**

**Lab Sample ID: 280-103410-5**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			395252	11/14/17 13:15	PAH	TAL DEN

**Client Sample ID: SB-21-11'**

**Date Collected: 11/07/17 10:15**

**Date Received: 11/10/17 07:30**

**Lab Sample ID: 280-103410-5**

**Matrix: Solid**

**Percent Solids: 86.3**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			5.876 g	5 mL	395122	11/07/17 10:15	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	395130	11/14/17 01:59	RSN	TAL DEN
Total/NA	Prep	5035			5.237 g	5 mL	395505	11/06/17 10:15	KDK	TAL DEN
Total/NA	Analysis	8015C		1	0.1 mL	5 mL	395529	11/16/17 14:22	KDK	TAL DEN
Total/NA	Prep	3546			30.4 g	1 mL	394990	11/13/17 07:59	TEB	TAL DEN
Total/NA	Analysis	8015C		1			396206	11/22/17 18:23	AFB	TAL DEN

**Client Sample ID: SB-22-8'**

**Date Collected: 11/06/17 15:00**

**Date Received: 11/10/17 07:30**

**Lab Sample ID: 280-103410-6**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Prep	20B			100.039 g	25 mL	395198	11/20/17 16:30	CDH	TAL DEN
Soluble	Analysis	20B		10			396650	11/27/17 15:51	CML	TAL DEN
Soluble	Prep	Sat Paste Ext			1 g	1 mL	476423	11/20/17 13:01	BAA	TAL NSH
Soluble	Analysis	29B_EC		1			477886	11/21/17 11:30	JAB	TAL NSH
Total/NA	Analysis	7196A		1			396252	11/22/17 14:04	DEG	TAL DEN
Soluble	Leach	DI Leach			40.48 g	40 mL	395339	11/15/17 09:09	A1D	TAL DEN
Soluble	Analysis	9045D		1			395400	11/15/17 13:31	A1D	TAL DEN
Total/NA	Analysis	Moisture		1			395078	11/13/17 14:36	PAH	TAL DEN

**Client Sample ID: SB-22-8'**

**Date Collected: 11/06/17 15:00**

**Date Received: 11/10/17 07:30**

**Lab Sample ID: 280-103410-6**

**Matrix: Solid**

**Percent Solids: 92.2**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			5.239 g	5 mL	395122	11/06/17 15:00	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	395130	11/14/17 02:19	RSN	TAL DEN
Total/NA	Prep	3546			30.3 g	1 mL	395024	11/13/17 11:32	TEB	TAL DEN
Total/NA	Analysis	8270D SIM		1			396646	11/28/17 01:40	MKW	TAL DEN
Total/NA	Prep	5035			5.121 g	5 mL	395505	11/06/17 15:00	KDK	TAL DEN
Total/NA	Analysis	8015C		1	0.1 mL	5 mL	395529	11/16/17 14:47	KDK	TAL DEN
Total/NA	Prep	3546			30.5 g	1 mL	394990	11/13/17 07:59	TEB	TAL DEN
Total/NA	Analysis	8015C		1			396206	11/22/17 19:35	AFB	TAL DEN
Total/NA	Prep	3050B			1.235 g	100 mL	395146	11/16/17 07:27	TEB	TAL DEN
Total/NA	Analysis	6010C		1			395786	11/17/17 17:53	CML	TAL DEN

TestAmerica Denver

# Lab Chronicle

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

**Client Sample ID: SB-22-8'**

**Date Collected: 11/06/17 15:00**

**Date Received: 11/10/17 07:30**

**Lab Sample ID: 280-103410-6**

**Matrix: Solid**

**Percent Solids: 92.2**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.235 g	100 mL	395146	11/16/17 07:27	TEB	TAL DEN
Total/NA	Analysis	6010C		1			396210	11/21/17 15:43	CML	TAL DEN
Total/NA	Prep	3050B			1.144 g	100 mL	395144	11/15/17 08:09	CDH	TAL DEN
Total/NA	Analysis	6020A		1			395475	11/15/17 19:44	LMT	TAL DEN
Total/NA	Prep	7471B			0.55 g	50 mL	395177	11/14/17 12:40	CDH	TAL DEN
Total/NA	Analysis	7471B		1			395334	11/14/17 21:37	CDH	TAL DEN
Total/NA	Prep	3060A			2.5920 g	500 mL	477143	11/18/17 11:46	BLM	TAL NSH
Total/NA	Analysis	7196A		1	50 mL	50 mL	477322	11/19/17 12:49	BLM	TAL NSH

**Client Sample ID: SB-23-6'**

**Date Collected: 11/08/17 09:30**

**Date Received: 11/10/17 07:30**

**Lab Sample ID: 280-103410-7**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			395252	11/14/17 13:15	PAH	TAL DEN

**Client Sample ID: SB-23-6'**

**Date Collected: 11/08/17 09:30**

**Date Received: 11/10/17 07:30**

**Lab Sample ID: 280-103410-7**

**Matrix: Solid**

**Percent Solids: 95.4**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5030A			4.907 g	5 mL	396139	11/21/17 20:45	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	396133	11/21/17 21:40	RSN	TAL DEN
Total/NA	Prep	5035			4.246 g	5 mL	395505	11/06/17 09:30	KDK	TAL DEN
Total/NA	Analysis	8015C		1	0.1 mL	5 mL	395529	11/16/17 15:12	KDK	TAL DEN
Total/NA	Prep	3546			30.9 g	1 mL	394990	11/13/17 07:59	TEB	TAL DEN
Total/NA	Analysis	8015C		1			396206	11/22/17 19:59	AFB	TAL DEN

**Client Sample ID: DUP-02**

**Date Collected: 11/06/17 00:00**

**Date Received: 11/10/17 07:30**

**Lab Sample ID: 280-103410-8**

**Matrix: Solid**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			395252	11/14/17 13:15	PAH	TAL DEN

**Client Sample ID: DUP-02**

**Date Collected: 11/06/17 00:00**

**Date Received: 11/10/17 07:30**

**Lab Sample ID: 280-103410-8**

**Matrix: Solid**

**Percent Solids: 83.8**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			5.771 g	5 mL	395122	11/06/17 00:00	RSN	TAL DEN
Total/NA	Analysis	8260B		1	5 g	5 mL	395130	11/14/17 03:01	RSN	TAL DEN
Total/NA	Prep	5035			6.695 g	5 mL	395505	11/06/17 00:00	KDK	TAL DEN

TestAmerica Denver

# Lab Chronicle

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

**Client Sample ID: DUP-02**

**Date Collected: 11/06/17 00:00**

**Date Received: 11/10/17 07:30**

**Lab Sample ID: 280-103410-8**

**Matrix: Solid**

**Percent Solids: 83.8**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8015C		2	0.1 mL	5 mL	395718	11/17/17 12:55	KDK	TAL DEN
Total/NA	Prep	3546			30.1 g	10 mL	394990	11/13/17 07:59	TEB	TAL DEN
Total/NA	Analysis	8015C		20			396206	11/22/17 20:23	AFB	TAL DEN

## Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177



# Accreditation/Certification Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Laboratory: TestAmerica Denver

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19 *
A2LA	ISO/IEC 17025		2907.01	10-31-19
Alabama	State Program	4	40730	09-30-12 *
Alaska (UST)	State Program	10	UST-30	04-05-18
Arizona	State Program	9	AZ0713	12-20-18
Arkansas DEQ	State Program	6	88-0687	06-01-18
California	State Program	9	2513	01-08-18 *
Connecticut	State Program	1	PH-0686	09-30-18
Florida	NELAP	4	E87667	06-30-18
Georgia	State Program	4	N/A	01-08-18
Illinois	NELAP	5	200017	04-30-18
Iowa	State Program	7	370	12-01-18
Kansas	NELAP	7	E-10166	04-30-18
Louisiana	NELAP	6	02096	06-30-18
Maine	State Program	1	CO0002	03-03-19
Minnesota	NELAP	5	8-999-405	12-31-17 *
Nevada	State Program	9	CO0026	07-31-18
New Hampshire	NELAP	1	205310	04-28-18
New Jersey	NELAP	2	CO004	06-30-18
New York	NELAP	2	11964	04-01-18
North Carolina (WW/SW)	State Program	4	358	12-31-18
North Dakota	State Program	8	R-034	01-09-18
Oklahoma	State Program	6	8614	08-31-18
Oregon	NELAP	10	4025	01-08-19
Pennsylvania	NELAP	3	68-00664	07-31-18
South Carolina	State Program	4	72002001	01-08-18
Texas	NELAP	6	T104704183-17-14	09-30-18
USDA	Federal		P330-16-00397	12-15-19
Utah	NELAP	8	CO00026	07-31-18
Virginia	NELAP	3	460232	06-14-18
Washington	State Program	10	C583	08-03-18
West Virginia DEP	State Program	3	354	12-31-17 *
Wisconsin	State Program	5	999615430	08-31-18
Wyoming (UST)	A2LA	8	2907.01	10-31-19

## Laboratory: TestAmerica Nashville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	A2LA		NA: NELAP & A2LA	12-31-19
A2LA	ISO/IEC 17025		0453.07	12-31-19
Alaska (UST)	State Program	10	UST-087	01-01-18 *
Arizona	State Program	9	AZ0473	05-05-18
Arkansas DEQ	State Program	6	88-0737	04-25-18
California	State Program	9	2938	10-31-18
Connecticut	State Program	1	PH-0220	12-31-19
Florida	NELAP	4	E87358	06-30-18
Georgia	State Program	4	E87358(FL)/453.07(A2L A)	06-30-18
Illinois	NELAP	5	200010	12-09-18
Iowa	State Program	7	131	04-01-18

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Denver

# Accreditation/Certification Summary

Client: Stantec Consulting Corp.  
Project/Site: Chevron Rangely, CO CS-47

TestAmerica Job ID: 280-103410-1

## Laboratory: TestAmerica Nashville (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Kansas	NELAP	7	E-10229	12-31-17 *
Kentucky (UST)	State Program	4	19	06-30-18
Kentucky (WW)	State Program	4	90038	12-31-18
Louisiana	NELAP	6	30613	06-30-18
Maine	State Program	1	TN00032	11-03-19
Maryland	State Program	3	316	03-31-18
Massachusetts	State Program	1	M-TN032	06-30-18
Minnesota	NELAP	5	047-999-345	12-31-18
Mississippi	State Program	4	N/A	06-30-18
Montana (UST)	State Program	8	NA	02-24-20
Nevada	State Program	9	TN00032	07-31-18
New Hampshire	NELAP	1	2963	10-09-18
New Jersey	NELAP	2	TN965	06-30-18
New York	NELAP	2	11342	03-31-18
North Carolina (WW/SW)	State Program	4	387	12-31-18
North Dakota	State Program	8	R-146	06-30-18
Ohio VAP	State Program	5	CL0033	07-06-19
Oklahoma	State Program	6	9412	08-31-18
Oregon	NELAP	10	TN200001	04-27-18
Pennsylvania	NELAP	3	68-00585	06-30-18
Rhode Island	State Program	1	LAO00268	12-30-17 *
South Carolina	State Program	4	84009 (001)	02-28-18
South Carolina (Do Not Use - DW)	State Program	4	84009 (002)	12-16-17
Tennessee	State Program	4	2008	02-23-20
Texas	NELAP	6	T104704077	08-31-18
USDA	Federal		P330-13-00306	12-01-19
Utah	NELAP	8	TN00032	07-31-18
Virginia	NELAP	3	460152	06-14-18
Washington	State Program	10	C789	07-19-18
West Virginia DEP	State Program	3	219	02-28-18
Wisconsin	State Program	5	998020430	08-31-18
Wyoming (UST)	A2LA	8	453.07	12-31-19

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Denver

Denver

4955 Yarrow Street

Arvada, CO 80002


phone 303.736.0100 fax 303.431.7171

## Chain of Custody Record


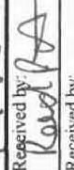
TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact		Project Manager: Brent Lucyk		Site Contact:		Date:		COC No. _____ of _____ COC's								
Tel/Fax:		Tel/Fax:		Lab Contact:		Carrier:		Job No. _____								
2000 South Colorado Boulevard Suite 2-300		Analysis Turnaround Time		Calendar (C) or Work Days (W)		TAT if different from Below _____		SDG No. _____								
Denver, CO		2 weeks		<input type="checkbox"/>		2 weeks		Sample Specific Notes:								
(517) 749-9405		1 week		<input type="checkbox"/>		1 week										
(xxx) xxx-xxxx FAX		2 days		<input type="checkbox"/>		2 days										
Project Name: Rangely		1 day		<input type="checkbox"/>		1 day										
Site: CS-47																
PO #																
Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	BTEX 826B	GRO 801SC	DRO 801SC	PAHs 8270 SIM	COGCC Metals (6010C, 6020A, 7471B)	CPI & CIII 7196A	Electrical Conductivity 29B	SAR 20B	PH 9025D	Moisture
SB-17-6'	11/6/2017	0930	grab	soil	6		X	X	X	X	X	X	X	X	X	
SB-18-8'	11/6/2017	1530	grab	soil	10		X	X	X	X	X	X	X	X	X	
SB-19-13'	11/6/2017	1600	grab	soil	6		X	X	X	X	X	X	X	X	X	
SB-20-13'	11/6/2017	1450	grab	soil	6		X	X	X	X	X	X	X	X	X	
SB-21-11'	11/7/2017	1015	grab	soil	6		X	X	X	X	X	X	X	X	X	
SB-22-8'	11/6/2017	1500	grab	soil	10		X	X	X	X	X	X	X	X	X	
SB-23-6'	11/8/2017	930	grab	soil	6		X	X	X	X	X	X	X	X	X	
DUP-02	11/6/2017		grab	soil	6		X	X	X	X	X	X	X	X	X	
 280-103410 Chain of Custody																
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other _____																
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown																
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months																

Special Instructions/QC Requirements &amp; Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Starline	11/9/2017		TAP	11-10-17 0730
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

4.9 IRAS to 4 Transfer Re 11-10-17



## COOLER RECEIPT FORM

Cooler Received/Opened On 11/16/2017 @ 09:25

Time Samples Removed From Cooler \_\_\_\_\_ Time Samples Placed In Storage \_\_\_\_\_ (2 Hour Window)

1. Tracking # 8515 (last 4 digits, FedEx) Courier: FedEx  
IR Gun ID 17960353 pH Strip Lot \_\_\_\_\_ Chlorine Strip Lot \_\_\_\_\_

2. Temperature of rep. sample or temp blank when opened: 5.2 Degrees Celsius

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: 1 front

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) es

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

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

8. Packing mat'l used? Bubblewrap 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

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

b. Was there any observable headspace present in any VOA vial? YES...NO...NA



Larger than this.

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # \_\_\_\_\_

I certify that I unloaded the cooler and answered questions 7-14 (initial) es

15a. 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) es

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

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) es

I certify that I attached a label with the unique LIMS number to each container (initial) es

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...# es

Phone (303) 736-0100 Fax (303) 431-7171

## Chain of Custody Record

**280-103410**

istAmerica

[illegible]



## Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 280-103410-1

**Login Number: 103410**

**List Source: TestAmerica Denver**

**List Number: 1**

**Creator: Pottruff, Reed W**

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	False	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	False	Refer to Job Narrative for details.
Sample collection date/times are provided.	False	Refer to Job Narrative for details.
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



19-Oct-2017

Tim Dobransky  
Olsson Associates  
760 Horizon Drive  
Suite 102  
Grand Junction, CO 81506

Re: **EMC CS47 Groundwater Sample**

Work Order: **1710599**

Dear Tim,

ALS Environmental received 7 samples on 10-Oct-2017 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 21.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton".

Electronically approved by: Chad Whelton

Chad Whelton  
Project Manager

Certificate No: MN 998501

### Report of Laboratory Analysis

ADDRESS 3352 128th Ave Holland, Michigan 49424 | PHONE (616) 399-6070 | FAX (616) 399-6185

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental

[www.alsglobal.com](http://www.alsglobal.com)

RIGHT SOLUTIONS RIGHT PARTNER



---

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**Work Order:** 1710599

**Work Order Sample Summary**

---

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1710599-01	MW3	Groundwater		10/6/2017 15:55	10/10/2017 09:30	<input type="checkbox"/>
1710599-02	MW4	Groundwater		10/6/2017 16:00	10/10/2017 09:30	<input type="checkbox"/>
1710599-03	MW5	Groundwater		10/6/2017 16:20	10/10/2017 09:30	<input type="checkbox"/>
1710599-04	TW1	Groundwater		10/6/2017 16:50	10/10/2017 09:30	<input type="checkbox"/>
1710599-05	MW2	Groundwater		10/6/2017 15:05	10/10/2017 09:30	<input type="checkbox"/>
1710599-06	MW1	Groundwater		10/6/2017 15:35	10/10/2017 09:30	<input type="checkbox"/>
1710599-07	DUP	Groundwater		10/6/2017 16:25	10/10/2017 09:30	<input type="checkbox"/>

---

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**Work Order:** 1710599

---

**Case Narrative**

Batch R222320, Method GRO\_8015\_W, Samples 1710599-01A, -05a and -06A: Verification of sample preservation indicated a pH >2 despite collection in HCl preserved containers.

Batch R222460, Method VOC\_8260\_W, Sample 1710599-05A: Verification of sample preservation indicated a pH >2 despite collection in HCl preserved containers.

Batch R222518a, Method VOC\_8260\_W, Sample 1710599-06A: The VOC reporting limits are elevated due to dilution needed to eliminate matrix-related interference.

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**WorkOrder:** 1710599

## **QUALIFIERS, ACRONYMS, UNITS**

<b>Qualifier</b>	<b>Description</b>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<b>Acronym</b>	<b>Description</b>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<b>Units Reported</b>	<b>Description</b>
mg/L	Milligrams per Liter

# ALS Group, USA

Date: 19-Oct-17

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**Sample ID:** MW3  
**Collection Date:** 10/6/2017 03:55 PM

**Work Order:** 1710599  
**Lab ID:** 1710599-01  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015C</b>			Prep: SW3511 / 10/13/17	Analyst: <b>KB</b>
DRO (C10-C28)	U		0.040	0.50	mg/L	1	10/15/2017 17:52
Surr: 4-Terphenyl-d14	73.9			35-161	%REC	1	10/15/2017 17:52
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>				Analyst: <b>KB</b>
GRO (C6-C10)	U		0.076	0.20	mg/L	1	10/15/2017 20:00
Surr: Toluene-d8	93.5			76-120	%REC	1	10/15/2017 20:00
<b>VOLATILE ORGANIC COMPOUNDS</b>							
			Method: <b>SW8260B</b>				Analyst: <b>BG</b>
Benzene	U		0.00042	0.0010	mg/L	1	10/17/2017 18:47
Ethylbenzene	U		0.00029	0.0010	mg/L	1	10/17/2017 18:47
m,p-Xylene	U		0.00053	0.0020	mg/L	1	10/17/2017 18:47
o-Xylene	U		0.00019	0.0010	mg/L	1	10/17/2017 18:47
<b>Toluene</b>	<b>0.00046</b>	J	<b>0.00032</b>	<b>0.0010</b>	<b>mg/L</b>	1	10/17/2017 18:47
Xylenes, Total	U		0.00074	0.0030	mg/L	1	10/17/2017 18:47
Surr: 1,2-Dichloroethane-d4	104			75-120	%REC	1	10/17/2017 18:47
Surr: 4-Bromofluorobenzene	97.0			80-110	%REC	1	10/17/2017 18:47
Surr: Dibromofluoromethane	101			85-115	%REC	1	10/17/2017 18:47
Surr: Toluene-d8	94.6			85-110	%REC	1	10/17/2017 18:47
<b>ANIONS BY ION CHROMATOGRAPHY</b>							
			Method: <b>SW9056A</b>				Analyst: <b>EE</b>
Chloride	720		31	100	mg/L	100	10/16/2017 16:55
Sulfate	1,800		34	100	mg/L	100	10/16/2017 16:55

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 19-Oct-17

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**Sample ID:** MW4  
**Collection Date:** 10/6/2017 04:00 PM

**Work Order:** 1710599  
**Lab ID:** 1710599-02  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015C</b>			Prep: SW3511 / 10/13/17	Analyst: <b>KB</b>
DRO (C10-C28)	U		0.040	0.50	mg/L	1	10/15/2017 18:50
Surr: 4-Terphenyl-d14	71.1			35-161	%REC	1	10/15/2017 18:50
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>				Analyst: <b>KB</b>
GRO (C6-C10)	U		0.076	0.20	mg/L	1	10/15/2017 20:29
Surr: Toluene-d8	93.6			76-120	%REC	1	10/15/2017 20:29
<b>VOLATILE ORGANIC COMPOUNDS</b>							
			Method: <b>SW8260B</b>				Analyst: <b>BG</b>
Benzene	0.00056	J	0.00042	0.0010	mg/L	1	10/17/2017 19:13
Ethylbenzene	U		0.00029	0.0010	mg/L	1	10/17/2017 19:13
m,p-Xylene	U		0.00053	0.0020	mg/L	1	10/17/2017 19:13
o-Xylene	U		0.00019	0.0010	mg/L	1	10/17/2017 19:13
Toluene	U		0.00032	0.0010	mg/L	1	10/17/2017 19:13
Xylenes, Total	U		0.00074	0.0030	mg/L	1	10/17/2017 19:13
Surr: 1,2-Dichloroethane-d4	101			75-120	%REC	1	10/17/2017 19:13
Surr: 4-Bromofluorobenzene	95.6			80-110	%REC	1	10/17/2017 19:13
Surr: Dibromofluoromethane	104			85-115	%REC	1	10/17/2017 19:13
Surr: Toluene-d8	95.5			85-110	%REC	1	10/17/2017 19:13
<b>ANIONS BY ION CHROMATOGRAPHY</b>							
			Method: <b>SW9056A</b>				Analyst: <b>EE</b>
Chloride	1,100		31	100	mg/L	100	10/16/2017 17:14
Sulfate	1,700		34	100	mg/L	100	10/16/2017 17:14

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 19-Oct-17

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**Sample ID:** MW5  
**Collection Date:** 10/6/2017 04:20 PM

**Work Order:** 1710599  
**Lab ID:** 1710599-03  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015C</b>			Prep: SW3511 / 10/13/17	Analyst: <b>KB</b>
<b>DRO (C10-C28)</b>	<b>0.052</b>	J	<b>0.040</b>	<b>0.50</b>	<b>mg/L</b>	1	10/15/2017 19:48
Surr: 4-Terphenyl-d14	60.4			35-161	%REC	1	10/15/2017 19:48
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>				Analyst: <b>KB</b>
GRO (C6-C10)	U		0.076	0.20	mg/L	1	10/15/2017 20:59
Surr: Toluene-d8	94.3			76-120	%REC	1	10/15/2017 20:59
<b>VOLATILE ORGANIC COMPOUNDS</b>							
			Method: <b>SW8260B</b>				Analyst: <b>BG</b>
Benzene	U		0.00042	0.0010	mg/L	1	10/17/2017 19:38
Ethylbenzene	U		0.00029	0.0010	mg/L	1	10/17/2017 19:38
m,p-Xylene	U		0.00053	0.0020	mg/L	1	10/17/2017 19:38
o-Xylene	U		0.00019	0.0010	mg/L	1	10/17/2017 19:38
Toluene	U		0.00032	0.0010	mg/L	1	10/17/2017 19:38
Xylenes, Total	U		0.00074	0.0030	mg/L	1	10/17/2017 19:38
Surr: 1,2-Dichloroethane-d4	103			75-120	%REC	1	10/17/2017 19:38
Surr: 4-Bromofluorobenzene	95.8			80-110	%REC	1	10/17/2017 19:38
Surr: Dibromofluoromethane	103			85-115	%REC	1	10/17/2017 19:38
Surr: Toluene-d8	97.0			85-110	%REC	1	10/17/2017 19:38
<b>ANIONS BY ION CHROMATOGRAPHY</b>							
			Method: <b>SW9056A</b>				Analyst: <b>EE</b>
Chloride	600		62	200	mg/L	200	10/16/2017 17:33
Sulfate	1,800		69	200	mg/L	200	10/16/2017 17:33

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 19-Oct-17

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**Sample ID:** TW1  
**Collection Date:** 10/6/2017 04:50 PM

**Work Order:** 1710599  
**Lab ID:** 1710599-04  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015C</b>		Prep: SW3511 / 10/13/17		Analyst: <b>KB</b>
<b>DRO (C10-C28)</b>	<b>0.099</b>	<b>J</b>	<b>0.040</b>	<b>0.50</b>	<b>mg/L</b>	<b>1</b>	10/15/2017 20:17
Surr: 4-Terphenyl-d14	75.1			35-161	%REC	1	10/15/2017 20:17
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>				Analyst: <b>KB</b>
<b>GRO (C6-C10)</b>	<b>U</b>		<b>0.076</b>	<b>0.20</b>	<b>mg/L</b>	<b>1</b>	10/15/2017 21:29
Surr: Toluene-d8	95.7			76-120	%REC	1	10/15/2017 21:29
<b>VOLATILE ORGANIC COMPOUNDS</b>							
			Method: <b>SW8260B</b>				Analyst: <b>BG</b>
Benzene	U		0.00042	0.0010	mg/L	1	10/17/2017 20:04
Ethylbenzene	U		0.00029	0.0010	mg/L	1	10/17/2017 20:04
m,p-Xylene	U		0.00053	0.0020	mg/L	1	10/17/2017 20:04
o-Xylene	U		0.00019	0.0010	mg/L	1	10/17/2017 20:04
Toluene	U		0.00032	0.0010	mg/L	1	10/17/2017 20:04
Xylenes, Total	U		0.00074	0.0030	mg/L	1	10/17/2017 20:04
Surr: 1,2-Dichloroethane-d4	96.7			75-120	%REC	1	10/17/2017 20:04
Surr: 4-Bromofluorobenzene	96.0			80-110	%REC	1	10/17/2017 20:04
Surr: Dibromofluoromethane	102			85-115	%REC	1	10/17/2017 20:04
Surr: Toluene-d8	97.6			85-110	%REC	1	10/17/2017 20:04
<b>ANIONS BY ION CHROMATOGRAPHY</b>							
			Method: <b>SW9056A</b>				Analyst: <b>EE</b>
<b>Chloride</b>	<b>320</b>		<b>31</b>	<b>100</b>	<b>mg/L</b>	<b>100</b>	10/16/2017 17:53
<b>Sulfate</b>	<b>1,200</b>		<b>34</b>	<b>100</b>	<b>mg/L</b>	<b>100</b>	10/16/2017 17:53

**Note:** See Qualifiers page for a list of qualifiers and their definitions.



# ALS Group, USA

Date: 19-Oct-17

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**Sample ID:** MW2  
**Collection Date:** 10/6/2017 03:05 PM

**Work Order:** 1710599  
**Lab ID:** 1710599-05  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015C</b>			Prep: SW3511 / 10/13/17	Analyst: <b>KB</b>
<b>DRO (C10-C28)</b>	<b>0.042</b>	J	<b>0.040</b>	<b>0.50</b>	<b>mg/L</b>	1	10/15/2017 20:46
Surr: 4-Terphenyl-d14	65.9			35-161	%REC	1	10/15/2017 20:46
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>				Analyst: <b>KB</b>
<b>GRO (C6-C10)</b>	U		0.076	0.20	mg/L	1	10/15/2017 21:58
Surr: Toluene-d8	94.2			76-120	%REC	1	10/15/2017 21:58
<b>VOLATILE ORGANIC COMPOUNDS</b>							
			Method: <b>SW8260B</b>				Analyst: <b>BG</b>
Benzene	U		0.00042	0.0010	mg/L	1	10/17/2017 20:29
Ethylbenzene	U		0.00029	0.0010	mg/L	1	10/17/2017 20:29
m,p-Xylene	U		0.00053	0.0020	mg/L	1	10/17/2017 20:29
o-Xylene	U		0.00019	0.0010	mg/L	1	10/17/2017 20:29
Toluene	U		0.00032	0.0010	mg/L	1	10/17/2017 20:29
Xylenes, Total	U		0.00074	0.0030	mg/L	1	10/17/2017 20:29
Surr: 1,2-Dichloroethane-d4	99.2			75-120	%REC	1	10/17/2017 20:29
Surr: 4-Bromofluorobenzene	95.8			80-110	%REC	1	10/17/2017 20:29
Surr: Dibromofluoromethane	105			85-115	%REC	1	10/17/2017 20:29
Surr: Toluene-d8	96.2			85-110	%REC	1	10/17/2017 20:29
<b>ANIONS BY ION CHROMATOGRAPHY</b>							
			Method: <b>SW9056A</b>				Analyst: <b>EE</b>
<b>Chloride</b>	<b>320</b>		<b>31</b>	<b>100</b>	<b>mg/L</b>	100	10/16/2017 18:50
<b>Sulfate</b>	<b>1,300</b>		<b>34</b>	<b>100</b>	<b>mg/L</b>	100	10/16/2017 18:50

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 19-Oct-17

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**Sample ID:** MW1  
**Collection Date:** 10/6/2017 03:35 PM

**Work Order:** 1710599  
**Lab ID:** 1710599-06  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015C</b>		Prep: SW3511 / 10/13/17		Analyst: <b>KB</b>
<b>DRO (C10-C28)</b>	<b>18</b>		<b>0.40</b>	<b>5.0</b>	<b>mg/L</b>	10	10/16/2017 18:35
Surr: 4-Terphenyl-d14	83.9			35-161	%REC	10	10/16/2017 18:35
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>				Analyst: <b>KB</b>
<b>GRO (C6-C10)</b>	<b>1.6</b>	J	<b>0.76</b>	<b>2.0</b>	<b>mg/L</b>	10	10/15/2017 22:31
Surr: Toluene-d8	92.6			76-120	%REC	10	10/15/2017 22:31
<b>VOLATILE ORGANIC COMPOUNDS</b>							
			Method: <b>SW8260B</b>				Analyst: <b>EMR</b>
Benzene	U		0.00084	0.0020	mg/L	2	10/18/2017 17:40
Ethylbenzene	U		0.00058	0.0020	mg/L	2	10/18/2017 17:40
m,p-Xylene	U		0.0011	0.0040	mg/L	2	10/18/2017 17:40
o-Xylene	U		0.00038	0.0020	mg/L	2	10/18/2017 17:40
Toluene	U		0.00064	0.0020	mg/L	2	10/18/2017 17:40
Xylenes, Total	U		0.0015	0.0060	mg/L	2	10/18/2017 17:40
Surr: 1,2-Dichloroethane-d4	95.2			75-120	%REC	2	10/18/2017 17:40
Surr: 4-Bromofluorobenzene	101			80-110	%REC	2	10/18/2017 17:40
Surr: Dibromofluoromethane	103			85-115	%REC	2	10/18/2017 17:40
Surr: Toluene-d8	100			85-110	%REC	2	10/18/2017 17:40
<b>ANIONS BY ION CHROMATOGRAPHY</b>							
			Method: <b>SW9056A</b>				Analyst: <b>EE</b>
<b>Chloride</b>	<b>990</b>		<b>31</b>	<b>100</b>	<b>mg/L</b>	100	10/16/2017 19:09
<b>Sulfate</b>	<b>920</b>		<b>34</b>	<b>100</b>	<b>mg/L</b>	100	10/16/2017 19:09

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 19-Oct-17

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**Sample ID:** DUP  
**Collection Date:** 10/6/2017 04:25 PM

**Work Order:** 1710599  
**Lab ID:** 1710599-07  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015C</b>		Prep: SW3511 / 10/13/17		Analyst: <b>KB</b>
DRO (C10-C28)	U		0.040	0.50	mg/L	1	10/15/2017 22:13
Surr: 4-Terphenyl-d14	78.3			35-161	%REC	1	10/15/2017 22:13
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>				Analyst: <b>KB</b>
GRO (C6-C10)	U		0.076	0.20	mg/L	1	10/15/2017 23:00
Surr: Toluene-d8	92.8			76-120	%REC	1	10/15/2017 23:00
<b>VOLATILE ORGANIC COMPOUNDS</b>							
			Method: <b>SW8260B</b>				Analyst: <b>EMR</b>
Benzene	U		0.00042	0.0010	mg/L	1	10/18/2017 17:24
Ethylbenzene	U		0.00029	0.0010	mg/L	1	10/18/2017 17:24
m,p-Xylene	U		0.00053	0.0020	mg/L	1	10/18/2017 17:24
o-Xylene	U		0.00019	0.0010	mg/L	1	10/18/2017 17:24
Toluene	U		0.00032	0.0010	mg/L	1	10/18/2017 17:24
Xylenes, Total	U		0.00074	0.0030	mg/L	1	10/18/2017 17:24
Surr: 1,2-Dichloroethane-d4	98.2			75-120	%REC	1	10/18/2017 17:24
Surr: 4-Bromofluorobenzene	95.8			80-110	%REC	1	10/18/2017 17:24
Surr: Dibromofluoromethane	99.7			85-115	%REC	1	10/18/2017 17:24
Surr: Toluene-d8	98.6			85-110	%REC	1	10/18/2017 17:24
<b>ANIONS BY ION CHROMATOGRAPHY</b>							
			Method: <b>SW9056A</b>				Analyst: <b>EE</b>
Chloride	600		31	100	mg/L	100	10/17/2017 14:10
Sulfate	1,800		34	100	mg/L	100	10/17/2017 14:10

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

Client: Olsson Associates

Work Order: 1710599

Project: EMC CS47 Groundwater Sample

## QC BATCH REPORT

Batch ID: 108991

Instrument ID GC8

Method: SW8015C

<b>MBLK</b>		Sample ID: <b>DBLKW1-108991-108991</b>				Units: <b>mg/L</b>		Analysis Date: <b>10/15/2017 04:25 PM</b>		
Client ID:		Run ID: <b>GC8_171015A</b>				SeqNo: <b>4702555</b>		Prep Date: <b>10/13/2017</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)

U 0.10

Surr: 4-Terphenyl-d14

0.0375 0 0.0417 0 89.9 35-161 0

<b>LCS</b>		Sample ID: <b>DLCSW1-108991-108991</b>				Units: <b>mg/L</b>		Analysis Date: <b>10/15/2017 04:54 PM</b>		
Client ID:		Run ID: <b>GC8_171015A</b>				SeqNo: <b>4702556</b>		Prep Date: <b>10/13/2017</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)

4.264 0.10 4.17 0 102 60-150 0

Surr: 4-Terphenyl-d14

0.0275 0 0.0417 0 65.9 35-161 0

<b>MS</b>		Sample ID: <b>1710599-01B MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>10/15/2017 06:21 PM</b>		
Client ID: <b>MW3</b>		Run ID: <b>GC8_171015A</b>				SeqNo: <b>4702559</b>		Prep Date: <b>10/13/2017</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)

4.417 0.10 4.17 0.008333 106 60-150 0

Surr: 4-Terphenyl-d14

0.02833 0 0.0417 0 67.9 35-161 0

<b>DUP</b>		Sample ID: <b>1710599-02B DUP</b>				Units: <b>mg/L</b>		Analysis Date: <b>10/15/2017 07:19 PM</b>		
Client ID: <b>MW4</b>		Run ID: <b>GC8_171015A</b>				SeqNo: <b>4702561</b>		Prep Date: <b>10/13/2017</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)

U 0.10 0 0 0 0.004333 0 30

Surr: 4-Terphenyl-d14

0.02917 0 0.0417 0 69.9 44-159 0.02967 1.7 30

The following samples were analyzed in this batch:

1710599-01B	1710599-02B	1710599-03B
1710599-04B	1710599-05B	1710599-06B
1710599-07B		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 1710599  
 Project: EMC CS47 Groundwater Sample

## QC BATCH REPORT

Batch ID: **R222320** Instrument ID **GC9** Method: **SW8015D**

<b>MBLK</b>		Sample ID: <b>GBLKW1-171015-R222320</b>				Units: <b>µg/L</b>		Analysis Date: <b>10/15/2017 07:31 PM</b>		
Client ID:		Run ID: <b>GC9_171015A</b>				SeqNo: <b>4701863</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	U	200								
Surr: Toluene-d8	95.57	0	100	0	95.6	76-120	0			

<b>LCS</b>		Sample ID: <b>GLCSW1-171015-R222320</b>				Units: <b>µg/L</b>		Analysis Date: <b>10/15/2017 06:32 PM</b>		
Client ID:		Run ID: <b>GC9_171015A</b>				SeqNo: <b>4701862</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	10660	200	10000	0	107	76-126	0			
Surr: Toluene-d8	110.3	0	100	0	110	76-120	0			

<b>MS</b>		Sample ID: <b>1710599-01A MS</b>				Units: <b>µg/L</b>		Analysis Date: <b>10/16/2017 01:29 A</b>		
Client ID: <b>MW3</b>		Run ID: <b>GC9_171015A</b>				SeqNo: <b>4701872</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	8020	200	10000	41.96	79.8	76-126	0			
Surr: Toluene-d8	102.5	0	100	0	102	76-120	0			

<b>MSD</b>		Sample ID: <b>1710599-01A MSD</b>				Units: <b>µg/L</b>		Analysis Date: <b>10/16/2017 01:59 A</b>		
Client ID: <b>MW3</b>		Run ID: <b>GC9_171015A</b>				SeqNo: <b>4701873</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	8103	200	10000	41.96	80.6	76-126	8020	1.03	30	
Surr: Toluene-d8	102	0	100	0	102	76-120	102.5	0.479	30	

The following samples were analyzed in this batch:

1710599-01A	1710599-02A	1710599-03A
1710599-04A	1710599-05A	1710599-06A
1710599-07A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 1710599  
 Project: EMC CS47 Groundwater Sample

# QC BATCH REPORT

Batch ID: **R222460** Instrument ID **VMS5** Method: **SW8260B**

MBLK				Sample ID: VBLKW1-171017-R222460			Units: µg/L		Analysis Date: 10/17/2017 04:39 PM		
Client ID:			Run ID: VMS5_171017A			SeqNo: 4706928		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	U	1.0									
Ethylbenzene	U	1.0									
m,p-Xylene	U	2.0									
o-Xylene	U	1.0									
Toluene	U	1.0									
Xylenes, Total	U	3.0									
Surr: 1,2-Dichloroethane-d4	21.71	0	20	0	109	75-120	0				
Surr: 4-Bromofluorobenzene	19.29	0	20	0	96.4	80-110	0				
Surr: Dibromofluoromethane	19.89	0	20	0	99.4	85-115	0				
Surr: Toluene-d8	19.79	0	20	0	99	85-110	0				

LCS				Sample ID: VLCSW1-171017-R222460			Units: µg/L		Analysis Date: 10/17/2017 03:49 PM		
Client ID:		Run ID: VMS5_171017A			SeqNo: 4706927		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	18.96	1.0	20	0	94.8	85-125	0				
Ethylbenzene	18.64	1.0	20	0	93.2	85-125	0				
m,p-Xylene	36.93	2.0	40	0	92.3	75-130	0				
o-Xylene	18.34	1.0	20	0	91.7	80-125	0				
Toluene	18.46	1.0	20	0	92.3	85-125	0				
Xylenes, Total	55.27	3.0	60	0	92.1	80-126	0				
Surr: 1,2-Dichloroethane-d4	21.28	0	20	0	106	75-120	0				
Surr: 4-Bromofluorobenzene	20.21	0	20	0	101	80-110	0				
Surr: Dibromofluoromethane	21.01	0	20	0	105	85-115	0				
Surr: Toluene-d8	19.7	0	20	0	98.5	85-110	0				

MS				Sample ID: 1710426-01A MS				Units: µg/L		Analysis Date: 10/18/2017 01:35 A	
Client ID:			Run ID: VMS5_171017A			SeqNo: 4706952		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	21.67	1.0	20	1.1	103	85-125	0				
Ethylbenzene	20.12	1.0	20	0	101	85-125	0				
m,p-Xylene	40.81	2.0	40	0	102	75-130	0				
o-Xylene	20.29	1.0	20	0	101	80-125	0				
Toluene	20.07	1.0	20	0.41	98.3	85-125	0				
Xylenes, Total	61.1	3.0	60	0	102	80-126	0				
Surr: 1,2-Dichloroethane-d4	19.22	0	20	0	96.1	75-120	0				
Surr: 4-Bromofluorobenzene	19.83	0	20	0	99.2	80-110	0				
Surr: Dibromofluoromethane	20.8	0	20	0	104	85-115	0				
Surr: Toluene-d8	19.28	0	20	0	96.4	85-110	0				

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 1710599  
 Project: EMC CS47 Groundwater Sample

# QC BATCH REPORT

Batch ID: **R222460** Instrument ID **VMS5** Method: **SW8260B**

MSD				Sample ID: <b>1710426-01A MSD</b>			Units: <b>µg/L</b>		Analysis Date: <b>10/18/2017 02:01 A</b>	
Client ID:				Run ID: <b>VMS5_171017A</b>			SeqNo: <b>4706955</b>		Prep Date:	
									DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	21.31	1.0	20	1.1	101	85-125	21.67	1.68	30	
Ethylbenzene	19.89	1.0	20	0	99.4	85-125	20.12	1.15	30	
m,p-Xylene	40.45	2.0	40	0	101	75-130	40.81	0.886	30	
o-Xylene	20.1	1.0	20	0	100	80-125	20.29	0.941	30	
Toluene	19.72	1.0	20	0.41	96.6	85-125	20.07	1.76	30	
Xylenes, Total	60.55	3.0	60	0	101	80-126	61.1	0.904	30	
Surr: 1,2-Dichloroethane-d4	20.4	0	20	0	102	75-120	19.22	5.96	30	
Surr: 4-Bromofluorobenzene	20.73	0	20	0	104	80-110	19.83	4.44	30	
Surr: Dibromofluoromethane	21.58	0	20	0	108	85-115	20.8	3.68	30	
Surr: Toluene-d8	20.08	0	20	0	100	85-110	19.28	4.07	30	

The following samples were analyzed in this batch:

1710599-01A	1710599-02A	1710599-03A
1710599-04A	1710599-05A	1710599-06A
1710599-07A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.



Client: Olsson Associates  
 Work Order: 1710599  
 Project: EMC CS47 Groundwater Sample

# QC BATCH REPORT

Batch ID: **R222518a** Instrument ID **VMS8** Method: **SW8260B**

MBLK				Sample ID: VBLKW1-171018-R222518a			Units: µg/L		Analysis Date: 10/18/2017 01:33 PM		
Client ID:			Run ID: VMS8_171018A			SeqNo: 4708114		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	U	1.0									
Ethylbenzene	U	1.0									
m,p-Xylene	U	2.0									
o-Xylene	U	1.0									
Toluene	U	1.0									
Xylenes, Total	U	3.0									
Surr: 1,2-Dichloroethane-d4	19.76	0	20	0	98.8	75-120	0				
Surr: 4-Bromofluorobenzene	19.65	0	20	0	98.2	80-110	0				
Surr: Dibromofluoromethane	20.43	0	20	0	102	85-115	0				
Surr: Toluene-d8	19.75	0	20	0	98.8	85-110	0				

LCS					Sample ID: VLCSW1-171018-R222518a			Units: µg/L		Analysis Date: 10/18/2017 12:46 PM	
Client ID:			Run ID: VMS8_171018A			SeqNo: 4708113		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	18.85	1.0	20	0	94.2	85-125	0				
Ethylbenzene	19.12	1.0	20	0	95.6	85-125	0				
m,p-Xylene	37.79	2.0	40	0	94.5	75-130	0				
o-Xylene	18.71	1.0	20	0	93.6	80-125	0				
Toluene	19.12	1.0	20	0	95.6	85-125	0				
Xylenes, Total	56.5	3.0	60	0	94.2	80-126	0				
Surr: 1,2-Dichloroethane-d4	19.89	0	20	0	99.4	75-120	0				
Surr: 4-Bromofluorobenzene	19.77	0	20	0	98.8	80-110	0				
Surr: Dibromofluoromethane	20.75	0	20	0	104	85-115	0				
Surr: Toluene-d8	19.92	0	20	0	99.6	85-110	0				

MS				Sample ID: 1710517-09A MS		Units: µg/L		Analysis Date: 10/18/2017 07:32 PM		
Client ID:		Run ID: VMS8_171018A		SeqNo: 4709025		Prep Date:		DF: 50		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	2054	50	1000	1143	91	85-125		0		
Ethylbenzene	3188	50	1000	2181	101	85-125		0		
m,p-Xylene	8016	100	2000	6060	97.8	75-130		0		
o-Xylene	1258	50	1000	306.5	95.1	80-125		0		
Toluene	1028	50	1000	66.5	96.2	85-125		0		
Xylenes, Total	9274	150	3000	6366	96.9	80-126		0		
Surr: 1,2-Dichloroethane-d4	1007	0	1000	0	101	75-120		0		
Surr: 4-Bromofluorobenzene	977	0	1000	0	97.7	80-110		0		
Surr: Dibromofluoromethane	1042	0	1000	0	104	85-115		0		
Surr: Toluene-d8	987.5	0	1000	0	98.8	85-110		0		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Olsson Associates  
**Work Order:** 1710599  
**Project:** EMC CS47 Groundwater Sample

## QC BATCH REPORT

Batch ID: **R222518a**      Instrument ID **VMS8**      Method: **SW8260B**

MSD				Sample ID: 1710517-09A MSD			Units: µg/L		Analysis Date: 10/18/2017 07:48 PM		
Client ID:			Run ID: VMS8_171018A			SeqNo: 4709031		Prep Date:		DF: 50	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	1990	50	1000	1143	84.8	85-125	2054	3.12	30	S	
Ethylbenzene	3052	50	1000	2181	87.1	85-125	3188	4.37	30		
m,p-Xylene	7782	100	2000	6060	86.1	75-130	8016	2.97	30		
o-Xylene	1181	50	1000	306.5	87.4	80-125	1258	6.27	30		
Toluene	969.5	50	1000	66.5	90.3	85-125	1028	5.86	30		
Xylenes, Total	8963	150	3000	6366	86.6	80-126	9274	3.41	30		
Surr: 1,2-Dichloroethane-d4	996.5	0	1000	0	99.6	75-120	1007	1.05	30		
Surr: 4-Bromofluorobenzene	976	0	1000	0	97.6	80-110	977	0.102	30		
Surr: Dibromofluoromethane	1047	0	1000	0	105	85-115	1042	0.431	30		
Surr: Toluene-d8	1002	0	1000	0	100	85-110	987.5	1.51	30		

The following samples were analyzed in this batch:

1710599-06A      1710599-07A

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Olsson Associates  
**Work Order:** 1710599  
**Project:** EMC CS47 Groundwater Sample

## QC BATCH REPORT

Batch ID: **R222406**      Instrument ID **IC4**      Method: **SW9056A**

<b>MBLK</b>		Sample ID: <b>CCB/MBLK-R222406</b>				Units: <b>mg/L</b>		Analysis Date: <b>10/16/2017 10:31 A</b>		
Client ID:		Run ID: <b>IC4_171016A</b>				SeqNo: <b>4703974</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	1.0								
Sulfate	U	1.0								

<b>LCS</b>		Sample ID: <b>LCS-R222406</b>				Units: <b>mg/L</b>		Analysis Date: <b>10/16/2017 10:50 A</b>		
Client ID:		Run ID: <b>IC4_171016A</b>				SeqNo: <b>4703976</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	9.419	1.0	10	0	94.2	88-110	0			
Sulfate	9.897	1.0	10	0	99	85-110	0			

<b>MS</b>		Sample ID: <b>1710426-01E MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>10/16/2017 01:43 PM</b>		
Client ID:		Run ID: <b>IC4_171016A</b>				SeqNo: <b>4703985</b>		Prep Date:		DF: <b>250</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	3280	250	2500	798.3	99.3	75-125	0			
Sulfate	2477	250	2500	0	99.1	75-125	0			

<b>MSD</b>		Sample ID: <b>1710426-01E MSD</b>				Units: <b>mg/L</b>		Analysis Date: <b>10/16/2017 02:02 PM</b>		
Client ID:		Run ID: <b>IC4_171016A</b>				SeqNo: <b>4703986</b>		Prep Date:		DF: <b>250</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	3266	250	2500	798.3	98.7	75-125	3280	0.441	20	
Sulfate	2462	250	2500	0	98.5	75-125	2477	0.573	20	

The following samples were analyzed in this batch:

1710599-01C	1710599-02C	1710599-03C
1710599-04C	1710599-05C	1710599-06C

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 1710599  
 Project: EMC CS47 Groundwater Sample

## QC BATCH REPORT

Batch ID: **R222490** Instrument ID **IC3** Method: **SW9056A**

<b>MBLK</b>		Sample ID: <b>CCB/MBLK-R222490</b>				Units: <b>mg/L</b>		Analysis Date: <b>10/17/2017 01:04 PM</b>		
Client ID:		Run ID: <b>IC3_171017A</b>				SeqNo: <b>4706539</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	1.0								
Sulfate	U	1.0								

<b>LCS</b>		Sample ID: <b>LCS-R222490</b>				Units: <b>mg/L</b>		Analysis Date: <b>10/17/2017 01:24 PM</b>		
Client ID:		Run ID: <b>IC3_171017A</b>				SeqNo: <b>4706540</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	9.335	1.0	10	0	93.4	88-110	0			
Sulfate	9.688	1.0	10	0	96.9	85-110	0			

<b>MS</b>		Sample ID: <b>1710599-07C MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>10/17/2017 05:03 PM</b>		
Client ID: <b>DUP</b>		Run ID: <b>IC3_171017A</b>				SeqNo: <b>4706550</b>		Prep Date:		DF: <b>500</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	5309	500	5000	602.7	94.1	75-125	0			
Sulfate	6668	500	5000	1766	98	75-125	0			

<b>MSD</b>		Sample ID: <b>1710599-07C MSD</b>				Units: <b>mg/L</b>		Analysis Date: <b>10/17/2017 06:00 PM</b>		
Client ID: <b>DUP</b>		Run ID: <b>IC3_171017A</b>				SeqNo: <b>4706553</b>		Prep Date:		DF: <b>500</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	5311	500	5000	602.7	94.2	75-125	5309	0.0358	20	
Sulfate	6629	500	5000	1766	97.2	75-125	6668	0.6	20	

The following samples were analyzed in this batch: 1710599-07C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.



# Chain of Custody Form

Page 1 of 1

COC ID: 123456

☐ Cincinnati, OH  
+1 513 733 5335

☐ Everett, WA  
+1 425 366 3906

☐ Fort Collins, CO  
+1 970 490 1811

☒ Holland, MI  
+1 616 389 8878

☐ Houston, TX  
+1 281 530 8686

☐ Middletown, PA  
+1 717 944 5541

☐ Salt Lake City, UT  
+1 801 256 7798

☐ Spring City, PA  
+1 610 948 4983

☐ York, PA  
+1 717 906 5290

ALS Project Manager:

Work Order #:

1710599

Customer Information		Project Information		Parameter/Method Request for Analysis															
Purchase Order		Project Name	EMC C847 Groundwater Sample	A BTEX															
Work Order		Project Number	017.0501.100.100001	B GRO															
Company Name	Olsson Associates	BILL To Company	Olsson Associates	C DRO															
Send Report To	Tim Dobransky	Invoice Attn.	Tim Dobransky	D Chlorides															
Address	780 Horizon Drive, Ste. 102	Address	780 Horizon Drive, Ste. 102	E Sulfates															
City/State/Zip	Grand Junction, CO 81506	City/State/Zip	Grand Junction, CO 81506	F															
Phone	970.283.7800	Phone	970.283.7800	G															
Fax	970.283.7456	Fax	970.283.7456	H															
e-Mail Address	tdobransky@olssonassociates.com	e-Mail Address		I															
No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold		
1	MW3	10-6-17	1555	GW	8	109	X	X	X	X	X								
2	MW4	10/6/17	1600	GW	8	109	X	X	X	X	X								
3	MW5	10/6/17	1620	GW	8	109	X	X	X	X	X								
4	TW1	10/6/17	1650	GW	8	109	X	X	X	X	X								
5	MW2	10-6-17	1505	GW	8	109	X	X	X	X	X								
6	MW1	10/6-17	1535	GW	8	109	X	X	X	X	X								
7	Dup	10/6/17	1625	GW	8	9	X	X	X	X	X								
8																			
9																			
10																			
11																			
12																			
13																			

Sampler(s): Please Print & Sign Robert A. Shuck		Shipment Method: FedEx		Required Turnaround Time: <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour		Results Due Date:	
Relinquished by: [Signature]		Date: 10/9/17	Time: 6:19	Received by: [Signature]		Notes: Chevron Pricing Applies - Per Bruce Schiatter	
Relinquished by: [Signature]		Date: 10/9/17	Time: 6:30/11	Received by (Laboratory): [Signature]		QC Package: (Check Box Below)	
Logged by (Laboratory): [Signature]		Date: 10/10/17	Time: 1050	Checked by (Laboratory): [Signature]		<input checked="" type="checkbox"/> Level II: Standard QC <input type="checkbox"/> Level III: Std QC + Raw Data <input type="checkbox"/> Level IV: SW846 CLP-Like Other:	
Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035							

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

PL48

Copyright 2011 by ALS Group

Sample Receipt Checklist

Client Name: OLSSON

Date/Time Received: 10-Oct-17 09:30

Work Order: 1710599

Received by: KRW

Checklist completed by Keith Wurenga  
eSignature

10-Oct-17  
Date

Reviewed by: Chad Whelton  
eSignature

11-Oct-17  
Date

Matrices: Water

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample(s) received on ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<u>3.2/3.2 C</u>		<u>SR2</u>
Cooler(s)/Kit(s):	<u></u>		
Date/Time sample(s) sent to storage:	<u>10/10/2017 12:16:07 PM</u>		
Water - VOA vials have zero headspace?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted by:	<u>-</u>		

Login Notes:

-----

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction:



29-Dec-2017

Tim Dobransky  
Olsson Associates  
760 Horizon Drive  
Suite 102  
Grand Junction, CO 81506

Re: **EMC CS47 Groundwater Sample**

Work Order: **17121056**

Dear Tim,

ALS Environmental received 7 samples on 15-Dec-2017 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 23.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton".

Electronically approved by: Alex Cszaszar

Chad Whelton  
Project Manager

Certificate No: MN 998501

## Report of Laboratory Analysis

ADDRESS 3352 128th Ave Holland, Michigan 49424 | PHONE (616) 399-6070 | FAX (616) 399-6185

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental

[www.alsglobal.com](http://www.alsglobal.com)

RIGHT SOLUTIONS RIGHT PARTNER



**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**Work Order:** 17121056

**Work Order Sample Summary**

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
17121056-01	MW3	Groundwater		12/12/2017 11:35	12/15/2017 10:00	<input type="checkbox"/>
17121056-02	MW4	Groundwater		12/12/2017 12:50	12/15/2017 10:00	<input type="checkbox"/>
17121056-03	MW5	Groundwater		12/12/2017 12:10	12/15/2017 10:00	<input type="checkbox"/>
17121056-04	MW6	Groundwater		12/13/2017 10:20	12/15/2017 10:00	<input type="checkbox"/>
17121056-05	TW1	Groundwater		12/13/2017 12:05	12/15/2017 10:00	<input type="checkbox"/>
17121056-06	MW2	Groundwater		12/13/2017 12:30	12/15/2017 10:00	<input type="checkbox"/>
17121056-07	MW1	Groundwater		12/13/2017 13:00	12/15/2017 10:00	<input type="checkbox"/>

---

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**Work Order:** 17121056

---

**Case Narrative**

Samples for the above noted Work Order were received on 12/15/2017. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting. A copy of the laboratory's scope of accreditation is available upon request.

With the following exceptions, all sample analyses achieved analytical criteria.

**Volatile Organics:**

Batch R227043, Method GRO\_8015\_W, Sample 17121056-07A: Surrogate high due to matrix interference.

**Extractable Organics:**

Batch 111938, Method DRLVI\_8015\_W, Sample 17121056-07B: The surrogate recoveries are unavailable due to dilution below the calibration range. DRO (C10-C28).

**Wet Chemistry:**

Batch R227017, Method SO4\_4500E\_DISC\_W, Samples 17121056-01C MS and MSD: The MS and MSD recoveries were outside of the control limits for Sulfate; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required for this analyte.

Batch R227020, Method CL\_4500E\_DISC\_W, Samples 17121056-01C MS and MSD: The MS and MSD recoveries were outside of the control limits for Chloride; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required for this analyte.

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**WorkOrder:** 17121056

## **QUALIFIERS, ACRONYMS, UNITS**

<b><u>Qualifier</u></b>	<b><u>Description</u></b>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<b><u>Acronym</u></b>	<b><u>Description</u></b>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<b><u>Units Reported</u></b>	<b><u>Description</u></b>
mg/L	Milligrams per Liter

# ALS Group, USA

Date: 29-Dec-17

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**Sample ID:** MW3  
**Collection Date:** 12/12/2017 11:35 AM

**Work Order:** 17121056  
**Lab ID:** 17121056-01  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015C</b>		Prep: SW3511 / 12/18/17		Analyst: <b>MEB</b>
<b>DRO (C10-C28)</b>	<b>0.13</b>		<b>0.040</b>	<b>0.10</b>	<b>mg/L</b>	1	12/21/2017 20:03
Surr: 4-Terphenyl-d14	41.6			35-161	%REC	1	12/21/2017 20:03
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>				Analyst: <b>MEB</b>
GRO (C6-C10)	U		0.076	0.20	mg/L	1	12/21/2017 17:36
Surr: Toluene-d8	105			76-120	%REC	1	12/21/2017 17:36
<b>VOLATILE ORGANIC COMPOUNDS</b>							
			Method: <b>SW8260B</b>				Analyst: <b>AK</b>
Benzene	U		0.00042	0.0010	mg/L	1	12/22/2017 08:49
Ethylbenzene	U		0.00029	0.0010	mg/L	1	12/22/2017 08:49
m,p-Xylene	U		0.00053	0.0020	mg/L	1	12/22/2017 08:49
o-Xylene	U		0.00019	0.0010	mg/L	1	12/22/2017 08:49
<b>Toluene</b>	<b>0.00034</b>	J	<b>0.00032</b>	<b>0.0010</b>	<b>mg/L</b>	1	12/22/2017 08:49
Xylenes, Total	U		0.00074	0.0030	mg/L	1	12/22/2017 08:49
Surr: 1,2-Dichloroethane-d4	116			75-120	%REC	1	12/22/2017 08:49
Surr: 4-Bromofluorobenzene	96.2			80-110	%REC	1	12/22/2017 08:49
Surr: Dibromofluoromethane	99.3			85-115	%REC	1	12/22/2017 08:49
Surr: Toluene-d8	94.4			85-110	%REC	1	12/22/2017 08:49
<b>CHLORIDE</b>							
			Method: <b>A4500-CL E-11</b>				Analyst: <b>STP</b>
Chloride	570		1.1	10	mg/L	10	12/21/2017 12:00
<b>SULFATE</b>							
			Method: <b>A4500-SO4 E-11</b>				Analyst: <b>STP</b>
Sulfate	1,600		8.4	30	mg/L	30	12/20/2017 17:30

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 29-Dec-17

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**Sample ID:** MW4  
**Collection Date:** 12/12/2017 12:50 PM

**Work Order:** 17121056  
**Lab ID:** 17121056-02  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015C</b>			Prep: SW3511 / 12/18/17	Analyst: <b>MEB</b>
<b>DRO (C10-C28)</b>	<b>0.058</b>	J	<b>0.040</b>	<b>0.10</b>	<b>mg/L</b>	1	12/21/2017 20:32
Surr: 4-Terphenyl-d14	37.2			35-161	%REC	1	12/21/2017 20:32
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>				Analyst: <b>MEB</b>
GRO (C6-C10)	U		0.076	0.20	mg/L	1	12/21/2017 18:06
Surr: Toluene-d8	105			76-120	%REC	1	12/21/2017 18:06
<b>VOLATILE ORGANIC COMPOUNDS</b>							
			Method: <b>SW8260B</b>				Analyst: <b>AK</b>
<b>Benzene</b>	<b>0.00062</b>	J	<b>0.00042</b>	<b>0.0010</b>	<b>mg/L</b>	1	12/22/2017 09:05
Ethylbenzene	U		0.00029	0.0010	mg/L	1	12/22/2017 09:05
m,p-Xylene	U		0.00053	0.0020	mg/L	1	12/22/2017 09:05
o-Xylene	U		0.00019	0.0010	mg/L	1	12/22/2017 09:05
Toluene	U		0.00032	0.0010	mg/L	1	12/22/2017 09:05
Xylenes, Total	U		0.00074	0.0030	mg/L	1	12/22/2017 09:05
Surr: 1,2-Dichloroethane-d4	115			75-120	%REC	1	12/22/2017 09:05
Surr: 4-Bromofluorobenzene	97.2			80-110	%REC	1	12/22/2017 09:05
Surr: Dibromofluoromethane	98.8			85-115	%REC	1	12/22/2017 09:05
Surr: Toluene-d8	95.5			85-110	%REC	1	12/22/2017 09:05
<b>CHLORIDE</b>							
			Method: <b>A4500-CL E-11</b>				Analyst: <b>STP</b>
<b>Chloride</b>	<b>830</b>		<b>1.1</b>	<b>10</b>	<b>mg/L</b>	10	12/21/2017 12:00
<b>SULFATE</b>							
			Method: <b>A4500-SO4 E-11</b>				Analyst: <b>STP</b>
<b>Sulfate</b>	<b>1,600</b>		<b>8.4</b>	<b>30</b>	<b>mg/L</b>	30	12/20/2017 17:30

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 29-Dec-17

Client: Olsson Associates

Project: EMC CS47 Groundwater Sample

Sample ID: MW5

Collection Date: 12/12/2017 12:10 PM

Work Order: 17121056

Lab ID: 17121056-03

Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015C</b>		Prep: SW3511 / 12/18/17		Analyst: <b>MEB</b>
DRO (C10-C28)	U		0.040	0.10	mg/L	1	12/21/2017 21:30
Surr: 4-Terphenyl-d14	35.4			35-161	%REC	1	12/21/2017 21:30
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>				Analyst: <b>MEB</b>
GRO (C6-C10)	U		0.076	0.20	mg/L	1	12/21/2017 18:35
Surr: Toluene-d8	105			76-120	%REC	1	12/21/2017 18:35
<b>VOLATILE ORGANIC COMPOUNDS</b>							
			Method: <b>SW8260B</b>				Analyst: <b>AK</b>
Benzene	U		0.00042	0.0010	mg/L	1	12/22/2017 09:20
Ethylbenzene	U		0.00029	0.0010	mg/L	1	12/22/2017 09:20
m,p-Xylene	U		0.00053	0.0020	mg/L	1	12/22/2017 09:20
o-Xylene	U		0.00019	0.0010	mg/L	1	12/22/2017 09:20
Toluene	U		0.00032	0.0010	mg/L	1	12/22/2017 09:20
Xylenes, Total	U		0.00074	0.0030	mg/L	1	12/22/2017 09:20
Surr: 1,2-Dichloroethane-d4	114			75-120	%REC	1	12/22/2017 09:20
Surr: 4-Bromofluorobenzene	93.4			80-110	%REC	1	12/22/2017 09:20
Surr: Dibromofluoromethane	98.2			85-115	%REC	1	12/22/2017 09:20
Surr: Toluene-d8	95.2			85-110	%REC	1	12/22/2017 09:20
<b>CHLORIDE</b>							
			Method: <b>A4500-CL E-11</b>				Analyst: <b>STP</b>
Chloride	550		1.1	10	mg/L	10	12/21/2017 12:00
<b>SULFATE</b>							
			Method: <b>A4500-SO4 E-11</b>				Analyst: <b>STP</b>
Sulfate	1,700		8.4	30	mg/L	30	12/20/2017 17:30

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 29-Dec-17

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**Sample ID:** MW6  
**Collection Date:** 12/13/2017 10:20 AM

**Work Order:** 17121056  
**Lab ID:** 17121056-04  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015C</b>			Prep: SW3511 / 12/18/17	Analyst: <b>MEB</b>
<b>DRO (C10-C28)</b>	<b>0.39</b>		<b>0.040</b>	<b>0.10</b>	<b>mg/L</b>	1	12/21/2017 21:59
Surr: 4-Terphenyl-d14	49.2			35-161	%REC	1	12/21/2017 21:59
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>				Analyst: <b>MEB</b>
GRO (C6-C10)	U		0.076	0.20	mg/L	1	12/21/2017 19:05
Surr: Toluene-d8	108			76-120	%REC	1	12/21/2017 19:05
<b>VOLATILE ORGANIC COMPOUNDS</b>							
			Method: <b>SW8260B</b>				Analyst: <b>LSY</b>
<b>Benzene</b>	<b>0.00098</b>	J	<b>0.00042</b>	<b>0.0010</b>	<b>mg/L</b>	1	12/22/2017 06:00
Ethylbenzene	U		0.00029	0.0010	mg/L	1	12/22/2017 06:00
m,p-Xylene	U		0.00053	0.0020	mg/L	1	12/22/2017 06:00
o-Xylene	U		0.00019	0.0010	mg/L	1	12/22/2017 06:00
<b>Toluene</b>	<b>0.00056</b>	J	<b>0.00032</b>	<b>0.0010</b>	<b>mg/L</b>	1	12/22/2017 06:00
Xylenes, Total	U		0.00074	0.0030	mg/L	1	12/22/2017 06:00
Surr: 1,2-Dichloroethane-d4	111			75-120	%REC	1	12/22/2017 06:00
Surr: 4-Bromofluorobenzene	86.7			80-110	%REC	1	12/22/2017 06:00
Surr: Dibromofluoromethane	111			85-115	%REC	1	12/22/2017 06:00
Surr: Toluene-d8	91.8			85-110	%REC	1	12/22/2017 06:00
<b>CHLORIDE</b>							
			Method: <b>A4500-CL E-11</b>				Analyst: <b>STP</b>
<b>Chloride</b>	<b>1,000</b>		<b>3.3</b>	<b>30</b>	<b>mg/L</b>	30	12/21/2017 12:00
<b>SULFATE</b>							
			Method: <b>A4500-SO4 E-11</b>				Analyst: <b>STP</b>
<b>Sulfate</b>	<b>1,700</b>		<b>8.4</b>	<b>30</b>	<b>mg/L</b>	30	12/20/2017 17:30

**Note:** See Qualifiers page for a list of qualifiers and their definitions.



# ALS Group, USA

Date: 29-Dec-17

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**Sample ID:** TW1  
**Collection Date:** 12/13/2017 12:05 PM

**Work Order:** 17121056  
**Lab ID:** 17121056-05  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015C</b>		Prep: SW3511 / 12/18/17		Analyst: <b>MEB</b>
<b>DRO (C10-C28)</b>	<b>0.28</b>		<b>0.040</b>	<b>0.10</b>	<b>mg/L</b>	1	12/21/2017 22:57
Surr: 4-Terphenyl-d14	36.8			35-161	%REC	1	12/21/2017 22:57
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>				Analyst: <b>MEB</b>
GRO (C6-C10)	U		0.076	0.20	mg/L	1	12/21/2017 19:35
Surr: Toluene-d8	105			76-120	%REC	1	12/21/2017 19:35
<b>VOLATILE ORGANIC COMPOUNDS</b>							
			Method: <b>SW8260B</b>				Analyst: <b>LSY</b>
<b>Benzene</b>	<b>0.00065</b>	J	<b>0.00042</b>	<b>0.0010</b>	<b>mg/L</b>	1	12/22/2017 06:16
Ethylbenzene	U		0.00029	0.0010	mg/L	1	12/22/2017 06:16
m,p-Xylene	U		0.00053	0.0020	mg/L	1	12/22/2017 06:16
o-Xylene	U		0.00019	0.0010	mg/L	1	12/22/2017 06:16
<b>Toluene</b>	<b>0.00044</b>	J	<b>0.00032</b>	<b>0.0010</b>	<b>mg/L</b>	1	12/22/2017 06:16
Xylenes, Total	U		0.00074	0.0030	mg/L	1	12/22/2017 06:16
Surr: 1,2-Dichloroethane-d4	112			75-120	%REC	1	12/22/2017 06:16
Surr: 4-Bromofluorobenzene	84.0			80-110	%REC	1	12/22/2017 06:16
Surr: Dibromofluoromethane	115			85-115	%REC	1	12/22/2017 06:16
Surr: Toluene-d8	93.8			85-110	%REC	1	12/22/2017 06:16
<b>CHLORIDE</b>							
			Method: <b>A4500-CL E-11</b>				Analyst: <b>STP</b>
<b>Chloride</b>	<b>330</b>		<b>0.44</b>	<b>4.0</b>	<b>mg/L</b>	4	12/21/2017 12:00
<b>SULFATE</b>							
			Method: <b>A4500-SO4 E-11</b>				Analyst: <b>STP</b>
<b>Sulfate</b>	<b>1,200</b>		<b>8.4</b>	<b>30</b>	<b>mg/L</b>	30	12/20/2017 17:30

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 29-Dec-17

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**Sample ID:** MW2  
**Collection Date:** 12/13/2017 12:30 PM

**Work Order:** 17121056  
**Lab ID:** 17121056-06  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015C</b>		Prep: SW3511 / 12/18/17		Analyst: <b>MEB</b>
<b>DRO (C10-C28)</b>	<b>0.13</b>		<b>0.040</b>	<b>0.10</b>	<b>mg/L</b>	1	12/21/2017 23:26
Surr: 4-Terphenyl-d14	41.2			35-161	%REC	1	12/21/2017 23:26
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>				Analyst: <b>MEB</b>
GRO (C6-C10)	U		0.076	0.20	mg/L	1	12/21/2017 20:04
Surr: Toluene-d8	104			76-120	%REC	1	12/21/2017 20:04
<b>VOLATILE ORGANIC COMPOUNDS</b>							
			Method: <b>SW8260B</b>				Analyst: <b>BG</b>
Benzene	U		0.00042	0.0010	mg/L	1	12/27/2017 13:35
Ethylbenzene	U		0.00029	0.0010	mg/L	1	12/27/2017 13:35
m,p-Xylene	U		0.00053	0.0020	mg/L	1	12/27/2017 13:35
o-Xylene	U		0.00019	0.0010	mg/L	1	12/27/2017 13:35
Toluene	U		0.00032	0.0010	mg/L	1	12/27/2017 13:35
Xylenes, Total	U		0.00074	0.0030	mg/L	1	12/27/2017 13:35
Surr: 1,2-Dichloroethane-d4	106			75-120	%REC	1	12/27/2017 13:35
Surr: 4-Bromofluorobenzene	94.2			80-110	%REC	1	12/27/2017 13:35
Surr: Dibromofluoromethane	100			85-115	%REC	1	12/27/2017 13:35
Surr: Toluene-d8	93.5			85-110	%REC	1	12/27/2017 13:35
<b>CHLORIDE</b>							
			Method: <b>A4500-CL E-11</b>				Analyst: <b>STP</b>
Chloride	260		0.44	4.0	mg/L	4	12/21/2017 12:00
<b>SULFATE</b>							
			Method: <b>A4500-SO4 E-11</b>				Analyst: <b>STP</b>
Sulfate	1,200		8.4	30	mg/L	30	12/20/2017 17:30

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

# ALS Group, USA

Date: 29-Dec-17

**Client:** Olsson Associates  
**Project:** EMC CS47 Groundwater Sample  
**Sample ID:** MW1  
**Collection Date:** 12/13/2017 01:00 PM

**Work Order:** 17121056  
**Lab ID:** 17121056-07  
**Matrix:** GROUNDWATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015C</b>		Prep: SW3511 / 12/18/17		Analyst: <b>MEB</b>
<b>DRO (C10-C28)</b>	<b>98</b>		<b>0.40</b>	<b>1.0</b>	<b>mg/L</b>	10	12/21/2017 23:55
Surr: 4-Terphenyl-d14	276	S		35-161	%REC	10	12/21/2017 23:55
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>							
			Method: <b>SW8015D</b>				Analyst: <b>MEB</b>
<b>GRO (C6-C10)</b>	<b>4.8</b>		<b>0.076</b>	<b>0.20</b>	<b>mg/L</b>	1	12/21/2017 20:34
Surr: Toluene-d8	206	S		76-120	%REC	1	12/21/2017 20:34
<b>VOLATILE ORGANIC COMPOUNDS</b>							
			Method: <b>SW8260B</b>				Analyst: <b>BG</b>
Benzene	U		0.00042	0.0010	mg/L	1	12/27/2017 13:51
Ethylbenzene	U		0.00029	0.0010	mg/L	1	12/27/2017 13:51
m,p-Xylene	U		0.00053	0.0020	mg/L	1	12/27/2017 13:51
o-Xylene	U		0.00019	0.0010	mg/L	1	12/27/2017 13:51
Toluene	U		0.00032	0.0010	mg/L	1	12/27/2017 13:51
Xylenes, Total	U		0.00074	0.0030	mg/L	1	12/27/2017 13:51
Surr: 1,2-Dichloroethane-d4	105			75-120	%REC	1	12/27/2017 13:51
Surr: 4-Bromofluorobenzene	95.8			80-110	%REC	1	12/27/2017 13:51
Surr: Dibromofluoromethane	101			85-115	%REC	1	12/27/2017 13:51
Surr: Toluene-d8	95.6			85-110	%REC	1	12/27/2017 13:51
<b>CHLORIDE</b>							
			Method: <b>A4500-CL E-11</b>				Analyst: <b>STP</b>
<b>Chloride</b>	<b>900</b>		<b>1.1</b>	<b>10</b>	<b>mg/L</b>	10	12/21/2017 12:00
<b>SULFATE</b>							
			Method: <b>A4500-SO4 E-11</b>				Analyst: <b>STP</b>
<b>Sulfate</b>	<b>1,400</b>		<b>8.4</b>	<b>30</b>	<b>mg/L</b>	30	12/20/2017 17:30

**Note:** See Qualifiers page for a list of qualifiers and their definitions.

**Client:** Olsson Associates  
**Work Order:** 17121056  
**Project:** EMC CS47 Groundwater Sample

## QC BATCH REPORT

Batch ID: **111938** Instrument ID **GC8** Method: **SW8015C**

MBLK		Sample ID: <b>DBLKW1-111938-111938</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/21/2017 11:18 A</b>			
Client ID:		Run ID: <b>GC8_171220A</b>				SeqNo: <b>4824125</b>		Prep Date: <b>12/18/2017</b>		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	U	0.04	0.10								
<i>Surr: 4-Terphenyl-d14</i>	<i>0.0295</i>	<i>0</i>	<i>0</i>	<i>0.042</i>	<i>0</i>	<i>70.7</i>	<i>35-161</i>	<i>0</i>			

LCS		Sample ID: <b>DLCSW1-111938-111938</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/21/2017 11:47 A</b>			
Client ID:		Run ID: <b>GC8_171220A</b>				SeqNo: <b>4824126</b>		Prep Date: <b>12/18/2017</b>		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	3.964	0.04	0.10	4.17	0	95.1	60-150	0			
<i>Surr: 4-Terphenyl-d14</i>	<i>0.03233</i>	<i>0</i>	<i>0</i>	<i>0.042</i>	<i>0</i>	<i>77.5</i>	<i>35-161</i>	<i>0</i>			

MS		Sample ID: <b>17121016-07D MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/21/2017 12:45 P</b>			
Client ID:		Run ID: <b>GC8_171220A</b>				SeqNo: <b>4824128</b>		Prep Date: <b>12/18/2017</b>		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	4.018	0.04	0.10	4.17	0	96.4	60-150	0			
<i>Surr: 4-Terphenyl-d14</i>	<i>0.0245</i>	<i>0</i>	<i>0</i>	<i>0.042</i>	<i>0</i>	<i>58.8</i>	<i>35-161</i>	<i>0</i>			

MSD		Sample ID: <b>17121016-07D MSD</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/21/2017 01:14 P</b>			
Client ID:		Run ID: <b>GC8_171220A</b>				SeqNo: <b>4824129</b>		Prep Date: <b>12/18/2017</b>		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	3.948	0.04	0.10	4.17	0	94.7	60-150	4.018	1.77	30	
<i>Surr: 4-Terphenyl-d14</i>	<i>0.02617</i>	<i>0</i>	<i>0</i>	<i>0.042</i>	<i>0</i>	<i>62.7</i>	<i>35-161</i>	<i>0.0245</i>	<i>6.58</i>	<i>30</i>	

The following samples were analyzed in this batch:

17121056-01B	17121056-02B	17121056-03B
17121056-04B	17121056-05B	17121056-06B
17121056-07B		

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 17121056  
 Project: EMC CS47 Groundwater Sample

## QC BATCH REPORT

Batch ID: **R227043** Instrument ID **GC9** Method: **SW8015D**

<b>MBLK</b>		Sample ID: <b>GBLKW1-121221-R227043</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/21/2017 10:32 P</b>			
Client ID:		Run ID: <b>GC9_171221A</b>				SeqNo: <b>4824997</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	U	76	200								
<i>Surr: Toluene-d8</i>	<i>106.4</i>	<i>0</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>106</i>	<i>76-120</i>	<i>0</i>			

<b>LCS</b>		Sample ID: <b>GLCSW1-171221-R227043</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/21/2017 09:33 P</b>			
Client ID:		Run ID: <b>GC9_171221A</b>				SeqNo: <b>4824995</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	9502	76	200	10000	0	95	76-126	0			
<i>Surr: Toluene-d8</i>	<i>98.92</i>	<i>0</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>98.9</i>	<i>76-120</i>	<i>0</i>			

<b>MS</b>		Sample ID: <b>17121331-01A MS</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/22/2017 12:01 P</b>			
Client ID:		Run ID: <b>GC9_171221A</b>				SeqNo: <b>4825003</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	8680	76	200	10000	0	86.8	76-126	0			
<i>Surr: Toluene-d8</i>	<i>102.2</i>	<i>0</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>102</i>	<i>76-120</i>	<i>0</i>			

<b>MSD</b>		Sample ID: <b>17121331-01A MSD</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/22/2017 12:31 P</b>			
Client ID:		Run ID: <b>GC9_171221A</b>				SeqNo: <b>4825005</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	7699	76	200	10000	0	77	76-126	8680	12	30	
<i>Surr: Toluene-d8</i>	<i>98.5</i>	<i>0</i>	<i>0</i>	<i>100</i>	<i>0</i>	<i>98.5</i>	<i>76-120</i>	<i>102.2</i>	<i>3.7</i>	<i>30</i>	

The following samples were analyzed in this batch:

17121056-01A	17121056-02A	17121056-03A
17121056-04A	17121056-05A	17121056-06A
17121056-07A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 17121056  
 Project: EMC CS47 Groundwater Sample

# QC BATCH REPORT

Batch ID: **R227040** Instrument ID **VMS10** Method: **SW8260B**

MBLK		Sample ID: <b>VLKW3-171221-R227040</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/22/2017 04:39 A</b>			
Client ID:		Run ID: <b>VMS10_171221C</b>				SeqNo: <b>4825719</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	0.42	1.0								
Ethylbenzene	U	0.29	1.0								
m,p-Xylene	U	0.53	2.0								
o-Xylene	U	0.19	1.0								
Toluene	U	0.32	1.0								
Xylenes, Total	U	0.74	3.0								
Surr: 1,2-Dichloroethane-d4	22.25	0	0	20	0	111	75-120	0			
Surr: 4-Bromofluorobenzene	19.03	0	0	20	0	95.2	80-110	0			
Surr: Dibromofluoromethane	19.41	0	0	20	0	97	85-115	0			
Surr: Toluene-d8	19.08	0	0	20	0	95.4	85-110	0			

LCS		Sample ID: <b>VLCSW4-171221-R227040</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/22/2017 10:22 A</b>			
Client ID:		Run ID: <b>VMS10_171221C</b>				SeqNo: <b>4825754</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	24.55	0.42	1.0	20	0	123	85-125	0			
Ethylbenzene	22	0.29	1.0	20	0	110	78-113	0			
m,p-Xylene	44.91	0.53	2.0	40	0	112	75-130	0			
o-Xylene	22.44	0.19	1.0	20	0	112	80-125	0			
Toluene	21.44	0.32	1.0	20	0	107	85-125	0			
Xylenes, Total	67.35	0.74	3.0	60	0	112	80-126	0			
Surr: 1,2-Dichloroethane-d4	22.68	0	0	20	0	113	75-120	0			
Surr: 4-Bromofluorobenzene	21	0	0	20	0	105	80-110	0			
Surr: Dibromofluoromethane	21.19	0	0	20	0	106	85-115	0			
Surr: Toluene-d8	19.62	0	0	20	0	98.1	85-110	0			

MS		Sample ID: <b>1712993-05A MS</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/22/2017 09:51 A</b>			
Client ID:		Run ID: <b>VMS10_171221C</b>				SeqNo: <b>4825749</b>		Prep Date:		DF: <b>100</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	10740	42	100	2000	8282	123	85-125	0			EO
Ethylbenzene	2588	29	100	2000	301	114	78-113	0			S
m,p-Xylene	6091	53	200	4000	1258	121	75-130	0			
o-Xylene	3301	19	100	2000	804	125	80-125	0			
Toluene	3269	32	100	2000	998	114	85-125	0			
Xylenes, Total	9392	74	300	6000	2062	122	80-126	0			
Surr: 1,2-Dichloroethane-d4	2266	0	0	2000	0	113	75-120	0			
Surr: 4-Bromofluorobenzene	2125	0	0	2000	0	106	80-110	0			
Surr: Dibromofluoromethane	2099	0	0	2000	0	105	85-115	0			
Surr: Toluene-d8	2009	0	0	2000	0	100	85-110	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 17121056  
 Project: EMC CS47 Groundwater Sample

## QC BATCH REPORT

Batch ID: **R227040** Instrument ID **VMS10** Method: **SW8260B**

MSD					Sample ID: 1712993-05A MSD			Units: µg/L		Analysis Date: 12/22/2017 10:07 A		
Client ID:					Run ID: VMS10_171221C			SeqNo: 4825752		Prep Date:		DF: 100
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	10410	42	100	2000	8282	107	85-125	10740	3.12	30	EO	
Ethylbenzene	2447	29	100	2000	301	107	78-113	2588	5.6	30		
m,p-Xylene	5795	53	200	4000	1258	113	75-130	6091	4.98	30		
o-Xylene	3124	19	100	2000	804	116	80-125	3301	5.51	30		
Toluene	3175	32	100	2000	998	109	85-125	3269	2.92	30		
Xylenes, Total	8919	74	300	6000	2062	114	80-126	9392	5.17	30		
Surr: 1,2-Dichloroethane-d4	2271	0	0	2000	0	114	75-120	2266	0.22	30		
Surr: 4-Bromofluorobenzene	2162	0	0	2000	0	108	80-110	2125	1.73	30		
Surr: Dibromofluoromethane	2118	0	0	2000	0	106	85-115	2099	0.901	30		
Surr: Toluene-d8	1994	0	0	2000	0	99.7	85-110	2009	0.749	30		

The following samples were analyzed in this batch:

17121056-01A	17121056-02A	17121056-03A
--------------	--------------	--------------

Note: See Qualifiers Page for a list of Qualifiers and their explanation.



Client: Olsson Associates  
 Work Order: 17121056  
 Project: EMC CS47 Groundwater Sample

# QC BATCH REPORT

Batch ID: **R227058A** Instrument ID **VMS8** Method: **SW8260B**

MBLK Sample ID: <b>VBLKW3-171221-R227058A</b>					Units: <b>µg/L</b>			Analysis Date: <b>12/22/2017 04:11 A</b>			
Client ID:		Run ID: <b>VMS8_171221B</b>			SeqNo: <b>4825324</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	0.42	1.0								
Ethylbenzene	U	0.29	1.0								
m,p-Xylene	U	0.53	2.0								
o-Xylene	U	0.19	1.0								
Toluene	U	0.32	1.0								
Xylenes, Total	U	0.74	3.0								
Surr: 1,2-Dichloroethane-d4	20.97	0	0	20	0	105	75-120	0			
Surr: 4-Bromofluorobenzene	16.88	0	0	20	0	84.4	80-110	0			
Surr: Dibromofluoromethane	21.2	0	0	20	0	106	85-115	0			
Surr: Toluene-d8	18.58	0	0	20	0	92.9	85-110	0			

LCS Sample ID: <b>VLCSW5-171221-R227058A</b>					Units: <b>µg/L</b>			Analysis Date: <b>12/22/2017 03:39 A</b>			
Client ID:		Run ID: <b>VMS8_171221B</b>			SeqNo: <b>4825322</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	22.04	0.42	1.0	20	0	110	85-125	0			
Ethylbenzene	21.86	0.29	1.0	20	0	109	78-113	0			
m,p-Xylene	39.84	0.53	2.0	40	0	99.6	75-130	0			
o-Xylene	19.81	0.19	1.0	20	0	99	80-125	0			
Toluene	21.24	0.32	1.0	20	0	106	85-125	0			
Xylenes, Total	59.65	0.74	3.0	60	0	99.4	80-126	0			
Surr: 1,2-Dichloroethane-d4	20.02	0	0	20	0	100	75-120	0			
Surr: 4-Bromofluorobenzene	20.73	0	0	20	0	104	80-110	0			
Surr: Dibromofluoromethane	20.21	0	0	20	0	101	85-115	0			
Surr: Toluene-d8	19.81	0	0	20	0	99	85-110	0			

MS Sample ID: <b>17121018-02A MS</b>					Units: <b>µg/L</b>			Analysis Date: <b>12/22/2017 09:39 A</b>			
Client ID:		Run ID: <b>VMS8_171221B</b>			SeqNo: <b>4825332</b>		Prep Date:		DF: <b>10</b>		
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	253.9	4.2	10	200	122.7	65.6	85-125	0			S
Ethylbenzene	210.9	2.9	10	200	10.3	100	78-113	0			
m,p-Xylene	499.6	5.3	20	400	104.3	98.8	75-130	0			
o-Xylene	190.7	1.9	10	200	12.8	89	80-125	0			
Toluene	195.1	3.2	10	200	38.3	78.4	85-125	0			S
Xylenes, Total	690.3	7.4	30	600	117.1	95.5	80-126	0			
Surr: 1,2-Dichloroethane-d4	205	0	0	200	0	102	75-120	0			
Surr: 4-Bromofluorobenzene	217	0	0	200	0	108	80-110	0			
Surr: Dibromofluoromethane	213.2	0	0	200	0	107	85-115	0			
Surr: Toluene-d8	201.4	0	0	200	0	101	85-110	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 17121056  
 Project: EMC CS47 Groundwater Sample

# QC BATCH REPORT

Batch ID: **R227058A** Instrument ID **VMS8** Method: **SW8260B**

MSD		Sample ID: 17121018-02A MSD				Units: µg/L		Analysis Date: 12/22/2017 09:55 A			
Client ID:		Run ID: VMS8_171221B				SeqNo: 4825333		Prep Date:		DF: 10	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	242.4	4.2	10	200	122.7	59.8	85-125	253.9	4.63	30	S
Ethylbenzene	201.5	2.9	10	200	10.3	95.6	78-113	210.9	4.56	30	
m,p-Xylene	446.1	5.3	20	400	104.3	85.4	75-130	499.6	11.3	30	
o-Xylene	179.1	1.9	10	200	12.8	83.2	80-125	190.7	6.27	30	
Toluene	186	3.2	10	200	38.3	73.8	85-125	195.1	4.78	30	S
Xylenes, Total	625.2	7.4	30	600	117.1	84.7	80-126	690.3	9.9	30	
Surr: 1,2-Dichloroethane-d4	203.8	0	0	200	0	102	75-120	205	0.587	30	
Surr: 4-Bromofluorobenzene	203.1	0	0	200	0	102	80-110	217	6.62	30	
Surr: Dibromofluoromethane	210.2	0	0	200	0	105	85-115	213.2	1.42	30	
Surr: Toluene-d8	196	0	0	200	0	98	85-110	201.4	2.72	30	

The following samples were analyzed in this batch:

17121056-04A	17121056-05A
--------------	--------------

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 17121056  
 Project: EMC CS47 Groundwater Sample

# QC BATCH REPORT

Batch ID: **R227168a** Instrument ID **VMS10** Method: **SW8260B**

MBLK		Sample ID: <b>VBLKW1-171227-R227168a</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/27/2017 11:28 A</b>			
Client ID:		Run ID: <b>VMS10_171227A</b>				SeqNo: <b>4828882</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	0.42	1.0								
Ethylbenzene	U	0.29	1.0								
m,p-Xylene	U	0.53	2.0								
o-Xylene	U	0.19	1.0								
Toluene	U	0.32	1.0								
Xylenes, Total	U	0.74	3.0								
Surr: 1,2-Dichloroethane-d4	19.86	0	0	20	0	99.3	75-120	0			
Surr: 4-Bromofluorobenzene	18.78	0	0	20	0	93.9	80-110	0			
Surr: Dibromofluoromethane	18.84	0	0	20	0	94.2	85-115	0			
Surr: Toluene-d8	19.11	0	0	20	0	95.6	85-110	0			

LCS		Sample ID: <b>VLCSW1-171227-R227168a</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/27/2017 10:42 A</b>			
Client ID:		Run ID: <b>VMS10_171227A</b>				SeqNo: <b>4828881</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	20.06	0.42	1.0	20	0	100	85-125	0			
Ethylbenzene	19.9	0.29	1.0	20	0	99.5	78-113	0			
m,p-Xylene	40.75	0.53	2.0	40	0	102	75-130	0			
o-Xylene	20.22	0.19	1.0	20	0	101	80-125	0			
Toluene	19.42	0.32	1.0	20	0	97.1	85-125	0			
Xylenes, Total	60.97	0.74	3.0	60	0	102	80-126	0			
Surr: 1,2-Dichloroethane-d4	18.72	0	0	20	0	93.6	75-120	0			
Surr: 4-Bromofluorobenzene	20.02	0	0	20	0	100	80-110	0			
Surr: Dibromofluoromethane	20.02	0	0	20	0	100	85-115	0			
Surr: Toluene-d8	20.13	0	0	20	0	101	85-110	0			

MS		Sample ID: <b>17121238-03A MS</b>				Units: <b>µg/L</b>		Analysis Date: <b>12/27/2017 05:32 P</b>			
Client ID:		Run ID: <b>VMS10_171227A</b>				SeqNo: <b>4828900</b>		Prep Date:		DF: <b>10</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	202	4.2	10	200	0	101	85-125	0			
Ethylbenzene	196.6	2.9	10	200	0	98.3	78-113	0			
m,p-Xylene	411	5.3	20	400	0	103	75-130	0			
o-Xylene	205.5	1.9	10	200	0	103	80-125	0			
Toluene	193.5	3.2	10	200	0	96.8	85-125	0			
Xylenes, Total	616.5	7.4	30	600	0	103	80-126	0			
Surr: 1,2-Dichloroethane-d4	206.6	0	0	200	0	103	75-120	0			
Surr: 4-Bromofluorobenzene	208.1	0	0	200	0	104	80-110	0			
Surr: Dibromofluoromethane	203.6	0	0	200	0	102	85-115	0			
Surr: Toluene-d8	204.1	0	0	200	0	102	85-110	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 17121056  
 Project: EMC CS47 Groundwater Sample

## QC BATCH REPORT

Batch ID: **R227168a** Instrument ID **VMS10** Method: **SW8260B**

MSD		Sample ID: 17121238-03A MSD				Units: µg/L		Analysis Date: 12/27/2017 05:47 P			
Client ID:		Run ID: VMS10_171227A				SeqNo: 4828901		Prep Date:		DF: 10	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	194.2	4.2	10	200	0	97.1	85-125	202	3.94	30	
Ethylbenzene	191.2	2.9	10	200	0	95.6	78-113	196.6	2.78	30	
m,p-Xylene	399.5	5.3	20	400	0	99.9	75-130	411	2.84	30	
o-Xylene	200.6	1.9	10	200	0	100	80-125	205.5	2.41	30	
Toluene	190.6	3.2	10	200	0	95.3	85-125	193.5	1.51	30	
Xylenes, Total	600.1	7.4	30	600	0	100	80-126	616.5	2.7	30	
Surr: 1,2-Dichloroethane-d4	197.7	0	0	200	0	98.8	75-120	206.6	4.4	30	
Surr: 4-Bromofluorobenzene	207.7	0	0	200	0	104	80-110	208.1	0.192	30	
Surr: Dibromofluoromethane	206	0	0	200	0	103	85-115	203.6	1.17	30	
Surr: Toluene-d8	208.3	0	0	200	0	104	85-110	204.1	2.04	30	

The following samples were analyzed in this batch:

17121056-06A	17121056-07A
--------------	--------------

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 17121056  
 Project: EMC CS47 Groundwater Sample

# QC BATCH REPORT

Batch ID: **R227017** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

<b>MBLK</b>		Sample ID: <b>MB-R227017-R227017</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/20/2017 05:30 P</b>			
Client ID:		Run ID: <b>GALLERY_171220C</b>				SeqNo: <b>4824274</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	U	0.28	1.0								

<b>MS</b>		Sample ID: <b>17121056-01C MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/20/2017 05:30 P</b>			
Client ID: <b>MW3</b>		Run ID: <b>GALLERY_171220C</b>				SeqNo: <b>4824277</b>		Prep Date:		DF: <b>30</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	1486	8.4	30	50	1606	-241	75-125	0			SO

<b>MSD</b>		Sample ID: <b>17121056-01C MSD</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/20/2017 05:30 P</b>			
Client ID: <b>MW3</b>		Run ID: <b>GALLERY_171220C</b>				SeqNo: <b>4824278</b>		Prep Date:		DF: <b>30</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	1458	8.4	30	50	1606	-296	75-125	1486	1.85	20	SO

<b>LCS1</b>		Sample ID: <b>LCS1-R227017</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/20/2017 05:30 P</b>			
Client ID:		Run ID: <b>GALLERY_171220C</b>				SeqNo: <b>4824275</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	10.44	0.28	1.0	10	0	104	80-120	0			

<b>LCS2</b>		Sample ID: <b>LCS2-R227017</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/20/2017 05:30 P</b>			
Client ID:		Run ID: <b>GALLERY_171220C</b>				SeqNo: <b>4824298</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	52.86	0.28	1.0	50	0	106	80-120	0			

The following samples were analyzed in this batch:

17121056-01C	17121056-02C	17121056-03C
17121056-04C	17121056-05C	17121056-06C
17121056-07C		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 17121056  
 Project: EMC CS47 Groundwater Sample

# QC BATCH REPORT

Batch ID: **R227020** Instrument ID **GALLERY** Method: **A4500-CI E-11**

<b>MBLK</b>		Sample ID: <b>MB-R227020-R227020</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/21/2017 12:00 P</b>			
Client ID:		Run ID: <b>GALLERY_171221A</b>				SeqNo: <b>4824323</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.11	1.0								

<b>MS</b>		Sample ID: <b>17121056-01C MS</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/21/2017 12:00 P</b>			
Client ID: <b>MW3</b>		Run ID: <b>GALLERY_171221A</b>				SeqNo: <b>4824326</b>		Prep Date:		DF: <b>10</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	566.4	1.1	10	50	573.6	-14.4	75-125	0			SO

<b>MSD</b>		Sample ID: <b>17121056-01C MSD</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/21/2017 12:00 P</b>			
Client ID: <b>MW3</b>		Run ID: <b>GALLERY_171221A</b>				SeqNo: <b>4824327</b>		Prep Date:		DF: <b>10</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	568.1	1.1	10	50	573.6	-11	75-125	566.4	0.3	25	SO

<b>LCS1</b>		Sample ID: <b>LCS1-R227020</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/21/2017 12:00 P</b>			
Client ID:		Run ID: <b>GALLERY_171221A</b>				SeqNo: <b>4824324</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	10.05	0.11	1.0	10	0	100	80-120	0			

<b>LCS2</b>		Sample ID: <b>LCS2-R227020</b>				Units: <b>mg/L</b>		Analysis Date: <b>12/21/2017 12:00 P</b>			
Client ID:		Run ID: <b>GALLERY_171221A</b>				SeqNo: <b>4824347</b>		Prep Date:		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	48.53	0.11	1.0	50	0	97.1	80-120	0			

The following samples were analyzed in this batch:

17121056-01C	17121056-02C	17121056-03C
17121056-04C	17121056-05C	17121056-06C
17121056-07C		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.



# Chain of Custody Form

Page 1 of 1

COC ID: 123456

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Cincinnati, OH<br>+1 513 233 5336   | <input checked="" type="checkbox"/> Holland, MI<br>+1 616 399 6070 | <input type="checkbox"/> Salt Lake City, UT<br>+1 801 266 7700 |
| <input type="checkbox"/> Everett, WA<br>+1 425 356 2600      | <input type="checkbox"/> Houston, TX<br>+1 281 530 5656            | <input type="checkbox"/> Spring City, PA<br>+1 610 948 4903    |
| <input type="checkbox"/> Fort Collins, CO<br>+1 970 490 1511 | <input type="checkbox"/> Middletown, PA<br>+1 717 944 5541         | <input type="checkbox"/> York, PA<br>+1 717 505 5280           |

<b>ALS Project Manager:</b>		<b>Work Order #:</b> <u>17121056</u>	
<b>Customer Information</b>		<b>Project Information</b>	
Purchase Order		Project Name	EMC CS47 Groundwater Sample
Work Order		Project Number	017.0501.100.100001
Company Name	Olsson Associates	Bill To Company	Olsson Associates
Send Report To	Tim Dobransky	Invoice Attn	Dana Mack
Address	760 Horizon Drive, Ste. 102	Address	760 Horizon Drive, Ste. 102
City/State/Zip	Grand Junction, CO 81506	City/State/Zip	Grand Junction, CO 81506
Phone	970.263.7800	Phone	970.263.7800
Fax	970.263.7456	Fax	970.263.7456
e-Mail Address	tim.dobransky@olssonassociates.com	e-Mail Address	dana.mack@olssonassociates.com
		<b>Parameter/Method Request for Analysis</b>	
		A	BTEX
		B	GRO
		C	DRO
		D	Chlorides
		E	Sulfates
		F	
		G	
		H	
		I	
		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW3	12/12/17	1135	GW	8	9	X	X	X	X	X						
2	MW4	12/12/17	1250	GW	8	9	X	X	X	X	X						
3	MW5	12/12/17	1210	GW	8	9	X	X	X	X	X						
4	MW6	12/13/17	1020	GW	8	9	X	X	X	X	X						
5	TW1	12/13/17	1205	GW	8	9	X	X	X	X	X						
6	MW2	12/13/17	1230	GW	8	9	X	X	X	X	X						
7	MW1	12/13/17	1300	GW	8	9	X	X	X	X	X						
8																	
9																	
10																	
11																	
12																	
13																	

<b>Sampler(s): Please Print &amp; Sign</b> Tim Dobransky / Jessica Dilka		<b>Shipment Method:</b> FedEx	<b>Required Turnaround Time:</b> <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour	<b>Results Due Date:</b>
<b>Relinquished by:</b> 	<b>Date:</b> 12/14/17 <b>Time:</b> 5:30	<b>Received by:</b> 	<b>Notes:</b> Chevron Pricing Applies - Per Bruce Schlatter	
<b>Relinquished by:</b>	<b>Date:</b> 12/15/17 <b>Time:</b> 1000	<b>Received by (Laboratory):</b> 	<b>Cooler Temp.</b> 3.8°C	<b>QC Package: (Check Box Below)</b> <input checked="" type="checkbox"/> Level II: Standard QC <input type="checkbox"/> Level III: Std QC - Raw Data <input type="checkbox"/> Level IV: SW846 CLP-Like
<b>Logged by (Laboratory):</b> DFS	<b>Date:</b> 12/15/17 <b>Time:</b> 1630	<b>Checked by (Laboratory):</b> 	<b>Other:</b>	

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

Sample Receipt Checklist

Client Name: **OLSSON**

Date/Time Received: **15-Dec-17 10:00**

Work Order: **17121056**

Received by: **DS**

Checklist completed by Diane Shaw 15-Dec-17  
eSignature Date

Reviewed by: Chad Whelton 18-Dec-17  
eSignature Date

Matrices: **Groundwater**

Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample(s) received on ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<u>3.8/3.8 c</u>		<u>SR2</u>
Cooler(s)/Kit(s):	<u></u>		
Date/Time sample(s) sent to storage:	<u>12/15/2017 4:48:57 PM</u>		
Water - VOA vials have zero headspace?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted by:	<u>-</u>		

Login Notes:

-----

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction:



## APPENDIX D

### POTENTIOMETRIC SURFACE AND GROUNDWATER ELEVATIONS MAPS - 3<sup>rd</sup> and 4<sup>th</sup> QUARTERS 2017



PROJECT NO: 017-024  
DRAWN BY: RAS  
CREATED: 01-03-2018

Potentiometric Surface and Groundwater Elevations Map  
CS-47 - Q3 2017  
Rio Blanco County, CO



240 Mesa Avenue  
Grand Junction, CO 81501  
TEL (970) 640-0568  
Entradainc.com

FIGURE  
1





PROJECT NO: 017-024  
DRAWN BY: RAS  
CREATED: 01-09-2017

Potentiometric Surface and Groundwater Elevations Map  
CS-47 - Q4 2017  
Rio Blanco County, CO



240 Mesa Avenue  
Grand Junction, CO 81501  
TEL (970) 640-0568  
Entradainc.com

FIGURE  
2