



October 12, 2016

Mr. Ken Raymond
Senior Environmental Health and Safety Specialist
SandRidge Exploration and Production, LLC
123 Robert S. Kerr Avenue
Oklahoma City, Oklahoma 73102

**RE: Supplemental Environmental Site Investigation
Former EE3 Production Facility – Peterson Ridge 1-20H (API # 05-057-06515)
Jackson County, Colorado**

Dear Mr. Raymond;

LT Environmental, Inc. (LTE), under the direction of SandRidge Exploration and Production, LLC (SandRidge), conducted a subsurface environmental site investigation (ESI) at the Peterson Ridge 1-20H (Site), API # 05-057-06515. This report includes a summary of previous work conducted at the Site, a discussion of the ESI's field activities, hydrogeological records, laboratory analytical results, cost estimates for source removal remediation.

The Site is located approximately 0.05 miles east of State Highway 14 and 0.5 miles south of County Road 68. The legal site description is the southwest quarter of the southeast quarter of Section 20, Township 8 North, Range 80 West, 6th Principal Meridian. The Site Location Map is provided as Figure 1 and the Site Map is provided as Figure 2.

Site History

In May, 2016, Fremont Environmental, Inc. (Fremont) on behalf of the Colorado Oil and Gas Conservation Commission (COGCC), conducted an ESI at the Site. Fremont advanced a total of six soil borings (A through F) as part of the initial ESI. Soil samples were collected from three of the soil borings (B, C, and D). The laboratory analytical results indicated that total petroleum hydrocarbons (TPH) exceeded the COGCC Table 910-1 allowable concentration in the soil sample C at 3,550 milligrams per kilogram (mg/kg). Additionally, arsenic exceeded the COGCC Table 910-1 allowable concentration in all of the soil samples, ranging from 1.22 mg/kg (B) to 2.57 mg/kg (C). A complete summary of the ESI is discussed in the COGCC report titled *Soil Sampling Report, Former EE3/SandRidge LLC Locations* and dated June 8, 2016.

At the request of SandRidge, LTE reviewed the ESI data and determined that developing an appropriate remediation strategy would require additional subsurface investigation to adequately delineate the vertical and lateral extent of environmental impact at the Site.



Subsequent Environmental Site Investigation – Field Summary

On September 9, 2016, LTE, under the direction of SandRidge, conducted a subsequent ESI to further delineate hydrocarbon impacts at the Site. Eight soil borings were advanced with a truck mounted Geoprobe[®] using direct push drilling technology by Elite Drilling Services, LLC. (Elite) of Denver, Colorado. LTE observed the continuous soil samples for evidence of environmental impacts and screened the soils for volatile organic compounds (VOCs) using a photo ionization detector (PID). The soil borings were advanced to a minimum of 5 feet below any evidence of environmental impacts including soil staining, odor, and elevated PID readings, or until refusal. The soil boring depths ranged from 8 feet to 17.5 feet below ground surface (bgs). LTE collected one soil sample from each of the soil borings for laboratory analysis from the interval with the highest PID reading, or demonstrated evidence of hydrocarbon impacts including staining or odor.

One soil boring (SBC-R) was advanced at the approximate location where elevated soil TPH concentrations were observed during the initial ESI (C). Soil boring SB02 was drilled as a step-out boring to delineate the northern extent of impact. However, field observations at soil boring SB02 indicated elevated PID readings and hydrocarbon staining and, as a result, soil borings SB06 and SB07 were drilled to delineate the western and eastern extent of impact at this location. Soil borings SB01 and SB03 through SB07 were drilled in cardinal directions from the remaining areas where hydrocarbon impacts were observed to delineate the remaining lateral extent. The soil boring lithologic logs are included as Attachment 1.

LTE collected the soil samples in laboratory provided sample containers, placed them on ice, and submitted them, with a completed chain of custody form, to Summit Scientific (Summit), of Golden, Colorado, for analysis. Summit analyzed the soil samples for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and TPH – gasoline range organics (GRO) under United States Environmental Protection Agency (EPA) method 8260, and TPH – diesel range organics (DRO) under EPA method 8015.

Field Summary

Field observations indicated hydrocarbon staining, odor, and elevated PID readings at soil borings SBC-R, SB02, and SB04. No evidence of hydrocarbon impact was observed in the remaining soil borings. The evidence of hydrocarbon impacts ranged in depth from 4 to 14 feet bgs at SB02, 3 to 8 feet bgs at SBC-R, and 3 to 9 feet bgs at SB04. The maximum VOC concentrations measured in the soil borings where field observation indicated hydrocarbon impact ranged from 37.1 parts per million (ppm) at 4.5 feet bgs (SB04) to 127.0 ppm at 6 feet bgs (SBC-R). The lithology of the impacted interval consisted of silty clay with some fibrous woody fragments observed between 3 and 8 feet bgs. Drilling refusal was encountered between 14 and 17.5 feet bgs and groundwater was not encountered in any of the soil borings.



Soil Analytical Results

The COGCC Table 910-1 standards for BTEX and TPH in soil are 0.17 mg/kg, 85 mg/kg, 100 mg/kg, 175 mg/kg, and 500 mg/kg, respectively. All soil sample analytical results were below the COGCC Table 910-1 standards for BTEX and TPH. The soil sample analytical results are presented on Figure 3 and summarized in Table 1. The laboratory analytical report is attached.

Discussion

The laboratory analytical results of the soil samples collected from soil borings B, C, and D by Freemont during the initial ESI had arsenic concentrations of 1.22 mg/kg, 2.57 mg/kg, and 1.68 mg/kg respectively. SandRidge collected background soil samples from seven sites within the region. The highest background arsenic concentrations observed at each of these sites ranged from 0.677 mg/kg to 6.09 mg/kg, and averaged 3.46 mg/kg. The COGCC has reviewed the background arsenic concentrations, and based on frequently asked question #31 of the COGCC 2008 Rule Making, has determined that the maximum allowable arsenic concentration of the samples collected during the initial ESI is not to exceed 3.80 mg/kg or 10% above of the average of the highest background arsenic concentrations observed at each location. The highest arsenic concentration of the samples collected during the initial ESI was 2.57 mg/kg which is below the COGCC determined maximum allowable concentration of 3.80 mg/kg. Based on these data, LTE recommends that SandRidge request a decision of No Further Action for arsenic impact with the COGCC. A map of the regional arsenic data collected by SandRidge is presented on Figure 4.

The initial ESI indicated TPH concentrations in the soil sample collected from soil boring C, that exceeded the COGCC Table 910 allowable limits. Additionally, elevated PID readings were observed during the initial ESI at termination depths of soil borings B and D. The supplemental ESI observed elevated TPH concentrations in the soil samples collected from soil borings SBC-R, SB02, and SB04. The vertical extent of impact was delineated to extend between approximately 3 and 14 feet bgs, however, field observations indicate that the majority of impact exists between ground surface and 6 feet bgs. The approximate lateral extent of hydrocarbon impacts is 120 feet in a general north-south direction as defined by point-of-compliance (POC) soil borings SB02 and SB04, and 50 feet in a general east-west direction as defined by POC soil borings SB03 and SB05. Groundwater was not encountered during this investigation. The defined lateral extent of impact is provided on Figure 3.

Based on the analytical results and field observations of the initial and supplemental ESI, LTE estimates the volume of hydrocarbon impacted soil existing at the Site to be approximately 1,333 cubic yards. Total petroleum hydrocarbon concentrations of soil samples collected from the area of observed impacts, during the initial and supplemental ESIs, ranged from 99.9 mg/kg (SB04@4.5') to 3,550 mg/kg (C@5').



Source Removal Excavation

SandRidge will secure an earthworks contractor to excavate the delineated impact and transport it to a properly permitted landfill facility for final disposal. LTE will oversee the source removal excavation to observe for hydrocarbon impacts, including soil staining and/or odor, and screen the excavated soils for VOCs using a PID and a PetroFlag[®] kit (field test for heavy organics). LTE will determine the extent of impacts and direct the earthworks contractor to segregate the impacted soils from the clean soils based on these observations.

Upon completion of the source removal activities, LTE will collect confirmation soil samples from the sidewalls and floor of each excavation. These confirmation soil samples will be representative of the excavation and, in general, spaced at 30 foot centers. The confirmation soil samples will be collected in laboratory provided sample containers, placed on ice, and submitted to Summit, under chain of custody protocol, for BTEX and TPH-GRO analysis using EPA method 8260B, and TPH-DRO analysis using EPA method 8015. The soil samples will be completed under 24-hour turnaround times in order to expedite source removal activities. The source removal excavation will be backfilled with clean fill upon verification that the confirmation soil samples are within the COGCC Table 910-1 allowable concentrations.

LTE, on behalf of SandRidge, will draft a Remediation Summary Report to provide the details of the remediation activities and confirmation sampling analytical results. The report will include a text summary, data tables, figures, and laboratory reports. SandRidge will submit the Remediation Summary Report with a Form 4 Sundry Notice to the COGCC to request closure with LTE support.

LTE anticipates that excavation activities will begin within two weeks upon receiving notice to proceed from SandRidge, and require two 10-hour days to complete the field tasks listed above. The cost for source removal excavation based on a time and materials structure, is estimated to be \$132,150 (Table 3) and includes the following assumptions:

- A lump sum cost of \$5,000 for the excavation subcontractor to conduct source removal was assumed;
- A cost of \$57 per ton for transportation and disposal of the impacted materials was assumed;
- A lump sum cost of \$25,000 for imported backfill materials was assumed;
- Source removal excavation can be completed in 2 days;
- Eight confirmation soil samples will be required; and
- The source removal area has been completely delineated and no additional impacts will be discovered during excavation.



Soil Shredding

LTE will secure an earthworks contractor to excavate the delineated impact and treat the impacted material utilizing soil shredding and chemical oxidation remediation technology. LTE will oversee the source removal excavation to observe for hydrocarbon impacts, including soil staining and/or odor, and screen the excavated soils for VOCs using a PID and a PetroFlag® kit (field test for heavy organics). LTE will determine the extent of impacts and direct the earthworks contractor to segregate the impacted soils from the clean soils based on these observations.

Upon completion of the source removal activities, LTE will collect confirmation soil samples from the sidewalls and floor of each excavation. These confirmation soil samples will be representative of the excavation and, in general, spaced at 30 foot centers. The confirmation soil samples will be collected in laboratory provided sample containers, placed on ice, and submitted to Summit, under chain of custody protocol, for BTEX and TPH-GRO analysis using EPA method 8260B, and TPH-DRO analysis using EPA method 8015. The soil samples will be completed under 24-hour turnaround times in order to expedite source removal activities.

Soil treatment of the impacted material will be initiated as soon as possible, and conducted to efficiently treat all soil impacts. It is expected that soil treatment will be completed in approximately three working days. Soil will be treated by mechanical agitation, shredding, and ex-situ chemical oxidation. Shortly after impacted soils are mechanical shredded, soils are treated with concentrated hydrogen peroxide (3-7% typically), and windrowed onsite.

Following treatment, the soil will need to be allowed to sit for a minimum of 24 hours prior to confirmation soil sampling to ensure that chemical reactions were complete and equilibrium in soil is established. LTE, under the direction of SandRidge, will collect one 20-point composite confirmation soil sample representative of each approximately 100 cubic yard interval up to 500 cubic yards and one representative sample of each approximately 500 cubic yard interval thereafter. Each composite sample will be field screened using a PID to verify the reduction in VOCs prior to laboratory analysis. Following receipt of confirmation sampling results indicating compliance with cleanup goals, the treated soil will be backfilled in the excavation. Stockpiled topsoil or import topsoil will be utilized in the upper three feet.

LTE, on behalf of SandRidge, will draft a Remediation Summary Report to provide the details of the remediation activities and confirmation sampling analytical results. The report will include a text summary, data tables, figures, and laboratory reports. SandRidge will submit the Remediation Summary Report with a Form 4 Sundry Notice to the COGCC to request closure with LTE support.

LTE anticipates that excavation activities will begin within two weeks upon receiving notice to proceed from SandRidge, and require five 10-hour days to complete the field tasks listed above. The cost for source removal excavation, soil shredding, and chemical oxidation treatment based



on a unit rate price structure, is estimated to be \$61 per cubic yard, totaling \$81,698 and includes the following assumptions:

- 16 confirmation soil samples will be required;
- Soil shredding remediation activities will take 5 days;
- Soil shredding will be conducted in line with the remediation of the other sites; thereby reducing mobilization costs;
- Unlimited construction services will provide unit rate costs for remediation based on the cumulative amount of impacted materials observed at all four sites; and
- The source removal area has been completely delineated and no additional impacts will be discovered during excavation.

LTE appreciates the opportunity to provide environmental services to SandRidge. Please feel free to contact the undersigned at 303-433-9788 if you have any questions or comments regarding the proposed remediation activities program.

Sincerely,

LT ENVIRONMENTAL, INC.

Jess Alexander
Project Environmental Scientist

Brett Forkner
Project Environmental Scientist

Attachments

Figure 1	Site Location Map
Figure 2	Site Map
Figure 3	Soil Sample Analytical Results
Figure 4	Regional Background Arsenic Concentration Map
Table 1	Soil Sample Analytical Results
Table 2	Source Removal Excavation Cost Estimate
Attachment 1	Soil Lithologic Boring Logs
Attachment 2	Laboratory Analytical Report

FIGURES

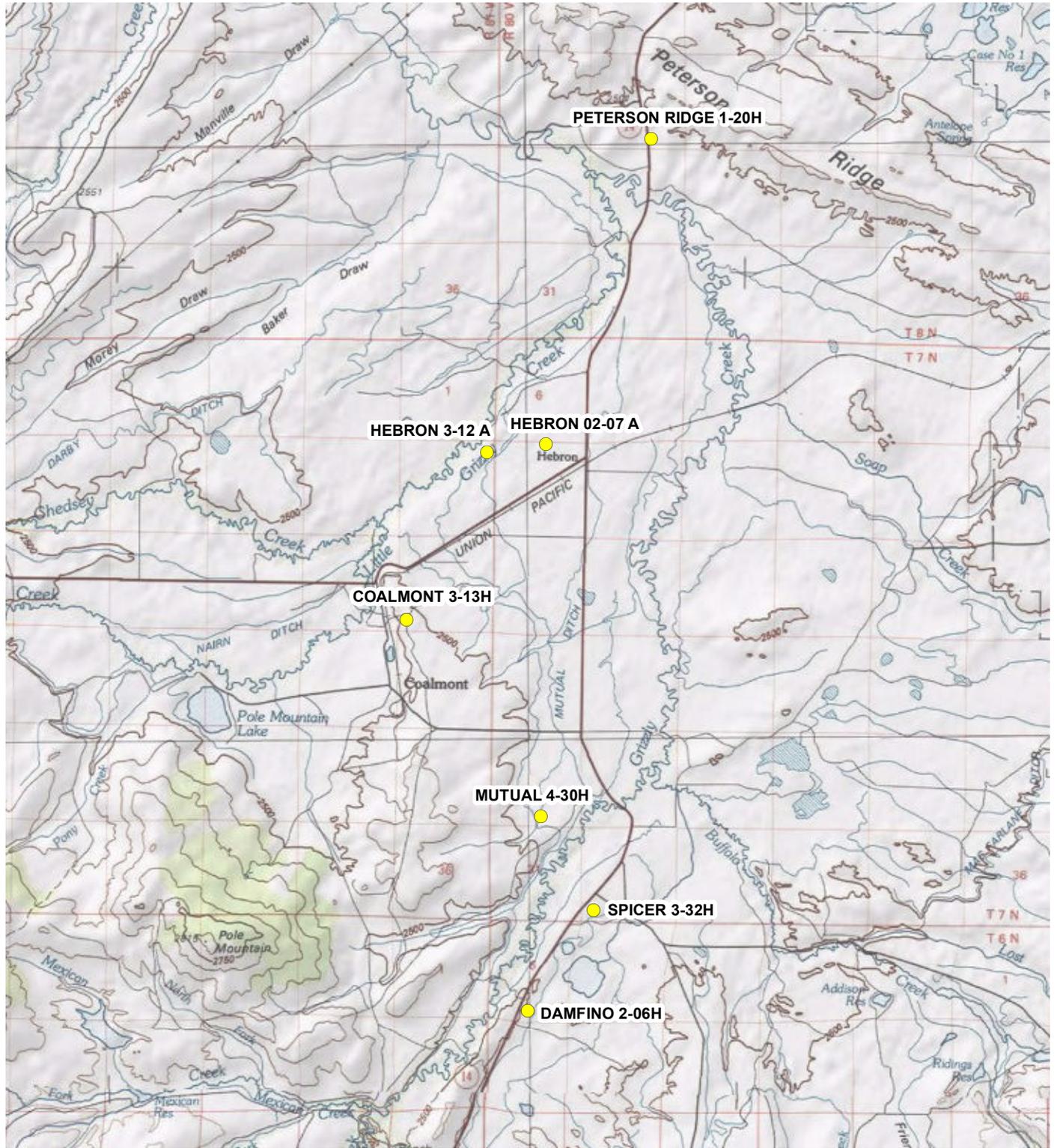


IMAGE COURTESY OF ESRI/USGS

LEGEND

● SITE LOCATION



FIGURE 1
SITE LOCATION MAP
SANDRIDGE WELLSITES
JACKSON COUNTY, COLORADO
SANDRIDGE EXPLORATION AND PRODUCTION, LLC



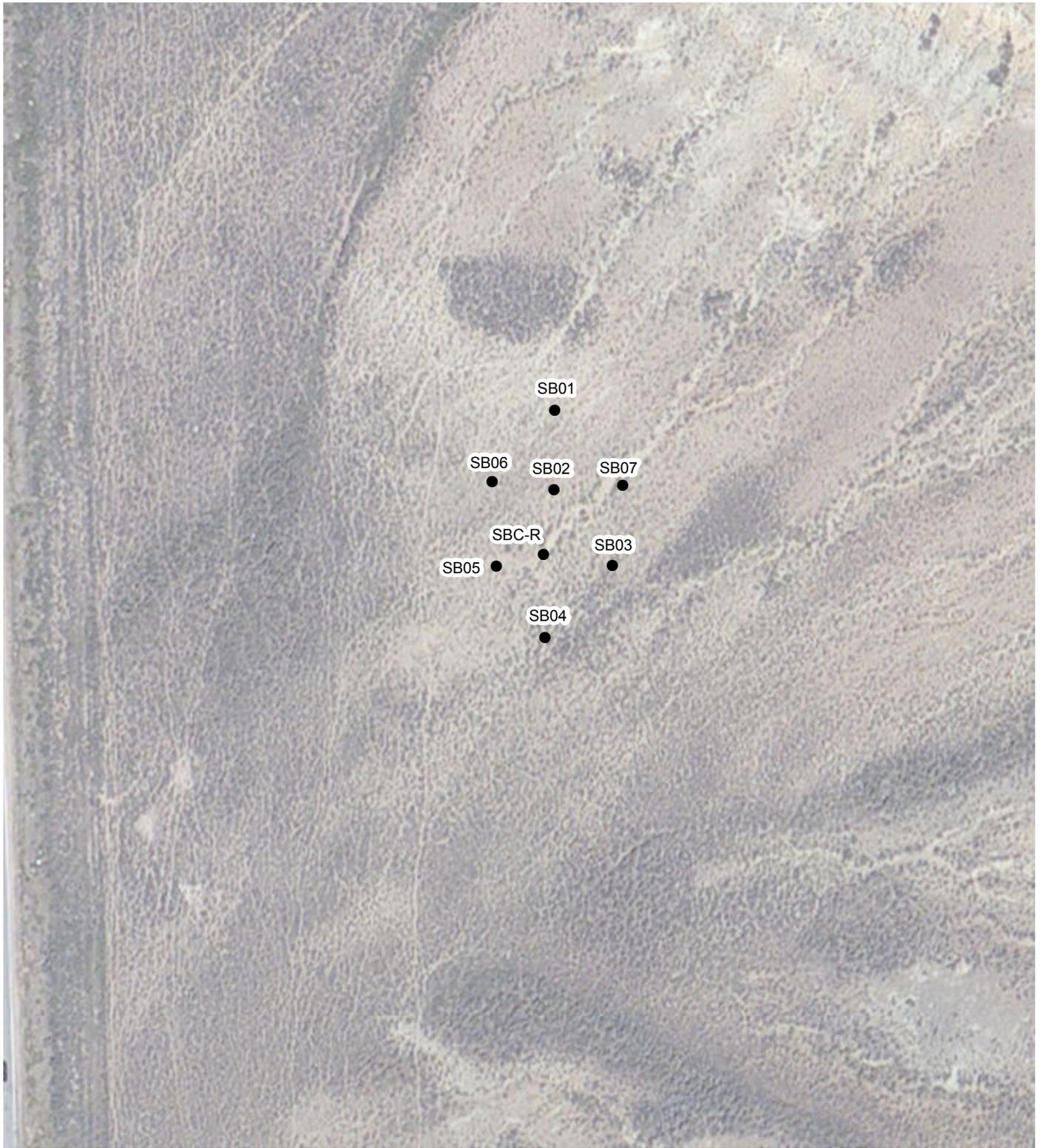


IMAGE COURTESY OF ESRI

LEGEND

- SOIL BORING

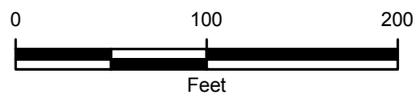
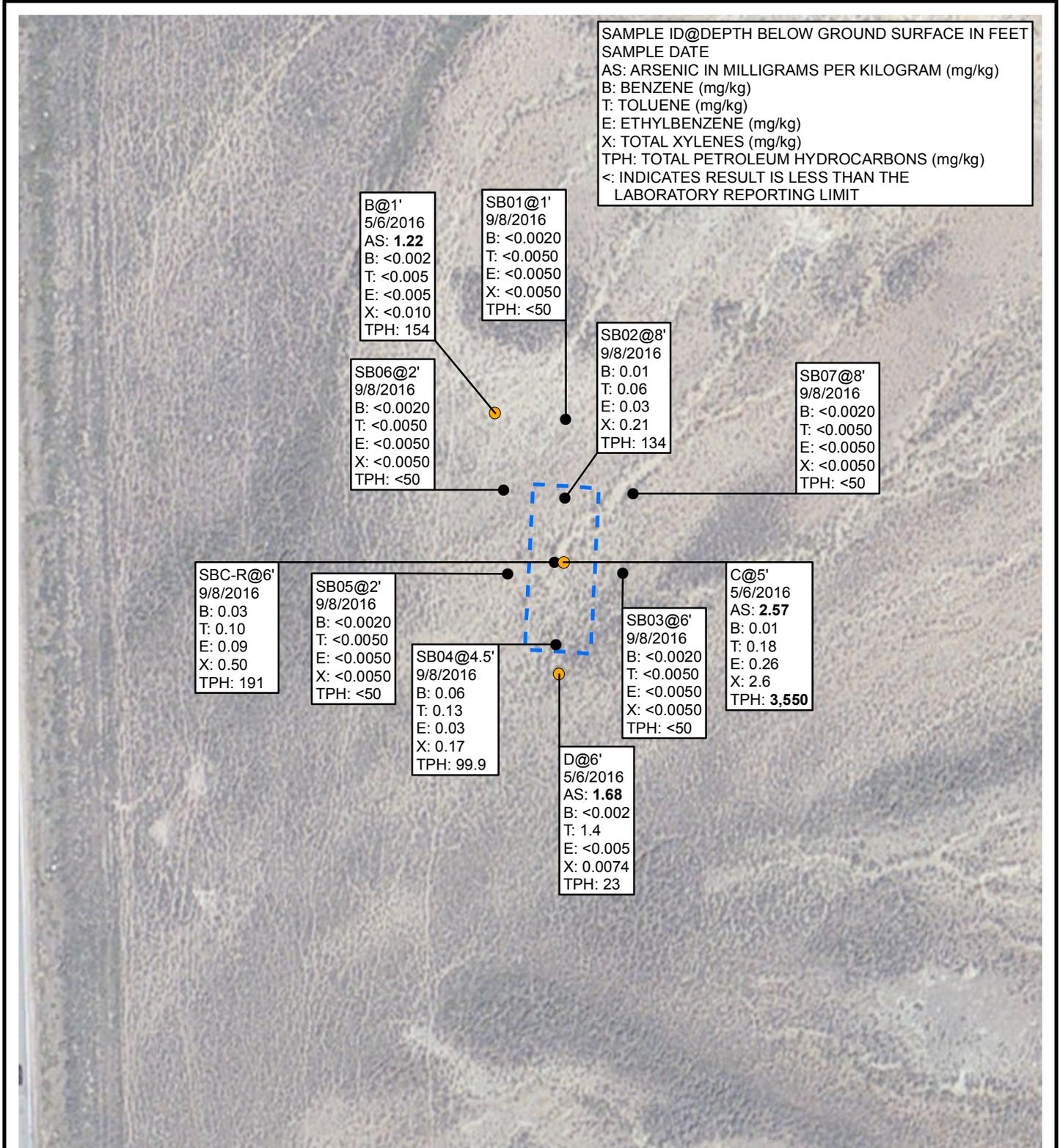


FIGURE 2
SITE MAP
PETERSON RIDGE 1-20H
JACKSON COUNTY, COLORADO
SANDRIDGE EXPLORATION AND PRODUCTION, LLC





SAMPLE ID@DEPTH BELOW GROUND SURFACE IN FEET
 SAMPLE DATE
 AS: ARSENIC IN MILLIGRAMS PER KILOGRAM (mg/kg)
 B: BENZENE (mg/kg)
 T: TOLUENE (mg/kg)
 E: ETHYLBENZENE (mg/kg)
 X: TOTAL XYLENES (mg/kg)
 TPH: TOTAL PETROLEUM HYDROCARBONS (mg/kg)
 <: INDICATES RESULT IS LESS THAN THE LABORATORY REPORTING LIMIT

B@1'
 5/6/2016
 AS: **1.22**
 B: <0.002
 T: <0.005
 E: <0.005
 X: <0.010
 TPH: 154

SB01@1'
 9/8/2016
 B: <0.0020
 T: <0.0050
 E: <0.0050
 X: <0.0050
 TPH: <50

SB02@8'
 9/8/2016
 B: 0.01
 T: 0.06
 E: 0.03
 X: 0.21
 TPH: 134

SB07@8'
 9/8/2016
 B: <0.0020
 T: <0.0050
 E: <0.0050
 X: <0.0050
 TPH: <50

SB06@2'
 9/8/2016
 B: <0.0020
 T: <0.0050
 E: <0.0050
 X: <0.0050
 TPH: <50

SBC-R@6'
 9/8/2016
 B: 0.03
 T: 0.10
 E: 0.09
 X: 0.50
 TPH: 191

SB05@2'
 9/8/2016
 B: <0.0020
 T: <0.0050
 E: <0.0050
 X: <0.0050
 TPH: <50

SB04@4.5'
 9/8/2016
 B: 0.06
 T: 0.13
 E: 0.03
 X: 0.17
 TPH: 99.9

SB03@6'
 9/8/2016
 B: <0.0020
 T: <0.0050
 E: <0.0050
 X: <0.0050
 TPH: <50

C@5'
 5/6/2016
 AS: **2.57**
 B: 0.01
 T: 0.18
 E: 0.26
 X: 2.6
 TPH: **3,550**

D@6'
 5/6/2016
 AS: **1.68**
 B: <0.002
 T: 1.4
 E: <0.005
 X: 0.0074
 TPH: 23

LEGEND

- SOIL BORING
- PREVIOUS COGCC SOIL SAMPLE
- ▭ EXTENT OF IMPACT

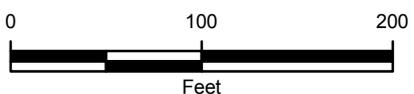
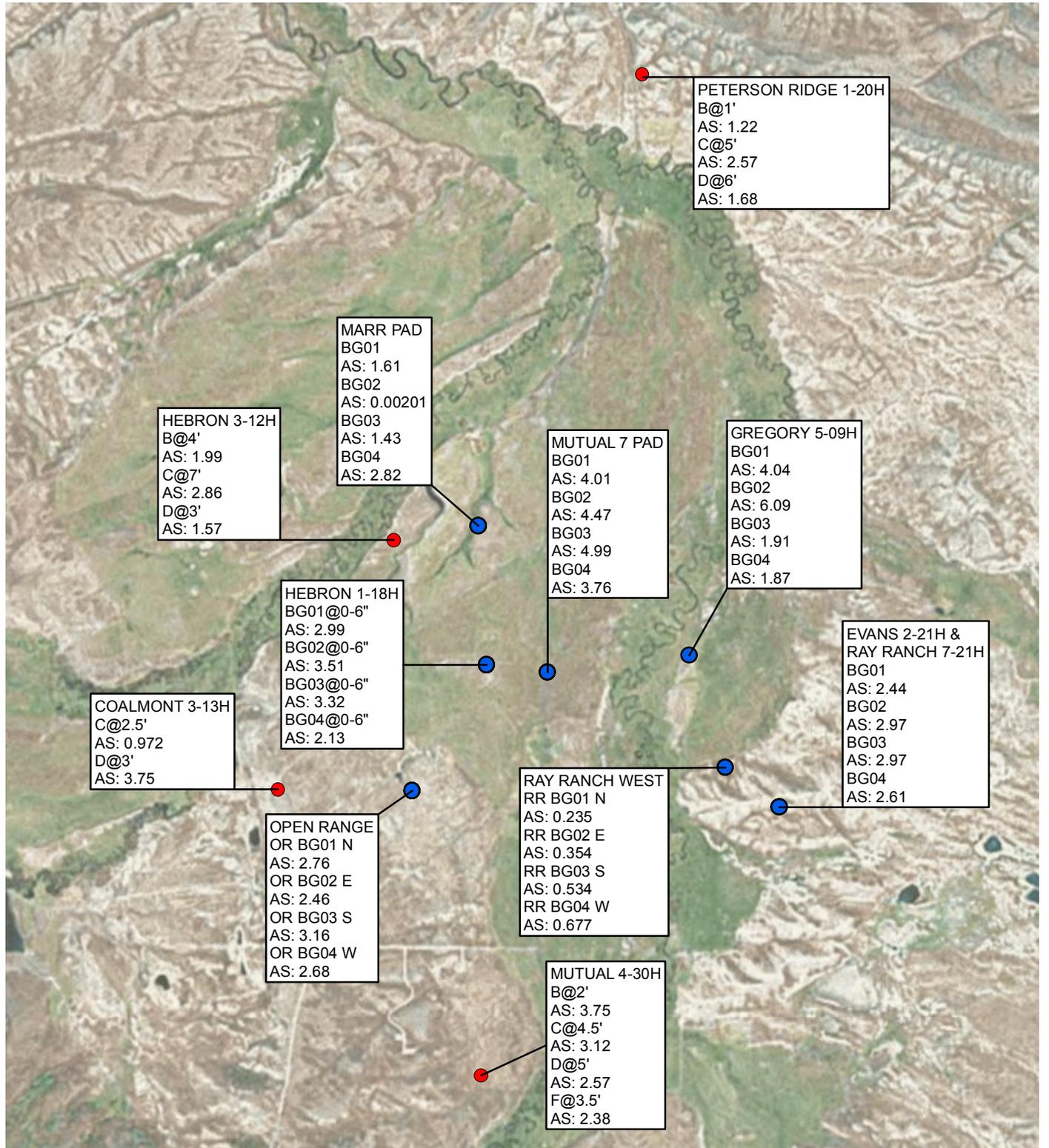


IMAGE COURTESY OF ESRI

FIGURE 3
 SOIL ANALYTICAL RESULTS
 PETERSON RIDGE 1-20H
 JACKSON COUNTY, COLORADO
 SANDRIDGE EXPLORATION AND PRODUCTION, LLC





LEGEND

- BACKGROUND ARSENIC SAMPLE (mg/kg)
- SANDRIDGE REMEDIATION SITE LOCATION



IMAGE COURTESY OF ESRI



FIGURE 4
ARSENIC SITE MAP
JACKSON COUNTY, COLORADO

SANDRIDGE EXPLORATION AND PRODUCTION, LLC



TABLES

**TABLE 1
SOIL ANALYTICAL RESULTS**

**PETERSON RIDGE 1-20H
JACKSON COUNTY, COLORADO
SANDRIDGE EXPLORATION AND PRODUCTION, LLC**

Sample ID	Date Sampled	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	TPH (mg/kg)
B@1'	5/6/2016	<0.002	<0.005	<0.005	<0.010	14	140	154
C@5'	5/6/2016	0.01	0.18	0.26	2.6	3,400	150	3,550
D@6'	5/6/2016	<0.002	1.4	<0.005	0.0074	23	<50	23
SBC-R@6'	9/8/2016	0.029	0.10	0.087	0.50	61	130	191
SB01@1'	9/8/2016	<0.0020	<0.0050	<0.0050	<0.0050	<0.50	<50	<50
SB02@8'	9/8/2016	0.011	0.060	0.034	0.21	24	110	134
SB03@6'	9/8/2016	<0.0020	<0.0050	<0.0050	<0.0050	<0.50	<50	<50
SB04@4.5'	9/8/2016	0.062	0.13	0.026	0.17	6.9	93	99.9
SB05@2'	9/8/2016	<0.0020	<0.0050	<0.0050	<0.0050	<0.50	<50	<50
SB06@2'	9/8/2016	<0.0020	<0.0050	<0.0050	<0.0050	<0.50	<50	<50
SB07@8'	9/8/2016	<0.0020	<0.0050	<0.0050	<0.0050	<0.50	<50	<50
COGCC Table 910-1 Allowable Concentration		0.17	85	100	175	--	--	500

Notes:

COGCC - Colorado Oil and Gas Conservation Commission

DRO - diesel range organics analyzed by EPA Method 8015

GRO - gasoline range organics analyzed by EPA Method 8260

mg/kg - milligrams per kilogram

TPH - total petroleum hydrocarbons is the sum of GRO and DRO

-- - not applicable

< indicates result is less than the stated laboratory method reporting limit

Benzene, toluene, ethylbenzene, and total xylenes analyzed by EPA Method 8260

Bold indicates the result exceeds the applicable standard

TABLE 2
COST ESTIMATE
SOURCE REMOVAL EXCAVATION
PETERSON RIDGE 1-20H
JACKSON COUNTY, COLORADO
SANDRIDGE EXPLORATION AND PRODUCTION, LLC

LABOR	Principal	Project Scientist I	Staff II Geologist/Eng.	GIS Specialist	Admin/ Clerical
TASK 1: Project Management	2	6			0.5
TASK 2: Excavation		2	28		
TASK 3: Reporting	2	10	2	2	0.5
TOTAL HOURS	4	18	30	2	1
RATE (\$)	\$140	\$110	\$83	\$72	\$55
LABOR COST	\$560	\$1,980	\$2,490	\$144	\$55

LABOR SUBTOTAL **\$5,229**

SUBCONTRACTOR	QTY.	COST/UNIT	UNIT TOTAL
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SandRidge Excavation Contractor

TASK 2: Excavation

Transportation and Disposal	1,733 Tons	\$57.00 /ton	\$98,775
Contractor	1 Lump Sum	\$5,000.00 /each	\$5,000
Import Backfill Material	1 Lump Sum	\$19,000.00 /each	\$19,000

Summit Scientific

TASK 2: Confirmation Soil Samples (Rush Turnaround)	BTEX/GRO	8	\$140.00 /sample	\$1,120
	DRO	8	\$160.00 /sample	\$1,280

SUBCONTRACTOR SUBTOTAL **\$125,415**

OTHER DIRECT COSTS (ODCs)	QTY.	COST/UNIT	UNIT TOTAL
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TASK 2: Supplemental ESI Soil Borings

Truck	4	\$110.00 /day	\$440
Organic Vapor Meter	2	\$50.00 /day	\$100
Trimble GPS	2	\$60.00 /day	\$120
LTE Per Diem	4	\$160.00 /day	\$640
Misc. Field Supplies	2	\$23.00 /day	\$46
PetroFlag	8	\$20.00 /each	\$160

ODC SUBTOTAL **\$1,506**

PROJECT TOTAL **\$132,150**

TABLE 3

**COST ESTIMATE
EXCAVATION, SOIL SHREDDING, BACKFILL
PETERSON RIDGE 1-20H
JACKSON COUNTY, COLORADO
SANDRIDGE EXPLORATION AND PRODUCTION, LLC**

LABOR	Principal	Project Scientist I	Staff II Geologist/Eng.	GIS Specialist	Admin/ Clerical
TASK 1: Project Management	2	6			0.5
TASK 2: Excavation, Soil Shredding, Backfill		5	58		
TASK 3: Reporting	2	10	2	2	0.5
TOTAL HOURS	4	21	60	2	1
RATE (\$)	\$140	\$110	\$83	\$72	\$55
LABOR COST	\$560	\$2,310	\$4,980	\$144	\$55

LABOR SUBTOTAL **\$8,049**

SUBCONTRACTOR	QTY.	COST/UNIT	UNIT TOTAL
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Unlimited Construction

TASK 2: Excavation, Soil Shredding, Backfill

Soil Shredding	1,333 Yards	\$45.00 /yard	\$59,985
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Summit Scientific

TASK 2: Confirmation Soil Samples (Rush Turnaround)

BTEX/GRO	8	\$140.00 /sample	\$1,120
DRO	8	\$160.00 /sample	\$1,280

TASK 2: Soil Shredding Confirmation Soil Samples (Rush

BTEX/GRO	8	\$140.00 /sample	\$1,120
DRO	8	\$160.00 /sample	\$1,280

SUBCONTRACTOR SUBTOTAL **\$71,264**

OTHER DIRECT COSTS (ODCs)	QTY.	COST/UNIT	UNIT TOTAL
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TASK 2: Excavation, Soil Shredding, Backfill

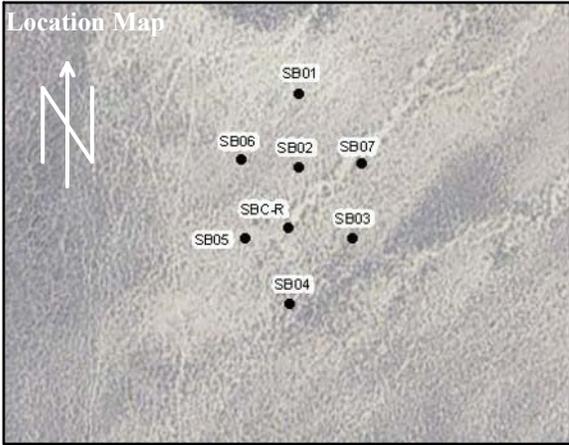
Truck	6.0	\$110.00 /day	\$660
Organic Vapor Meter	5.0	\$50.00 /day	\$250
Trimble GPS	5.0	\$60.00 /day	\$300
LTE Per Diem	6.0	\$160.00 /day	\$960
Misc. Field Supplies	5.0	\$23.00 /day	\$115
PetroFlag	5	\$20.00 /each	\$100

ODC SUBTOTAL **\$2,385**

PROJECT TOTAL **\$81,698**

ATTACHMENT 1
SOIL LITHOLOGIC BORING LOGS





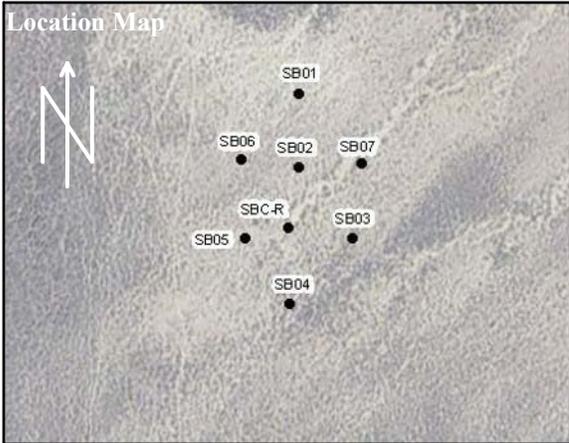
Compliance • Engineering • Remediation
LT Environmental, Inc.
 4600 W. 60th Avenue
 Arvada, Colorado 80003

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

HOLE DIAMETER: 2.25"
WELL DIAMETER: NA
CASING TYPE: NA
SCREEN TYPE: NA

PROJECT NAME: Peterson Ridge 1-20H
PROJECT NO: 065816008 **LOGGED BY:** Jeremy Pike
BORING/WELL ID: SB02 **SAMPLE METHOD:** Continuous
COMPLETION DATE: 09/09/2016 **DRILL METHOD:** Direct Push
TD (ft bgs): 17.5' **DRILLED BY:** Elite Drilling
DTW (ft bgs): Not encountered **DETECTOR:** MiniRAE 3000
SCREEN SLOT: NA **FILTER PACK:** NA
CASING LENGTH: NA **ANNULUS SEAL:** Bentonite chips
SCREEN LENGTH: NA **SURFACE SEAL:** NA

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
0.70		Moist			0	SM		SILTY SAND - 0.0' - 7.0' - light brown, fine grained, little clay, trace fine gravel, trace eco sponge at 4' to 7' bgs, moist, hydrocarbon odor and staining at 4' to 7' bgs	
0.80				4/4					
1.20									
64.20	Red		SB02 @8'		5	CI		SILTY CLAY - 7.0' - 14.0' - light brown, moist, no odor, slight hydrocarbon staining at 7' to 14' bgs	
41.20				3/4					
51.90									
54.20									
109.30					10				
26.00				2.5/4					
50.00									
4.00									
57.00	White	Dry			15	CH		CLAY - 14.0' - 17.5' - light reddish brown, high plasticity, dry, no odor, no staining, very rough drilling, saprolitic claystone, refusal at 17.5' bgs	
16.20				2/4					
6.00									
2.60									
0.40				1/1.5					



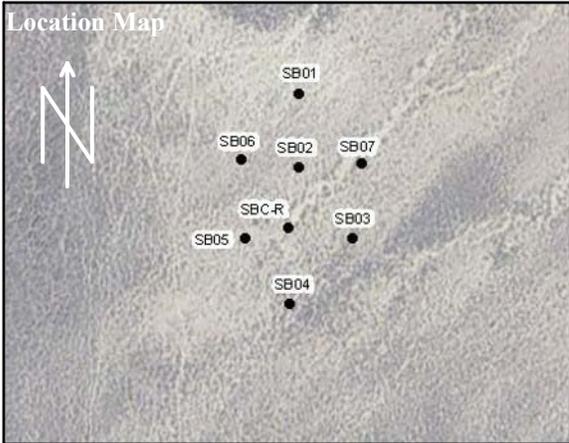
Compliance • Engineering • Remediation
LT Environmental, Inc.
 4600 W. 60th Avenue
 Arvada, Colorado 80003

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

PROJECT NAME: Peterson Ridge 1-20H
PROJECT NO: 065816008 **LOGGED BY:** Jeremy Pike
BORING/WELL ID: SB04 **SAMPLE METHOD:** Continuous
COMPLETION DATE: 09/09/2016 **DRILL METHOD:** Direct Push
TD (ft bgs): 15' **DRILLED BY:** Elite Drilling
DTW (ft bgs): Not encountered **DETECTOR:** MiniRAE 3000
SCREEN SLOT: NA **FILTER PACK:** NA
CASING LENGTH: NA **ANNULUS SEAL:** NA
SCREEN LENGTH: NA **SURFACE SEAL:** NA

HOLE DIAMETER: 2.25"
WELL DIAMETER: NA
CASING TYPE: NA
SCREEN TYPE: NA

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
0.40		Moist			0	SM		SILTY SAND - 0.0' - 3.0' - light brown, fine grained, little clay, trace fine gravel, moist, no odor, no staining	
5.40				4/4					
7.80	Moist		SB04 @4.5'			CL		SILTY CLAY - 3.0' - 9.0' - dark brownish gray, some ecosponge, moist, organic odor, slight hydrocarbon staining	
34.00									
37.10					5				
13.00									
2.10				3/4					
2.30									
12.50									
	Dry					CLS		CLAY - 9.0' - 15.0' - greenish brown, high plasticity, calcitic stringers, dry, no odor, iron oxide staining, saprolitic claystone, refusal at 15' bgs	
1.40				2.5/4	10				
3.20									
4.00									
2.50				2/3					
0.90									
0.70					15				



Compliance • Engineering • Remediation
LT Environmental, Inc.
 4600 W. 60th Avenue
 Arvada, Colorado 80003

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

PROJECT NAME: Peterson Ridge 1-20H
PROJECT NO: 065816008 **LOGGED BY:** Jeremy Pike
BORING/WELL ID: SB07 **SAMPLE METHOD:** Continuous
COMPLETION DATE: 09/09/2016 **DRILL METHOD:** Direct Push
TD (ft bgs): 8' **DRILLED BY:** Elite Drilling
DTW (ft bgs): Not encountered **DETECTOR:** MiniRAE 3000
SCREEN SLOT: NA **FILTER PACK:** NA
CASING LENGTH: NA **ANNULUS SEAL:** NA
SCREEN LENGTH: NA **SURFACE SEAL:** NA

HOLE DIAMETER: 2.25"
WELL DIAMETER: NA
CASING TYPE: NA
SCREEN TYPE: NA

PID (ppm)	Staining	Moisture Content	Sample ID	Recovery (ft/ft)	Depth (ft)	USCS	USCS Graphic	Lithology Description	Well Construction
		Moist			0				
0.30									
0.10				3.5/4		SM		SILTY SAND - 0.0' - 8.0' - light brown, fine grained, little clay, trace fine gravel, moist, no odor, no staining	
0.00									
0.00									
0.30					5				
0.30				3/4					
0.20									
0.30			SB07 @8'						

ATTACHMENT 2
LABORATORY ANALYTICAL REPORT



Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

October 07, 2016

Brett Forkner
LT Environmental, Inc.
4600 West 60th Avenue
Arvada, CO 80003
RE: Peterson Ridge 01-20H

Enclosed are the results of analyses for samples received by Summit Scientific on 09/09/16 16:40. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury
President



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Peterson Ridge 01-20H

Project Number: 065816008
Project Manager: Brett Forkner

Reported:
10/07/16 18:08

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SBC-R@6'	1609058-01	Soil	09/09/16 08:30	09/09/16 16:40
SB01@1'	1609058-02	Soil	09/09/16 09:00	09/09/16 16:40
SB02@8'	1609058-03	Soil	09/09/16 09:40	09/09/16 16:40
SB03@6'	1609058-04	Soil	09/09/16 10:05	09/09/16 16:40
SB04@4.5'	1609058-05	Soil	09/09/16 10:35	09/09/16 16:40
SB05@2'	1609058-06	Soil	09/09/16 11:00	09/09/16 16:40
SB06@2'	1609058-07	Soil	09/09/16 11:20	09/09/16 16:40
SB07@8'	1609058-08	Soil	09/09/16 11:50	09/09/16 16:40

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Peterson Ridge 01-20H

Project Number: 065816008
Project Manager: Brett Forkner

Reported:
10/07/16 18:08

Summit Scientific

1609058.1

741 Corporate Circle Suite 1 • Golden, Colorado 80401
303-277-9310 + 303-374-5933 Fax

Page 1 of 2

Client: LT ENVIRONMENTAL
Address: 6400 W. 60th AVE
City/State/Zip: ARVADA CO, 80003
Phone: 303-437-9788 Fax:
Sampler Name: SERENITY FIRE

Project Manager: JESS ALEXANDER / BRETT FORKNER
E-Mail: JALEXANDER@LTENV.COM / BFORKNER@LTENV.COM
Project Name: PETERSON RIDGE 1-20H
Project Number: 065816008

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative				Matrix			Analyze For:						Special Instructions	
				HCl	HNO ₃	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #	Other (Specify)	GBTEX 8260	TPH-DPD 8015	ARSENIC 5.M.3510P				
SB1-R @ 6'	9/17/16	0830	1			X		X			X	X						
SB2 @ 11'		0920	1			X		X			X	X						
SB02 @ 5'		0940	1			X		X			X	X						
SB03 @ 6'		1005	1			X		X			X	X						
SB04 @ 4.5'		1035	1			X		X			X	X						
SB05 @ 2'		1100	1			X		X			X	X						
SB06 @ 2'		1120	1			X		X			X	X						
SB07 @ 8'		1150	1			X		X			X	X						
9601		1205	1			X		X					X					Cancelled per client PS
9602		1210	1			X		X					X					
Relinquished by: <i>Jay H</i>	Date/Time: 9/16/16 1640	Received by: <i>Allyn</i>	Date/Time: 9/16/16 1640	Turn Around Time (Check)				Notes:										
Relinquished by:	Date/Time:	Received by:	Date/Time:	Same Day	<input type="checkbox"/>	72 Hours	<input type="checkbox"/>	Standard <input checked="" type="checkbox"/>										
Relinquished by:	Date/Time:	Received by:	Date/Time:	24 Hours	<input type="checkbox"/>	48 Hours	<input type="checkbox"/>											
Relinquished by:	Date/Time:	Received in Lab by:	Date/Time:	Sample Integrity:														
				Temperature Upon Receipt: 5.3°C				Intact: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>										

www.s2scientific.com



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Peterson Ridge 01-20H

Project Number: 065816008
Project Manager: Brett Forkner

Reported:
10/07/16 18:08

Sample Receipt Checklist

S2 Work Order: 1609058

Client: LTE Client Project ID: Peterson Ridge 1-20H

Shipped Via: HD Airbill #: _____
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Matrix (check all that apply): Air Soil/Solid Water Other: _____
(Describe)

Cooler ID				
Temp (°C)	<u>5.3°C</u>			

Thermometer ID: 61857155-K

	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature just above 0°C to ≤ 6°C ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
NOTE: If samples are delivered the same day of sampling, this requirement is waived provided that there is evidence that cooling has begun.				
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
If custody seals are present, are they intact ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) form present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client w/ date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling) ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Note the type of preservative in the Comments column – HCl, H2SO4, NaOH, HNO3, ect				
If samples are acid preserved for metals, is the pH ≤ 2 ⁽¹⁾ ?			<input checked="" type="checkbox"/>	
Record the pH in Comments.				
If dissolved metals are requested, were samples field filtered?			<input checked="" type="checkbox"/>	
Additional Comments (if any):				

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.

Mindy Mach
Custodian Printed Name

[Signature]
Signature or initials of Custodian

9/11/16 16:41
Date/Time

[Signature]



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Peterson Ridge 01-20H

Project Number: 065816008
Project Manager: Brett Forkner

Reported:
10/07/16 18:08

SBC-R@6'
1609058-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **09/09/16 08:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	130	50	mg/kg	1	1609076	09/12/16	09/13/16	8015M	

Date Sampled: **09/09/16 08:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		99.5 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/09/16 08:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.029	0.0020	mg/kg	1	1609075	09/12/16	09/13/16	EPA 8260B	
Toluene	0.10	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.087	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.50	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	61	0.50	"	"	"	"	"	"	

Date Sampled: **09/09/16 08:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		112 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		94.4 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		108 %	21-167		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Peterson Ridge 01-20H

Project Number: 065816008
Project Manager: Brett Forkner

Reported:
10/07/16 18:08

SB01@1'
1609058-02 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **09/09/16 09:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1609076	09/12/16	09/13/16	8015M	

Date Sampled: **09/09/16 09:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		94.7 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/09/16 09:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1609075	09/12/16	09/13/16	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/09/16 09:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		110 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		99.2 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.2 %	21-167		"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Peterson Ridge 01-20H

Project Number: 065816008
Project Manager: Brett Forkner

Reported:
10/07/16 18:08

SB02@8'
1609058-03 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **09/09/16 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	110	50	mg/kg	1	1609076	09/12/16	09/13/16	8015M	

Date Sampled: **09/09/16 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		99.9 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/09/16 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.011	0.0020	mg/kg	1	1609075	09/12/16	09/13/16	EPA 8260B	
Toluene	0.060	0.0050	"	"	"	"	"	"	
Ethylbenzene	0.034	0.0050	"	"	"	"	"	"	
Xylenes (total)	0.21	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	24	0.50	"	"	"	"	"	"	

Date Sampled: **09/09/16 09:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		108 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		92.6 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		98.6 %	21-167		"	"	"	"	

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Peterson Ridge 01-20H

Project Number: 065816008
Project Manager: Brett Forkner

Reported:
10/07/16 18:08

SB03@6'
1609058-04 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **09/09/16 10:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1609076	09/12/16	09/13/16	8015M	

Date Sampled: **09/09/16 10:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		95.4 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/09/16 10:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1609075	09/12/16	09/13/16	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/09/16 10:05**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.3 %	21-167		"	"	"	"	

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Peterson Ridge 01-20H

Project Number: 065816008
Project Manager: Brett Forkner

Reported:
10/07/16 18:08

SB04@4.5'
1609058-05 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **09/09/16 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	93	50	mg/kg	1	1609076	09/12/16	09/13/16	8015M	

Date Sampled: **09/09/16 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: o-Terphenyl</i>		98.7 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/09/16 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	0.062	0.0018	mg/kg	1	1609075	09/12/16	09/13/16	EPA 8260B	
Toluene	0.13	0.0045	"	"	"	"	"	"	
Ethylbenzene	0.026	0.0045	"	"	"	"	"	"	
Xylenes (total)	0.17	0.0045	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	6.9	0.45	"	"	"	"	"	"	

Date Sampled: **09/09/16 10:35**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<i>Surrogate: 1,2-Dichloroethane-d4</i>		110 %	23-173		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		93.7 %	20-170		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>		91.8 %	21-167		"	"	"	"	

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Peterson Ridge 01-20H

Project Number: 065816008
Project Manager: Brett Forkner

Reported:
10/07/16 18:08

SB05@2'
1609058-06 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **09/09/16 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1609076	09/12/16	09/13/16	8015M	

Date Sampled: **09/09/16 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		94.7 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/09/16 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1609075	09/12/16	09/13/16	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/09/16 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		108 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		95.8 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		95.0 %	21-167		"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Peterson Ridge 01-20H

Project Number: 065816008
Project Manager: Brett Forkner

Reported:
10/07/16 18:08

SB06@2'
1609058-07 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **09/09/16 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1609076	09/12/16	09/13/16	8015M	

Date Sampled: **09/09/16 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		95.2 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/09/16 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1609075	09/12/16	09/13/16	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/09/16 11:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		98.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.2 %	21-167		"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Peterson Ridge 01-20H

Project Number: 065816008
Project Manager: Brett Forkner

Reported:
10/07/16 18:08

SB07@8'
1609058-08 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **09/09/16 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	1609076	09/12/16	09/13/16	8015M	

Date Sampled: **09/09/16 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		95.9 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **09/09/16 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	1609075	09/12/16	09/13/16	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **09/09/16 11:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		107 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		96.4 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		98.3 %	21-167		"	"	"	"	

Summit Scientific

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO, 80003

Project: Peterson Ridge 01-20H

Project Number: 065816008
Project Manager: Brett Forkner

Reported:
10/07/16 18:08

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch 1609076 - EPA 3550A

Blank (1609076-BLK1)

Prepared & Analyzed: 09/12/16

C10-C28 (DRO)	ND	50	mg/kg								
<i>Surrogate: o-Terphenyl</i>	<i>11.9</i>		"	<i>12.5</i>		<i>94.9</i>	<i>30-150</i>				

LCS (1609076-BS1)

Prepared & Analyzed: 09/12/16

C10-C28 (DRO)	459	50	mg/kg	499		91.9	73-134				
<i>Surrogate: o-Terphenyl</i>	<i>15.4</i>		"	<i>12.5</i>		<i>123</i>	<i>30-150</i>				

Matrix Spike (1609076-MS1)

Source: 1609057-01

Prepared & Analyzed: 09/12/16

C10-C28 (DRO)	2040	50	mg/kg	462	1500	116	50-148				
<i>Surrogate: o-Terphenyl</i>	<i>27.9</i>		"	<i>11.6</i>		<i>241</i>	<i>30-150</i>				<i>S-02</i>

Matrix Spike Dup (1609076-MSD1)

Source: 1609057-01

Prepared & Analyzed: 09/12/16

C10-C28 (DRO)	2010	50	mg/kg	462	1500	109	50-148	1.45	20		
<i>Surrogate: o-Terphenyl</i>	<i>33.5</i>		"	<i>11.6</i>		<i>289</i>	<i>30-150</i>				<i>S-02</i>

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Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 1609075 - EPA 5030 Soil MS

Blank (1609075-BLK1)

Prepared & Analyzed: 09/12/16

Benzene	ND	0.0020	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.0050	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0399</i>		<i>"</i>	<i>0.0400</i>		<i>99.8</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0383</i>		<i>"</i>	<i>0.0400</i>		<i>95.8</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0373</i>		<i>"</i>	<i>0.0400</i>		<i>93.2</i>	<i>21-167</i>			

LCS (1609075-BS1)

Prepared & Analyzed: 09/12/16

Benzene	0.0766	0.0020	mg/kg	0.100		76.6	58-130			
Toluene	0.0836	0.0050	"	0.100		83.6	61-134			
Ethylbenzene	0.0958	0.0050	"	0.0992		96.6	74-139			
m,p-Xylene	0.196	0.010	"	0.200		98.2	73-137			
o-Xylene	0.106	0.0050	"	0.0980		108	73-141			
Xylenes (total)	0.302	0.0050	"				30-150			
Gasoline Range Hydrocarbons	1.82	0.50	"				30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0404</i>		<i>"</i>	<i>0.0400</i>		<i>101</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0384</i>		<i>"</i>	<i>0.0400</i>		<i>95.9</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0384</i>		<i>"</i>	<i>0.0400</i>		<i>95.9</i>	<i>21-167</i>			

Matrix Spike (1609075-MS1)

Source: 1609057-02

Prepared & Analyzed: 09/12/16

Benzene	0.0736	0.0020	mg/kg	0.0943	ND	78.0	30-131			
Toluene	0.0810	0.0050	"	0.0943	ND	85.9	30-134			
Ethylbenzene	0.0888	0.0050	"	0.0936	ND	94.8	22-153			
m,p-Xylene	0.182	0.010	"	0.188	ND	96.6	10-159			
o-Xylene	0.0995	0.0050	"	0.0925	ND	108	31-151			
Xylenes (total)	0.281	0.0050	"		ND		30-150			
Gasoline Range Hydrocarbons	14.9	0.50	"		10.6		30-150			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0427</i>		<i>"</i>	<i>0.0377</i>		<i>113</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0354</i>		<i>"</i>	<i>0.0377</i>		<i>93.9</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0394</i>		<i>"</i>	<i>0.0377</i>		<i>104</i>	<i>21-167</i>			

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Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC			RPD	Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 1609075 - EPA 5030 Soil MS

Matrix Spike Dup (1609075-MSD1)	Source: 1609057-02			Prepared & Analyzed: 09/12/16						
Benzene	0.0777	0.0020	mg/kg	0.0984	ND	78.9	30-131	5.46	34	
Toluene	0.0854	0.0050	"	0.0984	ND	86.7	30-134	5.25	30	
Ethylbenzene	0.0930	0.0050	"	0.0976	ND	95.3	22-153	4.72	24	
m,p-Xylene	0.191	0.010	"	0.196	ND	97.0	10-159	4.66	68	
o-Xylene	0.102	0.0050	"	0.0965	ND	106	31-151	2.40	38	
Xylenes (total)	0.293	0.0050	"		ND		30-150	3.87	20	
Gasoline Range Hydrocarbons	11.5	0.50	"		10.6		30-150	25.5	20	QM-07
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0434</i>		<i>"</i>	<i>0.0394</i>		<i>110</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0377</i>		<i>"</i>	<i>0.0394</i>		<i>95.8</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0419</i>		<i>"</i>	<i>0.0394</i>		<i>106</i>	<i>21-167</i>			

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Notes and Definitions

- S-02 The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.
- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference