November 20, 2020 Vertex Project #: 20E-00141-056

Spill Closure Report: Lava Tube 27 State 1
Unit B, Section 34, Township 21 South, Range 31 East
County: Eddy
API 30-015-40786
Incident Tracking Number: NJMW1308633738

Prepared For: Devon Energy Production Company
6488 Seven Rivers Highway
Artesia, New Mexico 88210

New Mexico Oil Conservation Division – District 2 – Artesia
811 South First Street
Artesia, New Mexico 88210

Devon Energy Production Company (Devon) retained Vertex Resource Services Inc. (Vertex) to conduct a spill assessment and remediation for a brine water release that occurred on March 9, 2013, at the Lava Tube 27 State 1 (hereafter referred to as "Lava Tube"). Devon provided immediate notification of the release to New Mexico Oil Conservation Division (NM OCD) District 2 on March 9, 2013. An initial C-141 Release Notification was submitted to NM OCD District 2 and the New Mexico State Land Office (SLO), who own the land, on March 13, 2013 (Attachment 1). The NM OCD incident tracking number assigned to the release is NJMW1308633738.

This letter provides a description of the spill assessment and remediation activities, and demonstrates that closure criteria established in 19.15.29.12 *New Mexico Administrative Code* (NMAC; New Mexico Oil Conservation Division, 2018) have been met and all applicable regulations are being followed. This document is intended to serve as a final report to obtain approval from NM OCD for closure of this release.

Incident Description

On March 9, 2013, a release occurred at Devon's Lava Tube site when a berm gave away on a three-sided cutting tank. This incident resulted in the release of approximately 350 barrels (bbls) of brine water onto the well pad surface. Upon discovery of the release, a hydrovac truck was dispatched to site to recover free fluid. Approximately 320 bbls of brine water were recovered from the impacted area and removed for disposal off-site at an approved location. No brine water was released into sensitive areas or waterways.

Site Characterization

The release at Lava Tube occurred on state-owned land, N 32.439532, W 103.762430, approximately 25 miles east of Carlsbad, New Mexico. The legal description for the site is Unit B, Section 34, Township 21 South, Range 31 East, Eddy County, New Mexico. This location is within the Permian Basin in southeast New Mexico and has historically been used for oil and gas exploration and production, and rangeland. An aerial photograph and site schematic are included in Attachment 2 (Figure 1).

Since 2013, Lava Tube has been a plugged and abandoned well site. The former well pad has been reclaimed, and vegetation is successfully growing throughout the area where the pad had been located. The following sections specifically describe the area in which the Lava Tube plugged and abandoned well is located.

The surrounding landscape is associated with plains and alluvial fans typical of elevations between 3,100 and 4,200 feet above sea level. The climate is semi-arid, with average annual precipitation ranging between 10 and 14 inches. Litter and, to a lesser extent, bare ground make up a significant proportion of ground cover, while grasses compose the remainder. The dominant grass species are black grama, dropseeds and bluestems, with perennial and annual forb abundance relative to precipitation (United States Department of Agriculture, Natural Resources Conservation Service, 2020). Vegetation is currently established in the reclaimed area around the abandoned well.

The Geological Map of New Mexico indicates the surface geology at Lava Tube is comprised of Qep – eolian and piedmont deposits, that include eolian sands interlaid with piedmont-slope deposits (New Mexico Bureau of Geology and Mineral Resources, 2020). The Natural Resources Conservation Service Web Soil Survey characterizes the soil at the site Kermit-Berino fine sands, characterized by deep, fine sands. These types of soils tend to be excessively-drained with negligible runoff and low available moisture levels in the soil profile (United States Department of Agriculture, Natural Resources Conservation Service, 2020). There is low potential for karst geology to be present near Lava Tube (United States Department of the Interior, United States Geological Survey, 2020).

There is no surface water located at Lava Tube. The nearest significant watercourse, as defined in Subsection P of 19.15.17.7 NMAC, is an intermittent stream located approximately 3 miles northwest of Lava Tube (United States Fish and Wildlife Service, 2020). A small stock pond is located approximately 1.4 miles due east of the release site (United States Fish and Wildlife Service, 2020). At Lava Tube, there are no continuously flowing watercourses, lakebeds, sinkholes, playa lakes, or other critical water or community features nearby as outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC.

The nearest groundwater well to the site is a 2003 New Mexico Office of the State Engineer (NM OSE) exploratory well, located approximately 0.4 miles south-southwest of the site. This well has no groundwater shown and a well depth of 970 feet below ground surface (bgs; New Mexico Office of the State Engineer, New Mexico Water Rights Reporting System, 2020). Documentation pertaining to site characterization and depth to groundwater determination is included in Attachment 3.

Closure Criteria Determination

Using site characterization information, a closure criteria determination worksheet (Attachment 3) was completed to determine if the release was subject to any of the special case scenarios outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC.

Based on data included in the closure criteria determination worksheet, the release at Lava Tube is not subject to the requirements of Paragraph (4) of Subsection C of 19.15.29.12 NMAC. Because the wellpad has been reclaimed, the constituent concentration limits fall to the strictest remediation category per NM OCD restoration and reclamation requirements as outlined in 19.15.29.13 NMAC and shown in Table 1.

Table 1. Closure Criteria for Soils Impacted by a Release		
Depth to Groundwater	**Constituent**	**Limit**
< 50 feet	Chloride	600 mg/kg
	TPH[1] (GRO + DRO + MRO)	100 mg/kg
	BTEX[2]	50 mg/kg
	Benzene	10 mg/kg

[1]Total petroleum hydrocarbons (TPH) = gasoline range organics (GRO) + diesel range organics (DRO) + motor oil range organics (MRO)
[2]Benzene, toluene, ethylbenzene and xylenes (BTEX)

Remedial Actions

An initial site inspection, completed on August 20, 2020, sought to identify and map the boundaries of the brine water release by field screening soil samples using an electroconductivity (EC) meter. As the wellpad has been reclaimed and none of the infrastructure is currently present, the exact release location is indeterminable. An area 85 feet long by 80 feet wide around the plugged and abandoned wellhead was selected as the potential release location and this area of approximately 6,294 square feet was evaluated for the presence of remaining contaminants. as shown on Figure 1 (Attachment 2).

Initial field screening activities indicated that no constituents of concern were present and no remediation was deemed necessary. The Daily Field Report associated with the site visit is included in Attachment 4 and the initial characterization field screening data and laboratory results are summarized in Table 2 (Attachment 5). Laboratory data reports and chain of custody forms are included in Attachment 6.

On September 16, 2020, Vertex provided 48-hour notification of confirmation sampling to the NM OCD, as required by Subparagraph (a) of Paragraph (1) of Subsection D 19.15.29.12 NMAC (Attachment 7). Confirmatory sampling was conducted on September 18, 2020, from the potential area of release, as identified during the initial site investigation. A total of 30 five-point composite confirmatory samples was collected from the potential release area at depths between 0 and 6 inches bgs. Each compost sample was representative of no more than 200 square feet per the alternate sampling method outlined in Subparagraph (c) of Paragraph (1) of Subsection D 19.15.29.12 NMAC, which does not require prior NM OCD approval. The confirmatory samples were placed into laboratory-provided containers, preserved on ice and submitted to a National Environmental Laboratory Accreditation Program-approved laboratory for chemical analysis.

Laboratory analyses included Method 300.0 for chlorides, Method 8021B for volatile organics, including BTEX, and EPA Method 8015 for TPH, including MRO, DRO and GRO. Confirmatory sampling analytical data are summarized in Table 3 (Attachment 5). Laboratory data reports and chain of custody forms are included in Attachment 6.

A GeoExplorer 7000 Series Trimble global positioning system (GPS) unit, or equivalent, was used to map the approximate center of each of the five-point composite samples. The confirmatory sampling locations are presented on Figure 2 (Attachment 2).

Closure Request

Vertex recommends no remediation action to address the release at Lava Tube. Laboratory analyses of the confirmatory samples showed constituent of concern concentration levels below NM OCD closure criteria for areas where depth to groundwater is less than 50 feet bgs. There are no anticipated risks to human, ecological or hydrological receptors associated with the release site.

Vertex requests that this incident (NJMW1308633738) be closed as all closure requirements set forth in Subsection E of 19.15.29.12 NMAC have been met. Devon certifies that all information in this report and the attachments is correct, and that they have complied with all applicable closure requirements and conditions specified in Division rules and directives to meet NM OCD requirements to obtain closure on the March 9, 2013, release at Lava Tube.

Should you have any questions or concerns, please do not hesitate to contact the undersigned at 505.506.0040 or ngordon@vertex.ca.

Sincerely,

Natalie Gordon
PROJECT MANAGER

Attachments

Attachment 1. NM OCD C-141 Initial Notification
Attachment 2. Figures
Attachment 3. Closure Criteria for Soils Impacted by a Release Research Determination Documentation
Attachment 4. Daily Field Report(s) with Photographs
Attachment 5. Characterization and Confirmatory Sampling Laboratory Results
Attachment 6. Laboratory Data Reports/Chain of Custody Forms
Attachment 7. Required 48-hr Notification of Confirmation Sampling to Regulatory Agencies

References

New Mexico Bureau of Geology and Mineral Resources. (2020). *Interactive Geologic Map.* Retrieved from http://geoinfo.nmt.edu

New Mexico Office of the State Engineer, New Mexico Water Rights Reporting System. (2020). *Water Column/Average Depth to Water Report.* Retrieved from http://nmwrrs.ose.state.nm.us/nmwrrs/waterColumn.html

New Mexico Oil Conservation Division. (2018). *New Mexico Administrative Code – Natural Resources and Wildlife Oil and Gas Releases*. Santa Fe, New Mexico.

United States Department of Agriculture, Natural Resources Conservation Service. (2020). *Web Soil Survey*. Retrieved from https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

United States Department of the Interior, United States Geological Survey. (2020). *Caves and Karst in the U.S. National Park Service*. Retrieved from https://www.arcgis.com/home/webmap/viewer.html?webmap=14675403c37948129acb758138f2dd1e

United States Fish and Wildlife Service. (2020). *National Wetlands Inventory*. Retrieved from https://www.fws.gov/wetlands/data/Mapper.html

Limitations

This report has been prepared for the sole benefit of Devon Energy Production Company (Devon). This document may not be used by any other person or entity, with the exception of the New Mexico Oil Conservation Division, without the express written consent of Vertex Resource Services Inc. (Vertex) and Devon. Any use of this report by a third party, or any reliance on decisions made based on it, or damages suffered as a result of the use of this report are the sole responsibility of the user.

The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted scientific practices current at the time the work was performed. The conclusions and recommendations presented represent the best judgement of Vertex based on the data collected during the assessment. Due to the nature of the assessment and the data available, Vertex cannot warrant against undiscovered environmental liabilities. Conclusions and recommendations presented in this report should not be considered legal advice.

ATTACHMENT 1

Amended

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

RECEIVED
MAR 13 2013
NMOCD ARTESIA

Form C-141
Revised October 10, 2003

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Release Notification and Corrective Action

nJMW1308633738

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company	Devon Energy Production Co LP 6137	Contact	Ralph Montoya
Address	PO Box 250, Artesia, NM 88211	Telephone No.	575-748-9935
Facility Name	Lava Tube 27 State #1	Facility Type	

Surface Owner State of New Mexico	Mineral Owner	~~Lease No.~~

*API: 30-015-40786

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
B	34	21S	31E	1015	NORTH	1655	EAST	EDDY

Latitude_____ **Longitude**_____

NATURE OF RELEASE

Type of Release BRINE WATER	Volume of Release 350 BBLS	Volume Recovered 320 BBLS
Source of Release 3 SIDED CUTTINGS TANK	Date and Hour of Occurrence 3/9/2013, 4:40 AM	Date and Hour of Discovery 3/9/2013, 4:40 AM
Was Immediate Notice Given? LEFT MESSAGE ON PHONE ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? RANDY DADE / OCD / ARTESIA, NM	
By Whom? GUY EMBRY, CONTRACT DRILLER	Date and Hour 3/9/2013, 9:30 AM	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

BERM GAVE AWAY ON 3-SIDED CUTTING TANK, SCRAPING AREA TO RECOVER LAST 30 BBLS.

Describe Area Affected and Cleanup Action Taken.*

1) 40' X 30', 2) 50' X 100', 3) 75' X 150', 4) 160' X 25'

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: Ralph Montoya 3-13-13

Printed Name: RALPH MONTOYA

Title: DRILLING SUPERINTENDENT

E-mail Address: Ralph.Montoya@dvn.com

Date: 3/13/2013 Phone: 575-748-9935

OIL CONSERVATION DIVISION

Approved by District Supervisor: Signed By Mike Bratcher

Approval Date: MAR 27 2013 Expiration Date:

Conditions of Approval:

Remediation per OCD Rule & Guidelines. **SUBMIT REMEDIATION PROPOSAL NO LATER THAN:** April 27, 2013

Attached ☐

2RP-1589

* Attach Additional Sheets If Necessary

State of New Mexico
Oil Conservation Division

Incident ID	NJMW1308633738
District RP	2RP- 1589
Facility ID	
Application ID	

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	282 (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☒ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☒ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ☒ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☒ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☒ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☒ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☐ Yes ☒ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☒ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☐ Yes ☒ No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: ***Each of the following items must be included in the report.***

- ☒ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ☒ Field data
- ☒ Data table of soil contaminant concentration data
- ☒ Depth to water determination
- ☒ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- ☒ NA Boring or excavation logs
- ☒ Photographs including date and GIS information
- ☒ Topographic/Aerial maps
- ☒ Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

Form C-141
Page 4

State of New Mexico
Oil Conservation Division

Incident ID	NJMW1308633738
District RP	2RP- 1589
Facility ID	
Application ID	

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Tom Bynum Title: EHS Consultant

Signature: Tom Bynum Date: 11/21/2020

email: tom.bynum@dvn.com Telephone: 575-748-2663

OCD Only

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	NJMW1308633738
District RP	2RP- 1589
Facility ID	
Application ID	

Closure

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

Closure Report Attachment Checklist: ***Each of the following items must be included in the closure report.***

[X] A scaled site and sampling diagram as described in 19.15.29.11 NMAC

[X] Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)

[X] Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)

[X] Description of remediation activities

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: Tom Bynum Title: EHS Consultant

Signature: Tom Bynum Date: 11/21/2020

email: tom.bynum@dvn.com Telephone: 575-748-2663

OCD Only

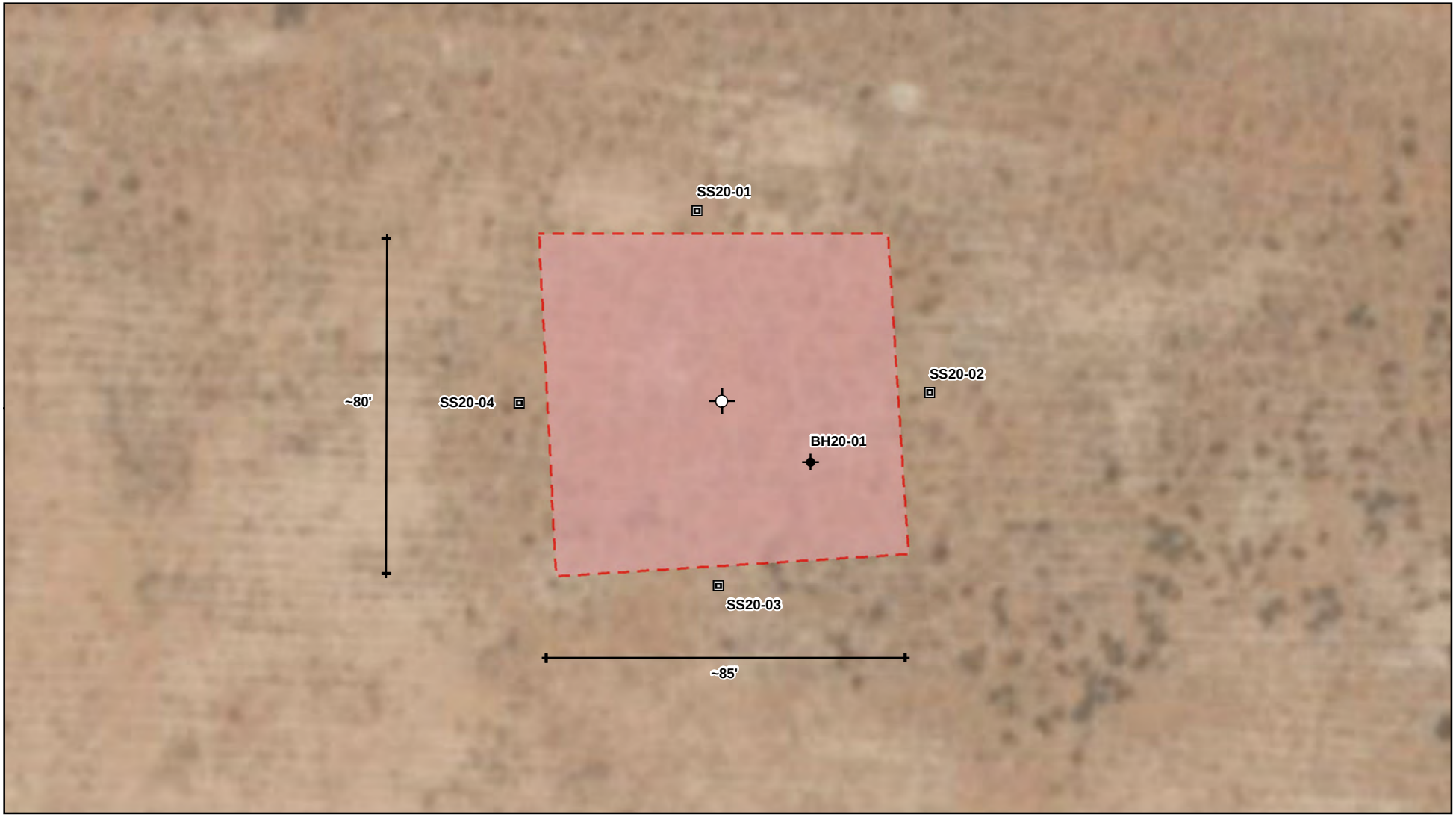
Received by: Date:

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by: Ashley Maxwell Date: 1/20/2023

Printed Name: Ashley Maxwell Title: Environmental Specialist

ATTACHMENT 2



Borehole
Surface Sample
Wellhead
Potential Release Extent (~ 6,294 sq. ft.)

VERTEX

0 12.5 25 Feet

Map Center:
Lat/Long: 32.439494, -103.762468

NAD 1983 UTM Zone 13N
Date: Aug 27/20

N

Initial Characterization and Site Schematic
Lava Tube 27 State #1H

FIGURE:
1

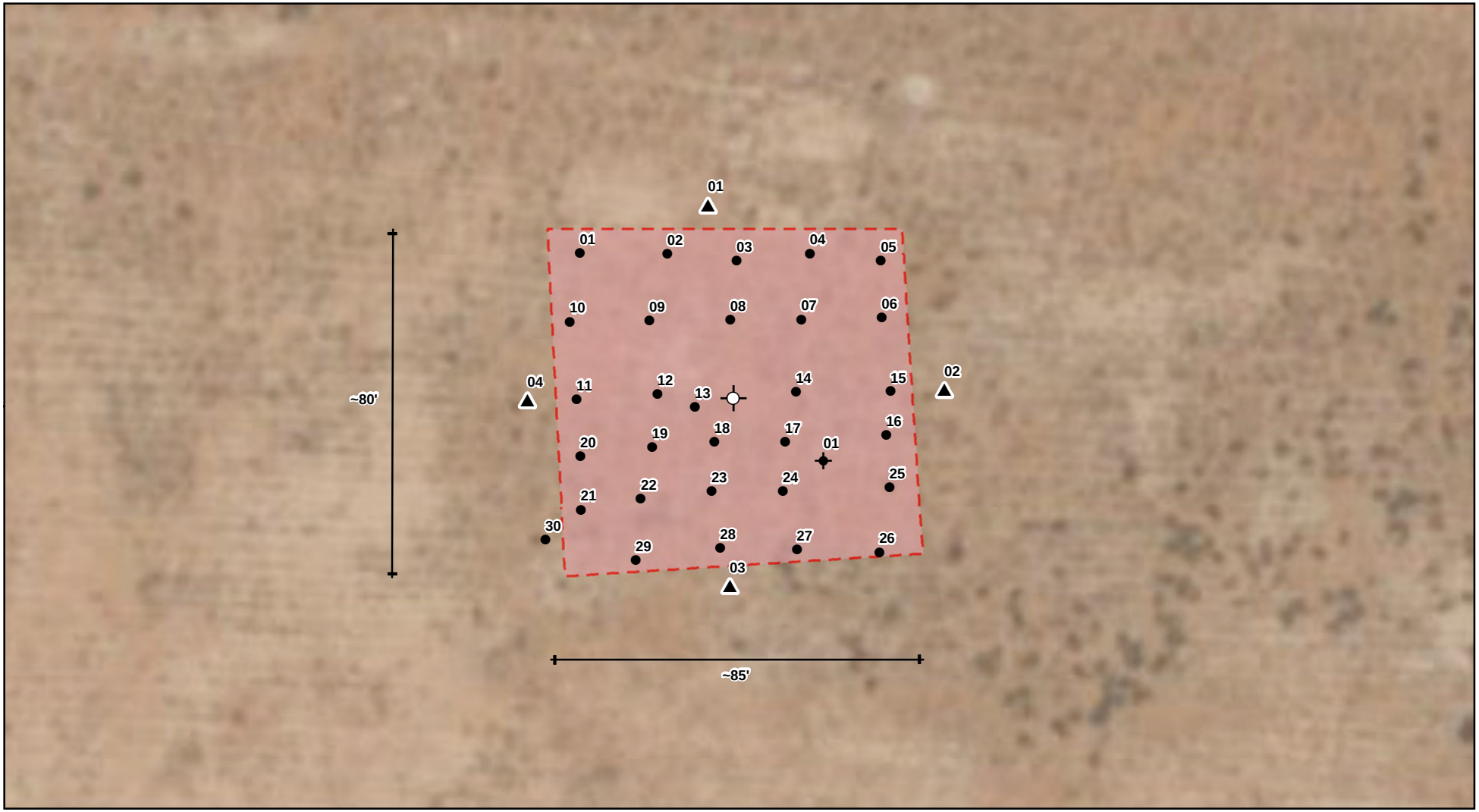
devon

Geospatial data presented in this figure may be derived from external sources and Vertex does not assume any liability for inaccuracies. This figure is intended for reference use only and is not certified for legal, survey, or engineering purposes.

Note: Imagery from Bing, 2019.

VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects_US PROJECTS\Devon Energy Corporation\20E-001411\056 - Lava Tube 27 State #1H\Figure 1 Initial Characterization (Lava Tube 27 State #1H).mxd



Borehole (Label prefixed BH20-)

Base Sample (Label prefixed BS20-)

Wall Sample (Label prefixed WS20-)

Well Center (Plugged and Abandoned)

Potential Release Extent (~ 6,294 sq. ft.)

VERTEX

0 12.5 25 Feet

Map Center:
Lat/Long: 32.439494, -103.762468

NAD 1983 UTM Zone 13N

Date: Oct 01/20

N

Confirmatory Sampling Schematic
Lava Tube 27 State #1H

FIGURE:
2

devon

Geospatial data presented in this figure may be derived from external sources and Vertex does not assume any liability for inaccuracies. This figure is intended for reference use only and is not certified for legal, survey, or engineering purposes.

Note: Imagery from Bing, 2019.

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Document Path: G:\1-Projects_US PROJECTS\Devon Energy Corporation\20E-001411\056 - Lava Tube 27 State #1H\Figure 2 Confirmatory Schematic (Lava Tube 27 State #1H).mxd

ATTACHMENT 3

Closure Criteria Worksheet			
Site Name: Lava Tube 27 State 1			
Spill Coordinates:		X: 32.439532	Y: -103.762430
Site Specific Conditions		Value	Unit
1	Depth to Groundwater	**970**	feet
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	15,840	feet
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	17,420	feet
4	Within 300 feet from an occupied residence, school, hospital, institution or church	N/A	feet
5	i) Within 500 feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, **or**	7,392	feet
	ii) Within 1000 feet of any fresh water well or spring	33,739	feet
6	Within incorporated municipal boundaries or within a defined municipal fresh water field covered under a municipal ordinance adopted pursuant to Section 3-27-3 NMSA 1978 as amended, unless the municipality specifically approves	No	(Y/N)
7	Within 300 feet of a wetland	7,392	feet
8	Within the area overlying a subsurface mine	No	(Y/N)
9	Within an unstable area (Karst Map)	Low	Critical High Medium Low
10	Within a 100-year Floodplain	NO	year
NMAC 19.15.29.12 E (Table 1) Closure Criteria		<50'	<50' 51-100' >100'

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
C 02949 EXPL	CUB	ED	1	1	4	34	21S	31E	616140	3589231*	625	970		
C 02727	CUB	ED	3	1	1	33	21S	31E	613716	3589809*	2615	913		
C 02744	CUB	ED	3	2	1	11	22S	31E	617374	3586631*	3361	4911		
C 03233 EXPLORE	CUB	ED	4	4	4	20	21S	31E	613489	3591816*	3469	566		
C 03112 EXPLORE	CUB	ED	3	1	1	09	22S	31E	613753	3586590*	4138	3567		
C 02745	CUB	ED	4	2	2	15	22S	31E	616789	3585013*	4835	925		
C 02746	CUB	ED	4	2	2	15	22S	31E	616789	3585013*	4835	930		
C 02747	CUB	ED	4	2	2	15	22S	31E	616789	3585013*	4835	1076		
C 03002	CUB	ED	4	2	4	06	22S	31E	611933	3587375*	5035	668		
C 02682	CUB	ED	4	4	4	08	22S	31E	613566	3585379*	5237	4400		
C 02953 EXPL	CUB	ED	1	3	1	16	21S	31E	613662	3594434*	5324		630	
C 04144 POD10	CUB	LE	2	4	4	12	22S	31E	620089	3585741	5550	67	0	67
C 04144 POD2	CUB	LE	3	1	3	07	22S	32E	620147	3585768	5569	60	55	5
C 04144 POD4	CUB	LE	3	1	3	07	22S	32E	620200	3585808	5577			
C 04144 POD1	CUB	LE	3	1	3	07	22S	32E	620240	3585844	5580	58	49	9
C 04144 POD3	CUB	LE	3	1	3	07	22S	32E	620240	3585842	5581			
C 04144 POD9	CUB	LE	1	3	3	07	22S	32E	620126	3585667	5630	63	0	63
C 03003	CUB	ED	3	1	3	31	21S	31E	610511	3588970*	5883	650		
C 03150	CUB	ED	2	4	4	14	22S	31E	618412	3584025*	6163	981		
C 02414	CUB	ED	3	1	3	16	22S	31E	613782	3584176*	6199	846		
C 02415	CUB	ED	3	3	4	16	22S	31E	614592	3583785*	6286	880	448	432
C 02748	CUB	ED	1	2	3	17	22S	31E	612576	3584364*	6628	3856		
C 02639	CUB	ED	4	4	4	17	22S	31E	613585	3583770*	6650	3928		
C 02684	CUB	ED	4	2	2	20	22S	31E	613590	3583368*	7016	1060		
C 02636	CUB	ED	1	1	2	18	21S	31E	611244	3594810*	7121	801		
C 02413	CUB	ED	1	2	1	20	22S	31E	612586	3583560*	7300	737		

***UTM location was derived from PLSS - see Help**

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Sub-basin Code	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
C 02755	CUB	ED	4	4	2	20	22S	31E	613595	3582966*	7386	1040		
C 02749	CUB	ED	1	1	1	18	22S	31E	610556	3585146*	7433	640		
C 02750	CUB	ED	1	1	1	18	22S	31E	610556	3585146*	7433	741		
C 02751	CUB	ED	1	1	1	18	22S	31E	610556	3585146*	7433	637		
C 03151	CUB	ED	4	1	4	07	21S	32E	621119	3595526*	7443	1352		
C 02683	CUB	ED	3	1	1	20	22S	31E	612184	3583356*	7685	840		
C 02754	CUB	ED	4	2	4	20	22S	31E	613599	3582564*	7759	1045		
C 02939	C	LE	3	3	1	19	22S	32E	620234	3583042*	7826	280		
C 02685	CUB	ED	2	2	2	28	22S	31E	615218	3581978*	7927	900		
C 02980	CUB	ED	2	4	4	20	22S	31E	613604	3582362*	7947	62		
C 02982	CUB	ED	2	4	4	20	22S	31E	613604	3582362*	7947	65		
C 02984	CUB	ED	2	4	4	20	22S	31E	613604	3582362*	7947	65		
C 02985	CUB	ED	2	4	4	20	22S	31E	613604	3582362*	7947	62		
C 02988	CUB	ED	2	4	4	20	22S	31E	613604	3582362*	7947	75		
C 02753	CUB	ED	1	4	4	20	22S	31E	613404	3582362*	8018	851		
C 02986	CUB	ED	1	4	4	20	22S	31E	613404	3582362*	8018	71		
C 02990	CUB	ED	1	4	4	20	22S	31E	613404	3582362*	8018	71		
C 02505	CUB	ED	4	4	4	20	22S	31E	613604	3582162*	8135	69	48	21
C 02506	CUB	ED	4	4	4	20	22S	31E	613604	3582162*	8135	69	48	21
C 02507	CUB	ED	4	4	4	20	22S	31E	613604	3582162*	8135	73	45	28
C 02752	CUB	ED	4	4	4	20	22S	31E	613604	3582162*	8135	2875		
C 02801	CUB	ED	4	4	4	20	22S	31E	613604	3582162*	8135	65		
C 02802	CUB	ED	4	4	4	20	22S	31E	613604	3582162*	8135	65		
C 02803	CUB	ED	4	4	4	20	22S	31E	613604	3582162*	8135	65		
C 02981	CUB	ED	4	4	4	20	22S	31E	613604	3582162*	8135	62		
C 02983	CUB	ED	4	4	4	20	22S	31E	613604	3582162*	8135	60		
C 02987	CUB	ED	4	4	4	20	22S	31E	613604	3582162*	8135	68		
C 02991	CUB	ED	4	4	4	20	22S	31E	613604	3582162*	8135	64		
C 03976 POD1	CUB	ED	1	3	4	20	22S	31E	612967	3582387	8164	180		

***UTM location was derived from PLSS - see Help**

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Sub-basin Code	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
C 03976 POD2	CUB	ED	1	3	4	20	22S	31E	612967	3582387	8164	70		
C 03976 POD3	CUB	ED	1	3	4	20	22S	31E	612967	3582387	8164	182		
C 03976 POD4	CUB	ED	1	3	4	20	22S	31E	612968	3582386	8164	71		
C 02989	CUB	ED	3	4	4	20	22S	31E	613404	3582162*	8204	54		
C 02662	CUB	ED	1	2	2	29	22S	31E	613409	3581960*	8391	856		
C 02765	CUB	ED	1	2	2	29	22S	31E	613409	3581960*	8391	856		
C 03717 POD1	C	LE	4	4	1	09	22S	32E	624094	3586365	8498	650		
C 03234 EXPLORE	CUB	ED	1	2	3	35	21S	30E	607695	3589207*	8658	410		
C 02737	C	ED	2	4	2	29	22S	31E	613604	3581567	8697	710		
C 02811	CUB	ED	2	4	2	29	22S	31E	613613	3581558*	8703	80		
C 02759	CUB	ED	1	2	1	29	22S	31E	612604	3581952*	8712	795		
C 02758	CUB	ED	3	2	1	29	22S	31E	612604	3581752*	8893	661		
C 02762	CUB	ED	3	2	1	29	22S	31E	612604	3581752*	8893	672		
C 02763	CUB	ED	3	2	1	29	22S	31E	612604	3581752*	8893	660		
C 02416	CUB	ED	3	2	4	28	22S	31E	615027	3580973*	8949	800	401	399
C 02420	CUB	ED	4	2	3	28	22S	31E	614423	3580964*	9065	779	450	329
C 02421	CUB	ED	4	2	3	28	22S	31E	614423	3580964*	9065	786	450	336
C 02422	CUB	ED	4	2	3	28	22S	31E	614423	3580964*	9065	785	450	335
C 02423	CUB	ED	4	2	3	28	22S	31E	614423	3580964*	9065	782	450	332
C 02424	CUB	ED	4	2	3	28	22S	31E	614423	3580964*	9065	786	450	336
C 02425	CUB	ED	4	2	3	28	22S	31E	614423	3580964*	9065	788	450	338
C 02426	CUB	ED	4	2	3	28	22S	31E	614423	3580964*	9065	785	450	335
C 02760	CUB	ED	2	2	4	29	22S	31E	613618	3581156*	9085	725		
C 02761	CUB	ED	2	2	4	29	22S	31E	613618	3581156*	9085	730		
C 02764	CUB	ED	2	2	4	29	22S	31E	613618	3581156*	9085	902		
C 02761 POD1	CUB	ED	2	2	4	29	22S	31E	613651	3581101	9127	725		
C 03138	CUB	ED	3	3	3	26	22S	31E	617043	3580591*	9262	750		
C 03207	CUB	ED	4	2	4	29	22S	31E	613618	3580956*	9276	150		
C 02757	CUB	ED	4	4	4	28	22S	31E	615232	3580571*	9320	4057		

***UTM location was derived from PLSS - see Help**

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Sub-basin Code	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
C 02756	CUB	ED	3	4	4	26	22S	31E	618250	3580606*	9418	1998		
C 03152	CUB	ED	3	4	4	26	22S	31E	618250	3580606*	9418	938		
C 03221 EXPLORE	CUB	ED	1	2	1	30	22S	31E	610995	3581935*	9526	651		
C 02418	CUB	ED	3	2	3	29	22S	31E	612613	3580948*	9625	617	413	204
C 02419	CUB	ED	3	2	3	29	22S	31E	612613	3580948*	9625	225		
C 02417	CUB	ED	4	4	4	29	22S	31E	613623	3580554*	9660	681		

Average Depth to Water: **293 feet**
Minimum Depth: **0 feet**
Maximum Depth: **630 feet**

Record Count: 90

UTMNAD83 Radius Search (in meters):

Easting (X): 616331.35 **Northing (Y):** 3589826.59 **Radius:** 10000

***UTM location was derived from PLSS - see Help**

New Mexico Office of the State Engineer

Active & Inactive Points of Diversion

(with Ownership Information)

(acre ft per annum) (R=POD has been replaced and no longer serves this file, C=the file is closed) (quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest) (NAD83 UTM in meters)

WR File Nbr	Sub basin	Use	Diversion	Owner	County	POD Number	Well Tag	Code	Grant	Source	q q q 6416 4	Sec	Tws	Rng	X	Y	Distance
C 02949	CUB	EXP	0	US DEPT OF ENERGY CARLSBAD FIELD OFFICE, WIPP	ED	C 02949 EXPL				Artesian	1 1 4	34	21S	31E	616140	3589231*	625
C 02727	CUB	MON	0	U.S. DEPT. OF ENERGY - WIPP	ED	C 02727				Shallow	3 1 1	33	21S	31E	613716	3589809*	2615
C 02744	CUB	MON	0	U.S. DEPT. OF ENERGY - WIPP	ED	C 02744					3 2 1	11	22S	31E	617374	3586631*	3361
C 03233	CUB	MON	0	U.S. DEPART OF ENERGY	ED	C 03233 EXPLORE				Artesian	4 4 4	20	21S	31E	613489	3591816*	3469
C 03112	CUB	MON	0	US DEPARTMENT OF ENERGY	ED	C 03112 POD2	NA				3 1 1	09	22S	31E	613734	3586676	4082
					ED	C 03112 EXPLORE				Artesian	3 1 1	09	22S	31E	613753	3586590*	4138
C 03635	CUB	MON	0	U S DEPARTMENT OF ENERGY	LE	C 03635 POD1					3 3 2	31	21S	32E	621059	3589565	4735
C 02745	CUB	MON	0	US DEPARTMENT OF ENERGY	ED	C 02745 POD2	NA				4 2 2	15	22S	31E	616805	3585021	4828
					ED	C 02745					4 2 2	15	22S	31E	616789	3585013*	4835
C 02746	CUB	MON	0	U.S. DEPT. OF ENERGY - WIPP	ED	C 02746					4 2 2	15	22S	31E	616789	3585013*	4835
C 02747	CUB	MON	0	U.S. DEPT. OF ENERGY - WIPP	ED	C 02747					4 2 2	15	22S	31E	616789	3585013*	4835

Record Count: 11

UTMNAD83 Radius Search (in meters):

Easting (X): 616331.35 **Northing (Y):** 3589826.59 **Radius:** 5000

Sorted by: Distance

***UTM location was derived from PLSS - see Help**

New Mexico Office of the State Engineer

Wells with Well Log Information

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest)

(NAD83 UTM in meters)

(in feet)

POD Number	POD Sub-basin Code	County	Source	q 6416	q 4	q 4	Sec	Tws	Rng	X	Y	Distance	Start Date	Finish Date	Log File Date	Depth Well	Depth Water	Driller	License Number
C 02949 EXPL	CUB	ED	Artesian	1	1	4	34	21S	31E	616140	3589231*	625	08/14/2003	09/11/2003	09/23/2003	970		RONNY KEITH	1184
C 02727	CUB	ED	Shallow	3	1	1	33	21S	31E	613716	3589809*	2615	08/27/2000	08/28/2000	01/19/2001	913		BENTLE, BILLY L	1292
C 03233 EXPLORE	CUB	ED	Artesian	4	4	4	20	21S	31E	613489	3591816*	3469	06/19/2006	06/30/2006	07/13/2006	566		KEITH, LARRY	1184

Record Count: 3

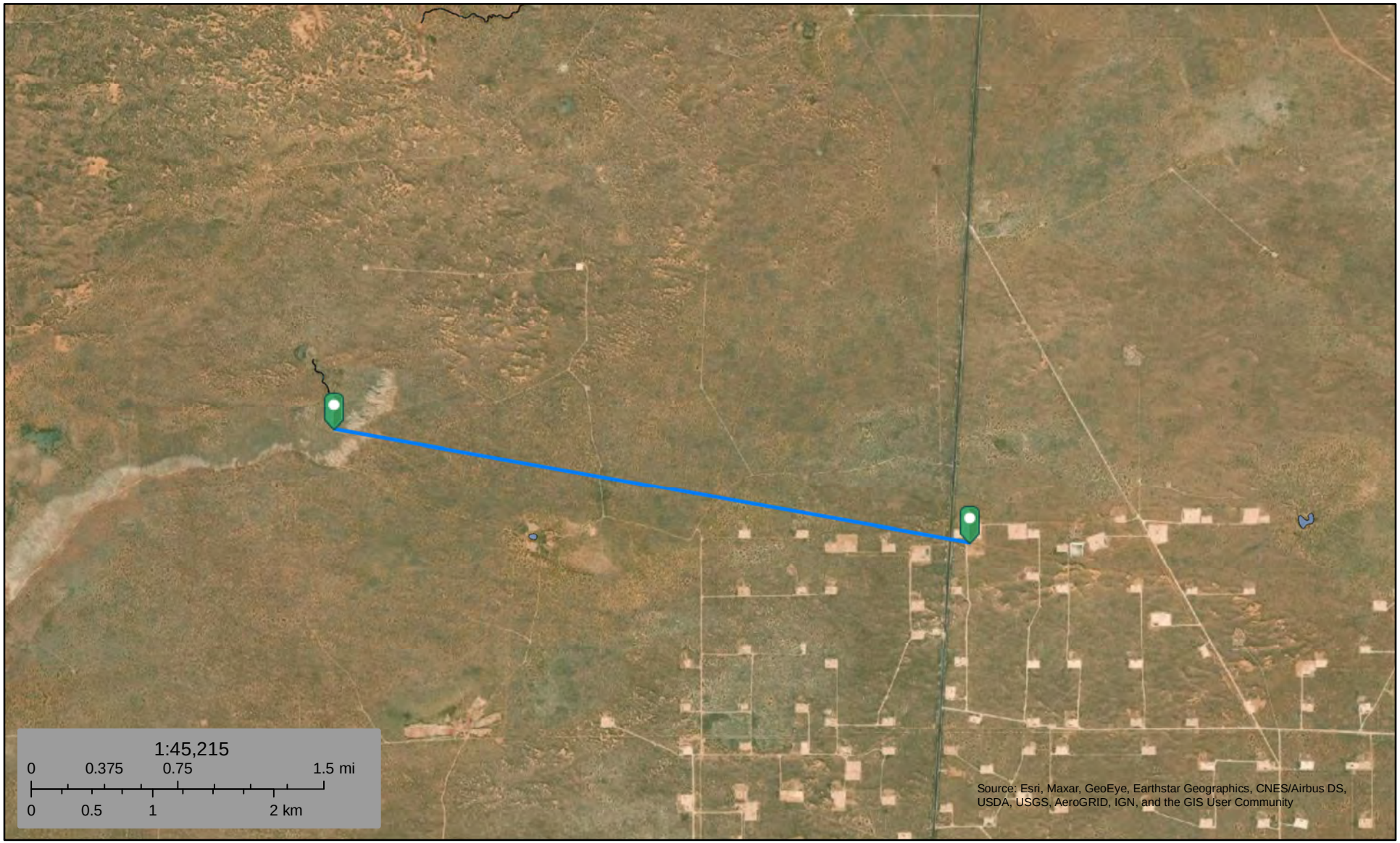
UTMNAD83 Radius Search (in meters):

Easting (X): 616331.35 **Northing (Y):** 3589826.59 **Radius:** 5000

***UTM location was derived from PLSS - see Help**

U.S. Fish and Wildlife Service
National Wetlands Inventory

Lava Tube: 14792 ft to Flowing Water



September 1, 2020

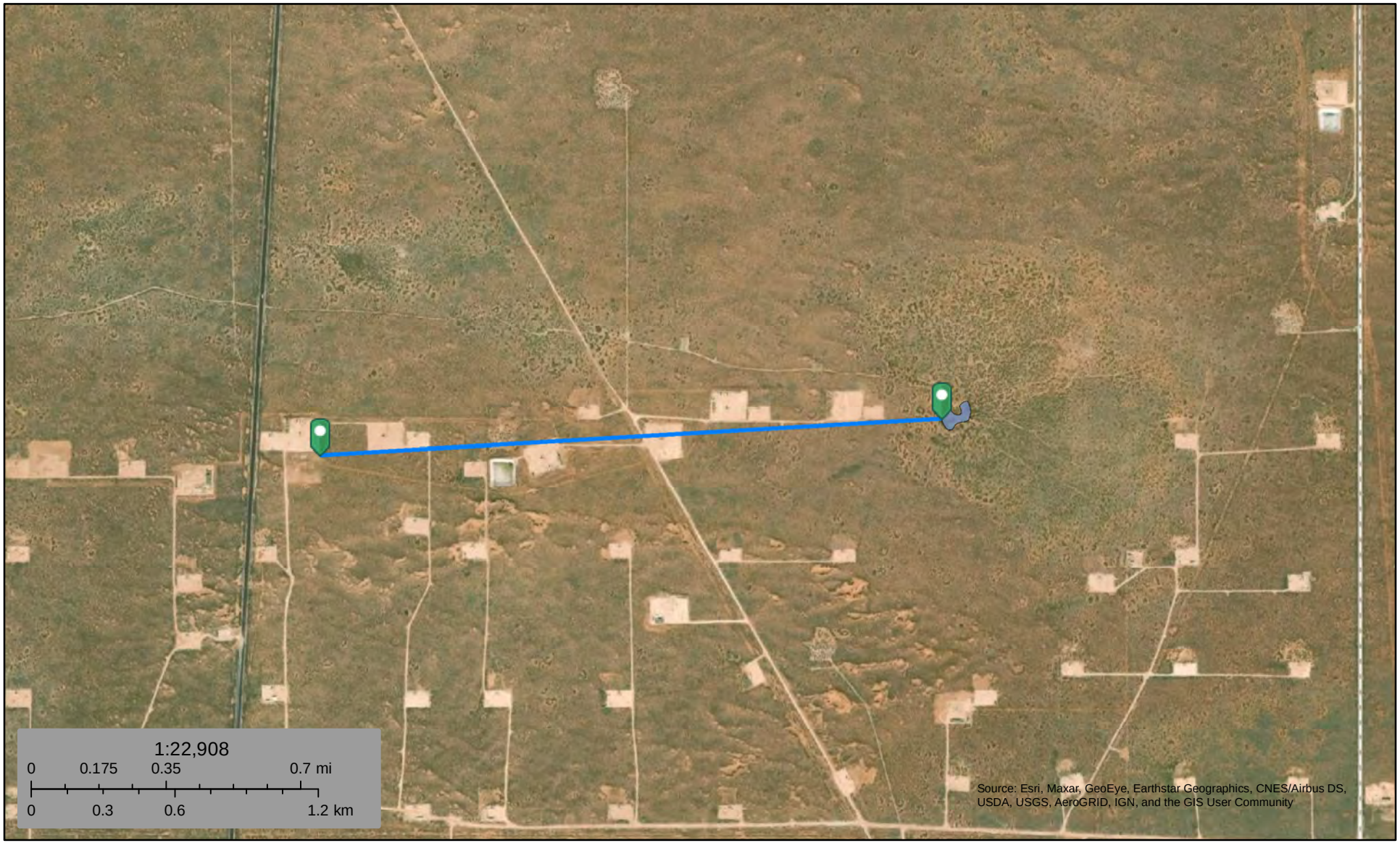
Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

U.S. Fish and Wildlife Service
National Wetlands Inventory

Lava Tube: 7215 ft to pond



September 1, 2020

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

U.S. Fish and Wildlife Service
National Wetlands Inventory

Lava Tube: 23849 ft to Wetland

September 1, 2020

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Flood Hazard Layer FIRMette

FEMA

103°46'4"W 32°26'37"N

103°45'26"W 32°26'7"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

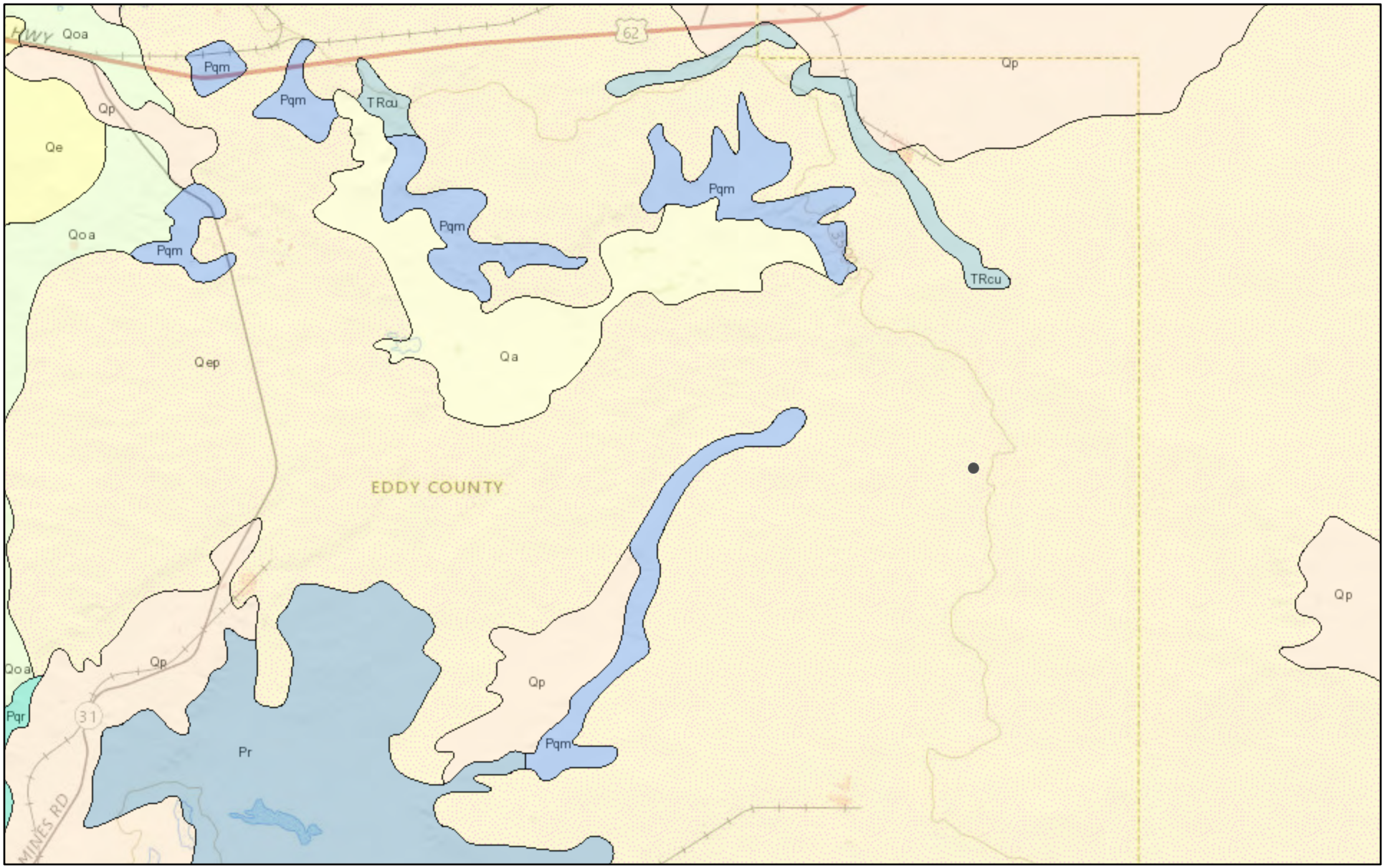
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/1/2020 at 2:37 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

ArcGIS Web Map



10/1/2020, 12:58:19 PM

1:144,448

0 1 2 4 mi

0 1.5 3 6 km

Lithologic Contacts

Contact, Exposed

Contact, Gradational

Nomenclature change

Map Boundary

Faults

Fault, Exposed

Fault, Intermittent

Fault, Concealed

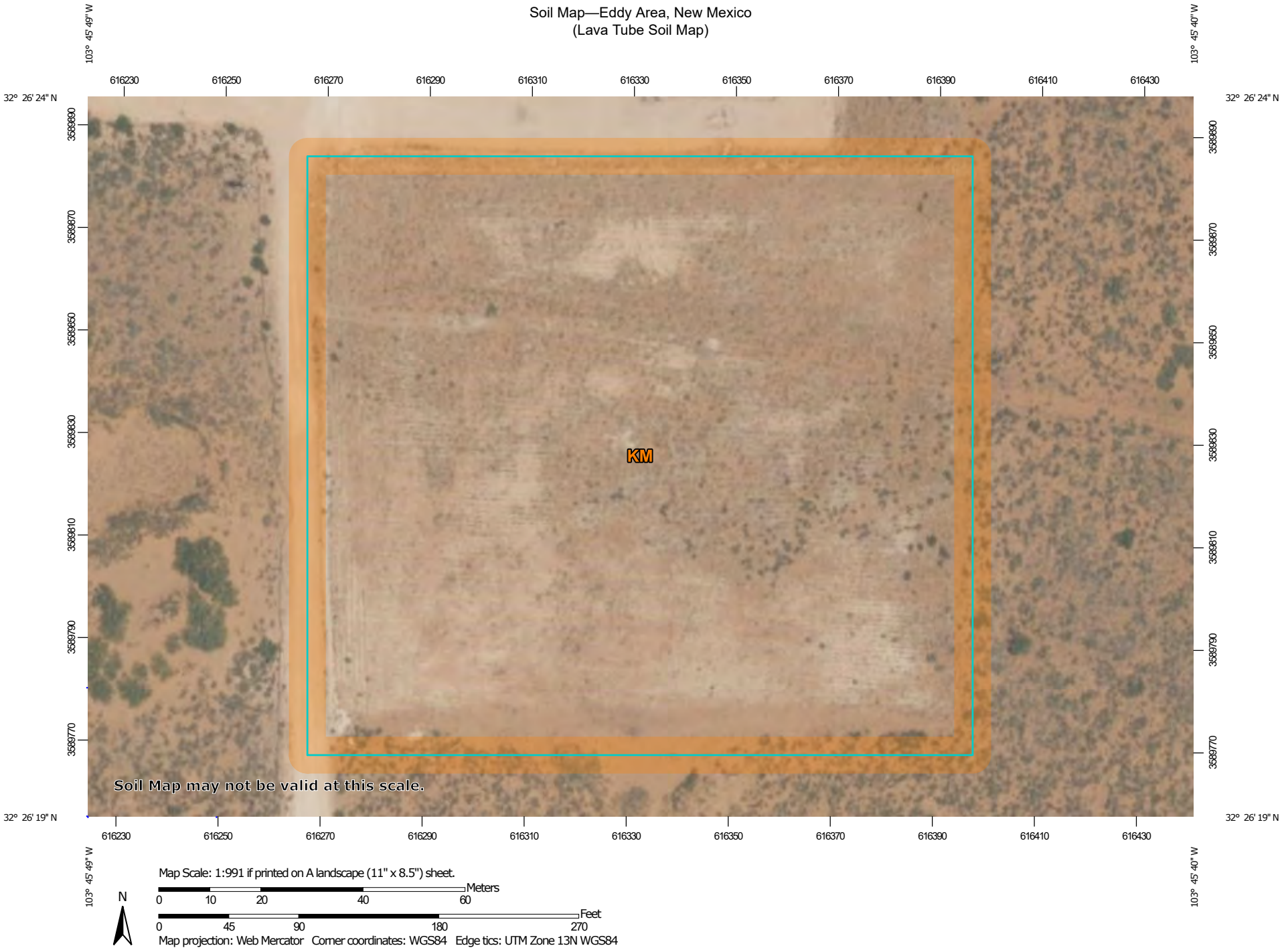
Shere Zone

NMBGMR, USGS The National Map: National Boundaries Dataset, 3DEP

Web AppBuilder for ArcGIS

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global

Soil Map—Eddy Area, New Mexico
(Lava Tube Soil Map)



Map Scale: 1:991 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 45 90 180 270

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

Soil Map—Eddy Area, New Mexico
(Lava Tube Soil Map)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 16, Jun 8, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 7, 2020—May 12, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
KM	Kermit-Berino fine sands, 0 to 3 percent slopes	3.8	100.0%
Totals for Area of Interest		**3.8**	**100.0%**

Eddy Area, New Mexico

KM—Kermit-Berino fine sands, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 1w4q
Elevation: 3,100 to 4,200 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 60 to 64 degrees F
Frost-free period: 190 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Kermit and similar soils: 50 percent
Berino and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kermit

Setting

Landform: Alluvial fans, plains
Landform position (three-dimensional): Rise, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Parent material: Mixed alluvium and/or eolian sands

Typical profile

H1 - 0 to 7 inches: fine sand
H2 - 7 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R042XC005NM - Deep Sand
Hydric soil rating: No

Description of Berino

Setting

Landform: Fan piedmonts, plains
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Mixed alluvium and/or eolian sands

Typical profile

H1 - 0 to 17 inches: fine sand
H2 - 17 to 50 inches: fine sandy loam
H3 - 50 to 58 inches: loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: R042XC003NM - Loamy Sand
Hydric soil rating: No

Minor Components

Active dune land

Percent of map unit: 15 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 16, Jun 8, 2020

ATTACHMENT 4

Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	8/20/2020
Site Location Name:	Lava Tube 27 State #1	Report Run Date:	8/21/2020 3:45 AM
Client Contact Name:	Amanda Davis	API #:	30-015-40786
Client Contact Phone #:	(575) 748-0176		
Unique Project ID	-Lava Tube 27 State #1	Project Owner:	Tom Bynum
Project Reference #	nJMW1308633738	Project Manager:	Natalie Gordon

Summary of Times

Arrived at Site	8/20/2020 12:39 PM
Departed Site	8/20/2020 2:47 PM

Field Notes

21:35 Characterization of historical spill (2018) by delineating the release vertically and horizontal to NMOCD standards: 600 ppm chloride, 100 ppm chloride.

21:36 The release area is now a reclaimed field and has been reseeded. No signs and evidence of release present in area. Samples were collected to ensure below OCD concentrations.

Next Steps & Recommendations

1 Submit characterization samples for laboratory analysis.

2 Prepare notice for confirmation sampling.

Daily Site Visit Report

Site Photos

Viewing Direction: South	**Viewing Direction**: North
	
Sample Area	Sample Area
Viewing Direction: East	**Viewing Direction**: West
	
Sample Area	Sample Area

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Kevin Smith

Signature: 
Signature

VERTEX

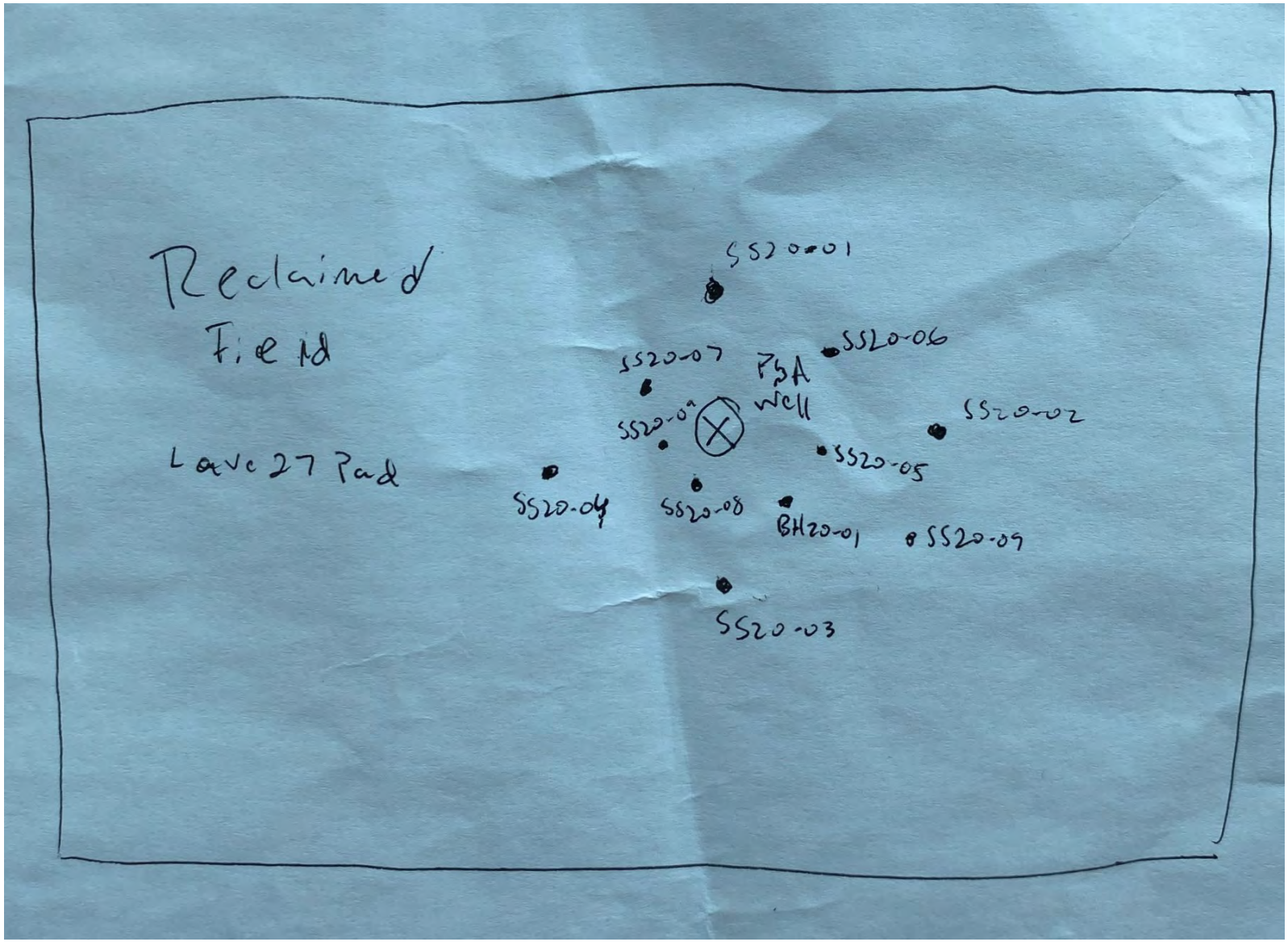
Spill Response and Sampling

Client:	Devon
Date:	8/20/2020
Site Name:	Lava Tube 27
Site Location:	Eddy, NM
Project Owner:	Natalie Gordon
Project Manager:	
Project #:	20E-00141 - 056

Initial Spill Information - Record on First Visit	
Spill Date:	
Spill Volume:	
Spill Cause:	
Spill Product:	
Recovered Spill Volume:	
Recovery Method:	

Sampling								
		Field Screening			Data Collection (Check for Yes)			
Sample ID	Depth (ft)	VOC (PID)	PetroFlag TPH (ppm)	Quantab (High/Low) + or -	Lab Analysis	Picture	Trimble Coordinates	Marked on Site Sketch
SS/TP/BH - Year - Number Ex. BH18-01	Ex. '2ft	Ex. 400 ppm	200 ppm	Ex. 'High +	Ex. Hydrocarbon Chloride			
Submitting SS20-01	0'	0	20	45				
SS20-02	0'	0	15	30				
SS20-03	0'	0		35				
SS20-04	0'	0		30				
BH20-01	0'	0		30				
BH20-01	1'	0		20				
other SS20-06				20				
SS20-07				25				
SS20-08				35				
SS20-09				25				
SS20-10				20				

VERSATILITY. EXPERTISE.



Natalie Gordon

From: Kevin Smith
Sent: Wednesday, September 16, 2020 11:11 AM
To: Natalie Gordon
Subject: RE: Lava Tube 27 State #001H
Attachments: InkedLava Tube_LI.jpg

Forgot to attach photo of the reclaimed field. The X is approximately the location of abandoned well.

From: Kevin Smith
Sent: September 16, 2020 11:01 AM
To: Natalie Gordon <ngordon@vertex.ca>
Subject: RE: Lava Tube 27 State #001H

Natalie,

The Lava Tube well was plugged and abandoned and had been reclaimed and reseeded for several years it looks like based on going back Google Earth imaging. The spill was caused when they were drilling the well so I chose the area around the plugged and abandoned post since that was most likely near the release area. All the soil in the field was found to be background and vegetation was growing well. I just chose approximately 40 x 40 area somewhat arbitrarily because there no telling how drilling equipment was set up and it's a huge field now. I'm assuming the well failed between now and 2013 and they decided to reclaim quickly so theres no way to track it down because they either cleaned it or covered it . I'll get the screens put up now. Hopefully that helps.

Thanks,
Kevin

From: Natalie Gordon <ngordon@vertex.ca>
Sent: September 16, 2020 9:06 AM
To: Kevin Smith <ksmith@vertex.ca>
Subject: Lava Tube 27 State #001H

Kevin,

You went out to this 2013 release to characterize it. Your DFR says that there is no evidence of a release and that the spill had been reclaimed/reseeded yet you show a characterization figure with a spill footprint. Your field screen numbers aren't in the file anywhere but I'm wondering how you came up with the clean edges of something that was already cleaned? Wouldn't you have been stepping your surface samples in further and further until you had sampled the area and shown that there was nothing? What made you pick those edges? And what were the surface numbers for the borehole and other surface areas within the release footprint to show that it had already been remediated?

I want to schedule confirmatory sampling, but based on the characterization figure and labs, it looks like you have delineated a release that needs to be remediated. Please upload any field screens that you have and let me know what were your actions that confirmed the area was already done.

Thank you,
Natalie

Natalie Gordon
Project Manager

Vertex Resource Group Ltd.
3101 Boyd Drive,
Carlsbad, NM 88220

P 575.725.5001 ext 709
C 505.506.0040
F

www.vertex.ca

ATTACHMENT 5

Client Name: Devon Energy Production Company
Site Name: Lava Tube 27 State 001
NM OCD Incident Tracking Number: NJMW1308633738
Project #: 20E-00141-056
Lab Reports: 2008C41

Table 2. Release Characterization Sampling - Depth to Groundwater < 50 ft

Sample Description			Field Screening			Petroleum Hydrocarbons							Inorganic
						Volatile		Extractable					
Sample ID	Depth (ft)	Sample Date	Volatile Organic Compounds (PID)	Extractable Organic Compounds (Petro Flag)	Inorganics (Electrical Conductivity)	Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride
			(ppm)	(ppm)	(ppm)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
SS20-01	0	August 20, 2020	0.0	20	45	<0.024	<0.213	<4.7	<9.2	<46	<13.9	<59.9	<60
SS20-02	0	August 20, 2020	0.0	15	30	<0.025	<0.221	<4.9	<9.6	<48	<14.5	<62.5	<60
SS20-03	0	August 20, 2020	0.0	-	35	<0.025	<0.222	<4.9	<9.3	<47	<14.2	<61.2	<60
SS20-04	0	August 20, 2020	0.0	-	30	<0.025	<0.225	<5.0	<9.6	<48	<14.6	<62.6	<60
BH20-01	1'	August 20, 2020	0.0	-	20	<0.023	<0.207	<4.6	<9.9	<49	<14.5	<63.5	<60

"-" - Not applicable/assessed

Bold and grey shaded indicates approaching, or exceedance outside of, NM OCD closure criteria

Client Name: Devon Energy Production Company
Site Name: Lava Tube 27 State 1H
NM OCD Incident Tracking Number: NJMW1308633738
Project #: 20E-00141-056
Lab Report: 2009B70

Table 3. Confirmatory Sampling Laboratory Results

Sample Description			Petroleum Hydrocarbons							Inorganic
			Volatile		Extractable					
Sample ID	Depth (ft)	Sample Date	Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
BS20-01	0-0.5	September 18, 2020	<0.024	<0.22	<4.9	<9.9	<50	<14.8	<64.8	<30
BS20-02	0-0.5	September 18, 2020	<0.024	<0.219	<4.9	<9.8	<49	<14.7	<63.7	<30
BS20-03	0-0.5	September 18, 2020	<0.024	<0.212	<4.7	<9.7	<48	<14.4	<62.4	<30
BS20-04	0-0.5	September 18, 2020	<0.025	<0.221	<4.9	<9.5	<48	<14.4	<62.4	<30
BS20-05	0-0.5	September 18, 2020	<0.024	<0.215	<4.8	<9.1	<46	<13.9	<59.9	<30
BS20-06	0-0.5	September 18, 2020	<0.024	<0.213	<4.7	<9.6	<48	<14.3	<62.3	<30
BS20-07	0-0.5	September 18, 2020	<0.023	<0.207	<4.6	<9.1	<46	<13.7	<59.7	<30
BS20-08	0-0.5	September 18, 2020	<0.024	<0.22	<4.9	<9.4	<47	<14.3	<61.3	64
BS20-09	0-0.5	September 18, 2020	<0.024	<0.216	<4.8	<9.9	<50	<14.7	<64.7	<30
BS20-10	0-0.5	September 18, 2020	<0.024	<0.216	<4.8	<9.7	<49	<14.5	<63.5	<30
BS20-11	0-0.5	September 18, 2020	<0.024	<0.217	<4.8	<9.6	<48	<14.4	<62.4	<30
BS20-12	0-0.5	September 18, 2020	<0.024	<0.217	<4.8	<9.5	<48	<14.3	<62.3	<30
BS20-13	0-0.5	September 18, 2020	<0.024	<0.213	<4.7	<9.7	<49	<14.4	<63.4	<30
BS20-14	0-0.5	September 18, 2020	<0.024	<0.216	<4.8	<9.3	<47	<14.1	<61.1	32
BS20-15	0-0.5	September 18, 2020	<0.023	<0.21	<4.7	<9.7	<48	<14.4	<62.4	<30
BS20-16	0-0.5	September 18, 2020	<0.024	<0.216	<4.8	<9.2	<46	<14	<60	<30
BS20-17	0-0.5	September 18, 2020	<0.024	<0.219	<4.9	<9.6	<48	<14.5	<62.5	<30
BS20-18	0-0.5	September 18, 2020	<0.024	<0.219	<4.9	<9.5	<47	<14.4	<61.4	<30
BS20-19	0-0.5	September 18, 2020	<0.023	<0.211	<4.7	<9.4	<47	<14.1	<61.1	<30
BS20-20	0-0.5	September 18, 2020	<0.024	<0.216	<4.8	<9.7	<49	<14.5	<63.5	<30
BS20-21	0-0.5	September 18, 2020	<0.024	<0.219	<4.9	<9.4	<47	<14.3	<61.3	<30
BS20-22	0-0.5	September 18, 2020	<0.024	<0.216	<4.8	<9.9	<50	<14.7	<64.7	<30
BS20-23	0-0.5	September 18, 2020	<0.024	<0.216	<4.8	<9.7	<48	<14.5	<62.5	<30
BS20-24	0-0.5	September 18, 2020	<0.025	<0.225	<5.0	<9.4	<47	<14.4	<61.4	<30
BS20-25	0-0.5	September 18, 2020	<0.024	<0.213	<4.7	<9.5	<47	<14.2	<61.2	<30
BS20-26	0-0.5	September 18, 2020	<0.024	<0.215	<4.8	<9.7	<48	<14.5	<62.5	<30
BS20-27	0-0.5	September 18, 2020	<0.024	<0.215	<4.8	<8.9	<45	<13.7	<58.7	<30
BS20-28	0-0.5	September 18, 2020	<0.023	<0.21	<4.7	<8.7	<43	<13.4	<56.4	<30
BS20-29	0-0.5	September 18, 2020	<0.024	<0.216	<4.8	<9.0	<45	<13.8	<58.8	<30
BS20-30	0-0.5	September 18, 2020	<0.025	<0.221	<4.9	<9.6	<48	<14.5	<62.5	<30

"-" - Not applicable/assessed

Bold and shaded indicates exceedance outside of applied action level

ATTACHMENT 6

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

August 31, 2020

Amanda Davis

Devon Energy
6488 Seven Rivers Highway
Artesia, NM 88210
TEL: (575) 748-0176
FAX:

RE: Lava Tube 27 State 001H OrderNo.: 2008C41

Dear Amanda Davis:

Hall Environmental Analysis Laboratory received 6 sample(s) on 8/22/2020 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2008C41**
Date Reported: **8/31/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 001H
Lab ID: 2008C41-001 **Matrix:** SOIL

Client Sample ID: SS20-01 0'
Collection Date: 8/20/2020 1:03:00 PM
Received Date: 8/22/2020 8:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	8/26/2020 7:10:51 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	8/26/2020 7:10:51 PM
Surr: DNOP	73.3	30.4-154		%Rec	1	8/26/2020 7:10:51 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	8/29/2020 4:51:16 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**
Benzene	ND	0.024		mg/Kg	1	8/26/2020 5:32:15 AM
Toluene	ND	0.047		mg/Kg	1	8/26/2020 5:32:15 AM
Ethylbenzene	ND	0.047		mg/Kg	1	8/26/2020 5:32:15 AM
Xylenes, Total	ND	0.095		mg/Kg	1	8/26/2020 5:32:15 AM
Surr: 1,2-Dichloroethane-d4	93.3	70-130		%Rec	1	8/26/2020 5:32:15 AM
Surr: 4-Bromofluorobenzene	96.7	70-130		%Rec	1	8/26/2020 5:32:15 AM
Surr: Dibromofluoromethane	90.8	70-130		%Rec	1	8/26/2020 5:32:15 AM
Surr: Toluene-d8	96.6	70-130		%Rec	1	8/26/2020 5:32:15 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	8/26/2020 5:32:15 AM
Surr: BFB	99.3	70-130		%Rec	1	8/26/2020 5:32:15 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2008C41**
Date Reported: **8/31/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 001H
Lab ID: 2008C41-002 **Matrix:** SOIL

Client Sample ID: SS20-02 0'
Collection Date: 8/20/2020 1:08:00 PM
Received Date: 8/22/2020 8:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	8/26/2020 7:20:53 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/26/2020 7:20:53 PM
Surr: DNOP	90.3	30.4-154		%Rec	1	8/26/2020 7:20:53 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	8/29/2020 5:28:30 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**
Benzene	ND	0.025		mg/Kg	1	8/25/2020 10:35:47 PM
Toluene	ND	0.049		mg/Kg	1	8/25/2020 10:35:47 PM
Ethylbenzene	ND	0.049		mg/Kg	1	8/25/2020 10:35:47 PM
Xylenes, Total	ND	0.098		mg/Kg	1	8/25/2020 10:35:47 PM
Surr: 1,2-Dichloroethane-d4	97.0	70-130		%Rec	1	8/25/2020 10:35:47 PM
Surr: 4-Bromofluorobenzene	97.0	70-130		%Rec	1	8/25/2020 10:35:47 PM
Surr: Dibromofluoromethane	107	70-130		%Rec	1	8/25/2020 10:35:47 PM
Surr: Toluene-d8	99.6	70-130		%Rec	1	8/25/2020 10:35:47 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/25/2020 10:35:47 PM
Surr: BFB	99.3	70-130		%Rec	1	8/25/2020 10:35:47 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2008C41**
Date Reported: **8/31/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 001H
Lab ID: 2008C41-003 **Matrix:** SOIL

Client Sample ID: SS20-03 0'
Collection Date: 8/20/2020 1:25:00 PM
Received Date: 8/22/2020 8:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	8/26/2020 7:30:56 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	8/26/2020 7:30:56 PM
Surr: DNOP	82.4	30.4-154		%Rec	1	8/26/2020 7:30:56 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	8/29/2020 5:40:54 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**
Benzene	ND	0.025		mg/Kg	1	8/26/2020 1:55:11 AM
Toluene	ND	0.049		mg/Kg	1	8/26/2020 1:55:11 AM
Ethylbenzene	ND	0.049		mg/Kg	1	8/26/2020 1:55:11 AM
Xylenes, Total	ND	0.099		mg/Kg	1	8/26/2020 1:55:11 AM
Surr: 1,2-Dichloroethane-d4	100	70-130		%Rec	1	8/26/2020 1:55:11 AM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	8/26/2020 1:55:11 AM
Surr: Dibromofluoromethane	109	70-130		%Rec	1	8/26/2020 1:55:11 AM
Surr: Toluene-d8	96.1	70-130		%Rec	1	8/26/2020 1:55:11 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/26/2020 1:55:11 AM
Surr: BFB	99.9	70-130		%Rec	1	8/26/2020 1:55:11 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2008C41**
Date Reported: **8/31/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 001H
Lab ID: 2008C41-004 **Matrix:** SOIL

Client Sample ID: SS20-04 0'
Collection Date: 8/20/2020 1:33:00 PM
Received Date: 8/22/2020 8:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	8/26/2020 7:40:59 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	8/26/2020 7:40:59 PM
Surr: DNOP	81.4	30.4-154		%Rec	1	8/26/2020 7:40:59 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	8/29/2020 5:53:18 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**
Benzene	ND	0.025		mg/Kg	1	8/26/2020 3:20:46 AM
Toluene	ND	0.050		mg/Kg	1	8/26/2020 3:20:46 AM
Ethylbenzene	ND	0.050		mg/Kg	1	8/26/2020 3:20:46 AM
Xylenes, Total	ND	0.10		mg/Kg	1	8/26/2020 3:20:46 AM
Surr: 1,2-Dichloroethane-d4	96.1	70-130		%Rec	1	8/26/2020 3:20:46 AM
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	8/26/2020 3:20:46 AM
Surr: Dibromofluoromethane	111	70-130		%Rec	1	8/26/2020 3:20:46 AM
Surr: Toluene-d8	99.3	70-130		%Rec	1	8/26/2020 3:20:46 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/26/2020 3:20:46 AM
Surr: BFB	104	70-130		%Rec	1	8/26/2020 3:20:46 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2008C41**
Date Reported: **8/31/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 001H
Lab ID: 2008C41-006 **Matrix:** SOIL

Client Sample ID: BH20-01 1'
Collection Date: 8/20/2020 1:51:00 PM
Received Date: 8/22/2020 8:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	8/26/2020 7:51:02 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	8/26/2020 7:51:02 PM
Surr: DNOP	71.5	30.4-154		%Rec	1	8/26/2020 7:51:02 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	8/29/2020 6:05:43 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**
Benzene	ND	0.023		mg/Kg	1	8/26/2020 3:49:20 AM
Toluene	ND	0.046		mg/Kg	1	8/26/2020 3:49:20 AM
Ethylbenzene	ND	0.046		mg/Kg	1	8/26/2020 3:49:20 AM
Xylenes, Total	ND	0.092		mg/Kg	1	8/26/2020 3:49:20 AM
Surr: 1,2-Dichloroethane-d4	96.2	70-130		%Rec	1	8/26/2020 3:49:20 AM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	8/26/2020 3:49:20 AM
Surr: Dibromofluoromethane	108	70-130		%Rec	1	8/26/2020 3:49:20 AM
Surr: Toluene-d8	99.1	70-130		%Rec	1	8/26/2020 3:49:20 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	8/26/2020 3:49:20 AM
Surr: BFB	103	70-130		%Rec	1	8/26/2020 3:49:20 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2008C41**
31-Aug-20

Client: Devon Energy
Project: Lava Tube 27 State 001H

Sample ID: **MB-54781**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **54781**	RunNo: **71481**							
Prep Date: **8/29/2020**	Analysis Date: **8/29/2020**	SeqNo: **2496084**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-54781**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **54781**	RunNo: **71481**							
Prep Date: **8/29/2020**	Analysis Date: **8/29/2020**	SeqNo: **2496085**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.8	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2008C41**

31-Aug-20

Client: Devon Energy

Project: Lava Tube 27 State 001H

Sample ID: **LCS-54670** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **LCSS** Batch ID: **54670** RunNo: **71390**

Prep Date: **8/25/2020** Analysis Date: **8/26/2020** SeqNo: **2492006** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	10	50.00	0	102	70	130			
Surr: DNOP	4.1		5.000		81.6	30.4	154			

Sample ID: **MB-54670** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **PBS** Batch ID: **54670** RunNo: **71390**

Prep Date: **8/25/2020** Analysis Date: **8/26/2020** SeqNo: **2492010** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.6		10.00		96.1	30.4	154			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2008C41**
31-Aug-20

Client: Devon Energy
Project: Lava Tube 27 State 001H

Sample ID: **lcs-54639** SampType: **LCS4** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **BatchQC** Batch ID: **54639** RunNo: **71349**
Prep Date: **8/24/2020** Analysis Date: **8/25/2020** SeqNo: **2490368** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.94	0.025	1.000	0	93.7	80	120			
Toluene	1.0	0.050	1.000	0	104	80	120			
Ethylbenzene	1.1	0.050	1.000	0	105	80	120			
Xylenes, Total	3.1	0.10	3.000	0	102	80	120			
Surr: 1,2-Dichloroethane-d4	0.46		0.5000		92.9	70	130			
Surr: 4-Bromofluorobenzene	0.47		0.5000		94.3	70	130			
Surr: Dibromofluoromethane	0.45		0.5000		90.6	70	130			
Surr: Toluene-d8	0.50		0.5000		100	70	130			

Sample ID: **mb-54639** SampType: **MBLK** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **PBS** Batch ID: **54639** RunNo: **71349**
Prep Date: **8/24/2020** Analysis Date: **8/25/2020** SeqNo: **2490369** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 1,2-Dichloroethane-d4	0.46		0.5000		91.8	70	130			
Surr: 4-Bromofluorobenzene	0.47		0.5000		93.7	70	130			
Surr: Dibromofluoromethane	0.47		0.5000		93.6	70	130			
Surr: Toluene-d8	0.48		0.5000		95.7	70	130			

Sample ID: **lcs-54644** SampType: **LCS4** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **BatchQC** Batch ID: **54644** RunNo: **71358**
Prep Date: **8/24/2020** Analysis Date: **8/25/2020** SeqNo: **2490933** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.93	0.025	1.000	0	92.9	80	120			
Toluene	0.96	0.050	1.000	0	95.6	80	120			
Ethylbenzene	0.99	0.050	1.000	0	98.8	80	120			
Xylenes, Total	3.1	0.10	3.000	0	102	80	120			
Surr: 1,2-Dichloroethane-d4	0.49		0.5000		97.4	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.5000		102	70	130			
Surr: Dibromofluoromethane	0.55		0.5000		110	70	130			
Surr: Toluene-d8	0.49		0.5000		97.0	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2008C41**
31-Aug-20

Client: Devon Energy
Project: Lava Tube 27 State 001H

Sample ID: **mb-54644** SampType: **MBLK** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **PBS** Batch ID: **54644** RunNo: **71358**
Prep Date: **8/24/2020** Analysis Date: **8/25/2020** SeqNo: **2490934** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 1,2-Dichloroethane-d4	0.52		0.5000		104	70	130			
Surr: 4-Bromofluorobenzene	0.49		0.5000		99.0	70	130			
Surr: Dibromofluoromethane	0.57		0.5000		115	70	130			
Surr: Toluene-d8	0.50		0.5000		100	70	130			

Sample ID: **2008c41-002ams** SampType: **MS4** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **SS20-02 0'** Batch ID: **54644** RunNo: **71358**
Prep Date: **8/24/2020** Analysis Date: **8/25/2020** SeqNo: **2490973** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	0.9970	0	102	71.1	115			
Toluene	1.1	0.050	0.9970	0	110	79.6	132			
Ethylbenzene	1.1	0.050	0.9970	0	112	83.8	134			
Xylenes, Total	3.5	0.10	2.991	0	117	82.4	132			
Surr: 1,2-Dichloroethane-d4	0.49		0.4985		98.5	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.4985		103	70	130			
Surr: Dibromofluoromethane	0.55		0.4985		111	70	130			
Surr: Toluene-d8	0.51		0.4985		102	70	130			

Sample ID: **2008c41-002amsd** SampType: **MSD4** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **SS20-02 0'** Batch ID: **54644** RunNo: **71358**
Prep Date: **8/24/2020** Analysis Date: **8/25/2020** SeqNo: **2490974** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.99	0.024	0.9690	0	102	71.1	115	2.69	20	
Toluene	1.0	0.048	0.9690	0	104	79.6	132	8.52	20	
Ethylbenzene	1.0	0.048	0.9690	0	104	83.8	134	10.6	20	
Xylenes, Total	3.2	0.097	2.907	0	112	82.4	132	7.74	20	
Surr: 1,2-Dichloroethane-d4	0.48		0.4845		98.3	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.49		0.4845		100	70	130	0	0	
Surr: Dibromofluoromethane	0.53		0.4845		110	70	130	0	0	
Surr: Toluene-d8	0.47		0.4845		96.2	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2008C41**
31-Aug-20

Client: Devon Energy
Project: Lava Tube 27 State 001H

Sample ID: **lcs-54639** SampType: **LCS** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **LCSS** Batch ID: **54639** RunNo: **71349**
Prep Date: **8/24/2020** Analysis Date: **8/25/2020** SeqNo: **2490400** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	5.0	25.00	0	80.4	70	130			
Surr: BFB	470		500.0		94.9	70	130			

Sample ID: **mb-54639** SampType: **MBLK** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **PBS** Batch ID: **54639** RunNo: **71349**
Prep Date: **8/24/2020** Analysis Date: **8/25/2020** SeqNo: **2490401** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	480		500.0		95.7	70	130			

Sample ID: **lcs-54644** SampType: **LCS** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **LCSS** Batch ID: **54644** RunNo: **71358**
Prep Date: **8/24/2020** Analysis Date: **8/25/2020** SeqNo: **2490993** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	86.3	70	130			
Surr: BFB	500		500.0		100	70	130			

Sample ID: **mb-54644** SampType: **MBLK** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **PBS** Batch ID: **54644** RunNo: **71358**
Prep Date: **8/24/2020** Analysis Date: **8/25/2020** SeqNo: **2490994** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	500		500.0		99.2	70	130			

Sample ID: **2008c41-003ams** SampType: **MS** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **SS20-03 0'** Batch ID: **54644** RunNo: **71358**
Prep Date: **8/24/2020** Analysis Date: **8/26/2020** SeqNo: **2491011** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	24.88	0	87.7	49.2	122			
Surr: BFB	490		497.5		99.3	70	130			

Sample ID: **2008c41-003amsd** SampType: **MSD** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **SS20-03 0'** Batch ID: **54644** RunNo: **71358**
Prep Date: **8/24/2020** Analysis Date: **8/26/2020** SeqNo: **2491012** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2008C41**
31-Aug-20

Client: Devon Energy
Project: Lava Tube 27 State 001H

Sample ID: **2008c41-003amsd** SampType: **MSD** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **SS20-03 0'** Batch ID: **54644** RunNo: **71358**
Prep Date: **8/24/2020** Analysis Date: **8/26/2020** SeqNo: **2491012** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	24.83	0	87.2	49.2	122	0.839	20	
Surr: BFB	500		496.5		101	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

Sample Log-In Check List

Client Name: Devon Energy Work Order Number: 2008C41 RcptNo: 1

Received By: **Juan Rojas** 8/22/2020 8:50:00 AM

Completed By: **Juan Rojas** 8/22/2020 9:20:45 AM

Reviewed By:

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. Received at least 1 vial with headspace <1/4" for AQ VOA?	Yes ☐	No ☐	NA ☑
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: SR 8/22/20

Special Handling (if applicable)

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

Person Notified:	Natalie	Date	
By Whom:	Desiree	Via:	☑ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:	Missing sample		
Client Instructions:	see attached email.		

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.4	Good				
2	0.3	Good				

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Client: Devon Energy

Mailing Address: on file

Phone #:

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time: 5 Day Turn
☒ Standard ☐ Rush

Project Name: Lava Tube 27 State #001H

Project #: 1910044701

Project Manager: Natalie Gordon

Sampler: Kevin Smith

On Ice: ☒ Yes ☐ No

# of Coolers: 2

Cooler Temp(including CF): 0.4-0=0.4 (°C) 0.3-0=0.3

HEAL No. 2008041

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type		BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
8/20/20	1:038	Soil	SS20-01 0'	4oz jar	ICE	-001	X	X					X			
"	1:08	"	SS20-02 0'	"	"	-002	"	"					"			
"	1:25	"	SS20-03 0'	"	"	-003	"	"					"			
"	1:33	"	SS20-04 0'	"	"	-004	"	"					"			
"	1:40	"	SS20-05 0'	"	"	-005	"	"					"			
"	1:51	"	BH20-01 1'	"	"	-006	"	"					"			

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
					8/21/20	1100
8/21/20	1900			courier	8/22/20	8:50

Remarks: Didnt recieve sample 005. DAD 81241
Send Report to Natalie Gordon
Bill Devon Energy

Desiree Dominguez

From: Natalie Gordon <ngordon@vertex.ca>
Sent: Monday, August 24, 2020 2:28 PM
To: Desiree Dominguez
Subject: RE: Apache 25 Fed 9 and Lava Tube 27 State 001H

Hi Desiree,

My apologies for the wonky dates. Please use 8/17 for the samples (the date that is on the COC).

You can just make a note on the COC that SS20-05 for Lava Tube was not received and I will be sure to address it in my final report.

Thank you for the heads up.
Natalie

From: Desiree Dominguez <dad@hallenvironmental.com>
Sent: Monday, August 24, 2020 10:50 AM
To: Natalie Gordon <ngordon@vertex.ca>
Subject: Apache 25 Fed 9 and Lava Tube 27 State 001H

Good morning Natalie,
So we received your samples for Apache 25 Fed 9 on Thursday 8/20 and the COC has a date of 8/17 and the jars have a date of 8/19. Let me know which we should stick with.

Also the project Lava Tube 27 State 001H was received Saturday; and we were missing sample 005 Which is SS20-05 0'

Look forward to hearing back when you have time.
Thank you,
Desiree Dominguez
Hall Environmental Analysis Lab

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

September 29, 2020

Natalie Gordon

Devon Energy
6488 Seven Rivers Highway
Artesia, NM 88210
TEL: (575) 748-0176
FAX:

RE: Lava Tube 27 State 1H OrderNo.: 2009B70

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 30 sample(s) on 9/19/2020 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-001 **Matrix:** SOIL

Client Sample ID: BS20-01 0-0.5'
Collection Date: 9/18/2020 11:10:00 AM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	30		mg/Kg	20	9/25/2020 10:22:24 PM	55453
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/24/2020 3:58:18 AM	55319
Surr: BFB	105	70-130		%Rec	1	9/24/2020 3:58:18 AM	55319
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	9/23/2020 12:13:33 AM	55325
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/23/2020 12:13:33 AM	55325
Surr: DNOP	72.5	30.4-154		%Rec	1	9/23/2020 12:13:33 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	0.024		mg/Kg	1	9/24/2020 3:58:18 AM	55319
Toluene	ND	0.049		mg/Kg	1	9/24/2020 3:58:18 AM	55319
Ethylbenzene	ND	0.049		mg/Kg	1	9/24/2020 3:58:18 AM	55319
Xylenes, Total	ND	0.098		mg/Kg	1	9/24/2020 3:58:18 AM	55319
Surr: 1,2-Dichloroethane-d4	89.8	70-130		%Rec	1	9/24/2020 3:58:18 AM	55319
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	9/24/2020 3:58:18 AM	55319
Surr: Dibromofluoromethane	102	70-130		%Rec	1	9/24/2020 3:58:18 AM	55319
Surr: Toluene-d8	95.2	70-130		%Rec	1	9/24/2020 3:58:18 AM	55319

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-002 **Matrix:** SOIL

Client Sample ID: BS20-02 0-0.5'
Collection Date: 9/18/2020 11:20:00 AM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	30		mg/Kg	20	9/25/2020 10:47:13 PM	55453
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/24/2020 4:26:44 AM	55319
Surr: BFB	103	70-130		%Rec	1	9/24/2020 4:26:44 AM	55319
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/23/2020 12:43:30 AM	55325
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/23/2020 12:43:30 AM	55325
Surr: DNOP	60.0	30.4-154		%Rec	1	9/23/2020 12:43:30 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	0.024		mg/Kg	1	9/24/2020 4:26:44 AM	55319
Toluene	ND	0.049		mg/Kg	1	9/24/2020 4:26:44 AM	55319
Ethylbenzene	ND	0.049		mg/Kg	1	9/24/2020 4:26:44 AM	55319
Xylenes, Total	ND	0.097		mg/Kg	1	9/24/2020 4:26:44 AM	55319
Surr: 1,2-Dichloroethane-d4	87.7	70-130		%Rec	1	9/24/2020 4:26:44 AM	55319
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	9/24/2020 4:26:44 AM	55319
Surr: Dibromofluoromethane	108	70-130		%Rec	1	9/24/2020 4:26:44 AM	55319
Surr: Toluene-d8	94.1	70-130		%Rec	1	9/24/2020 4:26:44 AM	55319

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-003 **Matrix:** SOIL

Client Sample ID: BS20-03 0-0.5'
Collection Date: 9/18/2020 11:30:00 AM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	30		mg/Kg	20	9/25/2020 11:12:01 PM	55453
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	9/24/2020 4:55:14 AM	55319
Surr: BFB	106	70-130		%Rec	1	9/24/2020 4:55:14 AM	55319
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/23/2020 12:53:26 AM	55325
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/23/2020 12:53:26 AM	55325
Surr: DNOP	57.6	30.4-154		%Rec	1	9/23/2020 12:53:26 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	0.024		mg/Kg	1	9/24/2020 4:55:14 AM	55319
Toluene	ND	0.047		mg/Kg	1	9/24/2020 4:55:14 AM	55319
Ethylbenzene	ND	0.047		mg/Kg	1	9/24/2020 4:55:14 AM	55319
Xylenes, Total	ND	0.094		mg/Kg	1	9/24/2020 4:55:14 AM	55319
Surr: 1,2-Dichloroethane-d4	89.0	70-130		%Rec	1	9/24/2020 4:55:14 AM	55319
Surr: 4-Bromofluorobenzene	99.3	70-130		%Rec	1	9/24/2020 4:55:14 AM	55319
Surr: Dibromofluoromethane	106	70-130		%Rec	1	9/24/2020 4:55:14 AM	55319
Surr: Toluene-d8	95.8	70-130		%Rec	1	9/24/2020 4:55:14 AM	55319

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-004 **Matrix:** SOIL

Client Sample ID: BS20-04 0-0.5'
Collection Date: 9/18/2020 11:40:00 AM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	30		mg/Kg	20	9/26/2020 12:01:41 AM	55453
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/24/2020 5:23:55 AM	55319
Surr: BFB	106	70-130		%Rec	1	9/24/2020 5:23:55 AM	55319
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/23/2020 1:03:27 AM	55325
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/23/2020 1:03:27 AM	55325
Surr: DNOP	68.5	30.4-154		%Rec	1	9/23/2020 1:03:27 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	0.025		mg/Kg	1	9/24/2020 5:23:55 AM	55319
Toluene	ND	0.049		mg/Kg	1	9/24/2020 5:23:55 AM	55319
Ethylbenzene	ND	0.049		mg/Kg	1	9/24/2020 5:23:55 AM	55319
Xylenes, Total	ND	0.098		mg/Kg	1	9/24/2020 5:23:55 AM	55319
Surr: 1,2-Dichloroethane-d4	85.9	70-130		%Rec	1	9/24/2020 5:23:55 AM	55319
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	9/24/2020 5:23:55 AM	55319
Surr: Dibromofluoromethane	105	70-130		%Rec	1	9/24/2020 5:23:55 AM	55319
Surr: Toluene-d8	101	70-130		%Rec	1	9/24/2020 5:23:55 AM	55319

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-005 **Matrix:** SOIL

Client Sample ID: BS20-05 0-0.5'
Collection Date: 9/18/2020 11:50:00 AM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	30		mg/Kg	20	9/26/2020 12:26:30 AM	55453
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/24/2020 5:52:43 AM	55319
Surr: BFB	106	70-130		%Rec	1	9/24/2020 5:52:43 AM	55319
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	9/23/2020 1:13:15 AM	55325
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/23/2020 1:13:15 AM	55325
Surr: DNOP	60.0	30.4-154		%Rec	1	9/23/2020 1:13:15 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	0.024		mg/Kg	1	9/24/2020 5:52:43 AM	55319
Toluene	ND	0.048		mg/Kg	1	9/24/2020 5:52:43 AM	55319
Ethylbenzene	ND	0.048		mg/Kg	1	9/24/2020 5:52:43 AM	55319
Xylenes, Total	ND	0.095		mg/Kg	1	9/24/2020 5:52:43 AM	55319
Surr: 1,2-Dichloroethane-d4	87.9	70-130		%Rec	1	9/24/2020 5:52:43 AM	55319
Surr: 4-Bromofluorobenzene	98.9	70-130		%Rec	1	9/24/2020 5:52:43 AM	55319
Surr: Dibromofluoromethane	109	70-130		%Rec	1	9/24/2020 5:52:43 AM	55319
Surr: Toluene-d8	98.5	70-130		%Rec	1	9/24/2020 5:52:43 AM	55319

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-006 **Matrix:** SOIL

Client Sample ID: BS20-06 0-0.5'
Collection Date: 9/18/2020 12:00:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	30		mg/Kg	20	9/26/2020 12:51:20 AM	55453
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	9/24/2020 6:21:10 AM	55319
Surr: BFB	103	70-130		%Rec	1	9/24/2020 6:21:10 AM	55319
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/23/2020 1:23:08 AM	55325
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/23/2020 1:23:08 AM	55325
Surr: DNOP	70.7	30.4-154		%Rec	1	9/23/2020 1:23:08 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	0.024		mg/Kg	1	9/24/2020 6:21:10 AM	55319
Toluene	ND	0.047		mg/Kg	1	9/24/2020 6:21:10 AM	55319
Ethylbenzene	ND	0.047		mg/Kg	1	9/24/2020 6:21:10 AM	55319
Xylenes, Total	ND	0.095		mg/Kg	1	9/24/2020 6:21:10 AM	55319
Surr: 1,2-Dichloroethane-d4	90.4	70-130		%Rec	1	9/24/2020 6:21:10 AM	55319
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	9/24/2020 6:21:10 AM	55319
Surr: Dibromofluoromethane	105	70-130		%Rec	1	9/24/2020 6:21:10 AM	55319
Surr: Toluene-d8	93.5	70-130		%Rec	1	9/24/2020 6:21:10 AM	55319

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-007 **Matrix:** SOIL

Client Sample ID: BS20-07 0-0.5'
Collection Date: 9/18/2020 12:10:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	30		mg/Kg	20	9/26/2020 1:16:09 AM	55453
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**	
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	9/24/2020 6:49:35 AM	55319
Surr: BFB	105	70-130		%Rec	1	9/24/2020 6:49:35 AM	55319
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	9/23/2020 1:32:55 AM	55325
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/23/2020 1:32:55 AM	55325
Surr: DNOP	79.6	30.4-154		%Rec	1	9/23/2020 1:32:55 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	0.023		mg/Kg	1	9/24/2020 6:49:35 AM	55319
Toluene	ND	0.046		mg/Kg	1	9/24/2020 6:49:35 AM	55319
Ethylbenzene	ND	0.046		mg/Kg	1	9/24/2020 6:49:35 AM	55319
Xylenes, Total	ND	0.092		mg/Kg	1	9/24/2020 6:49:35 AM	55319
Surr: 1,2-Dichloroethane-d4	87.7	70-130		%Rec	1	9/24/2020 6:49:35 AM	55319
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	9/24/2020 6:49:35 AM	55319
Surr: Dibromofluoromethane	106	70-130		%Rec	1	9/24/2020 6:49:35 AM	55319
Surr: Toluene-d8	97.4	70-130		%Rec	1	9/24/2020 6:49:35 AM	55319

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-008 **Matrix:** SOIL

Client Sample ID: BS20-08 0-0.5'
Collection Date: 9/18/2020 12:20:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	64	30		mg/Kg	20	9/26/2020 1:40:58 AM	55453
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/24/2020 7:18:08 AM	55319
Surr: BFB	104	70-130		%Rec	1	9/24/2020 7:18:08 AM	55319
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	9/23/2020 1:42:45 AM	55325
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/23/2020 1:42:45 AM	55325
Surr: DNOP	56.4	30.4-154		%Rec	1	9/23/2020 1:42:45 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	0.024		mg/Kg	1	9/24/2020 7:18:08 AM	55319
Toluene	ND	0.049		mg/Kg	1	9/24/2020 7:18:08 AM	55319
Ethylbenzene	ND	0.049		mg/Kg	1	9/24/2020 7:18:08 AM	55319
Xylenes, Total	ND	0.098		mg/Kg	1	9/24/2020 7:18:08 AM	55319
Surr: 1,2-Dichloroethane-d4	90.6	70-130		%Rec	1	9/24/2020 7:18:08 AM	55319
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	9/24/2020 7:18:08 AM	55319
Surr: Dibromofluoromethane	104	70-130		%Rec	1	9/24/2020 7:18:08 AM	55319
Surr: Toluene-d8	97.7	70-130		%Rec	1	9/24/2020 7:18:08 AM	55319

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-009 **Matrix:** SOIL

Client Sample ID: BS20-09 0-0.5'
Collection Date: 9/18/2020 12:30:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	30		mg/Kg	20	9/26/2020 2:30:35 AM	55453
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/24/2020 7:46:46 AM	55319
Surr: BFB	111	70-130		%Rec	1	9/24/2020 7:46:46 AM	55319
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	9/23/2020 1:52:39 AM	55325
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/23/2020 1:52:39 AM	55325
Surr: DNOP	54.7	30.4-154		%Rec	1	9/23/2020 1:52:39 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	0.024		mg/Kg	1	9/24/2020 7:46:46 AM	55319
Toluene	ND	0.048		mg/Kg	1	9/24/2020 7:46:46 AM	55319
Ethylbenzene	ND	0.048		mg/Kg	1	9/24/2020 7:46:46 AM	55319
Xylenes, Total	ND	0.096		mg/Kg	1	9/24/2020 7:46:46 AM	55319
Surr: 1,2-Dichloroethane-d4	90.8	70-130		%Rec	1	9/24/2020 7:46:46 AM	55319
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	9/24/2020 7:46:46 AM	55319
Surr: Dibromofluoromethane	103	70-130		%Rec	1	9/24/2020 7:46:46 AM	55319
Surr: Toluene-d8	103	70-130		%Rec	1	9/24/2020 7:46:46 AM	55319

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-010 **Matrix:** SOIL

Client Sample ID: BS20-10 0-0.5'
Collection Date: 9/18/2020 12:40:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	30		mg/Kg	20	9/26/2020 2:55:25 AM	55453
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **JMR**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/24/2020 8:15:24 AM	55319
Surr: BFB	103	70-130		%Rec	1	9/24/2020 8:15:24 AM	55319
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/23/2020 2:02:28 AM	55325
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/23/2020 2:02:28 AM	55325
Surr: DNOP	55.6	30.4-154		%Rec	1	9/23/2020 2:02:28 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	0.024		mg/Kg	1	9/24/2020 8:15:24 AM	55319
Toluene	ND	0.048		mg/Kg	1	9/24/2020 8:15:24 AM	55319
Ethylbenzene	ND	0.048		mg/Kg	1	9/24/2020 8:15:24 AM	55319
Xylenes, Total	ND	0.096		mg/Kg	1	9/24/2020 8:15:24 AM	55319
Surr: 1,2-Dichloroethane-d4	88.0	70-130		%Rec	1	9/24/2020 8:15:24 AM	55319
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	9/24/2020 8:15:24 AM	55319
Surr: Dibromofluoromethane	102	70-130		%Rec	1	9/24/2020 8:15:24 AM	55319
Surr: Toluene-d8	96.9	70-130		%Rec	1	9/24/2020 8:15:24 AM	55319

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-011 **Matrix:** SOIL

Client Sample ID: BS20-11 0-0.5'
Collection Date: 9/18/2020 12:45:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	30		mg/Kg	20	9/26/2020 3:20:14 AM	55453
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/24/2020 6:31:26 PM	55319
Surr: BFB	102	70-130		%Rec	1	9/24/2020 6:31:26 PM	55319
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/23/2020 2:12:23 AM	55325
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/23/2020 2:12:23 AM	55325
Surr: DNOP	84.7	30.4-154		%Rec	1	9/23/2020 2:12:23 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.024		mg/Kg	1	9/24/2020 6:31:26 PM	55319
Toluene	ND	0.048		mg/Kg	1	9/24/2020 6:31:26 PM	55319
Ethylbenzene	ND	0.048		mg/Kg	1	9/24/2020 6:31:26 PM	55319
Xylenes, Total	ND	0.097		mg/Kg	1	9/24/2020 6:31:26 PM	55319
Surr: 1,2-Dichloroethane-d4	86.1	70-130		%Rec	1	9/24/2020 6:31:26 PM	55319
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	9/24/2020 6:31:26 PM	55319
Surr: Dibromofluoromethane	104	70-130		%Rec	1	9/24/2020 6:31:26 PM	55319
Surr: Toluene-d8	92.4	70-130		%Rec	1	9/24/2020 6:31:26 PM	55319

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-012 **Matrix:** SOIL

Client Sample ID: BS20-12 0-0.5'
Collection Date: 9/18/2020 12:50:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	30		mg/Kg	20	9/26/2020 3:45:03 AM	55453
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/24/2020 6:59:59 PM	55319
Surr: BFB	105	70-130		%Rec	1	9/24/2020 6:59:59 PM	55319
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/23/2020 2:22:14 AM	55325
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/23/2020 2:22:14 AM	55325
Surr: DNOP	58.8	30.4-154		%Rec	1	9/23/2020 2:22:14 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.024		mg/Kg	1	9/24/2020 6:59:59 PM	55319
Toluene	ND	0.048		mg/Kg	1	9/24/2020 6:59:59 PM	55319
Ethylbenzene	ND	0.048		mg/Kg	1	9/24/2020 6:59:59 PM	55319
Xylenes, Total	ND	0.097		mg/Kg	1	9/24/2020 6:59:59 PM	55319
Surr: 1,2-Dichloroethane-d4	88.6	70-130		%Rec	1	9/24/2020 6:59:59 PM	55319
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	9/24/2020 6:59:59 PM	55319
Surr: Dibromofluoromethane	106	70-130		%Rec	1	9/24/2020 6:59:59 PM	55319
Surr: Toluene-d8	96.7	70-130		%Rec	1	9/24/2020 6:59:59 PM	55319

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-013 **Matrix:** SOIL

Client Sample ID: BS20-13 0-0.5'
Collection Date: 9/18/2020 12:55:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	30		mg/Kg	20	9/26/2020 4:09:52 AM	55453
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	9/24/2020 7:28:27 PM	55319
Surr: BFB	106	70-130		%Rec	1	9/24/2020 7:28:27 PM	55319
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/23/2020 2:32:10 AM	55325
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/23/2020 2:32:10 AM	55325
Surr: DNOP	55.1	30.4-154		%Rec	1	9/23/2020 2:32:10 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.024		mg/Kg	1	9/24/2020 7:28:27 PM	55319
Toluene	ND	0.047		mg/Kg	1	9/24/2020 7:28:27 PM	55319
Ethylbenzene	ND	0.047		mg/Kg	1	9/24/2020 7:28:27 PM	55319
Xylenes, Total	ND	0.095		mg/Kg	1	9/24/2020 7:28:27 PM	55319
Surr: 1,2-Dichloroethane-d4	87.3	70-130		%Rec	1	9/24/2020 7:28:27 PM	55319
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	9/24/2020 7:28:27 PM	55319
Surr: Dibromofluoromethane	106	70-130		%Rec	1	9/24/2020 7:28:27 PM	55319
Surr: Toluene-d8	96.8	70-130		%Rec	1	9/24/2020 7:28:27 PM	55319

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-014 **Matrix:** SOIL

Client Sample ID: BS20-14 0-0.5'
Collection Date: 9/18/2020 1:00:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	32	30		mg/Kg	20	9/26/2020 4:59:30 AM	55453
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/24/2020 7:56:56 PM	55319
Surr: BFB	104	70-130		%Rec	1	9/24/2020 7:56:56 PM	55319
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	9/23/2020 2:42:11 AM	55325
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/23/2020 2:42:11 AM	55325
Surr: DNOP	62.7	30.4-154		%Rec	1	9/23/2020 2:42:11 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.024		mg/Kg	1	9/24/2020 7:56:56 PM	55319
Toluene	ND	0.048		mg/Kg	1	9/24/2020 7:56:56 PM	55319
Ethylbenzene	ND	0.048		mg/Kg	1	9/24/2020 7:56:56 PM	55319
Xylenes, Total	ND	0.096		mg/Kg	1	9/24/2020 7:56:56 PM	55319
Surr: 1,2-Dichloroethane-d4	86.6	70-130		%Rec	1	9/24/2020 7:56:56 PM	55319
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	9/24/2020 7:56:56 PM	55319
Surr: Dibromofluoromethane	103	70-130		%Rec	1	9/24/2020 7:56:56 PM	55319
Surr: Toluene-d8	92.6	70-130		%Rec	1	9/24/2020 7:56:56 PM	55319

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-015 **Matrix:** SOIL

Client Sample ID: BS20-15 0-0.5'
Collection Date: 9/18/2020 1:05:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	30		mg/Kg	20	9/26/2020 5:24:19 AM	55453
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	9/24/2020 8:25:33 PM	55319
Surr: BFB	108	70-130		%Rec	1	9/24/2020 8:25:33 PM	55319
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/23/2020 2:52:05 AM	55325
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/23/2020 2:52:05 AM	55325
Surr: DNOP	61.1	30.4-154		%Rec	1	9/23/2020 2:52:05 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.023		mg/Kg	1	9/24/2020 8:25:33 PM	55319
Toluene	ND	0.047		mg/Kg	1	9/24/2020 8:25:33 PM	55319
Ethylbenzene	ND	0.047		mg/Kg	1	9/24/2020 8:25:33 PM	55319
Xylenes, Total	ND	0.093		mg/Kg	1	9/24/2020 8:25:33 PM	55319
Surr: 1,2-Dichloroethane-d4	85.0	70-130		%Rec	1	9/24/2020 8:25:33 PM	55319
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	9/24/2020 8:25:33 PM	55319
Surr: Dibromofluoromethane	102	70-130		%Rec	1	9/24/2020 8:25:33 PM	55319
Surr: Toluene-d8	98.7	70-130		%Rec	1	9/24/2020 8:25:33 PM	55319

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-016 **Matrix:** SOIL

Client Sample ID: BS20-16 0-0.5'
Collection Date: 9/18/2020 1:10:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**CAS**
Chloride	ND	30		mg/Kg	20	9/26/2020 1:20:08 PM	55462
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst:	**DJF**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/24/2020 8:54:00 PM	55319
Surr: BFB	104	70-130		%Rec	1	9/24/2020 8:54:00 PM	55319
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst:	**BRM**
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	9/23/2020 3:02:07 AM	55325
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/23/2020 3:02:07 AM	55325
Surr: DNOP	55.9	30.4-154		%Rec	1	9/23/2020 3:02:07 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst:	**DJF**
Benzene	ND	0.024		mg/Kg	1	9/24/2020 8:54:00 PM	55319
Toluene	ND	0.048		mg/Kg	1	9/24/2020 8:54:00 PM	55319
Ethylbenzene	ND	0.048		mg/Kg	1	9/24/2020 8:54:00 PM	55319
Xylenes, Total	ND	0.096		mg/Kg	1	9/24/2020 8:54:00 PM	55319
Surr: 1,2-Dichloroethane-d4	86.8	70-130		%Rec	1	9/24/2020 8:54:00 PM	55319
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	9/24/2020 8:54:00 PM	55319
Surr: Dibromofluoromethane	107	70-130		%Rec	1	9/24/2020 8:54:00 PM	55319
Surr: Toluene-d8	97.1	70-130		%Rec	1	9/24/2020 8:54:00 PM	55319

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-017 **Matrix:** SOIL

Client Sample ID: BS20-17 0-0.5'
Collection Date: 9/18/2020 1:15:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**CAS**
Chloride	ND	30		mg/Kg	20	9/26/2020 1:44:50 PM	55462
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst:	**DJF**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/24/2020 9:22:25 PM	55319
Surr: BFB	103	70-130		%Rec	1	9/24/2020 9:22:25 PM	55319
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst:	**BRM**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/23/2020 3:12:17 AM	55325
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/23/2020 3:12:17 AM	55325
Surr: DNOP	60.2	30.4-154		%Rec	1	9/23/2020 3:12:17 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst:	**DJF**
Benzene	ND	0.024		mg/Kg	1	9/24/2020 9:22:25 PM	55319
Toluene	ND	0.049		mg/Kg	1	9/24/2020 9:22:25 PM	55319
Ethylbenzene	ND	0.049		mg/Kg	1	9/24/2020 9:22:25 PM	55319
Xylenes, Total	ND	0.097		mg/Kg	1	9/24/2020 9:22:25 PM	55319
Surr: 1,2-Dichloroethane-d4	89.1	70-130		%Rec	1	9/24/2020 9:22:25 PM	55319
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	9/24/2020 9:22:25 PM	55319
Surr: Dibromofluoromethane	103	70-130		%Rec	1	9/24/2020 9:22:25 PM	55319
Surr: Toluene-d8	93.9	70-130		%Rec	1	9/24/2020 9:22:25 PM	55319

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-018 **Matrix:** SOIL

Client Sample ID: BS20-18 0-0.5'
Collection Date: 9/18/2020 1:20:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	ND	30		mg/Kg	20	9/26/2020 2:09:31 PM	55462
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/23/2020 6:10:12 PM	55324
Surr: BFB	92.7	70-130		%Rec	1	9/23/2020 6:10:12 PM	55324
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/22/2020 11:33:20 PM	55322
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/22/2020 11:33:20 PM	55322
Surr: DNOP	93.0	30.4-154		%Rec	1	9/22/2020 11:33:20 PM	55322
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	9/23/2020 6:10:12 PM	55324
Toluene	ND	0.049		mg/Kg	1	9/23/2020 6:10:12 PM	55324
Ethylbenzene	ND	0.049		mg/Kg	1	9/23/2020 6:10:12 PM	55324
Xylenes, Total	ND	0.097		mg/Kg	1	9/23/2020 6:10:12 PM	55324
Surr: 1,2-Dichloroethane-d4	93.3	70-130		%Rec	1	9/23/2020 6:10:12 PM	55324
Surr: 4-Bromofluorobenzene	95.5	70-130		%Rec	1	9/23/2020 6:10:12 PM	55324
Surr: Dibromofluoromethane	92.2	70-130		%Rec	1	9/23/2020 6:10:12 PM	55324
Surr: Toluene-d8	105	70-130		%Rec	1	9/23/2020 6:10:12 PM	55324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-019 **Matrix:** SOIL

Client Sample ID: BS20-19 0-0.5'
Collection Date: 9/18/2020 1:25:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**CAS**
Chloride	ND	30		mg/Kg	20	9/26/2020 2:58:53 PM	55462
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst:	**RAA**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	9/23/2020 7:38:53 PM	55324
Surr: BFB	95.6	70-130		%Rec	1	9/23/2020 7:38:53 PM	55324
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst:	**BRM**
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	9/23/2020 3:22:38 AM	55325
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/23/2020 3:22:38 AM	55325
Surr: DNOP	57.6	30.4-154		%Rec	1	9/23/2020 3:22:38 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst:	**RAA**
Benzene	ND	0.023		mg/Kg	1	9/23/2020 7:38:53 PM	55324
Toluene	ND	0.047		mg/Kg	1	9/23/2020 7:38:53 PM	55324
Ethylbenzene	ND	0.047		mg/Kg	1	9/23/2020 7:38:53 PM	55324
Xylenes, Total	ND	0.094		mg/Kg	1	9/23/2020 7:38:53 PM	55324
Surr: 1,2-Dichloroethane-d4	92.0	70-130		%Rec	1	9/23/2020 7:38:53 PM	55324
Surr: 4-Bromofluorobenzene	95.0	70-130		%Rec	1	9/23/2020 7:38:53 PM	55324
Surr: Dibromofluoromethane	90.8	70-130		%Rec	1	9/23/2020 7:38:53 PM	55324
Surr: Toluene-d8	105	70-130		%Rec	1	9/23/2020 7:38:53 PM	55324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-020 **Matrix:** SOIL

Client Sample ID: BS20-20 0-0.5'
Collection Date: 9/18/2020 1:30:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	ND	30		mg/Kg	20	9/26/2020 3:23:34 PM	55462
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/23/2020 9:07:31 PM	55324
Surr: BFB	94.3	70-130		%Rec	1	9/23/2020 9:07:31 PM	55324
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/23/2020 3:32:46 AM	55325
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/23/2020 3:32:46 AM	55325
Surr: DNOP	60.4	30.4-154		%Rec	1	9/23/2020 3:32:46 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	9/23/2020 9:07:31 PM	55324
Toluene	ND	0.048		mg/Kg	1	9/23/2020 9:07:31 PM	55324
Ethylbenzene	ND	0.048		mg/Kg	1	9/23/2020 9:07:31 PM	55324
Xylenes, Total	ND	0.096		mg/Kg	1	9/23/2020 9:07:31 PM	55324
Surr: 1,2-Dichloroethane-d4	91.8	70-130		%Rec	1	9/23/2020 9:07:31 PM	55324
Surr: 4-Bromofluorobenzene	97.8	70-130		%Rec	1	9/23/2020 9:07:31 PM	55324
Surr: Dibromofluoromethane	89.8	70-130		%Rec	1	9/23/2020 9:07:31 PM	55324
Surr: Toluene-d8	105	70-130		%Rec	1	9/23/2020 9:07:31 PM	55324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-021 **Matrix:** SOIL

Client Sample ID: BS20-21 0-0.5'
Collection Date: 9/18/2020 1:35:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	ND	30		mg/Kg	20	9/26/2020 3:48:16 PM	55462
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/23/2020 9:36:54 PM	55324
Surr: BFB	96.6	70-130		%Rec	1	9/23/2020 9:36:54 PM	55324
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	9/23/2020 3:42:53 AM	55325
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/23/2020 3:42:53 AM	55325
Surr: DNOP	57.0	30.4-154		%Rec	1	9/23/2020 3:42:53 AM	55325
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	9/23/2020 9:36:54 PM	55324
Toluene	ND	0.049		mg/Kg	1	9/23/2020 9:36:54 PM	55324
Ethylbenzene	ND	0.049		mg/Kg	1	9/23/2020 9:36:54 PM	55324
Xylenes, Total	ND	0.097		mg/Kg	1	9/23/2020 9:36:54 PM	55324
Surr: 1,2-Dichloroethane-d4	94.3	70-130		%Rec	1	9/23/2020 9:36:54 PM	55324
Surr: 4-Bromofluorobenzene	98.6	70-130		%Rec	1	9/23/2020 9:36:54 PM	55324
Surr: Dibromofluoromethane	91.5	70-130		%Rec	1	9/23/2020 9:36:54 PM	55324
Surr: Toluene-d8	108	70-130		%Rec	1	9/23/2020 9:36:54 PM	55324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-022 **Matrix:** SOIL

Client Sample ID: BS20-22 0-0.5'
Collection Date: 9/18/2020 1:40:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	ND	30		mg/Kg	20	9/26/2020 4:12:57 PM	55462
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/23/2020 10:06:24 PM	55324
Surr: BFB	98.0	70-130		%Rec	1	9/23/2020 10:06:24 PM	55324
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	9/22/2020 1:19:03 PM	55326
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/22/2020 1:19:03 PM	55326
Surr: DNOP	90.1	30.4-154		%Rec	1	9/22/2020 1:19:03 PM	55326
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	9/23/2020 10:06:24 PM	55324
Toluene	ND	0.048		mg/Kg	1	9/23/2020 10:06:24 PM	55324
Ethylbenzene	ND	0.048		mg/Kg	1	9/23/2020 10:06:24 PM	55324
Xylenes, Total	ND	0.096		mg/Kg	1	9/23/2020 10:06:24 PM	55324
Surr: 1,2-Dichloroethane-d4	95.6	70-130		%Rec	1	9/23/2020 10:06:24 PM	55324
Surr: 4-Bromofluorobenzene	98.8	70-130		%Rec	1	9/23/2020 10:06:24 PM	55324
Surr: Dibromofluoromethane	92.5	70-130		%Rec	1	9/23/2020 10:06:24 PM	55324
Surr: Toluene-d8	107	70-130		%Rec	1	9/23/2020 10:06:24 PM	55324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-023 **Matrix:** SOIL

Client Sample ID: BS20-23 0-0.5'
Collection Date: 9/18/2020 1:45:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	ND	30		mg/Kg	20	9/26/2020 4:37:38 PM	55462
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/23/2020 10:36:12 PM	55324
Surr: BFB	96.7	70-130		%Rec	1	9/23/2020 10:36:12 PM	55324
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/22/2020 2:30:21 PM	55326
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/22/2020 2:30:21 PM	55326
Surr: DNOP	87.7	30.4-154		%Rec	1	9/22/2020 2:30:21 PM	55326
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	9/23/2020 10:36:12 PM	55324
Toluene	ND	0.048		mg/Kg	1	9/23/2020 10:36:12 PM	55324
Ethylbenzene	ND	0.048		mg/Kg	1	9/23/2020 10:36:12 PM	55324
Xylenes, Total	ND	0.096		mg/Kg	1	9/23/2020 10:36:12 PM	55324
Surr: 1,2-Dichloroethane-d4	93.6	70-130		%Rec	1	9/23/2020 10:36:12 PM	55324
Surr: 4-Bromofluorobenzene	98.6	70-130		%Rec	1	9/23/2020 10:36:12 PM	55324
Surr: Dibromofluoromethane	91.7	70-130		%Rec	1	9/23/2020 10:36:12 PM	55324
Surr: Toluene-d8	107	70-130		%Rec	1	9/23/2020 10:36:12 PM	55324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-024 **Matrix:** SOIL

Client Sample ID: BS20-24 0-0.5'
Collection Date: 9/18/2020 1:50:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	ND	30		mg/Kg	20	9/26/2020 5:27:00 PM	55462
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/23/2020 11:06:12 PM	55324
Surr: BFB	95.0	70-130		%Rec	1	9/23/2020 11:06:12 PM	55324
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	9/22/2020 2:54:11 PM	55326
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/22/2020 2:54:11 PM	55326
Surr: DNOP	101	30.4-154		%Rec	1	9/22/2020 2:54:11 PM	55326
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	9/23/2020 11:06:12 PM	55324
Toluene	ND	0.050		mg/Kg	1	9/23/2020 11:06:12 PM	55324
Ethylbenzene	ND	0.050		mg/Kg	1	9/23/2020 11:06:12 PM	55324
Xylenes, Total	ND	0.10		mg/Kg	1	9/23/2020 11:06:12 PM	55324
Surr: 1,2-Dichloroethane-d4	90.7	70-130		%Rec	1	9/23/2020 11:06:12 PM	55324
Surr: 4-Bromofluorobenzene	98.0	70-130		%Rec	1	9/23/2020 11:06:12 PM	55324
Surr: Dibromofluoromethane	89.2	70-130		%Rec	1	9/23/2020 11:06:12 PM	55324
Surr: Toluene-d8	104	70-130		%Rec	1	9/23/2020 11:06:12 PM	55324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-025 **Matrix:** SOIL

Client Sample ID: BS20-25 0-0.5'
Collection Date: 9/18/2020 1:50:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	ND	30		mg/Kg	20	9/26/2020 5:51:41 PM	55462
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	9/23/2020 11:36:02 PM	55324
Surr: BFB	95.1	70-130		%Rec	1	9/23/2020 11:36:02 PM	55324
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/22/2020 3:18:01 PM	55326
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/22/2020 3:18:01 PM	55326
Surr: DNOP	91.8	30.4-154		%Rec	1	9/22/2020 3:18:01 PM	55326
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	9/23/2020 11:36:02 PM	55324
Toluene	ND	0.047		mg/Kg	1	9/23/2020 11:36:02 PM	55324
Ethylbenzene	ND	0.047		mg/Kg	1	9/23/2020 11:36:02 PM	55324
Xylenes, Total	ND	0.095		mg/Kg	1	9/23/2020 11:36:02 PM	55324
Surr: 1,2-Dichloroethane-d4	91.2	70-130		%Rec	1	9/23/2020 11:36:02 PM	55324
Surr: 4-Bromofluorobenzene	99.7	70-130		%Rec	1	9/23/2020 11:36:02 PM	55324
Surr: Dibromofluoromethane	90.2	70-130		%Rec	1	9/23/2020 11:36:02 PM	55324
Surr: Toluene-d8	104	70-130		%Rec	1	9/23/2020 11:36:02 PM	55324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-026 **Matrix:** SOIL

Client Sample ID: BS20-26 0-0.5'
Collection Date: 9/18/2020 1:55:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	ND	30		mg/Kg	20	9/26/2020 6:16:22 PM	55462
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/24/2020 12:05:32 AM	55324
Surr: BFB	95.0	70-130		%Rec	1	9/24/2020 12:05:32 AM	55324
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/22/2020 3:41:50 PM	55326
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/22/2020 3:41:50 PM	55326
Surr: DNOP	87.9	30.4-154		%Rec	1	9/22/2020 3:41:50 PM	55326
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	9/24/2020 12:05:32 AM	55324
Toluene	ND	0.048		mg/Kg	1	9/24/2020 12:05:32 AM	55324
Ethylbenzene	ND	0.048		mg/Kg	1	9/24/2020 12:05:32 AM	55324
Xylenes, Total	ND	0.095		mg/Kg	1	9/24/2020 12:05:32 AM	55324
Surr: 1,2-Dichloroethane-d4	94.8	70-130		%Rec	1	9/24/2020 12:05:32 AM	55324
Surr: 4-Bromofluorobenzene	95.9	70-130		%Rec	1	9/24/2020 12:05:32 AM	55324
Surr: Dibromofluoromethane	92.9	70-130		%Rec	1	9/24/2020 12:05:32 AM	55324
Surr: Toluene-d8	105	70-130		%Rec	1	9/24/2020 12:05:32 AM	55324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-027 **Matrix:** SOIL

Client Sample ID: BS20-27 0-0.5'
Collection Date: 9/18/2020 1:55:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	ND	30		mg/Kg	20	9/26/2020 6:41:02 PM	55462
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/24/2020 12:34:57 AM	55324
Surr: BFB	97.1	70-130		%Rec	1	9/24/2020 12:34:57 AM	55324
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	9/22/2020 4:05:32 PM	55326
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	9/22/2020 4:05:32 PM	55326
Surr: DNOP	84.2	30.4-154		%Rec	1	9/22/2020 4:05:32 PM	55326
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	9/24/2020 12:34:57 AM	55324
Toluene	ND	0.048		mg/Kg	1	9/24/2020 12:34:57 AM	55324
Ethylbenzene	ND	0.048		mg/Kg	1	9/24/2020 12:34:57 AM	55324
Xylenes, Total	ND	0.095		mg/Kg	1	9/24/2020 12:34:57 AM	55324
Surr: 1,2-Dichloroethane-d4	92.1	70-130		%Rec	1	9/24/2020 12:34:57 AM	55324
Surr: 4-Bromofluorobenzene	99.9	70-130		%Rec	1	9/24/2020 12:34:57 AM	55324
Surr: Dibromofluoromethane	90.9	70-130		%Rec	1	9/24/2020 12:34:57 AM	55324
Surr: Toluene-d8	105	70-130		%Rec	1	9/24/2020 12:34:57 AM	55324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-028 **Matrix:** SOIL

Client Sample ID: BS20-28 0-0.5'
Collection Date: 9/18/2020 2:00:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**CAS**
Chloride	ND	30		mg/Kg	20	9/26/2020 7:05:44 PM	55462
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst:	**RAA**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	9/24/2020 1:04:17 AM	55324
Surr: BFB	96.9	70-130		%Rec	1	9/24/2020 1:04:17 AM	55324
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst:	**BRM**
Diesel Range Organics (DRO)	ND	8.7		mg/Kg	1	9/22/2020 4:29:15 PM	55326
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	9/22/2020 4:29:15 PM	55326
Surr: DNOP	91.2	30.4-154		%Rec	1	9/22/2020 4:29:15 PM	55326
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst:	**RAA**
Benzene	ND	0.023		mg/Kg	1	9/24/2020 1:04:17 AM	55324
Toluene	ND	0.047		mg/Kg	1	9/24/2020 1:04:17 AM	55324
Ethylbenzene	ND	0.047		mg/Kg	1	9/24/2020 1:04:17 AM	55324
Xylenes, Total	ND	0.093		mg/Kg	1	9/24/2020 1:04:17 AM	55324
Surr: 1,2-Dichloroethane-d4	93.6	70-130		%Rec	1	9/24/2020 1:04:17 AM	55324
Surr: 4-Bromofluorobenzene	97.8	70-130		%Rec	1	9/24/2020 1:04:17 AM	55324
Surr: Dibromofluoromethane	90.7	70-130		%Rec	1	9/24/2020 1:04:17 AM	55324
Surr: Toluene-d8	105	70-130		%Rec	1	9/24/2020 1:04:17 AM	55324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-029 **Matrix:** SOIL

Client Sample ID: BS20-29 0-0.5'
Collection Date: 9/18/2020 2:00:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**CAS**
Chloride	ND	30		mg/Kg	20	9/26/2020 7:55:06 PM	55462
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst:	**RAA**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/24/2020 1:33:47 AM	55324
Surr: BFB	93.8	70-130		%Rec	1	9/24/2020 1:33:47 AM	55324
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst:	**BRM**
Diesel Range Organics (DRO)	ND	9.0		mg/Kg	1	9/22/2020 4:53:03 PM	55326
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	9/22/2020 4:53:03 PM	55326
Surr: DNOP	93.0	30.4-154		%Rec	1	9/22/2020 4:53:03 PM	55326
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst:	**RAA**
Benzene	ND	0.024		mg/Kg	1	9/24/2020 1:33:47 AM	55324
Toluene	ND	0.048		mg/Kg	1	9/24/2020 1:33:47 AM	55324
Ethylbenzene	ND	0.048		mg/Kg	1	9/24/2020 1:33:47 AM	55324
Xylenes, Total	ND	0.096		mg/Kg	1	9/24/2020 1:33:47 AM	55324
Surr: 1,2-Dichloroethane-d4	92.0	70-130		%Rec	1	9/24/2020 1:33:47 AM	55324
Surr: 4-Bromofluorobenzene	95.8	70-130		%Rec	1	9/24/2020 1:33:47 AM	55324
Surr: Dibromofluoromethane	88.4	70-130		%Rec	1	9/24/2020 1:33:47 AM	55324
Surr: Toluene-d8	106	70-130		%Rec	1	9/24/2020 1:33:47 AM	55324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **2009B70**
Date Reported: **9/29/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Lava Tube 27 State 1H
Lab ID: 2009B70-030 **Matrix:** SOIL

Client Sample ID: BS20-30 0-0.5'
Collection Date: 9/18/2020 2:00:00 PM
Received Date: 9/19/2020 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	ND	30		mg/Kg	20	9/26/2020 8:19:46 PM	55462
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/24/2020 2:03:35 AM	55324
Surr: BFB	94.9	70-130		%Rec	1	9/24/2020 2:03:35 AM	55324
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/22/2020 5:16:56 PM	55326
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/22/2020 5:16:56 PM	55326
Surr: DNOP	85.8	30.4-154		%Rec	1	9/22/2020 5:16:56 PM	55326
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	9/24/2020 2:03:35 AM	55324
Toluene	ND	0.049		mg/Kg	1	9/24/2020 2:03:35 AM	55324
Ethylbenzene	ND	0.049		mg/Kg	1	9/24/2020 2:03:35 AM	55324
Xylenes, Total	ND	0.098		mg/Kg	1	9/24/2020 2:03:35 AM	55324
Surr: 1,2-Dichloroethane-d4	93.9	70-130		%Rec	1	9/24/2020 2:03:35 AM	55324
Surr: 4-Bromofluorobenzene	97.6	70-130		%Rec	1	9/24/2020 2:03:35 AM	55324
Surr: Dibromofluoromethane	92.3	70-130		%Rec	1	9/24/2020 2:03:35 AM	55324
Surr: Toluene-d8	107	70-130		%Rec	1	9/24/2020 2:03:35 AM	55324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2009B70**
29-Sep-20

Client: Devon Energy
Project: Lava Tube 27 State 1H

Sample ID: **MB-55453** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **55453** RunNo: **72181**
Prep Date: **9/25/2020** Analysis Date: **9/25/2020** SeqNo: **2530640** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-55453** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **55453** RunNo: **72181**
Prep Date: **9/25/2020** Analysis Date: **9/25/2020** SeqNo: **2530641** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.9	90	110			

Sample ID: **2009B70-001AMS** SampType: **ms** TestCode: **EPA Method 300.0: Anions**
Client ID: **BS20-01 0-0.5'** Batch ID: **55453** RunNo: **72181**
Prep Date: **9/25/2020** Analysis Date: **9/25/2020** SeqNo: **2530652** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	19	7.5	15.00	0	127	47.2	156			

Sample ID: **2009B70-001AMSD** SampType: **msd** TestCode: **EPA Method 300.0: Anions**
Client ID: **BS20-01 0-0.5'** Batch ID: **55453** RunNo: **72181**
Prep Date: **9/25/2020** Analysis Date: **9/25/2020** SeqNo: **2530653** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	19	7.5	15.00	0	124	47.2	156	2.16	20	

Sample ID: **MB-55462** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **55462** RunNo: **72186**
Prep Date: **9/26/2020** Analysis Date: **9/26/2020** SeqNo: **2530828** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-55462** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **55462** RunNo: **72186**
Prep Date: **9/26/2020** Analysis Date: **9/26/2020** SeqNo: **2530829** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.4	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2009B70**
29-Sep-20

Client: Devon Energy
Project: Lava Tube 27 State 1H

Sample ID: **2009B70-016AMS** SampType: **ms** TestCode: **EPA Method 300.0: Anions**
Client ID: **BS20-16 0-0.5'** Batch ID: **55462** RunNo: **72186**
Prep Date: **9/26/2020** Analysis Date: **9/26/2020** SeqNo: **2530831** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	16	7.5	15.00	0	108	47.2	156			

Sample ID: **2009B70-016AMSD** SampType: **msd** TestCode: **EPA Method 300.0: Anions**
Client ID: **BS20-16 0-0.5'** Batch ID: **55462** RunNo: **72186**
Prep Date: **9/26/2020** Analysis Date: **9/26/2020** SeqNo: **2530832** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	16	7.5	15.00	0	108	47.2	156	0.223	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2009B70**
29-Sep-20

Client: Devon Energy
Project: Lava Tube 27 State 1H

Sample ID: **MB-55326** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **55326** RunNo: **72037**
Prep Date: **9/21/2020** Analysis Date: **9/22/2020** SeqNo: **2524305** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.1		10.00		91.3	30.4	154			

Sample ID: **LCS-55326** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **55326** RunNo: **72037**
Prep Date: **9/21/2020** Analysis Date: **9/22/2020** SeqNo: **2524307** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	47	10	50.00	0	94.1	70	130			
Surr: DNOP	4.8		5.000		96.3	30.4	154			

Sample ID: **2009B70-022AMS** SampType: **MS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BS20-22 0-0.5'** Batch ID: **55326** RunNo: **72037**
Prep Date: **9/21/2020** Analysis Date: **9/22/2020** SeqNo: **2524309** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	48	9.8	48.83	0	98.5	15	184			
Surr: DNOP	4.4		4.883		89.2	30.4	154			

Sample ID: **2009B70-022AMSD** SampType: **MSD** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BS20-22 0-0.5'** Batch ID: **55326** RunNo: **72037**
Prep Date: **9/21/2020** Analysis Date: **9/22/2020** SeqNo: **2524310** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	48	10	49.80	0	96.6	15	184	0.00964	23.9	
Surr: DNOP	4.4		4.980		87.8	30.4	154	0	0	

Sample ID: **2009B70-001AMS** SampType: **MS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BS20-01 0-0.5'** Batch ID: **55325** RunNo: **72063**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2524658** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	44	9.2	46.13	4.181	85.9	15	184			
Surr: DNOP	3.1		4.613		66.9	30.4	154			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2009B70**
29-Sep-20

Client: Devon Energy
Project: Lava Tube 27 State 1H

Sample ID: **2009B70-001AMSD** SampType: **MSD** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BS20-01 0-0.5'** Batch ID: **55325** RunNo: **72063**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2524659** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	9.7	48.69	4.181	86.8	15	184	5.83	23.9	
Surr: DNOP	2.8		4.869		57.8	30.4	154	0	0	

Sample ID: **LCS-55322** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **55322** RunNo: **72063**
Prep Date: **9/21/2020** Analysis Date: **9/22/2020** SeqNo: **2524684** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	10	50.00	0	91.8	70	130			
Surr: DNOP	4.0		5.000		80.5	30.4	154			

Sample ID: **LCS-55325** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **55325** RunNo: **72063**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2524685** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	48	10	50.00	0	95.4	70	130			
Surr: DNOP	4.6		5.000		92.7	30.4	154			

Sample ID: **MB-55322** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **55322** RunNo: **72063**
Prep Date: **9/21/2020** Analysis Date: **9/22/2020** SeqNo: **2524688** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.6		10.00		86.2	30.4	154			

Sample ID: **MB-55325** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **55325** RunNo: **72063**
Prep Date: **9/21/2020** Analysis Date: **9/22/2020** SeqNo: **2524689** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.1		10.00		90.9	30.4	154			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2009B70**
29-Sep-20

Client: Devon Energy
Project: Lava Tube 27 State 1H

Sample ID: **LCS-55398** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **55398** RunNo: **72109**
Prep Date: **9/23/2020** Analysis Date: **9/24/2020** SeqNo: **2527717** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	5.3		5.000		106	30.4	154			

Sample ID: **MB-55398** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **55398** RunNo: **72109**
Prep Date: **9/23/2020** Analysis Date: **9/24/2020** SeqNo: **2527718** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	11		10.00		111	30.4	154			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2009B70**
29-Sep-20

Client: Devon Energy
Project: Lava Tube 27 State 1H

Sample ID: **2009B70-019AMS** SampType: **MS4** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **BS20-19 0-0.5'** Batch ID: **55324** RunNo: **72112**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2527299** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.82	0.024	0.9794	0	83.2	71.1	115			
Toluene	1.0	0.049	0.9794	0	106	79.6	132			
Ethylbenzene	1.0	0.049	0.9794	0	105	83.8	134			
Xylenes, Total	3.1	0.098	2.938	0	104	82.4	132			
Surr: 1,2-Dichloroethane-d4	0.46		0.4897		94.0	70	130			
Surr: 4-Bromofluorobenzene	0.47		0.4897		96.4	70	130			
Surr: Dibromofluoromethane	0.45		0.4897		92.6	70	130			
Surr: Toluene-d8	0.52		0.4897		106	70	130			

Sample ID: **2009B70-019AMSD** SampType: **MSD4** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **BS20-19 0-0.5'** Batch ID: **55324** RunNo: **72112**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2527300** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.81	0.025	0.9833	0	82.8	71.1	115	0.106	20	
Toluene	1.0	0.049	0.9833	0	103	79.6	132	2.00	20	
Ethylbenzene	1.0	0.049	0.9833	0	103	83.8	134	1.29	20	
Xylenes, Total	3.0	0.098	2.950	0	102	82.4	132	1.68	20	
Surr: 1,2-Dichloroethane-d4	0.45		0.4916		91.9	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.48		0.4916		97.2	70	130	0	0	
Surr: Dibromofluoromethane	0.45		0.4916		92.1	70	130	0	0	
Surr: Toluene-d8	0.52		0.4916		105	70	130	0	0	

Sample ID: **lcs-55324** SampType: **LCS4** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **BatchQC** Batch ID: **55324** RunNo: **72112**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2527316** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.83	0.025	1.000	0	82.7	80	120			
Toluene	1.1	0.050	1.000	0	107	80	120			
Ethylbenzene	1.1	0.050	1.000	0	106	80	120			
Xylenes, Total	3.1	0.10	3.000	0	103	80	120			
Surr: 1,2-Dichloroethane-d4	0.45		0.5000		90.2	70	130			
Surr: 4-Bromofluorobenzene	0.49		0.5000		98.7	70	130			
Surr: Dibromofluoromethane	0.44		0.5000		87.7	70	130			
Surr: Toluene-d8	0.52		0.5000		105	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2009B70**
29-Sep-20

Client: Devon Energy
Project: Lava Tube 27 State 1H

Sample ID: **mb-55324** SampType: **MBLK** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **PBS** Batch ID: **55324** RunNo: **72112**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2527317** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 1,2-Dichloroethane-d4	0.46		0.5000		91.3	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.5000		95.0	70	130			
Surr: Dibromofluoromethane	0.44		0.5000		87.2	70	130			
Surr: Toluene-d8	0.53		0.5000		106	70	130			

Sample ID: **lcs-55319** SampType: **LCS4** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **BatchQC** Batch ID: **55319** RunNo: **72117**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2527379** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.99	0.025	1.000	0	99.2	80	120			
Toluene	1.0	0.050	1.000	0	104	80	120			
Ethylbenzene	1.0	0.050	1.000	0	103	80	120			
Xylenes, Total	3.2	0.10	3.000	0	106	80	120			
Surr: 1,2-Dichloroethane-d4	0.46		0.5000		92.9	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.5000		102	70	130			
Surr: Dibromofluoromethane	0.54		0.5000		108	70	130			
Surr: Toluene-d8	0.48		0.5000		95.2	70	130			

Sample ID: **mb-55319** SampType: **MBLK** TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **PBS** Batch ID: **55319** RunNo: **72117**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2527380** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 1,2-Dichloroethane-d4	0.43		0.5000		85.8	70	130			
Surr: 4-Bromofluorobenzene	0.50		0.5000		101	70	130			
Surr: Dibromofluoromethane	0.52		0.5000		104	70	130			
Surr: Toluene-d8	0.48		0.5000		95.8	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2009B70**
29-Sep-20

Client: Devon Energy
Project: Lava Tube 27 State 1H

Sample ID: **2009B70-018AMS** SampType: **MS** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **BS20-18 0-0.5'** Batch ID: **55324** RunNo: **72112**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2527323** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	5.0	24.83	0	84.1	49.2	122			
Surr: BFB	440		496.5		89.4	70	130			

Sample ID: **2009B70-018AMSD** SampType: **MSD** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **BS20-18 0-0.5'** Batch ID: **55324** RunNo: **72112**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2527324** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	4.8	24.13	0	88.5	49.2	122	2.31	20	
Surr: BFB	460		482.6		94.7	70	130	0	0	

Sample ID: **lcs-55324** SampType: **LCS** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **LCSS** Batch ID: **55324** RunNo: **72112**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2527344** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	92.4	70	130			
Surr: BFB	470		500.0		93.9	70	130			

Sample ID: **mb-55324** SampType: **MBLK** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **PBS** Batch ID: **55324** RunNo: **72112**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2527345** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	480		500.0		96.2	70	130			

Sample ID: **lcs-55319** SampType: **LCS** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **LCSS** Batch ID: **55319** RunNo: **72117**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2527412** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	89.0	70	130			
Surr: BFB	530		500.0		106	70	130			

Sample ID: **mb-55319** SampType: **MBLK** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **PBS** Batch ID: **55319** RunNo: **72117**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2527413** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2009B70**
29-Sep-20

Client: Devon Energy
Project: Lava Tube 27 State 1H

Sample ID: **mb-55319** SampType: **MBLK** TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **PBS** Batch ID: **55319** RunNo: **72117**
Prep Date: **9/21/2020** Analysis Date: **9/23/2020** SeqNo: **2527413** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	510		500.0		103	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

Sample Log-In Check List

Client Name: Devon Energy Work Order Number: 2009B70 RcptNo: 1

Received By: **Juan Rojas** 9/19/2020 7:30:00 AM

Completed By: **Juan Rojas** 9/19/2020 9:19:35 AM

Reviewed By: JR 9/19/20

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. Received at least 1 vial with headspace <1/4" for AQ VOA?	Yes ☐	No ☐	NA ☑
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? 9/19/20

Checked by: 9/19/20 9/19/20

Special Handling (if applicable)

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

Person Notified: _____ Date _____

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

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.4	Good				

Chain-of-Custody Record

Client: Devon

Mailing Address: On File

Phone #:

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time: 5 day
☒ Standard ☐ Rush

Project Name: Lava Tube 27 State 1H

Project #: 20E-00141

Project Manager: Natalie Gordon

Sampler: JB

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 7.4-0=7.4 (°C)

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2009370	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
9-18	11:10	0-0.5'	BS20-01	4oz	ice	-001	X	X					X			
	11:20		BS20-02			-002										
	11:30		BS20-03			-003										
	11:40		BS20-04			-004										
	11:50		BS20-05			-005										
	12:00		BS20-06			-006										
	12:10		BS20-07			-007										
	12:20		BS20-08			-008										
	12:30		BS20-09			-009										
	12:40		BS20-10			-010										
	12:45		BS20-11			-011										
	12:50		BS20-12			-012										

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
9-18	1500				9/18/20	1500
9/18/20	1900			courier	9/19/20	7:30

Remarks: CC: Natalie Gordon
1090044701
Bill to Devon

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: Devon

Mailing Address: On file

Phone #:

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time: 5 day
☒ Standard ☐ Rush

Project Name: Lava Tube 27 State Lit

Project #: 20E-00141

Project Manager: Natalie Gordon

Sampler: JR

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 2.4-0=2.4 (°C)

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2009370	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
9-18	12:55	0-0.5	BS20-13	4oz	Ice	-013	X	X					X			
	1:00		BS20-14			-014										
	1:05		BS20-15			-015										
	1:10		BS20-16			-016										
	1:15		BS20-17			-017										
	1:20		BS20-18			-018										
	1:25		BS20-19			-019										
	1:30		BS20-20			-020										
	1:35		BS20-21			-021										
	1:40		BS20-22			-022										
	1:45		BS20-23			-023										
	1:50		BS20-24			-024										

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
9-18	1500				9/18/20	1500
9/18/20	1900			courier	9/19/20	7:30

Remarks: CC: Natalie Gordon
10900 44701 Bill to Devon

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: Devon

Mailing Address: On file

Phone #:

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time: 5 day
☒ Standard ☐ Rush

Project Name: Lava Tube 27 State 1H

Project #: 20E-00141

Project Manager: Natalie Gordon

Sampler: JR

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 2.4-0=2.4 (°C)

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2009370	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
9-18	1:50	0-0.5'	BS20-25	4oz	ice	-025	X	X					X			
	1:55		BS20-26			-026										
	1:55		BS20-27			-027										
	2:00		BS20-28			-028										
			BS20-29			-029										
			BS20-30			-030										

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
9-18	1500				9/18/20	1500
9/18/20	1900			courier	9/19/20	7:30

Remarks: CC: Natalie Gordon
Bill to Devon
10900447 01

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

ATTACHMENT 7

Natalie Gordon

From: Dhugal Hanton <vertexresourcegroupusa@gmail.com>
Sent: Wednesday, September 16, 2020 9:13 AM
To: Natalie Gordon
Subject: Fwd: NJMW1308633738: Lava Tube 27 State #001 48-hr Notification of Confirmatory Sampling

---------- Forwarded message ---------
From: **Dhugal Hanton** <vertexresourcegroupusa@gmail.com>
Date: Wed, Sep 16, 2020 at 9:12 AM
Subject: NJMW1308633738: Lava Tube 27 State #001 48-hr Notification of Confirmatory Sampling
To: <OCD.Enviro@state.nm.us>, <spills@slo.state.nm.us>, <wesley.mathews@dvn.com>, <amanda.davis@dvn.com>, <Lupe.Carrasco@dvn.com>, <tom.bynum@dvn.com>

All,

Please accept this email as 48-hr notification that Vertex Resource Services has scheduled final confirmatory sampling to be conducted at Lava Tube 27 State #001H for the release that occurred on March 9, 2013, incident #NJMW1308633738.

This work will be completed on behalf of Devon Energy Production Company.

On Friday, September 18, 2020 at approximately 1:30 p.m., Austin Harris of Vertex will be onsite to conduct the final confirmatory sampling. He can be reached at 432-250-5003. If you need directions to the site, please do not hesitate to contact him.

If you have any questions or concerns regarding this notification, please give me a call at 505-506-0040.

Thank you,
Natalie

Natalie Gordon
Project Manager

Vertex Resource Group Ltd.
213 S. Mesa Street
Carlsbad, NM 88220

P 575.725.5001 ext 709
C 505.506.0040

www.vertex.ca

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 11330

CONDITIONS

Operator: DEVON ENERGY PRODUCTION COMPANY, LP 333 West Sheridan Ave. Oklahoma City, OK 73102	OGRID: 6137
	Action Number: 11330
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
amaxwell	None	1/20/2023