March 19, 2020 Vertex Project #: 19E-00575-022

Spill Closure Report: Tomcat 16 State 2 Battery
Unit M, Section 16, Township 23 South, Range 32 East
County: Lea
API: 30-025-34306
Tracking Number: TBD

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

New Mexico Oil Conservation Division – District 1 – Hobbs
1625 North French Drive
Hobbs, New Mexico 88240

Devon Energy Production Company (Devon) retained Vertex Resource Services Inc. (Vertex) to conduct a spill assessment and remediation for a produced water release that occurred at the Tomcat 16 State 2 Battery, API 30-025-34306 (hereafter referred to as "Tomcat"). Devon provided notification of the spill to New Mexico Oil Conservation Division (NM OCD) District 1, and the New Mexico State Land Office (NM SLO), via submission of an initial C-141 Release Notification (Attachment 1) on November 12, 2019. The NM OCD tracking number for this incident has not yet been assigned.

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, with the understanding that any restoration of the site required as a result of this incident will be deferred until such time as oil and gas activities are terminated and the site is reclaimed per 19.15.29.13 NMAC.

Incident Description

On October 1, 2019, a release occurred at Devon's Tomcat site when a layflat line was punctured. This incident resulted in the release of approximately 66.82 barrels (bbls) of produced water onto the wellpad and along the lease road. No produced water was released into undisturbed areas or waterways. Upon discovery of the release, a hydrovac truck was dispatched to the site to recover free liquids. Approximately 20 bbls of produced water were recovered from the spill area and removed for disposal off-site.

Site Characterization

The release at Tomcat occurred on state-owned land, N 32.299052, W 103.686197, approximately 22 miles east of Loving, New Mexico. The legal description for the site is Unit M, Section 16, Township 23 South, Range 32 East, Lea 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.

Tomcat is typical of oil and gas exploration and production sites in the western portion of the Permian Basin, and is currently used for oil and gas production, and storage. The following sections specifically describe the release area on the eastern portion of the constructed wellpad and north along the lease road.

The surrounding landscape has historically been associated with plains at elevations of 3,000 to 3,900 feet above sea level. The climate is semiarid, with average annual precipitation ranging between 10 and 12 inches. The historical plant community is dominated by black grama, dropseeds and bluestems, with scattered shinnery oak and sand sage. Litter and, to a lesser extent, bare ground make up a significant proportion of ground cover (United States Department of Agriculture, Natural Resources Conservation Service, 2020). Limited to no vegetation is allowed to grow on the compacted production wellpad and lease road.

The Geological Map of New Mexico indicates the surface geology at Tomcat is comprised primarily of Qep – interlayed eolian sands and piedmont-slope deposits from the Holocene to middle Pleistocene ages (New Mexico Bureau of Geology and Mineral Resources, 2020). The National Resources Conservation Service (NRCS) Web Soil Survey characterizes the soil at the site as Pyote and Maljamar fine sands, comprised of fine sand over a layer of sandy clay loam and a deeper layer of cemented material. This type of soil tends to be well-drained with very low 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 Tomcat (United States Department of the Interior, Bureau of Land Management, 2020).

There is no surface water located on-site. The nearest significant watercourse, as defined in Subsection P of 19.15.17.7 NMAC, is an intermittent stream located approximately 4.7 miles northwest of the site (United States Department of the Interior, United States Fish and Wildlife, 2020). There are no continuously flowing watercourses or significant watercourses, lakebeds, sinkholes, playa lakes, or other critical water or community features as outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC near Tomcat.

The nearest well to Tomcat is a New Mexico Office of the State Engineer (NM OSE)-identified well located approximately 1 mile southeast of Tomcat. Depth to groundwater at this well is 400 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 Tomcat is not subject to the requirements of Paragraph (4) of Subsection C of 19.15.29.12 NMAC and the closure criteria for the site are determined to be associated with the following constituent concentration limits based on depth to groundwater.

Table 1. Closure Criteria for Soils Impacted by a Release		
Depth to Groundwater	**Constituent**	**Limit**
>100 feet	Chloride	20,000 mg/kg
	TPH[1] (GRO + DRO + MRO)	2,500 mg/kg
	GRO + DRO	1,000 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

Following an initial spill inspection and GIS mapping of the release footprint, completed on October 7, 2019, the release area, including the impacted areas on the wellpad and lease road, was determined to be approximately 476 feet by 54 feet; the total affected area was determined to be approximately 8,711 square feet. That initial site visit also showed no indication that impacts from the release extended off the wellpad or outside of the lease road right-of-way. Due to the road's heavy use, restoration efforts will not be required until such time as the lease road is abandoned and reclaimed. As the depth to groundwater in the area is greater than 100 feet bgs and it was not expected that chlorides would exceed the maximum closure criteria limits for soils in this region, Vertex decided to proceed directly to confirmatory sampling. The Daily Field Report (DFR) associated with the initial spill inspection and subsequent site visits are included in Attachment 4.

On October 11, 2019, Vertex provided 48-hour notification of confirmatory sampling to NM OCD District 1 and the SLO, as required by Subparagraph (a) of Paragraph (1) of Subsection D 19.15.29.12 NMAC (Attachment 5). On October 15, 2019, Vertex was on-site to conduct confirmatory sampling. Vertex collected 37 composite confirmatory soil samples, each 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. A GeoExplorer 7000 Series Trimble global positioning system (GPS) unit was used to map the approximate center of the five-point composite samples. The confirmatory sample locations are presented on Figure 1 (Attachment 2). Relevant equipment and prominent features/reference points at the site were mapped as well.

The composite samples were placed into laboratory-provided containers, preserved on ice, and submitted to a National Environmental Laboratory Accreditation Program (NELAP)-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.

Laboratory analyses indicated that all confirmatory samples met NM OCD closure criteria and no further action is needed at the site. The final confirmatory sample analytical data are summarized in Attachment 6, and laboratory data reports and chain of custody forms are included in Attachment 7.

Closure Request

Vertex does not recommend any additional remediation actions to address the release at Tomcat. Laboratory analyses of the confirmatory samples showed constituent of concern concentration levels below NM OCD closure criteria for areas where depth to groundwater is greater than 100 feet bgs as presented in Table 1. There are no anticipated risks to human, ecological or hydrological receptors associated with the release site.

As the release occurred on an active wellpad and lease road, Vertex requests that restoration and reclamation of the spill area be deferred until such time as the wellpad and lease road are reclaimed per 19.15.29.13 NMAC.

Vertex requests that this incident 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 October 1, 2019, release at Tomcat.

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 Report
Attachment 2. Site Schematic and Confirmatory Sample Locations
Attachment 3. Closure Criteria for Soils Impacted by a Release Research Determination Documentation
Attachment 4. Daily Field Report(s) with Photographs
Attachment 5. 48-hr Notification of Confirmatory Sampling
Attachment 6. Confirmatory Sampling Laboratory Results
Attachment 7. Laboratory Data Reports/COCs

References

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

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

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.

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, Bureau of Land Management. (2020). *New Mexico Cave/Karsts*. Retrieved from https://www.blm.gov/programs/recreation/recreation-programs/caves/new-mexico.

United States Department of the Interior, United States Fish and Wildlife (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

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., 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 Department

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

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party Devon Energy Production Company	OGRID 6137
Contact Name Amanda T. Davis	Contact Telephone 575-748-0176
Contact email amanda.davis@dvn.com	Incident # *(assigned by OCD)*
Contact mailing address 6488 Seven Rivers HWY	

Location of Release Source

Latitude 32.299052 Longitude -103.686197

(NAD 83 in decimal degrees to 5 decimal places)

Site Name Tomcat 16 State 2 Battery	Site Type Oil
Date Release Discovered 10/1/2019	API# *(if applicable)*

Unit Letter	Section	Township	Range	County
M	16	23S	32E	Lea

Surface Owner: ☒ State ☐ Federal ☐ Tribal ☐ Private (*Name:* _____)

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

☐ Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
☒ Produced Water	Volume Released (bbls) 66.82	Volume Recovered (bbls) 20
	Is the concentration of total dissolved solids (TDS) in the produced water >10,000 mg/l?	☐ Yes ☐ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release Layflat was punctured causing fluid release.

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? ☐ Yes ☐ No	If YES, for what reason(s) does the responsible party consider this a major release? This is considered a major release because it is over 25 BBLS.

If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?
Immediate notice was not given.

Initial Response

The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury

- ■ The source of the release has been stopped.
- ■ The impacted area has been secured to protect human health and the environment.
- ☐ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.
- ■ All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:
Spill was not in containment.

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

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: Kendra DeHoyos Title: EHS Associate

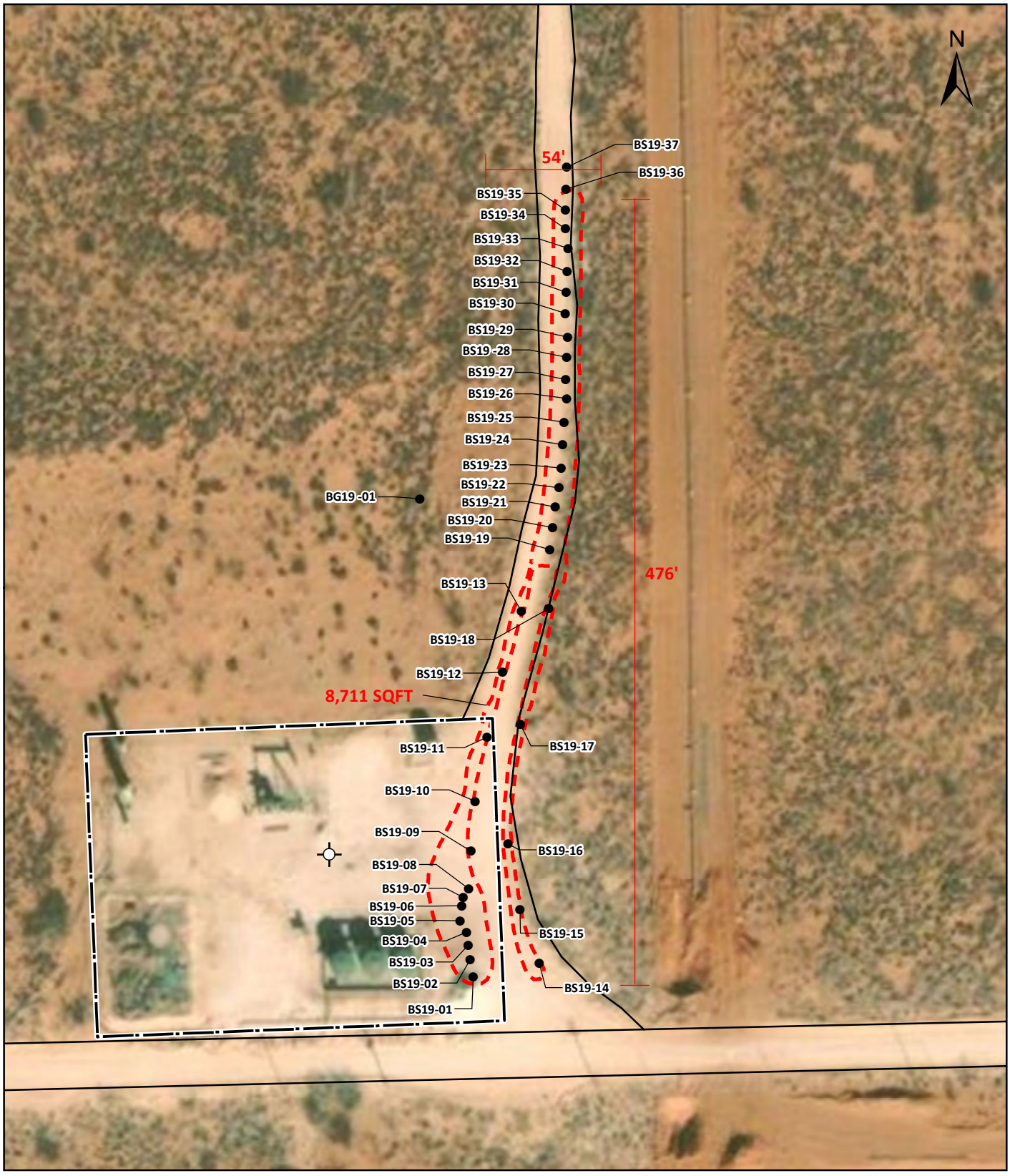
Signature: Kendra DeHoyos Date: 11/12/2019

email: kendra.dehoyos@dvn.com Telephone: 575-748-3371

OCD Only

Received by: _____ Date: _____

ATTACHMENT 2



LEGEND

- SOIL SAMPLE
- WELLHEAD
- ROAD
- WELLPAD
- SPILL AREA

Notes: Aerial Image from ESRI Digital Globe 2017

BG BACKGROUND SAMPLE
BS EXCAVATION BASE SAMPLE

0 20 40 80 Ft
SCALE 1:1,000

devon

Site Schematic and Confirmatory Sample Locations
Tomcat 16 State 2 Battery

VERTEX

DRAWN:	NM
APPROVED:	SH
DATE:	OCT 18/19

FIGURE: 1

VERSATILITY. EXPERTISE.

Document Path: C:\Users\nmocny\Documents\Natasha Mocny\Projects\Deven Energy\Big Cat 16-9 State Fed Com 1H\Big Cat 16-9 Remediation Confirmatory.mxd

ATTACHMENT 3

Table 1. Closure Criteria Determination			
Site Name: Tomcat 16 State 002			
Spill Coordinates:		X: 32.29936944	Y: -103.68555556
Site Specific Conditions		Value	Unit
1	Depth to Groundwater	**400**	feet
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	24,869	feet
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	40,318	feet
4	Within 300 feet from an occupied residence, school, hospital, institution or church	27,881	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**	5,582	feet
	ii) Within 1000 feet of any fresh water well or spring	47,666	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	18,737	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	undetermined	year
NMAC 19.15.29.12 E (Table 1) Closure Criteria		>100'	<50' 51-100' >100'

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 02216	CUB	PLS	11.3	BRININSTOOL XL RANCH LLC	LE	C 02216					2 2 4	21	23S	32E	625035	3573261*	1710
C 03851	CUB	MON	0	US DEPARTMENT OF ENERGY	LE	C 03851 POD1			NON	Artesian	3 3 4	20	23S	32E	622879	3572660	1882
C 02520	C	PRO	0	PENWELL ENERGY	LE	C 02520					1 4	15	23S	32E	626122	3574791*	2448
C 03529	C	STK	0	MARK MCCLOY	LE	C 03529 POD1					2 4 3	29	23S	32E	622651	3571212	3310
C 02349	CUB	STK	3	CHARLES F. JAMES	ED	C 02349					2 3	03	23S	32E	625678	3578004*	4150
C 02445	C	STK	3	BUREAU OF LAND MANAGEMENT	LE	C 02445					3 3 3	13	23S	32E	628437	3574327*	4722

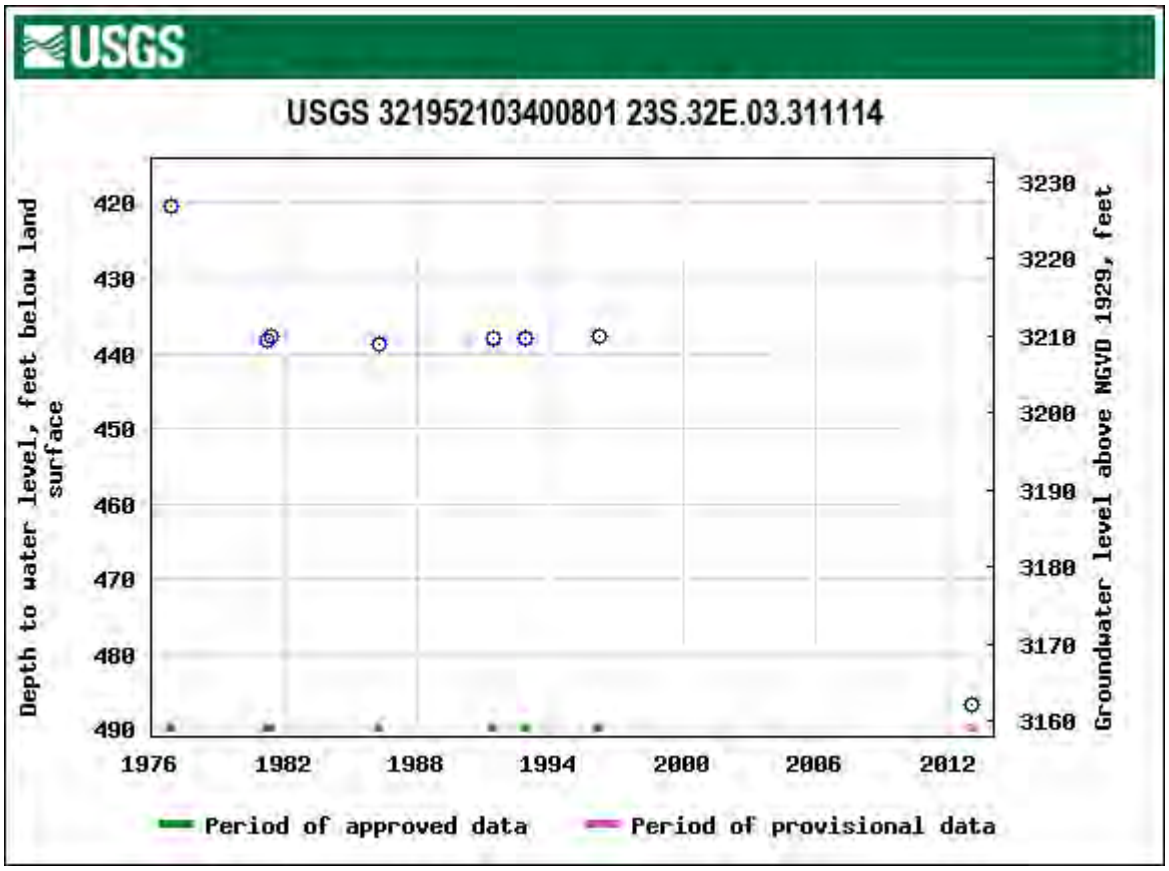
Record Count: 6

UTMNAD83 Radius Search (in meters):

Easting (X): 623714.41 **Northing (Y):** 3574347.56 **Radius:** 5000

Sorted by: Distance

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


USGS
USGS 321952103400801 23S.32E.03.311114
Depth to water level, feet below land surface
420
430
440
450
460
470
480
490
3230
3220
3210
3200
3190
3180
3170
3160
Groundwater level above NGVD 1929, feet
1976
1982
1988
1994
2000
2006
2012
Period of approved data
Period of provisional data

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 02216	CUB	LE	2	2	4	21	23S	32E	625035	3573261*	1710	585	400	185
C 03851 POD1	CUB	LE	3	3	4	20	23S	32E	622880	3572660	1882	1392	713	679
C 03529 POD1	C	LE	2	4	3	29	23S	32E	622651	3571212	3310	550		
C 02349	CUB	ED		2	3	03	23S	32E	625678	3578004*	4150	525		

Average Depth to Water: **556 feet**

Minimum Depth: **400 feet**

Maximum Depth: **713 feet**

Record Count: 4

UTMNAD83 Radius Search (in meters):

Easting (X): 623714.41 **Northing (Y):** 3574347.56 **Radius:** 5000

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

U.S. Fish and Wildlife Service
National Wetlands Inventory

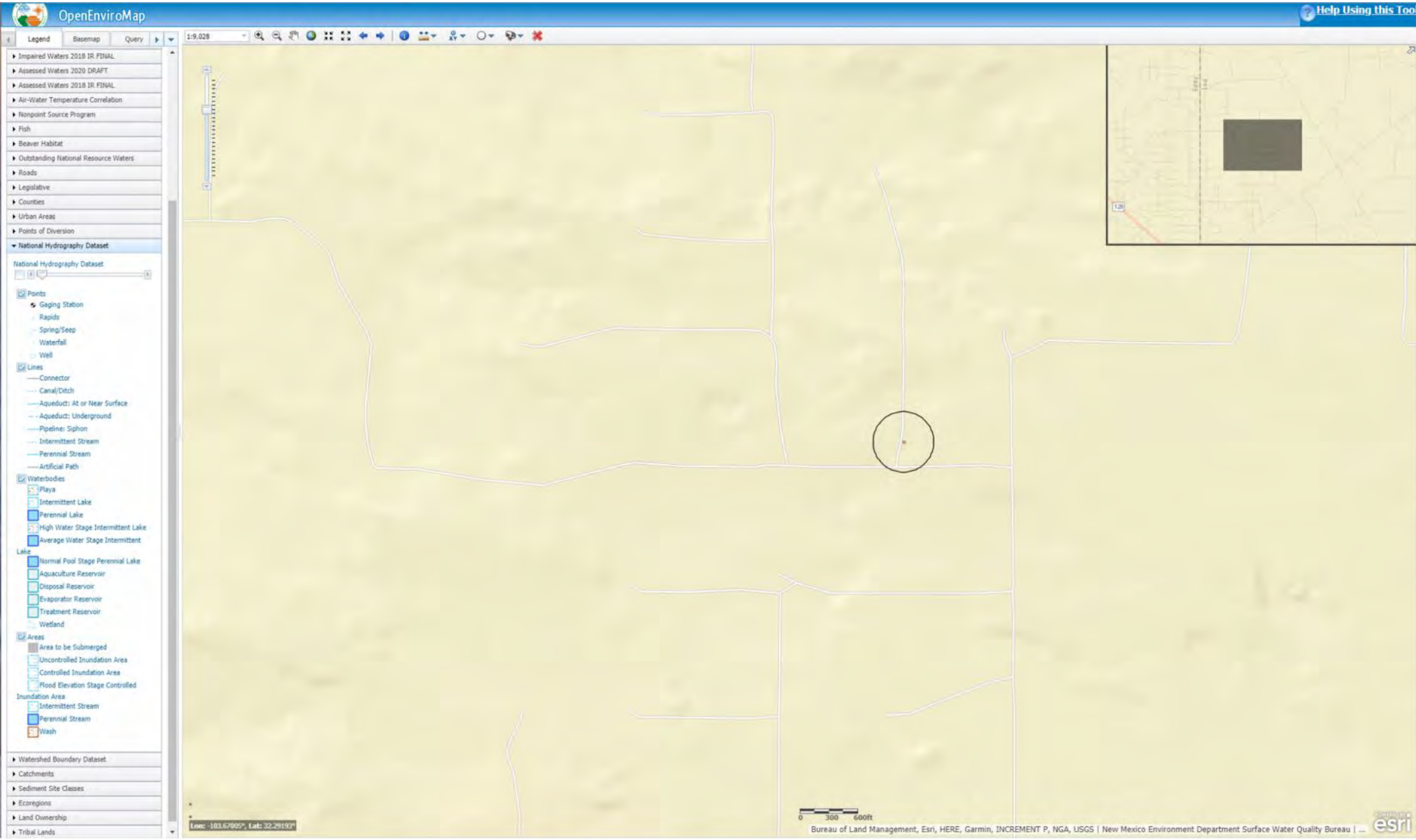
Tomcat 16 State 002 - 24,868.9 feet Riverin

October 11, 2019

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.


OpenEnviroMap
Help Using this Too
Legend
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Query
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Impaired Waters 2018 IR FINAL
Assessed Waters 2020 DRAFT
Assessed Waters 2018 IR FINAL
Air-Water Temperature Correlation
Nonpoint Source Program
Fish
Beaver Habitat
Outstanding National Resource Waters
Roads
Legislative
Counties
Urban Areas
Points of Diversion
National Hydrography Dataset
National Hydrography Dataset
Points
Gaging Station
Rapids
Spring/Seep
Waterfall
Well
Lines
Connector
Canal/Ditch
Aqueduct: At or Near Surface
Aqueduct: Underground
Pipeline: Siphon
Intermittent Stream
Perennial Stream
Artificial Path
Waterbodies
Playa
Intermittent Lake
Perennial Lake
High Water Stage Intermittent Lake
Average Water Stage Intermittent Lake
Normal Pool Stage Perennial Lake
Aquaculture Reservoir
Disposal Reservoir
Evaporator Reservoir
Treatment Reservoir
Wetland
Areas
Area to be Submerged
Uncontrolled Inundation Area
Controlled Inundation Area
Flood Elevation Stage Controlled Inundation Area
Intermittent Stream
Perennial Stream
Wash
Watershed Boundary Dataset
Catchments
Sediment Site Classes
Ecoregions
Land Ownership
Tribal Lands
0 300 600ft
Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, NGA, USGS | New Mexico Environment Department Surface Water Quality Bureau | ...
esri

U.S. Fish and Wildlife Service
National Wetlands Inventory

Tomcat 16 State 002 - Pond 62,545.8 feet

October 7, 2019

Wetlands

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

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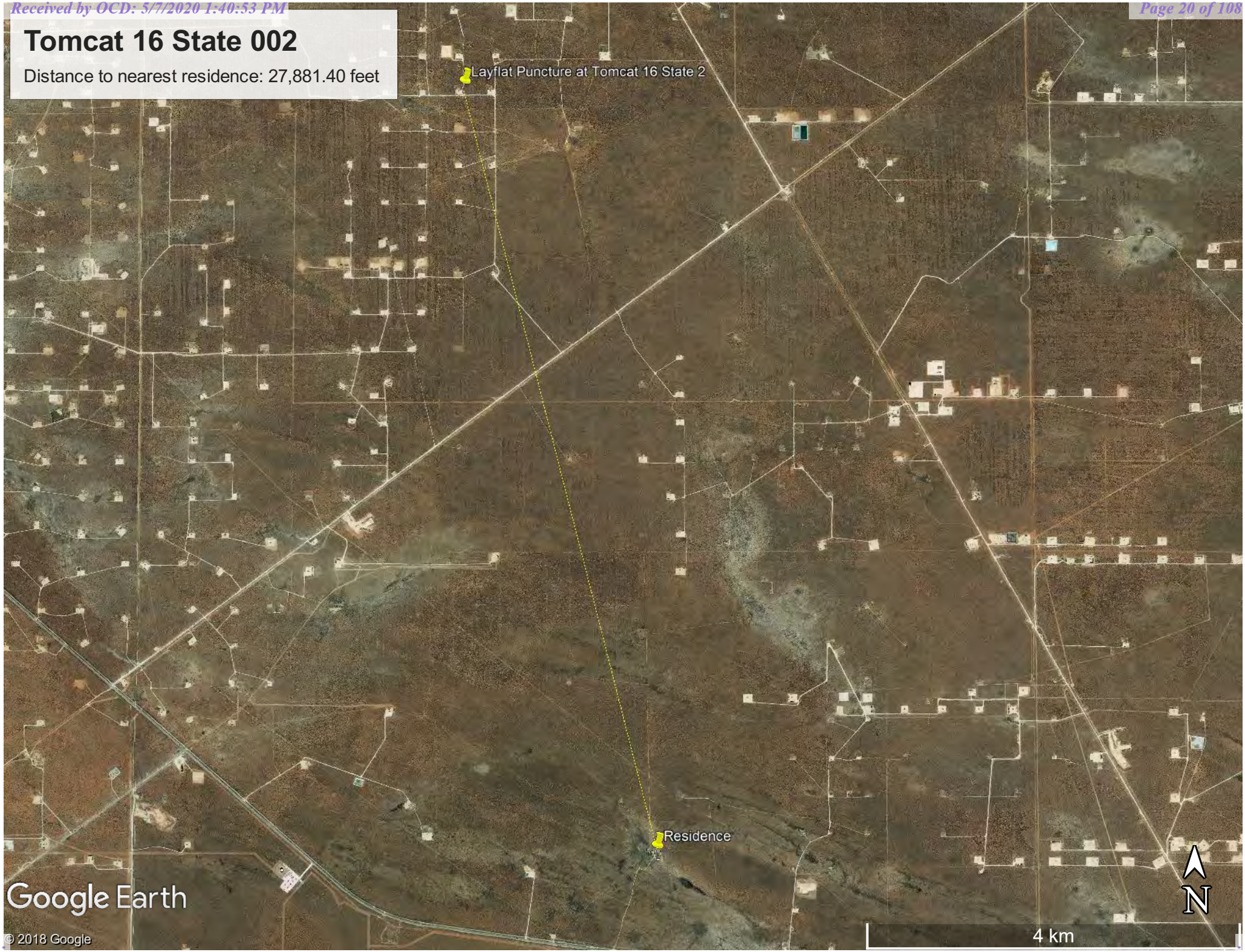
National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Tomcat 16 State 002

Distance to nearest residence: 27,881.40 feet

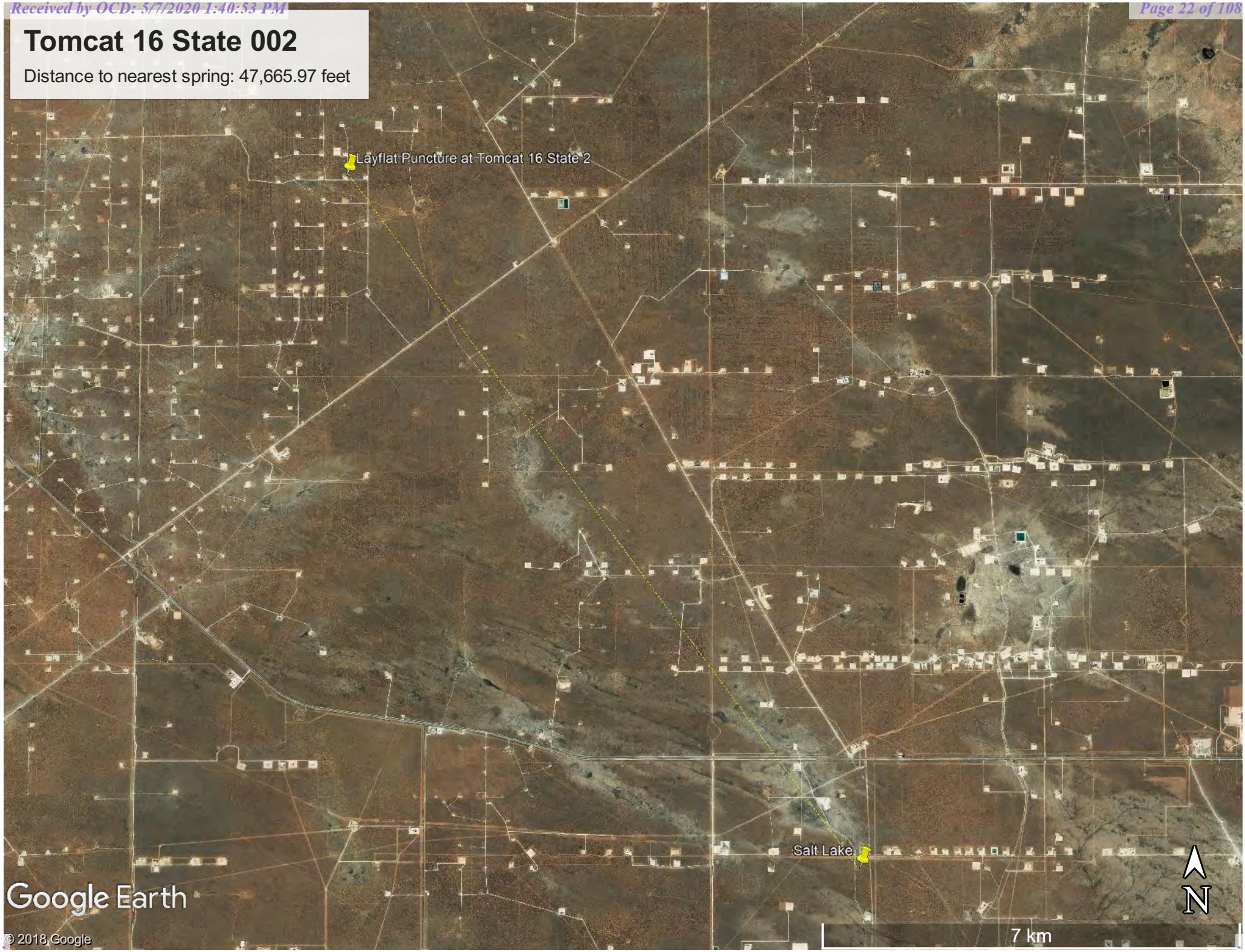


Tomcat 16 State 002

Distance to nearest water well: 5,582 feet

Tomcat 16 State 002

Distance to nearest spring: 47,665.97 feet



U.S. Fish and Wildlife Service
National Wetlands Inventory

Tomcat 16 State 002 - Wetland 18,737.2 Fe

October 7, 2019

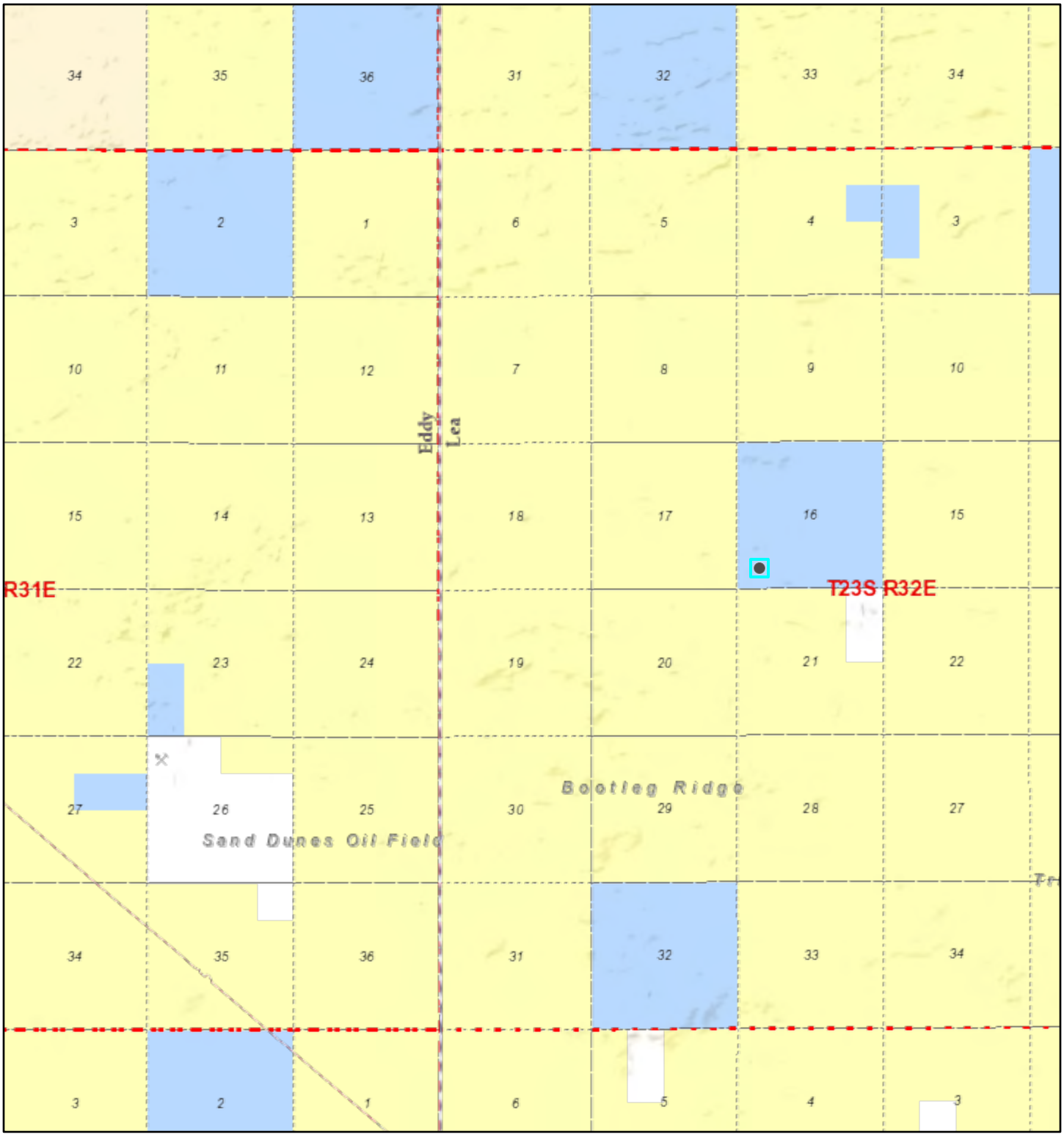
Wetlands

- 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

Tomcat 16 State 002 - Not Near Active Mines



10/7/2019, 1:34:29 PM

1:72,224

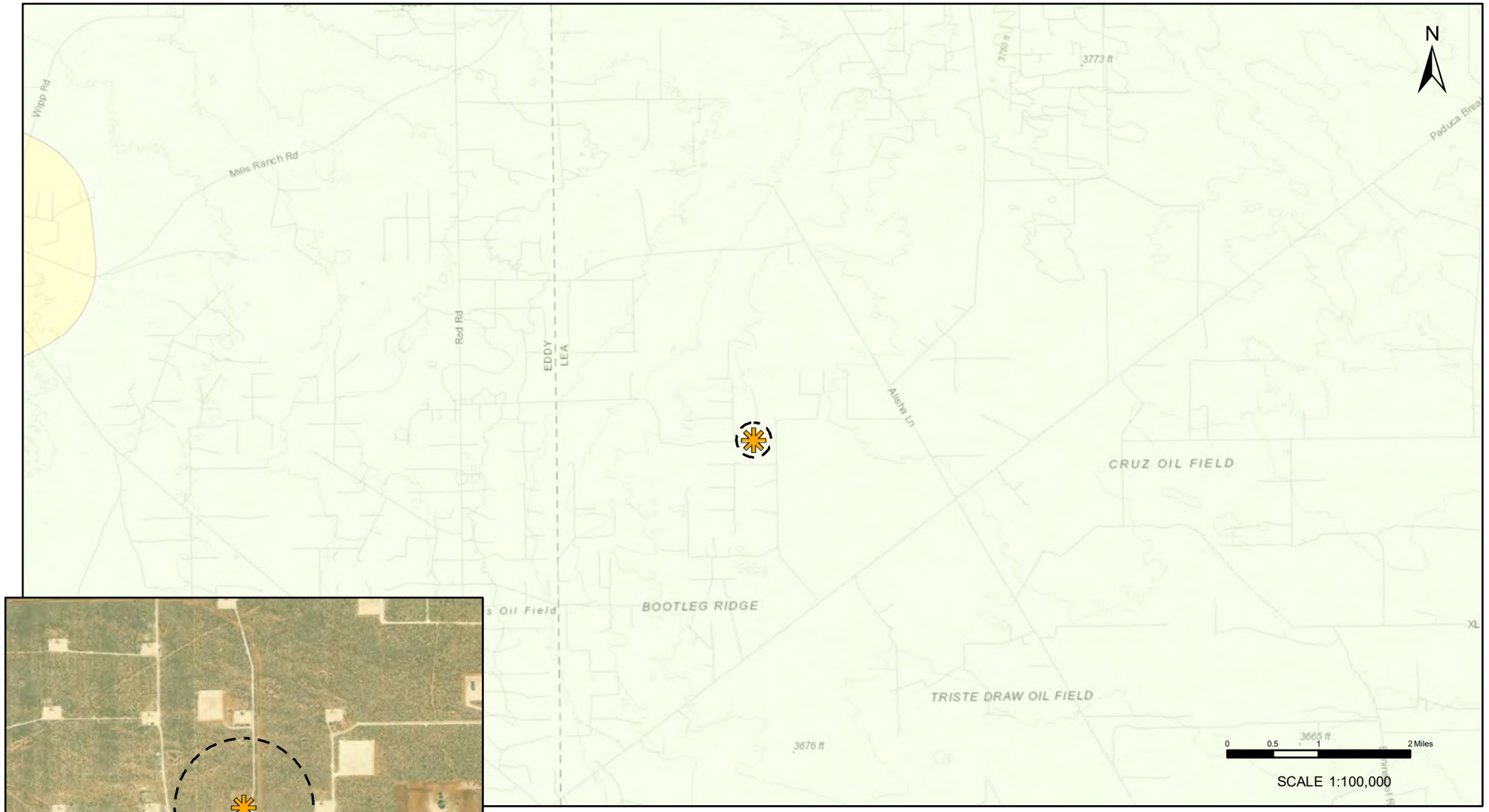
0 0.5 1 2 mi

0 0.75 1.5 3 km

Registered Mines

- Aggregate, Stone etc.
- Aggregate, Stone etc.

U.S. Bureau of Land Management - New Mexico State Office, Sources: Esri, USGS, NOAA, Sources: Esri, Garmin, USGS, NPS



LEGEND

SITE

1000FT BUFFER

KARST POTENTIAL

CRITICAL

HIGH

MEDIUM

LOW

Notes: Aerial Image from ESRI Digital Globe 2018

devon

Karst Potential
Big Cat 16-9 State Fed Com 215H

VERTEX

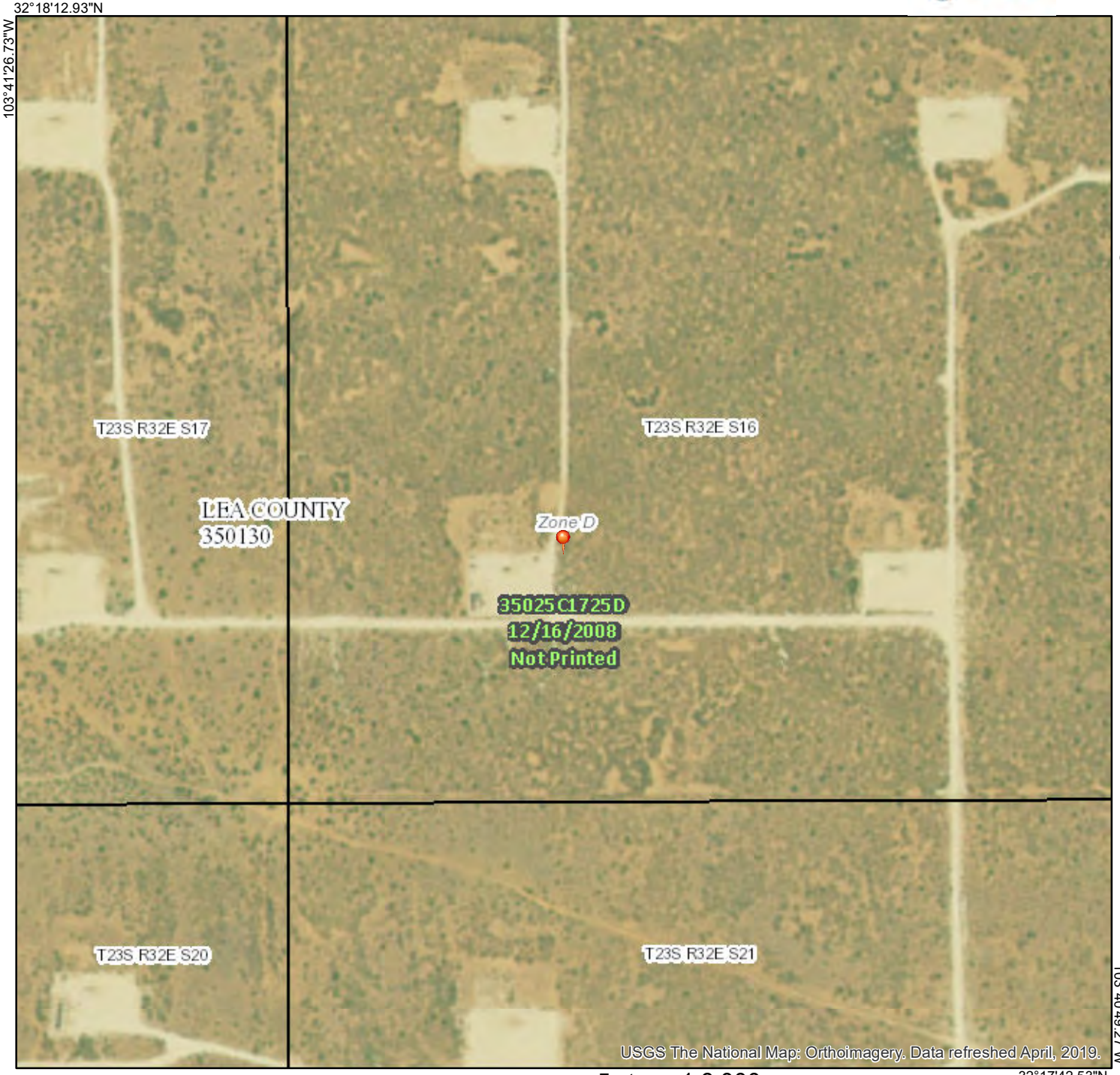
DRAWN:	NM
APPROVED:	SH
DATE:	OCT 08/19

FIGURE: 1

VERSATILITY. EXPERTISE.

National Flood Hazard Layer FIRMette

FEMA



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 10/7/2019 at 3:36:00 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.

Lea County, New Mexico

PU—Pyote and maljamar fine sands

Map Unit Setting

National map unit symbol: dmqq
Elevation: 3,000 to 3,900 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 60 to 62 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Maljamar and similar soils: 45 percent
Pyote and similar soils: 45 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Maljamar

Setting

Landform: Plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 24 inches: fine sand
Bt - 24 to 50 inches: sandy clay loam
Bkm - 50 to 60 inches: cemented material

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 40 to 60 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: Loamy Sand (R042XC003NM)
Hydric soil rating: No

Description of Pyote

Setting

Landform: Plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 30 inches: fine sand
Bt - 30 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: Loamy Sand (R042XC003NM)
Hydric soil rating: No

Minor Components

Kermit

Percent of map unit: 10 percent
Ecological site: Sandhills (R042XC022NM)

Hydric soil rating: No

Data Source Information

Soil Survey Area: Lea County, New Mexico
Survey Area Data: Version 16, Sep 15, 2019

ATTACHMENT 4

Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	10/4/2019
Site Location Name:	Tomcat 16 State 006	Report Run Date:	10/4/2019 10:38 PM
Project Owner:	Amanda Davis	File (Project) #:	19E-00575
Project Manager:	Dennis Williams	API #:	30-025-34949
Client Contact Name:	Amanda Davis	Reference	Layflat line puncture
Client Contact Phone #:	(575) 748-0176		

Summary of Times

Left Office	10/4/2019 9:44 AM
Arrived at Site	10/4/2019 11:15 AM
Departed Site	10/4/2019 2:30 PM
Returned to Office	10/4/2019 3:20 PM

Summary of Daily Operations

12:45 Initial site visit to layflat puncture spill area.

Next Steps & Recommendations

1 Call one call.

2 Schedule remediation work.

Daily Site Visit Report

Site Photos

Viewing Direction: North

Puncture location from NE corner of Tomcat 16 Fed #2.

Viewing Direction: North

Spill Area, southern extent.

Viewing Direction: North

Aerial photo of spill area.

Viewing Direction: North

Aerial with general outline of spill area.

Daily Site Visit Report

Viewing Direction: South	**Viewing Direction**: South
	
Northern most apparent edge of possible spill area.	Northern extent of possible spill area with sketch of extent.

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Sharlene Harvester

Signature:

Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	10/7/2019
Site Location Name:	Big Cat 16 9 State Federal Com #217H	Report Run Date:	10/7/2019 9:02 PM
Project Owner:	Amanda Davis	File (Project) #:	19E-00575
Project Manager:	Dennis Williams	API #:	30-025-45201
Client Contact Name:	Amanda Davis	Reference	Layflat line puncture
Client Contact Phone #:	(575) 748-0176		

Summary of Times

Left Office	10/7/2019 9:45 AM
Arrived at Site	10/7/2019 10:30 AM
Departed Site	10/7/2019 1:01 PM
Returned to Office	10/7/2019 2:00 PM

Summary of Daily Operations

12:50 Arrive on site.
Complete safety paperwork.
GPS spill and determine length and area of spill.
Complete DFR.
Return to office.

Next Steps & Recommendations

1 Create excavation plan

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Austin Harris

Signature: 
Signature

Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	10/14/2019
Site Location Name:	Big Cat 16 9 State Federal Com #217H	Report Run Date:	10/15/2019 12:39 AM
Project Owner:	Amanda Davis	File (Project) #:	19E-00575
Project Manager:	Dennis Williams	API #:	30-025-45201
Client Contact Name:	Amanda Davis	Reference	Layflat line puncture
Client Contact Phone #:	(575) 748-0176		

Summary of Times

Left Office	10/14/2019 10:58 AM
Arrived at Site	10/14/2019 12:02 PM
Departed Site	10/14/2019 5:10 PM
Returned to Office	10/14/2019 6:34 PM

Summary of Daily Operations

12:03 Delineate extent of chloride exceedances.

12:36 Delineate spill using field screening.

Next Steps & Recommendations

1 Conduct base samples in spill area.

Sampling

Daily Site Visit Report

VERTEX

Background19-01

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.						✓	32.29968689, -103.68584067	Yes

SS19-01

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.						✓	,	Yes

SS19-02

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.						✓	,	Yes

SS19-03

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.						✓	,	Yes

Daily Site Visit Report

SS19-04

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.						✓	,	Yes

SS19-05

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.						✓	,	Yes

SS19-06

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.						✓	32.29940587, -103.68567355	Yes

SS19-07

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.						✓	32.29956833, -103.68564597	Yes

Daily Site Visit Report

SS19-09

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.						✓	32.29932821, -103.68572827	Yes

SS19-10

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.						✓	32.29889430, -103.685597	Yes

SS19-11

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.						✓	32.29904192, -103.68563618	Yes

SS19-12

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.						✓	32.29932692, -103.68563539	Yes

Daily Site Visit Report

SS19-13

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.						✓	32.29948230, -103.68556290	Yes

SS19-14

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.						✓	32.29961540, -103.68554878	Yes

Daily Site Visit Report

Depth Sample Photos

Sample Point ID: SS19-01	**Sample Point ID**: SS19-02
	
Depth: 0 ft.	**Depth:** 0 ft.
Sample Point ID: SS19-03	**Sample Point ID**: SS19-04
	
Depth: 0 ft.	**Depth:** 0 ft.

Daily Site Visit Report

Sample Point ID: SS19-05	**Sample Point ID**: SS19-06
	
Depth: 0 ft.	**Depth:** 0 ft.
Sample Point ID: SS19-07	**Sample Point ID**: SS19-09
	
Depth: 0 ft.	**Depth:** 0 ft.

Daily Site Visit Report

Sample Point ID: SS19-14

Depth: 0 ft.

Sample Point ID: SS19-10

Depth: 0 ft.

Sample Point ID: SS19-11

Depth: 0 ft.

Sample Point ID: SS19-12

Depth: 0 ft.

Daily Site Visit Report

Sample Point ID: SS19-13	**Sample Point ID**: Background19-01
	
Depth: 0 ft.	**Depth:** 0 ft.

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Sharlene Harvester

Signature: 
Signature

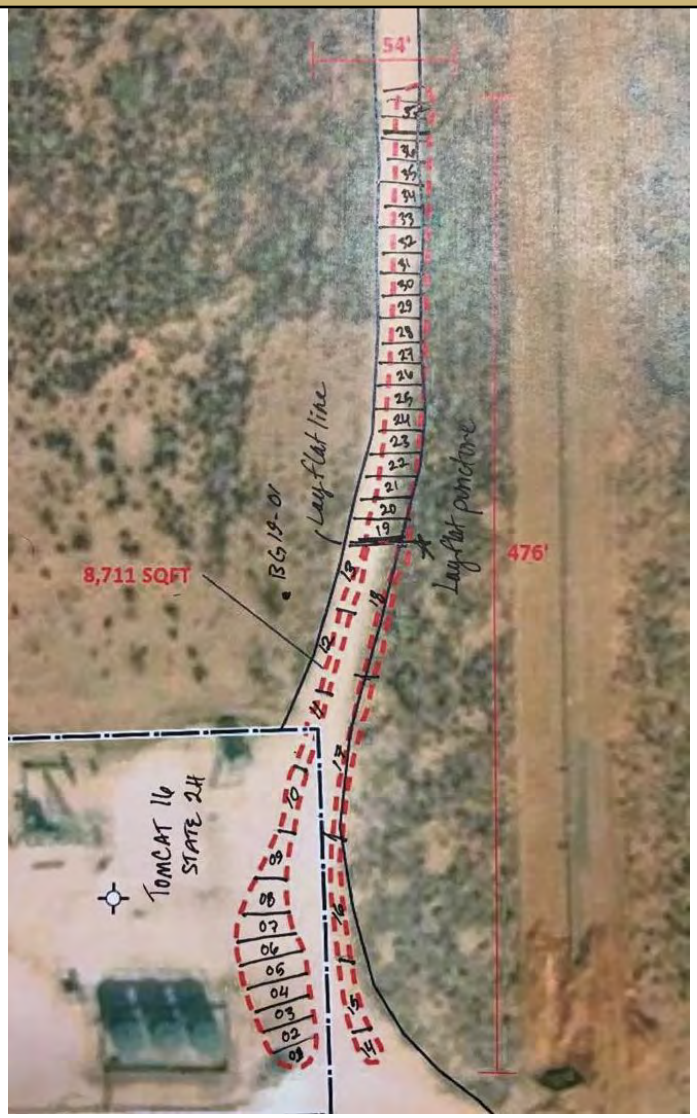
Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	10/15/2019
Site Location Name:	Big Cat 16 9 State Federal Com #217H	Report Run Date:	10/17/2019 7:00 PM
Project Owner:	Amanda Davis	File (Project) #:	19E-00575
Project Manager:	Dennis Williams	API #:	30-025-45201
Client Contact Name:	Amanda Davis	Reference	Layflat line puncture
Client Contact Phone #:	(575) 748-0176		

Summary of Times	
Left Office	10/15/2019 8:00 AM
Arrived at Site	10/15/2019 9:15 AM
Departed Site	10/15/2019 7:06 PM
Returned to Office	10/15/2019 8:06 PM

Daily Site Visit Report

Site Sketch



Daily Site Visit Report

Summary of Daily Operations

10:42 Conduct confirmatory samples.

Next Steps & Recommendations

1 Submit samples to lab.

2 Provided results are below closure criteria, submit closure Report.

Sampling

ES-Base19-01

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29888819, -103.68574743	Yes

ES-Base19-02

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29891708, -103.68575303	Yes

ES-Base19-03

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.	1.3 ppm	146 ppm	High (300-6000ppm)	675 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29894097, -103.68575672	Yes

Daily Site Visit Report

ES-Base19-04

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29896273, -103.68576013	Yes

ES-Base19-05

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29898204, -103.68577209	Yes

ES-Base19-06

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29900667, -103.68576818	Yes

ES-Base19-07

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29902094, -103.68576544	Yes

Daily Site Visit Report

ES-Base19-08

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29903484, -103.68575379	Yes

ES-Base19-09

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29909800, -103.68574924	Yes

ES-Base19-10

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29918084, -103.68573978	Yes

ES-Base19-11

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.	1.2 ppm	78 ppm	High (300-6000ppm)	675 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29928738, -103.68571499	Yes

Daily Site Visit Report

ES-Base19-11

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.			High (300-6000ppm)	675 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	,	Yes

ES-Base19-12

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29939569, -103.68568231	Yes

ES-Base19-13

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29949701, -103.68564424	Yes

ES-Base19-14

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.			High (300-6000ppm)	975 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	,	Yes

Daily Site Visit Report

ES-Base19-14

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.	1.3 ppm	46 ppm	High (300-6000ppm)	975 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29891016, -103.68561785	Yes

ES-Base19-15

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29899939, -103.68565402	Yes

ES-Base19-16

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29910936, -103.68567611	Yes

ES-Base19-17

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29930841, -103.68564815	Yes

Daily Site Visit Report

ES-Base19-18

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29950089, -103.68559027	Yes

ES-Base19-19

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29959946, -103.68558704	Yes

ES-Base19-20

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29963609, -103.68558071	Yes

ES-Base19-21

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.	1.2 ppm	88 ppm	High (300-6000ppm)	3450 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29967029, -103.68557551	Yes

Daily Site Visit Report

ES-Base19-22

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29970244, -103.68556735	Yes

ES-Base19-23

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29973488, -103.68556203	Yes

ES-Base19-24

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29977427, -103.68555921	Yes

ES-Base19-25

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29981143, -103.68555624	Yes

Daily Site Visit Report

ES-Base19-26

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29985083, -103.68554948	Yes

ES-Base19-27

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.	2 ppm	65 ppm	High (300-6000ppm)	3450 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29988212, -103.68555116	Yes

ES-Base19-28

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29992016, -103.68554916	Yes

ES-Base19-29

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29995368, -103.68554695	Yes

Daily Site Visit Report

ES-Base19-30

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.29999323, -103.68555018	Yes

ES-Base19-31

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.30002845, -103.68554803	Yes

ES-Base19-32

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.30006239, -103.68554638	Yes

ES-Base19-33

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.30010122, -103.68554367	Yes

Daily Site Visit Report

ES-Base19-34

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.30013430, -103.68554873	Yes

ES-Base19-35

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.30016591, -103.68554854	Yes

ES-Base19-36

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.30019997, -103.68554627	Yes

ES-Base19-37

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.					BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.30023702, -103.68554404	Yes

Daily Site Visit Report

Site Photos

Viewing Direction: North

Spill site.

Viewing Direction: Southeast

Sample area 1-4

Viewing Direction: East

Sample areas 5 & 6.

Viewing Direction: North

Sample areas 7-10

Daily Site Visit Report

Viewing Direction: North	**Viewing Direction**: North
	
Sample areas 11-13.	Sample areas 14 & 15
Viewing Direction: North	**Viewing Direction**: North
	
Sample area 16	Sample area 17 & 18

Daily Site Visit Report

Viewing Direction: South	**Viewing Direction**: North
	
Sample areas 37-19. Blue bucket at sample area 32.	Sample areas 19- 37. Areas marked by white flag with blue marking; new area starts every 10 feet. Blue bucket at sample area 32.

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Sharlene Harvester

Signature: 

ATTACHMENT 5

Natalie Gordon

From: Dennis Williams
Sent: Thursday, October 17, 2019 11:36 AM
To: Natalie Gordon
Subject: FW: Devon Energy - Fluffy Cat 16-21 State Fed Com 212H - RP Yet to Be Assigned - Final Confirmatory Sampling

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From: Dhugal Hanton <DHanton@vertex.ca>
Sent: October 9, 2019 5:15 PM
To: Bratcher, Mike, EMNRD <mike.bratcher@state.nm.us>; Hamlet, Robert, EMNRD <Robert.Hamlet@state.nm.us>; Venegas, Victoria, EMNRD <Victoria.Venegas@state.nm.us>
Cc: Davis, Amanda <amanda.davis@dvn.com>; Bynum, Tom (Contract) <Tom.Bynum@dvn.com>; Dennis Williams <DWilliams@vertex.ca>
Subject: Devon Energy - Fluffy Cat 16-21 State Fed Com 212H - RP Yet to Be Assigned - Final Confirmatory Sampling

Afternoon All,

Please accept this email as 48hr notification that Vertex Resource Services Inc. has scheduled final confirmatory sampling at the above named location on October 11 2019 at 5:00 PM. Austin Harris from Vertex will be on site performing the sampling and can be reached at (432) 250-5003. If you need assistance with directions to site please do not hesitate to contact him. If you have any other questions or concerns, please do not hesitate to contact me.

Cheers,
Dhugal

Dhugal Hanton B.Sc., P.Ag., SR/WA, P.Biol.
Vice President,
US Operations

Vertex Resource Services Inc.
7223 Empire Central Drive,
Houston, TX
77040

O 832-535-1585 Ext. 700
C 832-588-0674

ATTACHMENT 6

Client Name: Devon Energy Production Company
Site Name: Tomcat 16 State 2 Battery
NM OCD Incident Tracking Number: TBD
Project #: 19E-00575-022
Lab Report: 2001730

Table 2. Confirmatory Sampling Laboratory Results - Depth to Groundwater >100 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 (Quantab - High/Low)	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)	(+/-)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
BS 19-01	0	October 15, 2019	-	-	-	<0.025	<0.224	<5.0	12	<48	12	12	180
BS 19-02	0	October 15, 2019	-	-	-	<0.025	<0.225	<5.0	86	210	86	296	170
BS 19-03	0	October 15, 2019	1.3	146	675	<0.025	<0.221	<4.9	14	66	14	80	230
BS 19-04	0	October 15, 2019	-	-	-	<0.025	<0.224	<5.0	13	71	13	84	350
BS 19-05	0	October 15, 2019	-	-	-	<0.025	<0.222	<4.9	<9.6	52	<14.5	52	310
BS 19-06	0	October 15, 2019	-	-	-	<0.025	<0.225	<5.0	<9.9	<49	<14.9	<63.9	120
BS 19-07	0	October 15, 2019	-	-	-	<0.025	<0.225	<5.0	<9.8	<49	<14.8	<63.8	130
BS 19-08	0	October 15, 2019	-	-	-	<0.025	<0.224	<5.0	<9.6	<48	<14.6	<62.6	1,000
BS 19-09	0	October 15, 2019	-	-	-	<0.025	<0.224	<5.0	<9.9	<50	<14.9	<64.9	340
BS 19-10	0	October 15, 2019	-	-	-	<0.025	<0.225	<5.0	21	56	21	77	1,500
BS 19-11	0	October 15, 2019	1.2	78	675	<0.025	<0.222	<4.9	<9.3	<46	<14.2	<60.2	230
BS 19-12	0	October 15, 2019	-	-	-	<0.025	<0.224	<5.0	<8.8	<44	<13.8	<57.8	870
BS 19-13	0	October 15, 2019	-	-	-	<0.025	<0.222	<4.9	<9.2	<46	<14.1	<60.1	550
BS 19-14	0	October 15, 2019	1.3	46	975	<0.025	<0.222	<4.9	<9.8	<49	<14.7	<63.7	130
BS 19-15	0	October 15, 2019	-	-	-	<0.025	<0.222	<4.9	<9.2	<46	<14.1	<60.1	220
BS 19-16	0	October 15, 2019	-	-	-	<0.025	<0.221	<4.9	<9.9	<50	<14.8	<64.8	770
BS 19-17	0	October 15, 2019	-	-	-	<0.025	<0.222	<4.9	<8.5	<43	<13.3	<56.3	810
BS 19-18	0	October 15, 2019	-	-	-	<0.025	<0.224	<5.0	<9.9	<50	<14.9	<64.9	330
BS 19-19	0	October 15, 2019	-	-	-	<0.025	<0.224	<5.0	<9.9	<49	<14.9	<63.9	370
BS 19-20	0	October 15, 2019	-	-	-	<0.025	<0.224	<5.0	<9.2	<46	<14.2	<60.2	1,200
BS 19-21	0	October 15, 2019	1.2	88	3,450	<0.025	<0.225	<5.0	<9.7	<48	<14.7	<62.7	3,000
BS 19-22	0	October 15, 2019	-	-	-	<0.025	<0.222	<4.9	<9.0	<45	<13.9	<58.9	1,700
BS 19-23	0	October 15, 2019	-	-	-	<0.025	<0.224	<5.0	<9.9	<49	<14.9	<63.9	1,800
BS 19-24	0	October 15, 2019	-	-	-	<0.025	<0.221	<4.9	<9.3	<46	<14.2	<60.2	2,600
BS 19-25	0	October 15, 2019	-	-	-	<0.025	<0.224	<5.0	<9.7	<48	<14.7	<62.7	2,100
BS 19-26	0	October 15, 2019	-	-	-	<0.025	<0.225	<5.0	15	60	15	75	4,000
BS 19-27	0	October 15, 2019	2.0	65	3,450	<0.025	<0.224	<5.0	<9.7	<48	<14.7	<62.7	3,400
BS 19-28	0	October 15, 2019	-	-	-	<0.025	<0.225	<5.0	<9.1	<46	<14.1	<60.1	2,300
BS 19-29	0	October 15, 2019	-	-	-	<0.024	<0.220	<4.9	12	<49	12	12	3,200
BS 19-30	0	October 15, 2019	-	-	-	<0.025	<0.225	<5.0	22	54	22	76	3,600
BS 19-31	0	October 15, 2019	-	-	-	<0.025	<0.221	<4.9	12	<47	12	12	2,400
BS 19-32	0	October 15, 2019	-	-	-	<0.025	<0.225	<5.0	13	<48	13	13	2,300
BS 19-33	0	October 15, 2019	-	-	-	<0.025	<0.225	<5.0	11	<48	11	11	3,600
BS 19-34	0	October 15, 2019	-	-	-	<0.025	<0.224	<5.0	<9.8	<49	<14.8	<63.8	2,300
BS 19-35	0	October 15, 2019	-	-	-	<0.025	<0.221	<4.9	<10	<50	<14.9	<64.9	1,600
BS 19-36	0	October 15, 2019	-	-	-	<0.024	<0.220	<4.9	<9.7	<48	<14.6	<62.6	1,400
BS 19-37	0	October 15, 2019	-	-	-	<0.024	<0.220	<4.9	<9.8	<49	<14.7	<63.7	990
BG 19-01	0	October 15, 2019	-	-	-	<0.025	<0.225	<5.0	<8.6	<43	<13.6	<56.6	<60

"-" - Not applicable/assessed

Bold and shaded indicates exceedance outside of applied action level

VERTEX

ATTACHMENT 7

Analytical Report
Lab Order **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-01 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 10:00:00 AM
Lab ID: 1910977-001 **Matrix:** SOIL **Received Date:** 10/17/2019 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)	12	9.6		mg/Kg	1	10/22/2019 1:13:16 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/22/2019 1:13:16 PM
Surr: DNOP	63.3	70-130	S	%Rec	1	10/22/2019 1:13:16 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/19/2019 12:58:35 AM
Surr: BFB	92.8	77.4-118		%Rec	1	10/19/2019 12:58:35 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 12:58:35 AM
Toluene	ND	0.050		mg/Kg	1	10/19/2019 12:58:35 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/19/2019 12:58:35 AM
Xylenes, Total	ND	0.099		mg/Kg	1	10/19/2019 12:58:35 AM
Surr: 4-Bromofluorobenzene	95.0	80-120		%Rec	1	10/19/2019 12:58:35 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	180	61		mg/Kg	20	10/21/2019 8:19:57 PM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-02 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 10:10:00 AM
Lab ID: 1910977-002 **Matrix:** SOIL **Received Date:** 10/17/2019 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)	86	9.7		mg/Kg	1	10/21/2019 8:50:48 PM
Motor Oil Range Organics (MRO)	210	49		mg/Kg	1	10/21/2019 8:50:48 PM
Surr: DNOP	95.3	70-130		%Rec	1	10/21/2019 8:50:48 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/19/2019 2:09:30 AM
Surr: BFB	96.5	77.4-118		%Rec	1	10/19/2019 2:09:30 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 2:09:30 AM
Toluene	ND	0.050		mg/Kg	1	10/19/2019 2:09:30 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/19/2019 2:09:30 AM
Xylenes, Total	ND	0.10		mg/Kg	1	10/19/2019 2:09:30 AM
Surr: 4-Bromofluorobenzene	98.9	80-120		%Rec	1	10/19/2019 2:09:30 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	170	59		mg/Kg	20	10/21/2019 8:32:18 PM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-03 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 10:20:00 AM
Lab ID: 1910977-003 **Matrix:** SOIL **Received Date:** 10/17/2019 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)	14	9.6		mg/Kg	1	10/21/2019 9:56:37 PM
Motor Oil Range Organics (MRO)	66	48		mg/Kg	1	10/21/2019 9:56:37 PM
Surr: DNOP	68.7	70-130	S	%Rec	1	10/21/2019 9:56:37 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/19/2019 3:20:35 AM
Surr: BFB	88.6	77.4-118		%Rec	1	10/19/2019 3:20:35 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 3:20:35 AM
Toluene	ND	0.049		mg/Kg	1	10/19/2019 3:20:35 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/19/2019 3:20:35 AM
Xylenes, Total	ND	0.098		mg/Kg	1	10/19/2019 3:20:35 AM
Surr: 4-Bromofluorobenzene	92.0	80-120		%Rec	1	10/19/2019 3:20:35 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	230	60		mg/Kg	20	10/21/2019 8:44:39 PM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-04 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 10:30:00 AM
Lab ID: 1910977-004 **Matrix:** SOIL **Received Date:** 10/17/2019 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)	13	9.7		mg/Kg	1	10/21/2019 10:18:37 PM
Motor Oil Range Organics (MRO)	71	49		mg/Kg	1	10/21/2019 10:18:37 PM
Surr: DNOP	72.5	70-130		%Rec	1	10/21/2019 10:18:37 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/19/2019 3:44:13 AM
Surr: BFB	97.2	77.4-118		%Rec	1	10/19/2019 3:44:13 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 3:44:13 AM
Toluene	ND	0.050		mg/Kg	1	10/19/2019 3:44:13 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/19/2019 3:44:13 AM
Xylenes, Total	ND	0.099		mg/Kg	1	10/19/2019 3:44:13 AM
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	10/19/2019 3:44:13 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	350	60		mg/Kg	20	10/21/2019 8:56:59 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-05 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 10:40:00 AM
Lab ID: 1910977-005 **Matrix:** SOIL **Received Date:** 10/17/2019 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	10/21/2019 10:40:29 PM
Motor Oil Range Organics (MRO)	52	48		mg/Kg	1	10/21/2019 10:40:29 PM
Surr: DNOP	74.4	70-130		%Rec	1	10/21/2019 10:40:29 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/19/2019 4:07:50 AM
Surr: BFB	93.0	77.4-118		%Rec	1	10/19/2019 4:07:50 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 4:07:50 AM
Toluene	ND	0.049		mg/Kg	1	10/19/2019 4:07:50 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/19/2019 4:07:50 AM
Xylenes, Total	ND	0.099		mg/Kg	1	10/19/2019 4:07:50 AM
Surr: 4-Bromofluorobenzene	96.3	80-120		%Rec	1	10/19/2019 4:07:50 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	310	60		mg/Kg	20	10/21/2019 11:49:45 PM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-06 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 10:50:00 AM
Lab ID: 1910977-006 **Matrix:** SOIL **Received Date:** 10/17/2019 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	10/21/2019 11:02:29 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/21/2019 11:02:29 PM
Surr: DNOP	72.8	70-130		%Rec	1	10/21/2019 11:02:29 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/19/2019 4:31:25 AM
Surr: BFB	94.3	77.4-118		%Rec	1	10/19/2019 4:31:25 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 4:31:25 AM
Toluene	ND	0.050		mg/Kg	1	10/19/2019 4:31:25 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/19/2019 4:31:25 AM
Xylenes, Total	ND	0.10		mg/Kg	1	10/19/2019 4:31:25 AM
Surr: 4-Bromofluorobenzene	98.1	80-120		%Rec	1	10/19/2019 4:31:25 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	120	60		mg/Kg	20	10/22/2019 12:26:47 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-07 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 11:00:00 AM
Lab ID: 1910977-007 **Matrix:** SOIL **Received Date:** 10/17/2019 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	9.8		mg/Kg	1	10/21/2019 11:24:19 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/21/2019 11:24:19 PM
Surr: DNOP	78.3	70-130		%Rec	1	10/21/2019 11:24:19 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/19/2019 4:54:55 AM
Surr: BFB	89.4	77.4-118		%Rec	1	10/19/2019 4:54:55 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 4:54:55 AM
Toluene	ND	0.050		mg/Kg	1	10/19/2019 4:54:55 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/19/2019 4:54:55 AM
Xylenes, Total	ND	0.10		mg/Kg	1	10/19/2019 4:54:55 AM
Surr: 4-Bromofluorobenzene	91.8	80-120		%Rec	1	10/19/2019 4:54:55 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	130	60		mg/Kg	20	10/22/2019 1:28:28 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-08 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 11:10:00 AM
Lab ID: 1910977-008 **Matrix:** SOIL **Received Date:** 10/17/2019 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	10/21/2019 11:46:15 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/21/2019 11:46:15 PM
Surr: DNOP	80.3	70-130		%Rec	1	10/21/2019 11:46:15 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/19/2019 5:18:27 AM
Surr: BFB	94.4	77.4-118		%Rec	1	10/19/2019 5:18:27 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 5:18:27 AM
Toluene	ND	0.050		mg/Kg	1	10/19/2019 5:18:27 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/19/2019 5:18:27 AM
Xylenes, Total	ND	0.099		mg/Kg	1	10/19/2019 5:18:27 AM
Surr: 4-Bromofluorobenzene	98.7	80-120		%Rec	1	10/19/2019 5:18:27 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	1000	60		mg/Kg	20	10/22/2019 1:40:48 AM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-09 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 11:20:00 AM
Lab ID: 1910977-009 **Matrix:** SOIL **Received Date:** 10/17/2019 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	10/22/2019 12:08:04 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	10/22/2019 12:08:04 AM
Surr: DNOP	77.3	70-130		%Rec	1	10/22/2019 12:08:04 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/19/2019 5:42:00 AM
Surr: BFB	89.3	77.4-118		%Rec	1	10/19/2019 5:42:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 5:42:00 AM
Toluene	ND	0.050		mg/Kg	1	10/19/2019 5:42:00 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/19/2019 5:42:00 AM
Xylenes, Total	ND	0.099		mg/Kg	1	10/19/2019 5:42:00 AM
Surr: 4-Bromofluorobenzene	92.5	80-120		%Rec	1	10/19/2019 5:42:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	340	60		mg/Kg	20	10/22/2019 1:53:09 AM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-10 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 11:30:00 AM
Lab ID: 1910977-010 **Matrix:** SOIL **Received Date:** 10/17/2019 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)	21	9.1		mg/Kg	1	10/22/2019 12:30:01 AM
Motor Oil Range Organics (MRO)	56	45		mg/Kg	1	10/22/2019 12:30:01 AM
Surr: DNOP	74.9	70-130		%Rec	1	10/22/2019 12:30:01 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/19/2019 6:05:28 AM
Surr: BFB	88.3	77.4-118		%Rec	1	10/19/2019 6:05:28 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 6:05:28 AM
Toluene	ND	0.050		mg/Kg	1	10/19/2019 6:05:28 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/19/2019 6:05:28 AM
Xylenes, Total	ND	0.10		mg/Kg	1	10/19/2019 6:05:28 AM
Surr: 4-Bromofluorobenzene	91.3	80-120		%Rec	1	10/19/2019 6:05:28 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	1500	60		mg/Kg	20	10/22/2019 2:05:29 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-11 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 11:40:00 AM
Lab ID: 1910977-011 **Matrix:** SOIL **Received Date:** 10/17/2019 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	10/22/2019 12:51:47 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/22/2019 12:51:47 AM
Surr: DNOP	77.2	70-130		%Rec	1	10/22/2019 12:51:47 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/19/2019 8:02:40 AM
Surr: BFB	90.6	77.4-118		%Rec	1	10/19/2019 8:02:40 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 8:02:40 AM
Toluene	ND	0.049		mg/Kg	1	10/19/2019 8:02:40 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/19/2019 8:02:40 AM
Xylenes, Total	ND	0.099		mg/Kg	1	10/19/2019 8:02:40 AM
Surr: 4-Bromofluorobenzene	93.6	80-120		%Rec	1	10/19/2019 8:02:40 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	230	60		mg/Kg	20	10/22/2019 2:17:50 AM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-12 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 11:50:00 AM
Lab ID: 1910977-012 **Matrix:** SOIL **Received Date:** 10/17/2019 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	8.8		mg/Kg	1	10/22/2019 1:13:52 AM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	10/22/2019 1:13:52 AM
Surr: DNOP	77.0	70-130		%Rec	1	10/22/2019 1:13:52 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/19/2019 8:26:06 AM
Surr: BFB	89.3	77.4-118		%Rec	1	10/19/2019 8:26:06 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 8:26:06 AM
Toluene	ND	0.050		mg/Kg	1	10/19/2019 8:26:06 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/19/2019 8:26:06 AM
Xylenes, Total	ND	0.099		mg/Kg	1	10/19/2019 8:26:06 AM
Surr: 4-Bromofluorobenzene	93.7	80-120		%Rec	1	10/19/2019 8:26:06 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	870	60		mg/Kg	20	10/22/2019 2:30:10 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-13 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 12:00:00 PM
Lab ID: 1910977-013 **Matrix:** SOIL **Received Date:** 10/17/2019 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	10/22/2019 1:35:48 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/22/2019 1:35:48 AM
Surr: DNOP	82.4	70-130		%Rec	1	10/22/2019 1:35:48 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/19/2019 8:49:36 AM
Surr: BFB	87.4	77.4-118		%Rec	1	10/19/2019 8:49:36 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 8:49:36 AM
Toluene	ND	0.049		mg/Kg	1	10/19/2019 8:49:36 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/19/2019 8:49:36 AM
Xylenes, Total	ND	0.099		mg/Kg	1	10/19/2019 8:49:36 AM
Surr: 4-Bromofluorobenzene	90.6	80-120		%Rec	1	10/19/2019 8:49:36 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	550	60		mg/Kg	20	10/22/2019 2:42:31 AM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-14 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 12:10:00 PM
Lab ID: 1910977-014 **Matrix:** SOIL **Received Date:** 10/17/2019 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	9.8		mg/Kg	1	10/22/2019 1:57:34 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/22/2019 1:57:34 AM
Surr: DNOP	82.5	70-130		%Rec	1	10/22/2019 1:57:34 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/19/2019 9:13:06 AM
Surr: BFB	92.1	77.4-118		%Rec	1	10/19/2019 9:13:06 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 9:13:06 AM
Toluene	ND	0.049		mg/Kg	1	10/19/2019 9:13:06 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/19/2019 9:13:06 AM
Xylenes, Total	ND	0.099		mg/Kg	1	10/19/2019 9:13:06 AM
Surr: 4-Bromofluorobenzene	95.2	80-120		%Rec	1	10/19/2019 9:13:06 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	130	60		mg/Kg	20	10/22/2019 2:54:51 AM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-15 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 12:20:00 PM
Lab ID: 1910977-015 **Matrix:** SOIL **Received Date:** 10/17/2019 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	10/22/2019 2:19:21 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/22/2019 2:19:21 AM
Surr: DNOP	87.9	70-130		%Rec	1	10/22/2019 2:19:21 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/19/2019 9:36:40 AM
Surr: BFB	92.7	77.4-118		%Rec	1	10/19/2019 9:36:40 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 9:36:40 AM
Toluene	ND	0.049		mg/Kg	1	10/19/2019 9:36:40 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/19/2019 9:36:40 AM
Xylenes, Total	ND	0.099		mg/Kg	1	10/19/2019 9:36:40 AM
Surr: 4-Bromofluorobenzene	96.6	80-120		%Rec	1	10/19/2019 9:36:40 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	220	60		mg/Kg	20	10/22/2019 3:31:52 AM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-16 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 12:30:00 PM
Lab ID: 1910977-016 **Matrix:** SOIL **Received Date:** 10/17/2019 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	10/22/2019 3:03:02 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	10/22/2019 3:03:02 AM
Surr: DNOP	84.2	70-130		%Rec	1	10/22/2019 3:03:02 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/19/2019 10:00:05 AM
Surr: BFB	90.4	77.4-118		%Rec	1	10/19/2019 10:00:05 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 10:00:05 AM
Toluene	ND	0.049		mg/Kg	1	10/19/2019 10:00:05 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/19/2019 10:00:05 AM
Xylenes, Total	ND	0.098		mg/Kg	1	10/19/2019 10:00:05 AM
Surr: 4-Bromofluorobenzene	94.0	80-120		%Rec	1	10/19/2019 10:00:05 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	770	60		mg/Kg	20	10/22/2019 3:44:13 AM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-17 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 12:40:00 PM
Lab ID: 1910977-017 **Matrix:** SOIL **Received Date:** 10/17/2019 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	8.5		mg/Kg	1	10/22/2019 3:24:56 AM
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	10/22/2019 3:24:56 AM
Surr: DNOP	85.8	70-130		%Rec	1	10/22/2019 3:24:56 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/19/2019 10:23:40 AM
Surr: BFB	93.7	77.4-118		%Rec	1	10/19/2019 10:23:40 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 10:23:40 AM
Toluene	ND	0.049		mg/Kg	1	10/19/2019 10:23:40 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/19/2019 10:23:40 AM
Xylenes, Total	ND	0.099		mg/Kg	1	10/19/2019 10:23:40 AM
Surr: 4-Bromofluorobenzene	97.7	80-120		%Rec	1	10/19/2019 10:23:40 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	810	60		mg/Kg	20	10/22/2019 3:56:33 AM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-18 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 12:50:00 PM
Lab ID: 1910977-018 **Matrix:** SOIL **Received Date:** 10/17/2019 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	10/22/2019 3:46:42 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	10/22/2019 3:46:42 AM
Surr: DNOP	84.2	70-130		%Rec	1	10/22/2019 3:46:42 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/19/2019 10:47:10 AM
Surr: BFB	89.1	77.4-118		%Rec	1	10/19/2019 10:47:10 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 10:47:10 AM
Toluene	ND	0.050		mg/Kg	1	10/19/2019 10:47:10 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/19/2019 10:47:10 AM
Xylenes, Total	ND	0.099		mg/Kg	1	10/19/2019 10:47:10 AM
Surr: 4-Bromofluorobenzene	93.8	80-120		%Rec	1	10/19/2019 10:47:10 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	330	60		mg/Kg	20	10/22/2019 4:08:53 AM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-19 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 2:30:00 PM
Lab ID: 1910977-019 **Matrix:** SOIL **Received Date:** 10/17/2019 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	10/22/2019 4:08:39 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/22/2019 4:08:39 AM
Surr: DNOP	83.0	70-130		%Rec	1	10/22/2019 4:08:39 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/19/2019 11:10:39 AM
Surr: BFB	89.6	77.4-118		%Rec	1	10/19/2019 11:10:39 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 11:10:39 AM
Toluene	ND	0.050		mg/Kg	1	10/19/2019 11:10:39 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/19/2019 11:10:39 AM
Xylenes, Total	ND	0.099		mg/Kg	1	10/19/2019 11:10:39 AM
Surr: 4-Bromofluorobenzene	93.3	80-120		%Rec	1	10/19/2019 11:10:39 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	370	60		mg/Kg	20	10/22/2019 4:21:13 AM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-20 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 2:40:00 PM
Lab ID: 1910977-020 **Matrix:** SOIL **Received Date:** 10/17/2019 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	10/22/2019 4:30:24 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/22/2019 4:30:24 AM
Surr: DNOP	82.0	70-130		%Rec	1	10/22/2019 4:30:24 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/19/2019 11:34:00 AM
Surr: BFB	88.2	77.4-118		%Rec	1	10/19/2019 11:34:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 11:34:00 AM
Toluene	ND	0.050		mg/Kg	1	10/19/2019 11:34:00 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/19/2019 11:34:00 AM
Xylenes, Total	ND	0.099		mg/Kg	1	10/19/2019 11:34:00 AM
Surr: 4-Bromofluorobenzene	92.0	80-120		%Rec	1	10/19/2019 11:34:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	1200	59		mg/Kg	20	10/22/2019 4:33:33 AM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-21 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 2:50:00 PM
Lab ID: 1910977-021 **Matrix:** SOIL **Received Date:** 10/17/2019 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	9.7		mg/Kg	1	10/22/2019 4:52:28 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/22/2019 4:52:28 AM
Surr: DNOP	71.0	70-130		%Rec	1	10/22/2019 4:52:28 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	3000	150		mg/Kg	50	10/22/2019 10:56:30 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.025		mg/Kg	1	10/18/2019 3:36:42 PM
Toluene	ND	0.050		mg/Kg	1	10/18/2019 3:36:42 PM
Ethylbenzene	ND	0.050		mg/Kg	1	10/18/2019 3:36:42 PM
Xylenes, Total	ND	0.10		mg/Kg	1	10/18/2019 3:36:42 PM
Surr: 1,2-Dichloroethane-d4	99.9	70-130		%Rec	1	10/18/2019 3:36:42 PM
Surr: 4-Bromofluorobenzene	86.1	70-130		%Rec	1	10/18/2019 3:36:42 PM
Surr: Dibromofluoromethane	99.5	70-130		%Rec	1	10/18/2019 3:36:42 PM
Surr: Toluene-d8	98.6	70-130		%Rec	1	10/18/2019 3:36:42 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/18/2019 3:36:42 PM
Surr: BFB	88.3	70-130		%Rec	1	10/18/2019 3:36:42 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-22 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 3:00:00 PM
Lab ID: 1910977-022 **Matrix:** SOIL **Received Date:** 10/17/2019 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	9.0		mg/Kg	1	10/22/2019 5:58:34 AM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	10/22/2019 5:58:34 AM
Surr: DNOP	62.9	70-130	S	%Rec	1	10/22/2019 5:58:34 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	1700	60		mg/Kg	20	10/22/2019 4:58:14 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.025		mg/Kg	1	10/18/2019 5:04:32 PM
Toluene	ND	0.049		mg/Kg	1	10/18/2019 5:04:32 PM
Ethylbenzene	ND	0.049		mg/Kg	1	10/18/2019 5:04:32 PM
Xylenes, Total	ND	0.099		mg/Kg	1	10/18/2019 5:04:32 PM
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	10/18/2019 5:04:32 PM
Surr: 4-Bromofluorobenzene	83.9	70-130		%Rec	1	10/18/2019 5:04:32 PM
Surr: Dibromofluoromethane	103	70-130		%Rec	1	10/18/2019 5:04:32 PM
Surr: Toluene-d8	97.0	70-130		%Rec	1	10/18/2019 5:04:32 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/18/2019 5:04:32 PM
Surr: BFB	85.0	70-130		%Rec	1	10/18/2019 5:04:32 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-23 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 3:10:00 PM
Lab ID: 1910977-023 **Matrix:** SOIL **Received Date:** 10/17/2019 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	10/22/2019 6:20:38 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/22/2019 6:20:38 AM
Surr: DNOP	64.0	70-130	S	%Rec	1	10/22/2019 6:20:38 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	1800	60		mg/Kg	20	10/22/2019 5:10:34 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.025		mg/Kg	1	10/18/2019 6:31:02 PM
Toluene	ND	0.050		mg/Kg	1	10/18/2019 6:31:02 PM
Ethylbenzene	ND	0.050		mg/Kg	1	10/18/2019 6:31:02 PM
Xylenes, Total	ND	0.099		mg/Kg	1	10/18/2019 6:31:02 PM
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	10/18/2019 6:31:02 PM
Surr: 4-Bromofluorobenzene	84.1	70-130		%Rec	1	10/18/2019 6:31:02 PM
Surr: Dibromofluoromethane	102	70-130		%Rec	1	10/18/2019 6:31:02 PM
Surr: Toluene-d8	97.6	70-130		%Rec	1	10/18/2019 6:31:02 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/18/2019 6:31:02 PM
Surr: BFB	83.8	70-130		%Rec	1	10/18/2019 6:31:02 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-24 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 3:20:00 PM
Lab ID: 1910977-024 **Matrix:** SOIL **Received Date:** 10/17/2019 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	10/22/2019 6:42:37 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/22/2019 6:42:37 AM
Surr: DNOP	67.5	70-130	S	%Rec	1	10/22/2019 6:42:37 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	2600	150		mg/Kg	50	10/22/2019 11:08:54 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.025		mg/Kg	1	10/18/2019 7:00:26 PM
Toluene	ND	0.049		mg/Kg	1	10/18/2019 7:00:26 PM
Ethylbenzene	ND	0.049		mg/Kg	1	10/18/2019 7:00:26 PM
Xylenes, Total	ND	0.098		mg/Kg	1	10/18/2019 7:00:26 PM
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	10/18/2019 7:00:26 PM
Surr: 4-Bromofluorobenzene	83.9	70-130		%Rec	1	10/18/2019 7:00:26 PM
Surr: Dibromofluoromethane	104	70-130		%Rec	1	10/18/2019 7:00:26 PM
Surr: Toluene-d8	97.3	70-130		%Rec	1	10/18/2019 7:00:26 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/18/2019 7:00:26 PM
Surr: BFB	87.2	70-130		%Rec	1	10/18/2019 7:00:26 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-25 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 3:20:00 PM
Lab ID: 1910977-025 **Matrix:** SOIL **Received Date:** 10/17/2019 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	9.7		mg/Kg	1	10/22/2019 7:26:45 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/22/2019 7:26:45 AM
Surr: DNOP	68.1	70-130	S	%Rec	1	10/22/2019 7:26:45 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	2100	60		mg/Kg	20	10/22/2019 4:56:39 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.025		mg/Kg	1	10/18/2019 7:29:17 PM
Toluene	ND	0.050		mg/Kg	1	10/18/2019 7:29:17 PM
Ethylbenzene	ND	0.050		mg/Kg	1	10/18/2019 7:29:17 PM
Xylenes, Total	ND	0.099		mg/Kg	1	10/18/2019 7:29:17 PM
Surr: 1,2-Dichloroethane-d4	98.8	70-130		%Rec	1	10/18/2019 7:29:17 PM
Surr: 4-Bromofluorobenzene	85.2	70-130		%Rec	1	10/18/2019 7:29:17 PM
Surr: Dibromofluoromethane	100	70-130		%Rec	1	10/18/2019 7:29:17 PM
Surr: Toluene-d8	96.9	70-130		%Rec	1	10/18/2019 7:29:17 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/18/2019 7:29:17 PM
Surr: BFB	87.7	70-130		%Rec	1	10/18/2019 7:29:17 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-26 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 3:30:00 PM
Lab ID: 1910977-026 **Matrix:** SOIL **Received Date:** 10/17/2019 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)	15	9.8		mg/Kg	1	10/22/2019 7:48:56 AM
Motor Oil Range Organics (MRO)	60	49		mg/Kg	1	10/22/2019 7:48:56 AM
Surr: DNOP	76.1	70-130		%Rec	1	10/22/2019 7:48:56 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	4000	150		mg/Kg	50	10/23/2019 11:52:25 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.025		mg/Kg	1	10/18/2019 7:58:05 PM
Toluene	ND	0.050		mg/Kg	1	10/18/2019 7:58:05 PM
Ethylbenzene	ND	0.050		mg/Kg	1	10/18/2019 7:58:05 PM
Xylenes, Total	ND	0.10		mg/Kg	1	10/18/2019 7:58:05 PM
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	10/18/2019 7:58:05 PM
Surr: 4-Bromofluorobenzene	84.2	70-130		%Rec	1	10/18/2019 7:58:05 PM
Surr: Dibromofluoromethane	105	70-130		%Rec	1	10/18/2019 7:58:05 PM
Surr: Toluene-d8	99.6	70-130		%Rec	1	10/18/2019 7:58:05 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/18/2019 7:58:05 PM
Surr: BFB	89.1	70-130		%Rec	1	10/18/2019 7:58:05 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-27 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 3:40:00 PM
Lab ID: 1910977-027 **Matrix:** SOIL **Received Date:** 10/17/2019 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	9.7		mg/Kg	1	10/22/2019 8:10:59 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/22/2019 8:10:59 AM
Surr: DNOP	67.4	70-130	S	%Rec	1	10/22/2019 8:10:59 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	3400	150		mg/Kg	50	10/24/2019 12:04:50 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.025		mg/Kg	1	10/18/2019 8:27:22 PM
Toluene	ND	0.050		mg/Kg	1	10/18/2019 8:27:22 PM
Ethylbenzene	ND	0.050		mg/Kg	1	10/18/2019 8:27:22 PM
Xylenes, Total	ND	0.099		mg/Kg	1	10/18/2019 8:27:22 PM
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	10/18/2019 8:27:22 PM
Surr: 4-Bromofluorobenzene	84.2	70-130		%Rec	1	10/18/2019 8:27:22 PM
Surr: Dibromofluoromethane	105	70-130		%Rec	1	10/18/2019 8:27:22 PM
Surr: Toluene-d8	95.4	70-130		%Rec	1	10/18/2019 8:27:22 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/18/2019 8:27:22 PM
Surr: BFB	88.1	70-130		%Rec	1	10/18/2019 8:27:22 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-28 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 3:50:00 PM
Lab ID: 1910977-028 **Matrix:** SOIL **Received Date:** 10/17/2019 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	9.1		mg/Kg	1	10/22/2019 8:33:03 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/22/2019 8:33:03 AM
Surr: DNOP	65.6	70-130	S	%Rec	1	10/22/2019 8:33:03 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	2300	60		mg/Kg	20	10/22/2019 5:58:42 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.025		mg/Kg	1	10/18/2019 8:56:03 PM
Toluene	ND	0.050		mg/Kg	1	10/18/2019 8:56:03 PM
Ethylbenzene	ND	0.050		mg/Kg	1	10/18/2019 8:56:03 PM
Xylenes, Total	ND	0.10		mg/Kg	1	10/18/2019 8:56:03 PM
Surr: 1,2-Dichloroethane-d4	95.1	70-130		%Rec	1	10/18/2019 8:56:03 PM
Surr: 4-Bromofluorobenzene	86.3	70-130		%Rec	1	10/18/2019 8:56:03 PM
Surr: Dibromofluoromethane	99.4	70-130		%Rec	1	10/18/2019 8:56:03 PM
Surr: Toluene-d8	97.7	70-130		%Rec	1	10/18/2019 8:56:03 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/18/2019 8:56:03 PM
Surr: BFB	85.4	70-130		%Rec	1	10/18/2019 8:56:03 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-29 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 4:00:00 PM
Lab ID: 1910977-029 **Matrix:** SOIL **Received Date:** 10/17/2019 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)	12	9.8		mg/Kg	1	10/22/2019 8:54:56 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/22/2019 8:54:56 AM
Surr: DNOP	65.5	70-130	S	%Rec	1	10/22/2019 8:54:56 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	3200	150		mg/Kg	50	10/24/2019 12:17:14 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.024		mg/Kg	1	10/18/2019 11:22:44 PM
Toluene	ND	0.049		mg/Kg	1	10/18/2019 11:22:44 PM
Ethylbenzene	ND	0.049		mg/Kg	1	10/18/2019 11:22:44 PM
Xylenes, Total	ND	0.098		mg/Kg	1	10/18/2019 11:22:44 PM
Surr: 1,2-Dichloroethane-d4	100	70-130		%Rec	1	10/18/2019 11:22:44 PM
Surr: 4-Bromofluorobenzene	85.0	70-130		%Rec	1	10/18/2019 11:22:44 PM
Surr: Dibromofluoromethane	105	70-130		%Rec	1	10/18/2019 11:22:44 PM
Surr: Toluene-d8	100	70-130		%Rec	1	10/18/2019 11:22:44 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/18/2019 11:22:44 PM
Surr: BFB	89.5	70-130		%Rec	1	10/18/2019 11:22:44 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-30 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 4:10:00 PM
Lab ID: 1910977-030 **Matrix:** SOIL **Received Date:** 10/17/2019 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)	22	9.7		mg/Kg	1	10/22/2019 9:17:01 AM
Motor Oil Range Organics (MRO)	54	49		mg/Kg	1	10/22/2019 9:17:01 AM
Surr: DNOP	70.3	70-130		%Rec	1	10/22/2019 9:17:01 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	3600	150		mg/Kg	50	10/24/2019 12:29:38 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.025		mg/Kg	1	10/18/2019 11:52:13 PM
Toluene	ND	0.050		mg/Kg	1	10/18/2019 11:52:13 PM
Ethylbenzene	ND	0.050		mg/Kg	1	10/18/2019 11:52:13 PM
Xylenes, Total	ND	0.10		mg/Kg	1	10/18/2019 11:52:13 PM
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	10/18/2019 11:52:13 PM
Surr: 4-Bromofluorobenzene	80.9	70-130		%Rec	1	10/18/2019 11:52:13 PM
Surr: Dibromofluoromethane	103	70-130		%Rec	1	10/18/2019 11:52:13 PM
Surr: Toluene-d8	102	70-130		%Rec	1	10/18/2019 11:52:13 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/18/2019 11:52:13 PM
Surr: BFB	84.6	70-130		%Rec	1	10/18/2019 11:52:13 PM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-31 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 4:15:00 PM
Lab ID: 1910977-031 **Matrix:** SOIL **Received Date:** 10/17/2019 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)	12	9.5		mg/Kg	1	10/22/2019 9:39:04 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/22/2019 9:39:04 AM
Surr: DNOP	70.5	70-130		%Rec	1	10/22/2019 9:39:04 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	2400	150		mg/Kg	50	10/24/2019 12:42:03 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 12:21:26 AM
Toluene	ND	0.049		mg/Kg	1	10/19/2019 12:21:26 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/19/2019 12:21:26 AM
Xylenes, Total	ND	0.098		mg/Kg	1	10/19/2019 12:21:26 AM
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	10/19/2019 12:21:26 AM
Surr: 4-Bromofluorobenzene	84.6	70-130		%Rec	1	10/19/2019 12:21:26 AM
Surr: Dibromofluoromethane	105	70-130		%Rec	1	10/19/2019 12:21:26 AM
Surr: Toluene-d8	101	70-130		%Rec	1	10/19/2019 12:21:26 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/19/2019 12:21:26 AM
Surr: BFB	88.7	70-130		%Rec	1	10/19/2019 12:21:26 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-32 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 4:20:00 PM
Lab ID: 1910977-032 **Matrix:** SOIL **Received Date:** 10/17/2019 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)	13	9.6		mg/Kg	1	10/22/2019 10:00:54 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/22/2019 10:00:54 AM
Surr: DNOP	77.2	70-130		%Rec	1	10/22/2019 10:00:54 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	2300	60		mg/Kg	20	10/22/2019 6:48:20 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 12:50:51 AM
Toluene	ND	0.050		mg/Kg	1	10/19/2019 12:50:51 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/19/2019 12:50:51 AM
Xylenes, Total	ND	0.10		mg/Kg	1	10/19/2019 12:50:51 AM
Surr: 1,2-Dichloroethane-d4	107	70-130		%Rec	1	10/19/2019 12:50:51 AM
Surr: 4-Bromofluorobenzene	84.0	70-130		%Rec	1	10/19/2019 12:50:51 AM
Surr: Dibromofluoromethane	107	70-130		%Rec	1	10/19/2019 12:50:51 AM
Surr: Toluene-d8	100	70-130		%Rec	1	10/19/2019 12:50:51 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/19/2019 12:50:51 AM
Surr: BFB	87.4	70-130		%Rec	1	10/19/2019 12:50:51 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-33 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 4:25:00 PM
Lab ID: 1910977-033 **Matrix:** SOIL **Received Date:** 10/17/2019 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)	11	9.7		mg/Kg	1	10/22/2019 10:22:52 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/22/2019 10:22:52 AM
Surr: DNOP	74.7	70-130		%Rec	1	10/22/2019 10:22:52 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	3600	150		mg/Kg	50	10/24/2019 12:54:28 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 1:19:47 AM
Toluene	ND	0.050		mg/Kg	1	10/19/2019 1:19:47 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/19/2019 1:19:47 AM
Xylenes, Total	ND	0.10		mg/Kg	1	10/19/2019 1:19:47 AM
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	10/19/2019 1:19:47 AM
Surr: 4-Bromofluorobenzene	88.4	70-130		%Rec	1	10/19/2019 1:19:47 AM
Surr: Dibromofluoromethane	106	70-130		%Rec	1	10/19/2019 1:19:47 AM
Surr: Toluene-d8	103	70-130		%Rec	1	10/19/2019 1:19:47 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/19/2019 1:19:47 AM
Surr: BFB	91.0	70-130		%Rec	1	10/19/2019 1:19:47 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-34 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 4:30:00 PM
Lab ID: 1910977-034 **Matrix:** SOIL **Received Date:** 10/17/2019 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	9.8		mg/Kg	1	10/22/2019 10:44:53 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/22/2019 10:44:53 AM
Surr: DNOP	67.3	70-130	S	%Rec	1	10/22/2019 10:44:53 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	2300	60		mg/Kg	20	10/22/2019 7:13:09 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 1:49:08 AM
Toluene	ND	0.050		mg/Kg	1	10/19/2019 1:49:08 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/19/2019 1:49:08 AM
Xylenes, Total	ND	0.099		mg/Kg	1	10/19/2019 1:49:08 AM
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	10/19/2019 1:49:08 AM
Surr: 4-Bromofluorobenzene	87.6	70-130		%Rec	1	10/19/2019 1:49:08 AM
Surr: Dibromofluoromethane	109	70-130		%Rec	1	10/19/2019 1:49:08 AM
Surr: Toluene-d8	103	70-130		%Rec	1	10/19/2019 1:49:08 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/19/2019 1:49:08 AM
Surr: BFB	91.8	70-130		%Rec	1	10/19/2019 1:49:08 AM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-35 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 4:40:00 PM
Lab ID: 1910977-035 **Matrix:** SOIL **Received Date:** 10/17/2019 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	10		mg/Kg	1	10/22/2019 11:06:43 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	10/22/2019 11:06:43 AM
Surr: DNOP	72.7	70-130		%Rec	1	10/22/2019 11:06:43 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	1600	60		mg/Kg	20	10/22/2019 7:25:34 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 2:18:28 AM
Toluene	ND	0.049		mg/Kg	1	10/19/2019 2:18:28 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/19/2019 2:18:28 AM
Xylenes, Total	ND	0.098		mg/Kg	1	10/19/2019 2:18:28 AM
Surr: 1,2-Dichloroethane-d4	107	70-130		%Rec	1	10/19/2019 2:18:28 AM
Surr: 4-Bromofluorobenzene	85.7	70-130		%Rec	1	10/19/2019 2:18:28 AM
Surr: Dibromofluoromethane	105	70-130		%Rec	1	10/19/2019 2:18:28 AM
Surr: Toluene-d8	102	70-130		%Rec	1	10/19/2019 2:18:28 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/19/2019 2:18:28 AM
Surr: BFB	90.8	70-130		%Rec	1	10/19/2019 2:18:28 AM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-36 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 4:50:00 PM
Lab ID: 1910977-036 **Matrix:** SOIL **Received Date:** 10/17/2019 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	9.7		mg/Kg	1	10/22/2019 11:28:48 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	10/22/2019 11:28:48 AM
Surr: DNOP	60.7	70-130	S	%Rec	1	10/22/2019 11:28:48 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	1400	60		mg/Kg	20	10/22/2019 8:02:48 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.024		mg/Kg	1	10/19/2019 2:47:45 AM
Toluene	ND	0.049		mg/Kg	1	10/19/2019 2:47:45 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/19/2019 2:47:45 AM
Xylenes, Total	ND	0.098		mg/Kg	1	10/19/2019 2:47:45 AM
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	10/19/2019 2:47:45 AM
Surr: 4-Bromofluorobenzene	87.1	70-130		%Rec	1	10/19/2019 2:47:45 AM
Surr: Dibromofluoromethane	103	70-130		%Rec	1	10/19/2019 2:47:45 AM
Surr: Toluene-d8	100	70-130		%Rec	1	10/19/2019 2:47:45 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/19/2019 2:47:45 AM
Surr: BFB	89.4	70-130		%Rec	1	10/19/2019 2:47:45 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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-37 0'
Project: BIGCAT 215H **Collection Date:** 10/15/2019 5:00:00 PM
Lab ID: 1910977-037 **Matrix:** SOIL **Received Date:** 10/17/2019 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	9.8		mg/Kg	1	10/22/2019 11:50:49 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/22/2019 11:50:49 AM
Surr: DNOP	64.1	70-130	S	%Rec	1	10/22/2019 11:50:49 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	990	60		mg/Kg	20	10/22/2019 8:15:12 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.024		mg/Kg	1	10/19/2019 3:17:03 AM
Toluene	ND	0.049		mg/Kg	1	10/19/2019 3:17:03 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/19/2019 3:17:03 AM
Xylenes, Total	ND	0.098		mg/Kg	1	10/19/2019 3:17:03 AM
Surr: 1,2-Dichloroethane-d4	99.2	70-130		%Rec	1	10/19/2019 3:17:03 AM
Surr: 4-Bromofluorobenzene	86.8	70-130		%Rec	1	10/19/2019 3:17:03 AM
Surr: Dibromofluoromethane	104	70-130		%Rec	1	10/19/2019 3:17:03 AM
Surr: Toluene-d8	102	70-130		%Rec	1	10/19/2019 3:17:03 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/19/2019 3:17:03 AM
Surr: BFB	90.8	70-130		%Rec	1	10/19/2019 3:17:03 AM

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 **1910977**
Date Reported:

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BG19-01 0'
Project: BIGCAT 215H **Collection Date:** 10/14/2019 5:10:00 PM
Lab ID: 1910977-038 **Matrix:** SOIL **Received Date:** 10/17/2019 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	8.6		mg/Kg	1	10/22/2019 12:12:44 PM
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	10/22/2019 12:12:44 PM
Surr: DNOP	62.9	70-130	S	%Rec	1	10/22/2019 12:12:44 PM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	ND	60		mg/Kg	20	10/22/2019 8:27:37 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	0.025		mg/Kg	1	10/19/2019 3:46:15 AM
Toluene	ND	0.050		mg/Kg	1	10/19/2019 3:46:15 AM
Ethylbenzene	ND	0.050		mg/Kg	1	10/19/2019 3:46:15 AM
Xylenes, Total	ND	0.10		mg/Kg	1	10/19/2019 3:46:15 AM
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	10/19/2019 3:46:15 AM
Surr: 4-Bromofluorobenzene	82.7	70-130		%Rec	1	10/19/2019 3:46:15 AM
Surr: Dibromofluoromethane	104	70-130		%Rec	1	10/19/2019 3:46:15 AM
Surr: Toluene-d8	97.3	70-130		%Rec	1	10/19/2019 3:46:15 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/19/2019 3:46:15 AM
Surr: BFB	84.6	70-130		%Rec	1	10/19/2019 3:46:15 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

State of New Mexico
Oil Conservation Division

Incident ID	NRM2003158355
District RP	
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?	400 (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.

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State of New Mexico
Oil Conservation Division

Incident ID	NRM2003158355
District RP	
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: Wes Mathews . Title: EnvironmentalRepresentative

Signature: Wesley Mathews Date: 3/19/2020

email: Wesley.mathews@dvn.com . Telephone: 575-746-5549 .

OCD Only

Received by: Cristina Eads Date: 05/07/2020

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State of New Mexico
Oil Conservation Division

Incident ID	NRM2003158355
District RP	
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: Wes Mathews Title: Environmental Representative

Signature: Wesley Mathews Date: 3/19/2020

email: wesley.mathews@dvn.com . Telephone: 575-746-5549 .

OCD Only

Received by: Cristina Eads Date: 05/07/2020

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: D e n i e d Date: 06/30/2020

Printed Name: Cristina Eads Title: Environmental Specialist