April 24, 2020 Vertex Project #: 19E-00575-032

Spill Closure Report: Cotton Draw Unit #153
Unit B, Section 3, Township 25 South, Range 31 East
County: Eddy
API: 30-015-38535
Tracking Number: NAB1524750307

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

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

Devon Energy Production Company (Devon) retained Vertex Resource Services Inc. (Vertex) to conduct a spill assessment and remediation for an historical oil release that occurred at Cotton Draw Unit #153, API 30-015-38535 (hereafter referred to as "Cotton Draw") on July 19, 2015. Devon provided immediate notification of the spill to New Mexico Oil Conservation Division (NM OCD) District 2 and the Bureau of Land Management (BLM), who owns the property, on July 19, 2015, followed by submission of the initial C-141 Release Notification (Attachment 1). The NM OCD tracking number assigned to this incident is NAB1524750307.

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 the NM OCD for closure of this release.

Incident Description

On July 19, 2015, a release occurred at Devon's Cotton Draw site when a suction line in the circulating pump developed a leak. This incident resulted in the release of approximately 40 barrels (bbls) of oil onto the wellpad. The Lease Operator closed the valves to stop the release and a vacuum truck was dispatched to the site to recover free fluids; approximately 35 bbls of oil were recovered. The spill was contained on-site and no oil was released into undisturbed areas or waterways.

Site Characterization

The release at Cotton Draw occurred on federally-owned land, N 32.16613, W 103.76310, approximately 30 miles southeast of Carlsbad, New Mexico. The legal description for the site is Unit B, Section 3, Township 25 South, Range 31 East, Eddy County, New Mexico. This location is within the Permian Basin in southeast New Mexico and has historically been used for oil and gas exploration and production. An aerial photograph and site schematic are included in Attachment 2.

Cotton Draw 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 west edge of the wellpad.

The surrounding landscape is associated with sandy plains typical of elevations of 2,000 to 5,700 feet above sea level. The climate is arid to semi-arid, with average annual precipitation ranging between 5 and 15 inches. Historically, the plant community has been dominated by grasses, with scattered shinnery oak and sand sage; perennial and annual forb abundance is dependent on precipitation. The dominant grass species are black grama, dropseeds and bluestems. Litter and, to a lesser extent, bare ground make up a significant proportion of the ground cover (United States Department of Agriculture, Natural Resources Conservation Service, 2020).

The Geological Map of New Mexico indicates the surface geology at Cotton Draw is comprised of Qep – eolian and piedmont deposits that include eolian sands interlayed with piedmont-slope deposits (New Mexico Bureau of Geology and Mineral Resources, 2020). The Natural Resources Conservation Service *Web Soil Survey* characterizes the soil at the site as Berino complex, characterized by fine sand and sandy clay loam over sandy loam. It tends to be well-drained with low runoff and moderate 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 Cotton Draw (United States Department of the Interior, United States Geological Survey, 2020a).

There is no surface water located on-site. An emergent wetland is located approximately 2 miles south of the release site (United States Fish and Wildlife Service, 2020). The nearest significant watercourse, as defined in Subsection P of 19.15.17.7 NMAC, is an intermittent stream located approximately 5 miles west of the site (United States Department of the Interior, United States Geological Survey, 2020b). There are no continuously flowing watercourses, lakebeds, sinkholes, playa lakes, or other critical water or community features near Cotton Draw, as outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC.

The nearest active well to the release site is a United States Geologic Survey-identified well, located approximately 1 mile east of the site, which shows a depth to groundwater of approximately 406 feet below ground surface (bgs; United States Department of the Interior, United States Geological Survey, 2020c). 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 Cotton Draw 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

An initial spill inspection and remediation, completed by a different environmental consultant, in 2015, revealed some chloride contamination in the vicinity of the release. As the unexpected chloride contamination was not fully delineated and the site not fully remediated as part of the work for the 2015 incident, the initial request for closure was denied by NM OCD and the release remained open in NM OCD incident records.

In November 2019, Devon assigned the open incident at Cotton Draw to Vertex for additional investigation and remediation, if needed, and to obtain closure of the incident from NM OCD. In November and December 2019, and January 2020, Vertex conducted site visits to confirm full remediation of the initial release, as identified in the rejected closure report; delineate remaining chloride contamination present onsite, if any; and to determine additional remediation required. During site visits, soil samples were collected and field screened for chloride using a titrator, and for hydrocarbons and volatile organics using PetroFlag and a photoionization detector, respectively, before being submitted for laboratory analysis. Field screening results are summarized in the Daily Field Report associated with the initial visit (Attachment 4).

Using initial field screening and lab data, the chloride contamination was delineated horizontally and vertically. Based on the data analysis, the chloride contamination did not exceed closure criteria for locations where depth to groundwater is greater than 100 feet bgs and no remediation work was deemed necessary. However, the fieldwork did reveal remaining hydrocarbon contamination, in excess of NM OCD Closure Criteria, at three places within the original 2015 release footprint.

On January 23, 2020, Vertex provided 48-hour notification of confirmation sampling to the NM OCD (Attachment 5), as required by Subparagraph (a) of Paragraph (1) of Subsection D 19.15.29.12 NMAC. On January 27, 2020, Vertex was on-site to oversee excavation of the remaining impacted soil and to re-collect confirmatory samples from the original failed locations. Three five-point composite samples were collected and placed into laboratory-provided containers, preserved on ice, and submitted to a National Environmental Laboratory Accreditation Program-approved laboratory for chemical analysis.

Laboratory analyses included Method 300.0 for chlorides, Method 8021B for volatile organics, including BTEX, and EPA Method 8015 for TPH, including MRO, DRO and GRO. Confirmatory sampling analytical data are summarized in

Attachment 6 along with characterization field screens and laboratory data. Laboratory data reports and chain of custody forms are included in Attachment 7.

A GeoExplorer 7000 Series Trimble global positioning system (GPS) unit, or equivalent, was used to map the approximate center of each of the re-collected five-point composite samples. The confirmatory sample locations are presented on Figure 1 (Attachment 2).

Closure Request

Vertex does not recommend additional remediation action to address the release at Cotton Draw. 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 shown 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, final restoration and reclamation of the area per 19.15.29.13 NMAC will be completed at such time as the well is plugged and the site reclaimed as a whole.

Vertex requests that this incident (NAB1524750307) 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 July 19, 2015, release at Cotton Draw.

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. Required 48-hr Notification of Confirmation Sampling to Regulatory Agencies
Attachment 6. Field Screening and Confirmatory Sampling Laboratory Results
Attachment 7. Laboratory Data Reports/Chain of Custody Forms

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

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

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

United States Department of the Interior, United States Geological Survey. (2020b). *The National Map: National Hydrography Dataset*. Retrieved from https://www.arcgis.com/home/webmap/viewer.html?url=https%3A%2F%2Fbasemap.nationalmap.gov%2Farcgis%2Frest%2Fservices%2FUSGSHydroCached%2FMapServer&source=sd

United States Department of the Interior, United States Geological Survey. (2020c). *Groundwater for New Mexico: Water Levels*. Retrieved from https://nwis.waterdata.usgs.gov/nm/nwis/gwlevels?

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

Limitations

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

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

ATTACHMENT 1

Recd. 8/28/15 NMOCD Artesia

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

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

Form C-141
Revised August 8, 2011

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

nAB1524750307

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company Devon Energy Production 6137	**Contact** Garry Michael
Address 6488 Seven Rivers Hwy Artesia, NM 88220	**Telephone No.** 575-513-4895
Facility Name Cotton Draw Unit 153H	**Facility Type** Oil

Surface Owner Federal	**Mineral Owner** Federal	**API No.** 30-015-38535

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
B	3	25 S	31 E	200	North	1980	East	Eddy

Latitude: N 32°16'62.16" **Longitude:** W 103°76'35.73"

NATURE OF RELEASE

Type of Release Spill Oil	**Volume of Release** 40 bbls	**Volume Recovered** 35 bbls
Source of Release Suction Lines in the circulating pump where not closed	**Date and Hour of Occurrence** 7.19.2015 @ 4:00 AM	**Date and Hour of Discovery** 7.19.2015 @ 4:00 AM
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	**If YES, To Whom?** Jim Amos BLM Mike Bratcher OCD	
By Whom? Eduardo Enriquez	**Date and Hour** 7.19.2015 @ 4:56 AM 7.19.2015 @ 4:58 AM	
Was a Watercourse Reached? ☐ Yes ☒ No	**If YES, Volume Impacting the Watercourse**	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

On July 19, 2015 Pace Energy Lease Operator was driving by the Cotton Draw Unit 153 H at 4:00 AM when he noticed fluid on location. The fluid was coming from the suction lines in the circulating pump, Lease Operator proceeded to close the valves to stop the spill.

Describe Area Affected and Cleanup Action Taken.*
Horizon trucking was called to recover 35 bbls. Further documentation to follow.

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

Signature: Corina Moya

Printed Name: **Corina Moya**

Title: **Field Admin Support**

E-mail Address: **corina.moya@dvn.com**

Date: 7.20.2015 Phone: **575.746.5559**

OIL CONSERVATION DIVISION

Approved by Environmental Specialist:

Approval Date: 9/4/15 Expiration Date: N/A

Conditions of Approval: Attached ☐

Remediation per O.C.D. Rules & Guidelines
SUBMIT REMEDIATION PROPOSAL NO LATER THAN: 10/4/15

2RP-3241

* Attach Additional Sheets If Necessary

ENVIRONMENTAL RELEASE NOTIFICATION
Call-In Sheet

Date: 7/14/15 Notice received by: Randy

Devon Colfax Dow 153
Name of Company/Phone # Facility Name

30-045-38535 J 3 25S 31E 7/15 @ 4:58pm
API # Sec. Township Range Date of Occurrence

7/19/15 4:00am Oil 40 bbls 35 bbls
Date/Hour of Discovery Type of Release Volume of Release Volume Recovered

Briefly Describe Cause of Problem and action taken: Suction lines in the circulating pump where not closed.

Devon 575-513-9637 7/14
Notice given by: Name/ Company *Date/Hour Immediate Notice given*

Date C-141 received: 8/20/15 *2RP-* 3241

****

FLARE NOTIFICATION
Call-In Sheet

Date: _____ Notice received by: _____

Name of Company/Phone # Facility Name

Date of Occurrence Date/Hour of Flare Type of Release

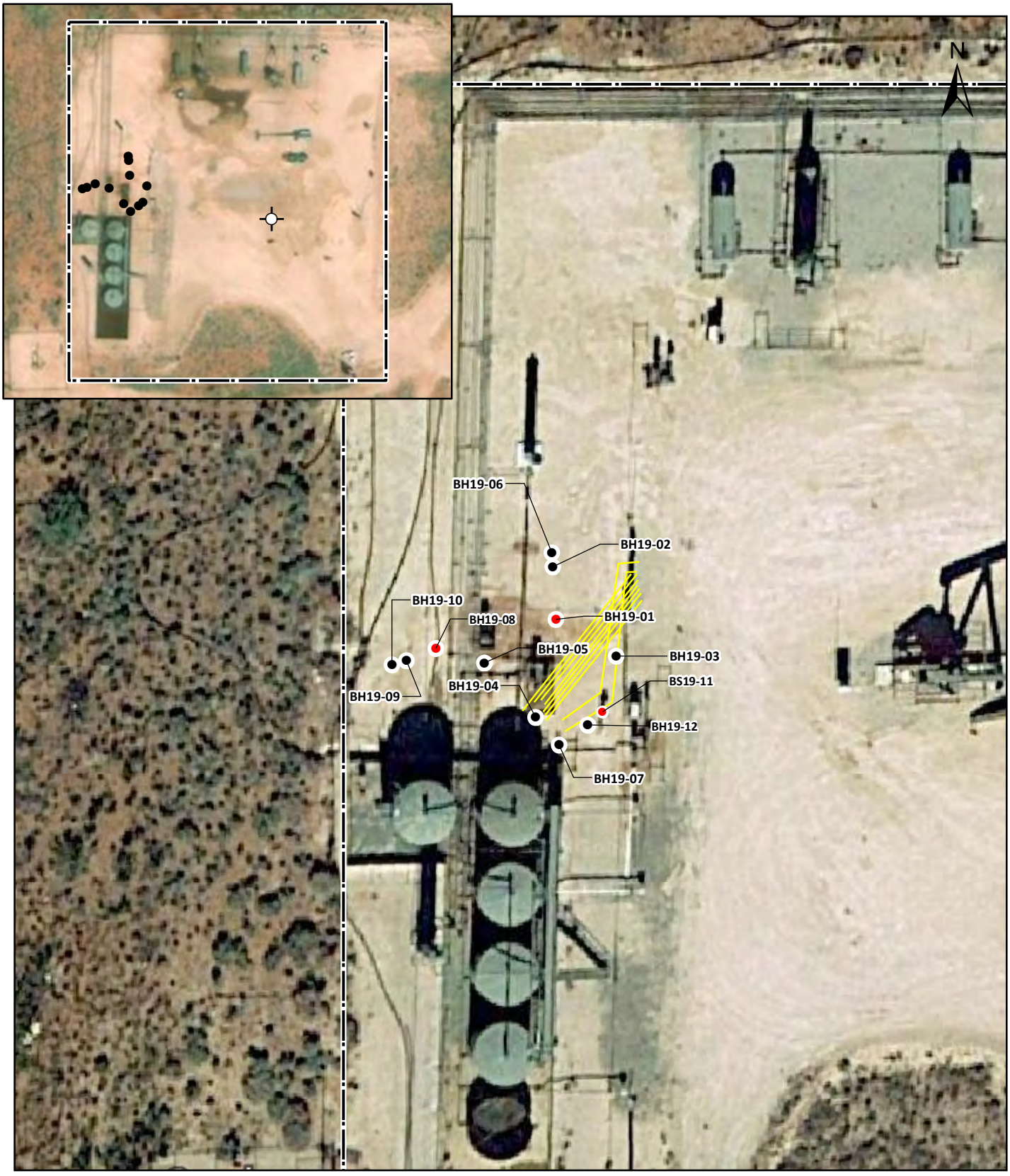
Flared MCF Volume Volume Recovered

Briefly Describe Cause of Problem and action taken: _____

Notice given by: Name/ Company *Date/Hour Immediate Notice given*

Date C-141 received: _____ *2RP-* _____

ATTACHMENT 2



LEGEND

- WELLHEAD
- CHARACTERIZATION SOIL SAMPLE
- UNDERGROUND ELECTRICAL LINES
- WELLPAD
- FAILED SAMPLES FOR RE-CONFIRMATION

BH BOREHOLES

0 10 20 40 Ft

SCALE 1:400

Notes: Aerial Image from ESRI Digital Globe 2017

devon

Site Schematic and Confirmatory Sample Locations
Cotton Draw Unit 153

VERTEX

DRAWN:	NG	FIGURE: 1
APPROVED:	NG	
DATE:	APR 20/20	

VERSATILITY. EXPERTISE.

Document Path: C:\Users\nmocny\Documents\Natasha Mocny\Projects\Deven Energy\Cotton Draw Unit 153H\Figure 2 - Characterization Cotton Draw Unit 153H.mxd

ATTACHMENT 3

Table 1. Closure Criteria Determination			
Site Name: Cotton Draw Unit 153H			
Spill Coordinates:		X: 32.16620	Y: -103.76360
Site Specific Conditions		Value	Unit
1	Depth to Groundwater	**406.40**	feet
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	26,988	feet
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	29,773	feet
4	Within 300 feet from an occupied residence, school, hospital, institution or church	37,640	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**	4,948	feet
	ii) Within 1000 feet of any fresh water well or spring	53,563	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	8,420	feet
8	Within the area overlying a subsurface mine	No	(Y/N)
9	Within an unstable area (Karst Map)		Critical High Medium Low
10	Within a 100-year Floodplain	Undetermined	year
NMAC 19.15.29.12 E (Table 1) Closure Criteria			<50' 51-100' >100'

Column1
Critical
High
Medium
Low

Column1
Yes
No

<50'
51-100'
>100'

Cotton Draw Unit 153H

5,945.08 ft to nearest well with depth to groundwater data

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 02574	CUB	COM	12	OXY USA INC	ED	C 02574				Shallow	1 1 2	02	25S	31E	618092	3559494*	1514
C 01914	C	PRO	0	PERRY R BASS	ED	C 01914					4 1 2	04	25S	31E	615064	3559275*	1534
C 02571	CUB	COM	3	BUREAU OF LAND MANAGEMENT	ED	C 02571				Shallow	4 1 2	02	25S	31E	618292	3559294*	1730
C 02573	CUB	COM	3	BUREAU OF LAND MANAGEMENT	ED	C 02573					1 4 2	02	25S	31E	618499	3559091*	1970
C 02959	C	STK	3	RICHARDSON CATTLE COMPANY	ED	C 02959					1 3 2	33	24S	31E	614866	3560646*	2044
C 02572	CUB	COM	3	OXY USA INC	ED	C 02572					4 2 2	02	25S	31E	618695	3559294*	2130
C 02020	C	STK	3	BUREAU OF LAND MANAGEMENT	ED	C 02020					4 4	28	24S	31E	615360	3561356*	2196
C 02569	CUB	COM	12	BUREAU OF LAND MANAGEMENT	ED	C 02569				Shallow	4 4 2	02	25S	31E	618699	3558891*	2215
C 03830	CUB	EXP	0	ROCKHOUSE RANCH INC	ED	C 03830 POD1			NON	Shallow	4 2 4	02	25S	31E	618632	3558432	2328
C 02570	CUB	COM	3	BUREAU OF LAND MANAGEMENT	ED	C 02570					4 2 4	02	25S	31E	618704	3558489*	2366
C 02568	CUB	COM	3	OXY USA INC	ED	C 02568					4 3 1	01	25S	31E	619103	3558892*	2604
C 02245	C	STK	3	JR ENGINEERING & CONST. CO.	ED	C 02245					1 1	12	25S	31E	619018	3557785*	2998
C 02021	C	STK	3	BUREAU OF LAND MANAGEMENT	ED	C 02021					1 2	28	24S	31E	614944	3562559*	3443
C 01839	C	PRO	0	OXY PETROLEUM INC	ED	C 01839					3 2	08	25S	31E	613364	3557344*	3885
C 01831	C	PRO	0	OXY PETROLEUM INC	ED	C 01831					2 1	17	25S	31E	612972	3556126*	4956

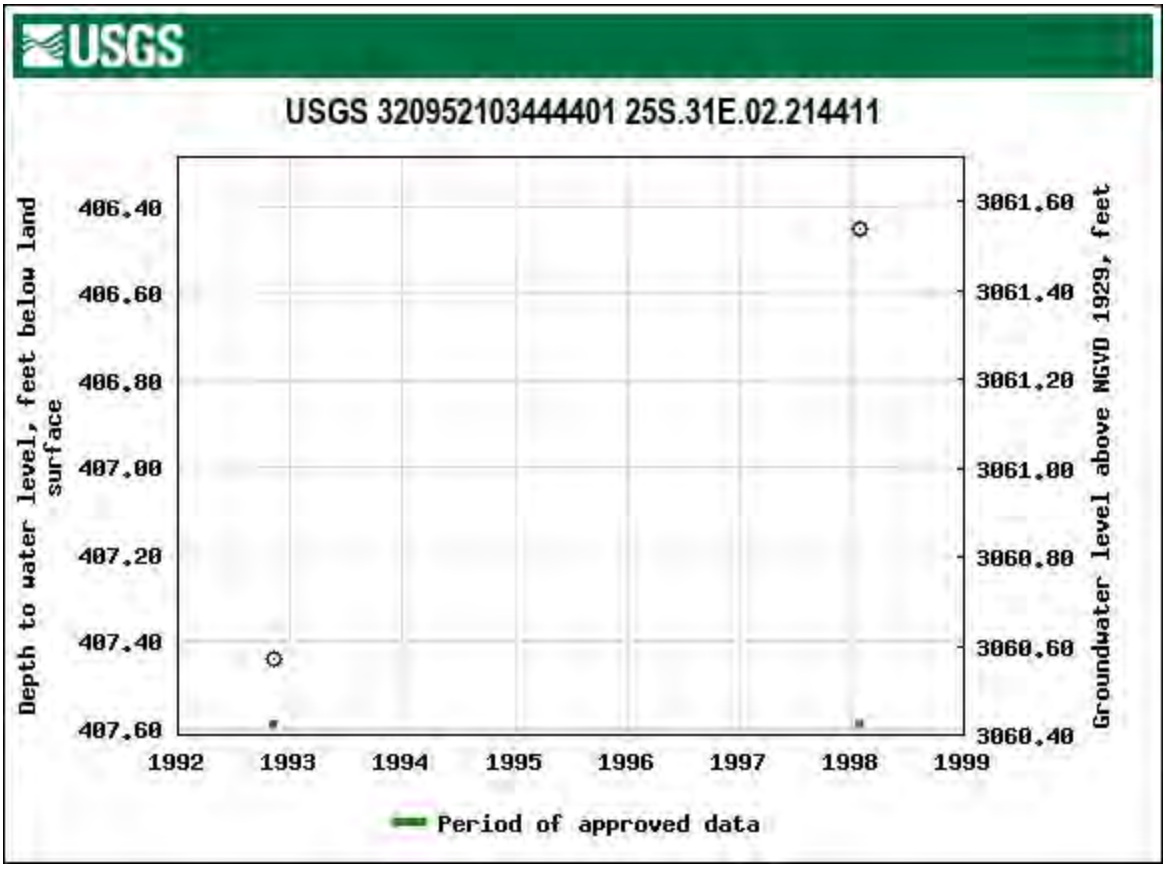
***UTM location was derived from PLSS - see Help**

Record Count: 15

UTMNAD83 Radius Search (in meters):

Easting (X): 616577.39 **Northing (Y):** 3559527.65 **Radius:** 5000

Sorted by: Distance


USGS
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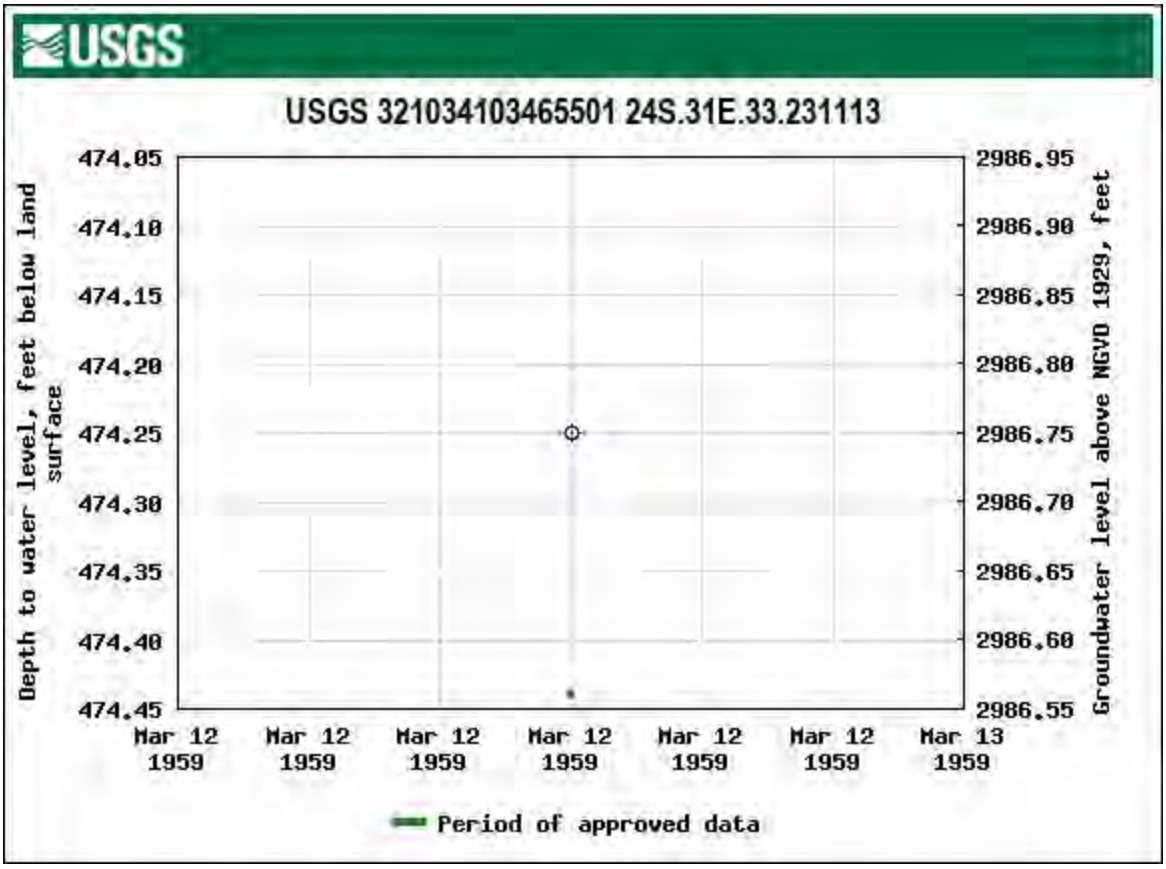
Depth to water level, feet below land surface
406.40
406.60
406.80
407.00
407.20
407.40
407.60
Groundwater level above NGVD 1929, feet
3061.60
3061.40
3061.20
3061.00
3060.80
3060.60
3060.40
1992
1993
1994
1995
1996
1997
1998
1999
Period of approved data


USGS
USGS 321034103465501 24S.31E.33.231113
Depth to water level, feet below land surface
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474.10
474.15
474.20
474.25
474.30
474.35
474.40
474.45
Groundwater level above NGVD 1929, feet
2986.95
2986.90
2986.85
2986.80
2986.75
2986.70
2986.65
2986.60
2986.55
Mar 12 1959
Mar 12 1959
Mar 12 1959
Mar 12 1959
Mar 12 1959
Mar 12 1959
Mar 13 1959
Period of approved 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 02574	CUB	ED	1	1	2	02	25S	31E	618092	3559494*	1514			
C 02571	CUB	ED	4	1	2	02	25S	31E	618292	3559294*	1730	860		
C 02573	CUB	ED	1	4	2	02	25S	31E	618499	3559091*	1970			
C 02572	CUB	ED	4	2	2	02	25S	31E	618695	3559294*	2130	852		
C 02569	CUB	ED	4	4	2	02	25S	31E	618699	3558891*	2215	1016		
C 03830 POD1	CUB	ED	4	2	4	02	25S	31E	618632	3558432	2328	450		
C 02570	CUB	ED	4	2	4	02	25S	31E	618704	3558489*	2366	895		
C 02568	CUB	ED	4	3	1	01	25S	31E	619103	3558892*	2604	1025		

Average Depth to Water: --

Minimum Depth: --

Maximum Depth: --

Record Count: 8

UTMNAD83 Radius Search (in meters):

Easting (X): 616577.39 **Northing (Y):** 3559527.65 **Radius:** 5000

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

U.S. Fish and Wildlife Service
National Wetlands Inventory

Cotton Draw Unit 153H - Riverine 26,988 ft

December 2, 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.

U.S. Fish and Wildlife Service
National Wetlands Inventory

Cotton Draw Unit 153H - Pond 29,773.3 ft

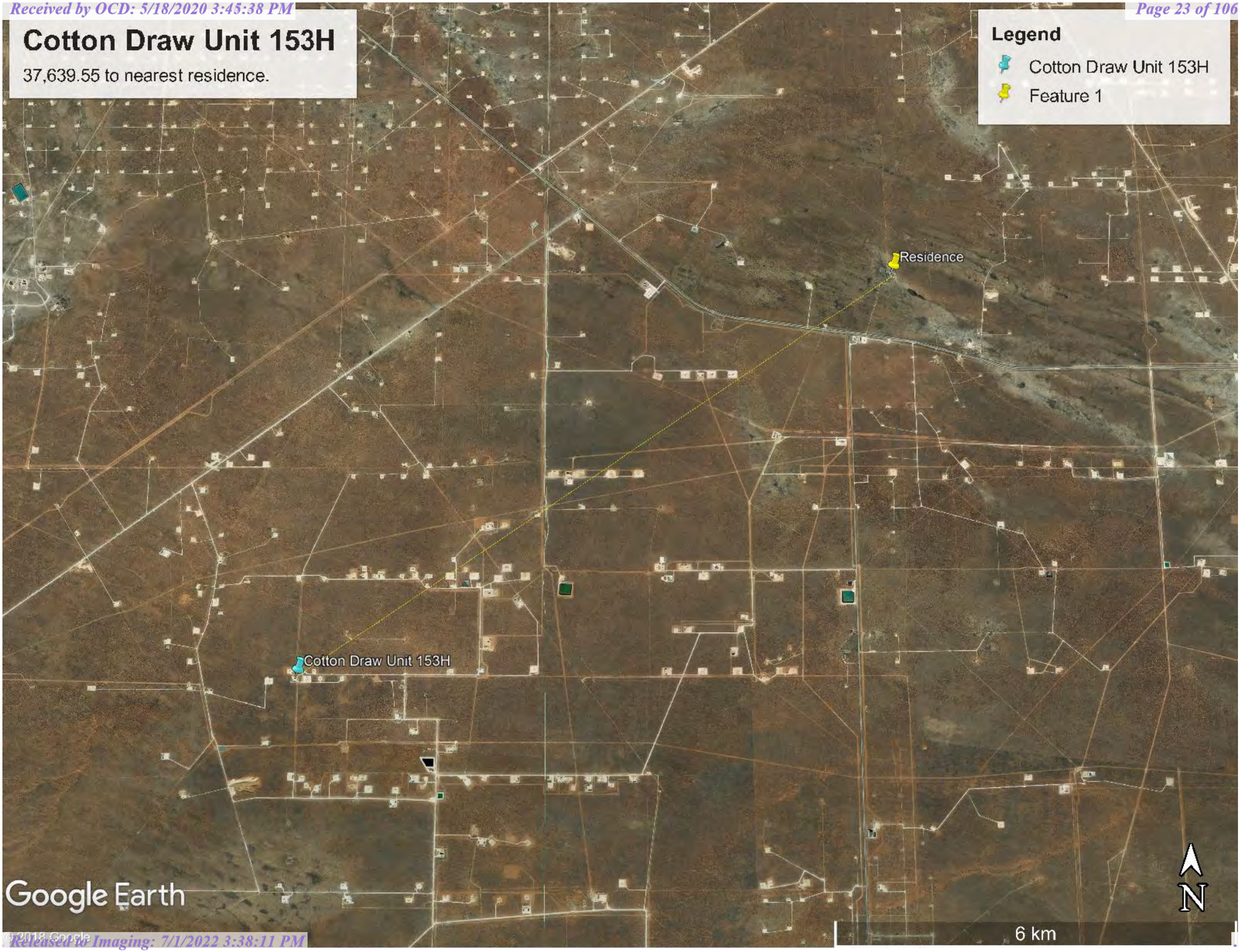
December 2, 2019

Wetlands

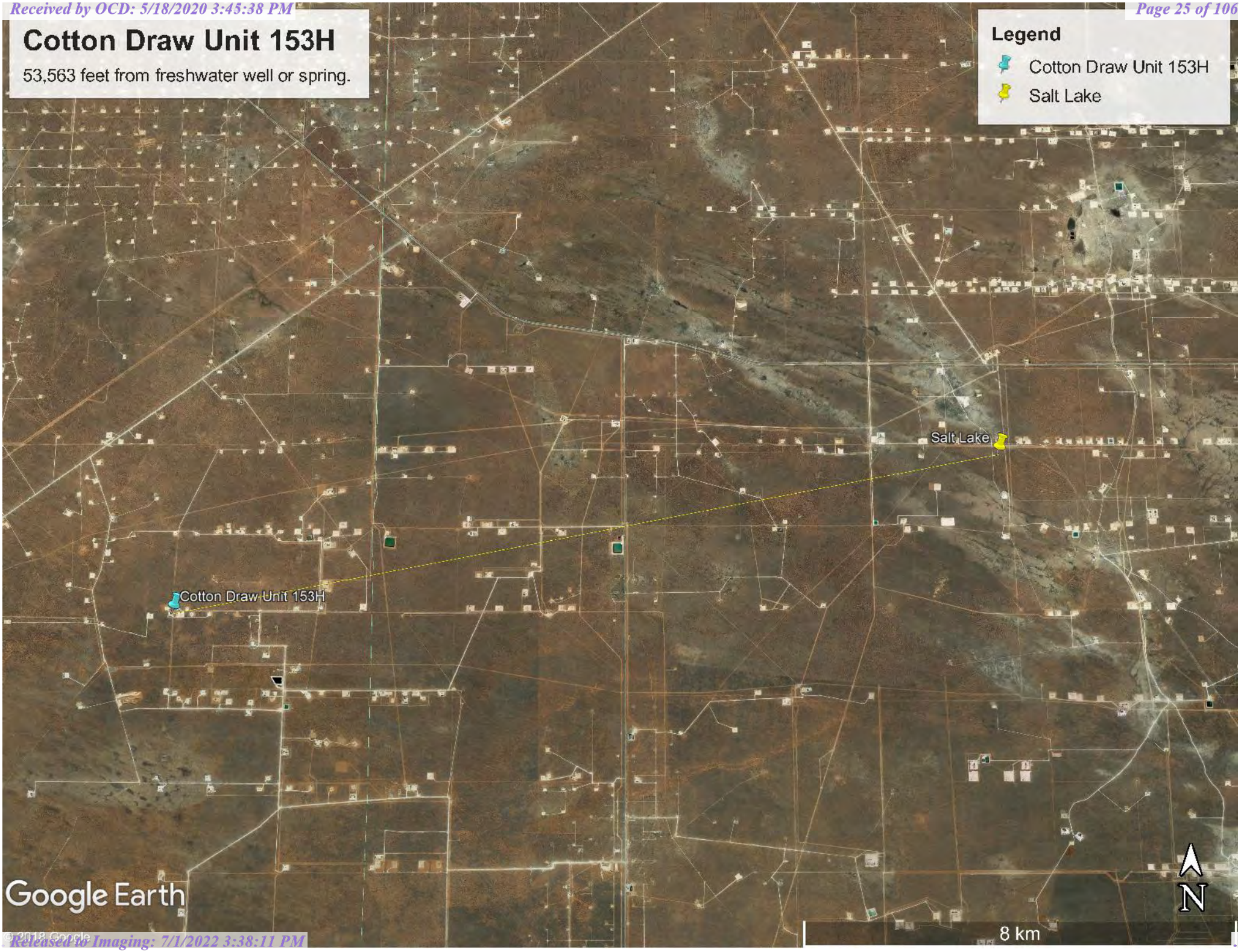
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

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

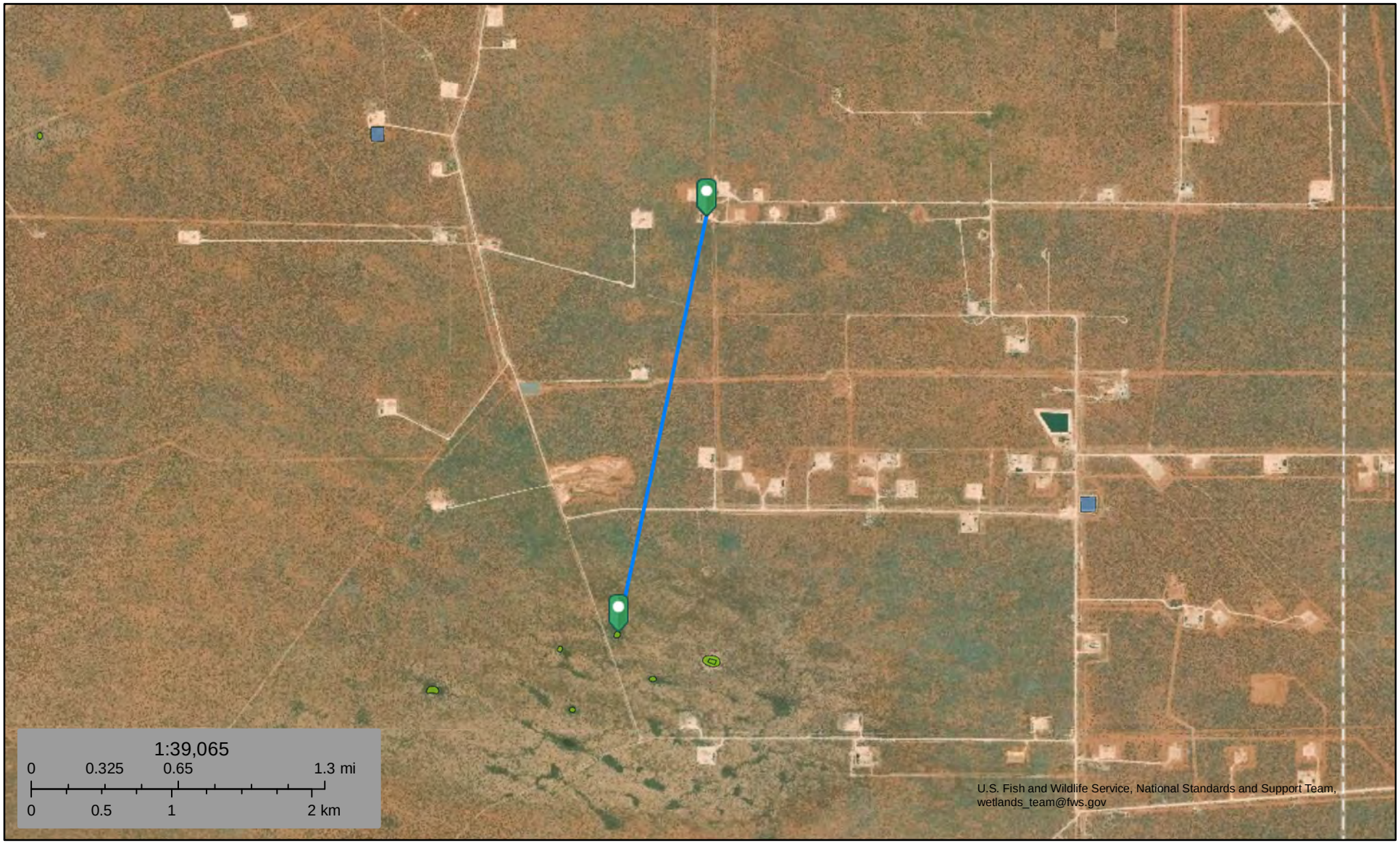

Cotton Draw Unit 153H
37,639.55 to nearest residence.
Legend
Cotton Draw Unit 153H
Feature 1
Residence
Cotton Draw Unit 153H
Google Earth
© 2018 Google
6 km
N


Cotton Draw Unit 153H
4,948.11 ft to nearest water well.
Legend
Commercial Well
Cotton Draw Unit 153H
Cotton Draw Unit 153H
Commercial Well
N
Google Earth
700 m


Cotton Draw Unit 153H
53,563 feet from freshwater well or spring.
Legend
Cotton Draw Unit 153H
Salt Lake
Salt Lake
Cotton Draw Unit 153H
Google Earth
© 2018 Google
8 km
N

U.S. Fish and Wildlife Service
National Wetlands Inventory

Cotton Draw Unit 153H - Wetland 8,420 ft



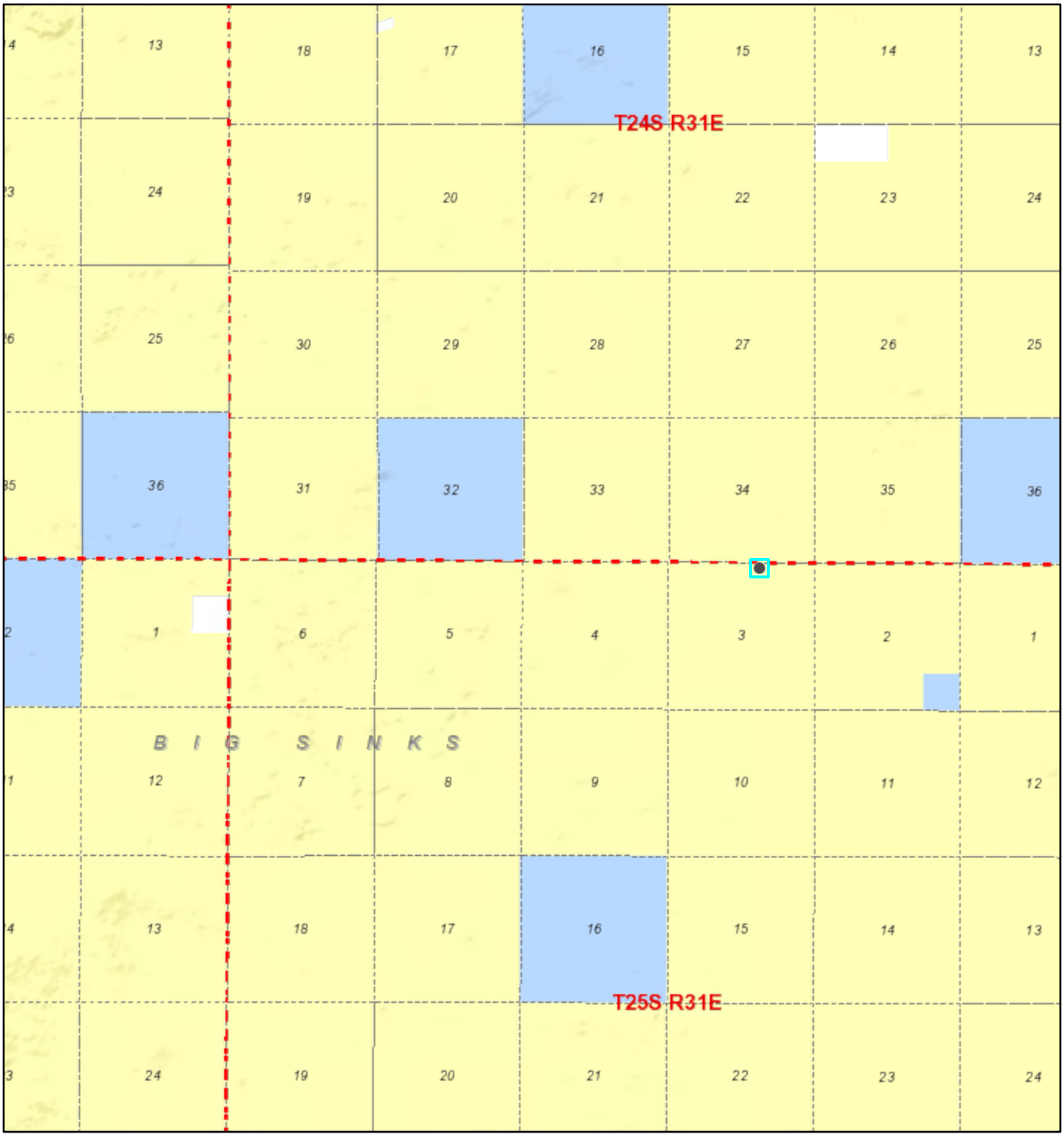
December 2, 2019

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.

Active Mines near Cotton Draw Unit 153H



12/2/2019, 1:46:30 PM

1:72,224

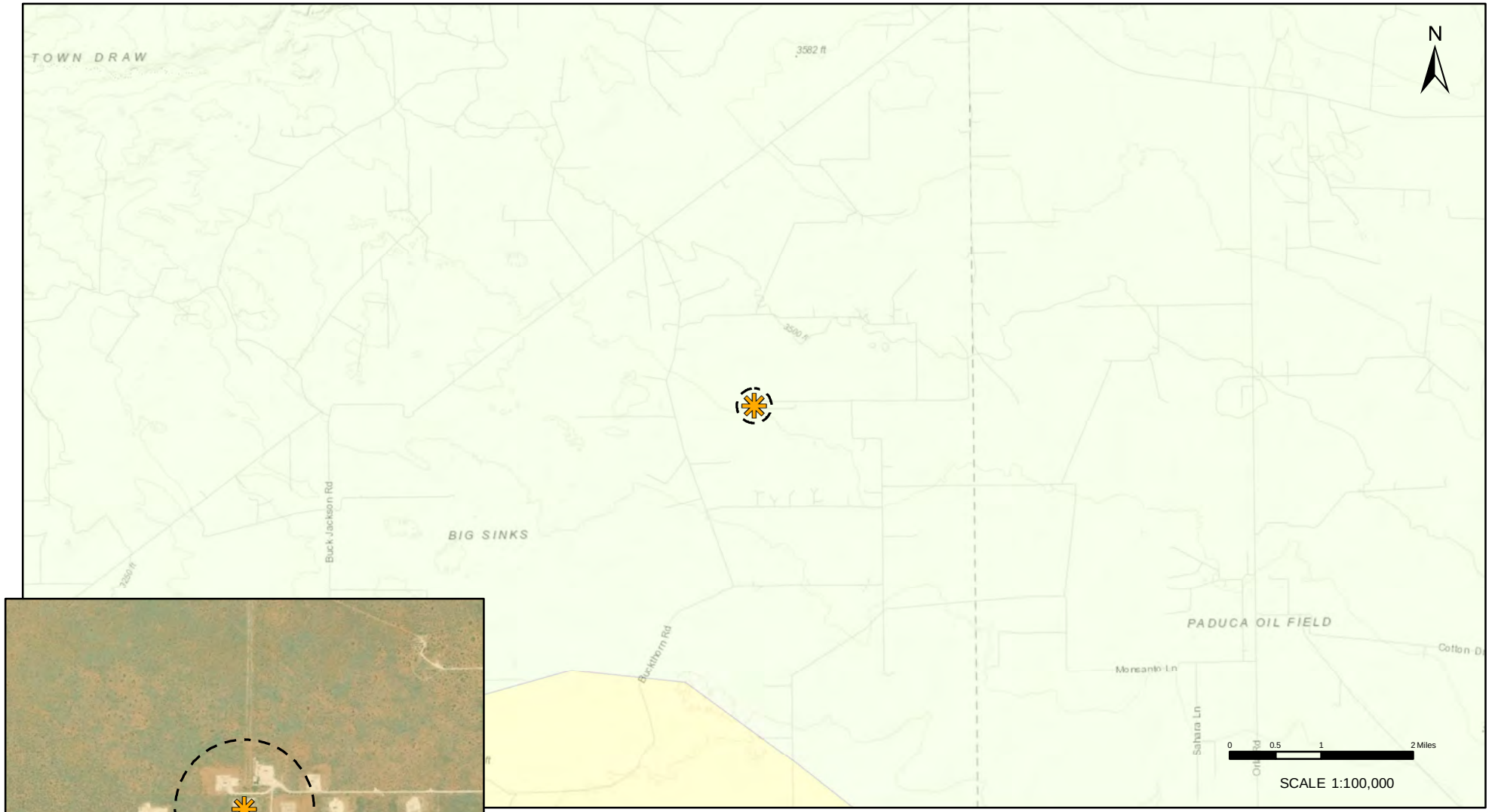
0 0.5 1 2 mi

0 0.75 1.5 3 km

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

EMNRD MMD GIS Coordinator

New Energy, Minerals and Natural Resources Department (http://nm-emnrd.maps.arcgis.com/apps/webappviewer/index.html?id=1b5e577974664d689b47790897ca2795)



LEGEND

SITE

1000FT BUFFER

KARST POTENTIAL

CRITICAL

HIGH

MEDIUM

LOW

Notes: Aerial Image from ESRI Digital Globe 2018

devon

Karst Potential
Cotton Draw
Unit 153H

VERTEX

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

FIGURE: 1

VERSATILITY. EXPERTISE.

ATTACHMENT 4

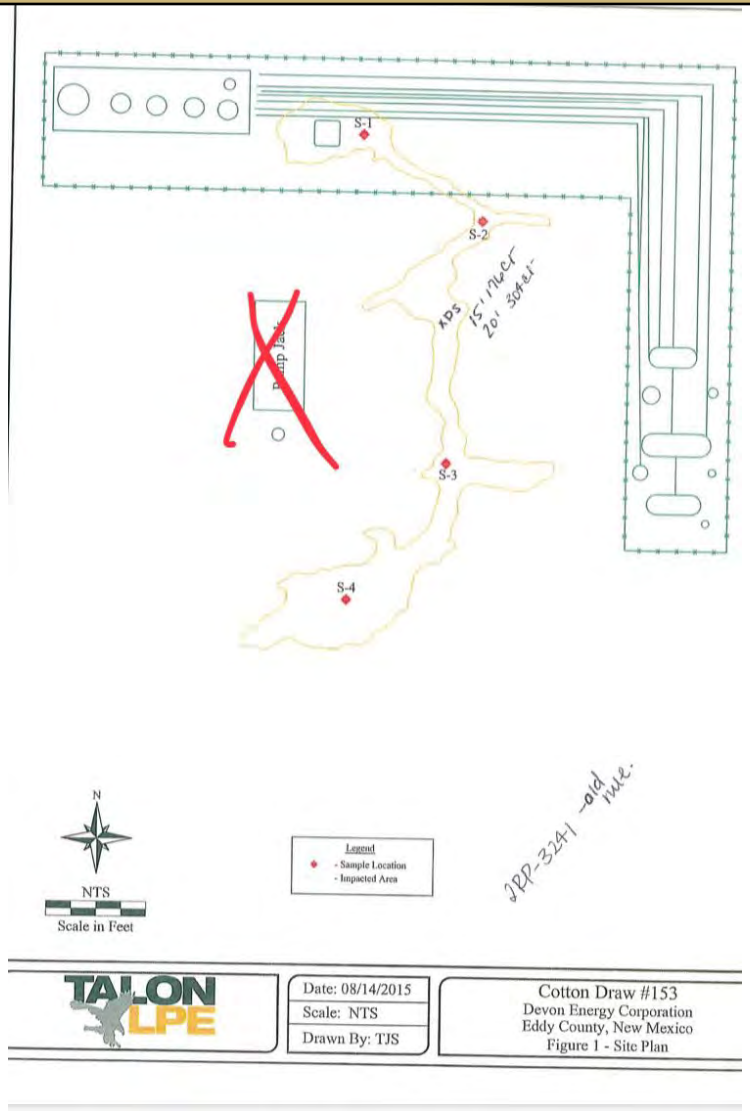
Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	11/27/2019
Site Location Name:	Cotton Draw Unit #153H	Report Run Date:	11/27/2019 9:55 PM
Project Owner:	Amanda Davis	File (Project) #:	19E-03535
Project Manager:	Dennis Williams	API #:	30-015-38535
Client Contact Name:	Amanda Davis	Reference	EM Survey
Client Contact Phone #:	(575) 748-0176		

Summary of Times	
Left Office	11/27/2019 11:30 AM
Arrived at Site	11/27/2019 12:30 PM
Departed Site	11/27/2019 1:10 PM
Returned to Office	

Daily Site Visit Report

Site Sketch



Daily Site Visit Report

Summary of Daily Operations

Next Steps & Recommendations

1 Conduct one call.

Daily Site Visit Report

Site Photos

Viewing Direction: Southeast	**Viewing Direction**: South
	
White line outside production area.	White line outside production area

Viewing Direction: West	**Viewing Direction**: West
	
White line and flagging inside production area	White line and flagging inside production area

Daily Site Visit Report

Viewing Direction: North	**Viewing Direction**: West
	
White line and flagging inside production area	White line and flagging on north edge of spill area.

Viewing Direction: East	**Viewing Direction**: North
	
White line and flagging on south edge of spill. Flagging used where possible.	White line and flagging on east edge of spill area. White flagging used where possible.

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Sharlene Harvester

Signature:

Daily Site Visit Report

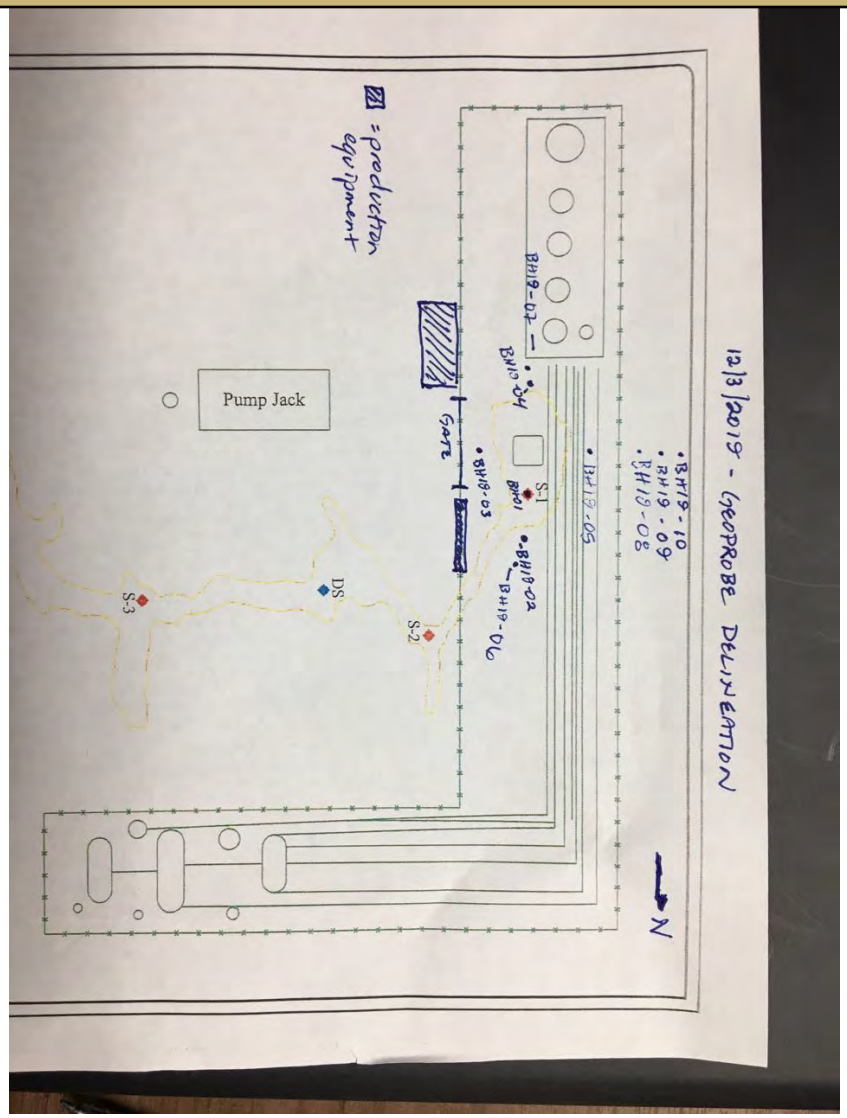
Client:	Devon Energy Corporation	Inspection Date:	12/3/2019
Site Location Name:	Cotton Draw Unit #153H	Report Run Date:	12/4/2019 3:01 AM
Project Owner:	Amanda Davis	File (Project) #:	19E-00575
Project Manager:	Natalie Gordon	API #:	30-015-38535
Client Contact Name:	Amanda Davis	Reference	Historic Spill
Client Contact Phone #:	(575) 748-0176		

Summary of Times	
Left Office	12/3/2019 9:00 AM
Arrived at Site	12/3/2019 10:16 AM
Departed Site	12/3/2019 5:27 PM
Returned to Office	12/3/2019 6:44 PM

Daily Site Visit Report

VERTEX

Site Sketch



Daily Site Visit Report

Summary of Daily Operations

10:17 Delineate historic spill.

Next Steps & Recommendations

1

Sampling

BH19-06

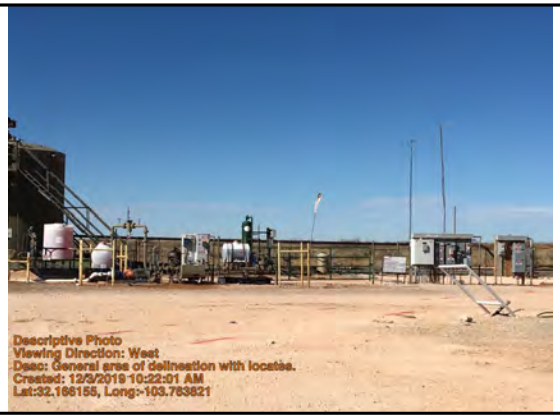
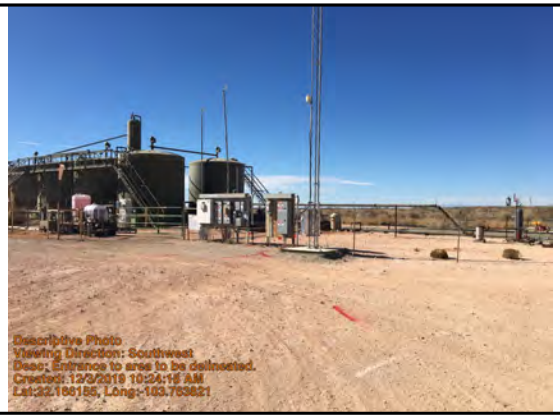
Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
0 ft.	0.9 ppm	91 ppm	High (300-6000ppm)	525 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.16632672, -103.76400523	Yes

BH19-10

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.		9 ppm			BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.16625260, -103.76413293	Yes

Daily Site Visit Report

Site Photos

Viewing Direction: West	**Viewing Direction**: Southwest
	
General area of delineation with locates.	Entrance to area to be delineated.

Daily Site Visit Report

Depth Sample Photos

Sample Point ID: BH19-06	Sample Point ID: BH19-10
	
Depth: 0 ft.	**Depth:** 0 ft.

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Sharlene Harvester

Signature: 

Daily Site Visit Report

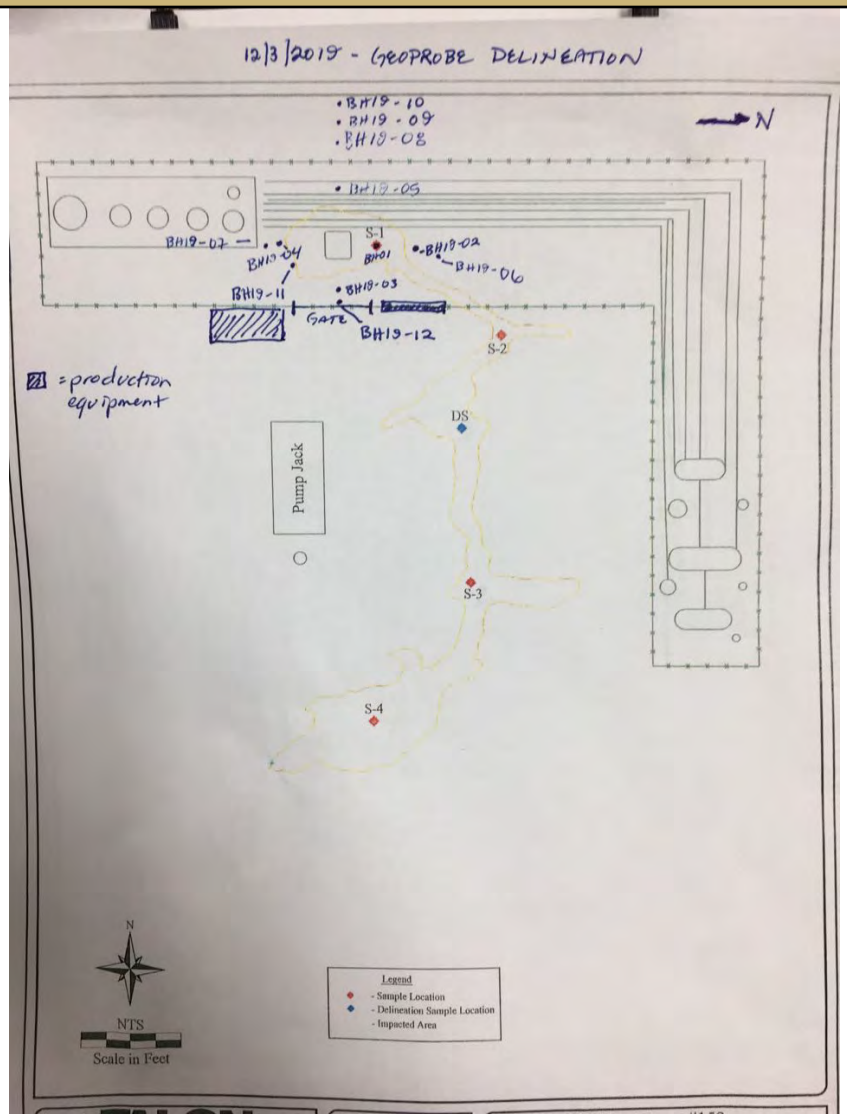
Client:	Devon Energy Corporation	Inspection Date:	12/4/2019
Site Location Name:	Cotton Draw Unit #153H	Report Run Date:	12/5/2019 3:21 AM
Project Owner:	Amanda Davis	File (Project) #:	19E-00575
Project Manager:	Natalie Gordon	API #:	30-015-38535
Client Contact Name:	Amanda Davis	Reference	Historic Spill
Client Contact Phone #:	(575) 748-0176		

Summary of Times	
Left Office	12/4/2019 8:20 AM
Arrived at Site	12/4/2019 9:32 AM
Departed Site	12/4/2019 5:53 PM
Returned to Office	12/4/2019 7:13 PM

Daily Site Visit Report

VERTEX

Site Sketch



Daily Site Visit Report

Summary of Daily Operations

9:33 Delineate chloride and TPH contamination.

Next Steps & Recommendations

1 Submit samples to lab.

Sampling

BH19-01

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
9 ft.	0.1 ppm	29 ppm	High (300-6000ppm)	375 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.16628185, -103.76400260	Yes

BH19-03

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.		116 ppm	High (300-6000ppm)	240 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.16625641, -103.76395510	Yes
2 ft.		8 ppm	High (300-6000ppm)	300 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.16625903, -103.7639604	Yes

BH19-04

Depth ft	VOC PID	Petro Flag TPH ppm	Quantab Range ppm	Quantab Reading ppm	Lab Analysis	Picture	Trimble Location	Marked On Site Sketch?
4 ft.		33 ppm	High (300-6000ppm)	750 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.16621600, -103.76401954	Yes

Daily Site Visit Report

BH19-11

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.	0.4 ppm		High (300-6000ppm)	375 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.16621020, -103.76397859	Yes

BH19-12

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.		58 ppm	High (300-6000ppm)	1650 ppm	BTEX (EPA SW-846 Method 8021B/8260B), Chloride (EPA 300.0), TPH (EPA SW-846 Method 8015M)	✓	32.16625903, -103.7639604	Yes

Daily Site Visit Report

Site Photos

Viewing Direction: Southwest

Third attempt at BH19-01 - bear original S1 location.

Viewing Direction: South

Location of BH19-06.

Viewing Direction: North

Location of BH19-11.

Viewing Direction: West

Locations of BH19-04 and -07.

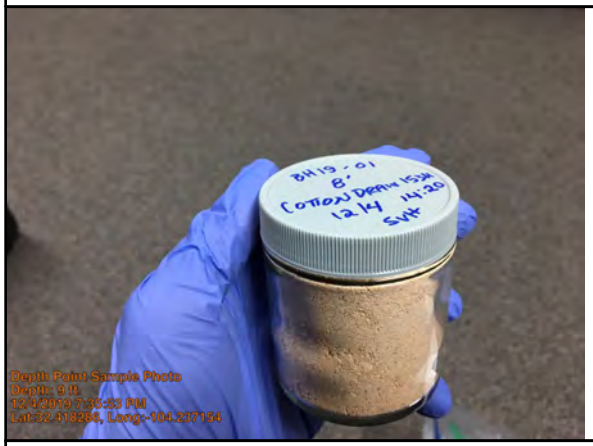
Daily Site Visit Report

Viewing Direction: South	**Viewing Direction**: South
	
Locations of BH19-09 and -10.	Location of BH19-03 and -12.

Daily Site Visit Report

Depth Sample Photos

Sample Point ID: BH19-01

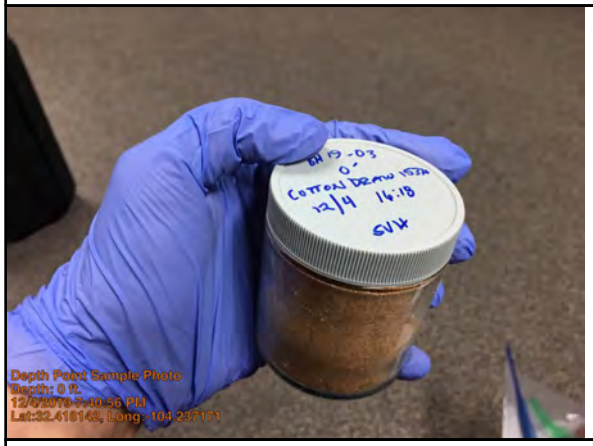


Depth: 9 ft.

Sample Point ID: BH19-11

Depth: 0 ft.

Sample Point ID: BH19-03



Depth: 0 ft.

Sample Point ID: BH19-12

Depth: 0 ft.

Daily Site Visit Report

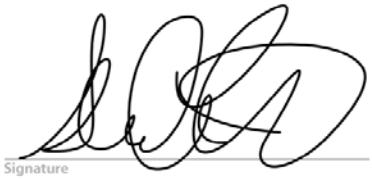
Sample Point ID: BH19-03	**Sample Point ID**: BH19-04
	
Depth: 2 ft.	**Depth:** 4 ft.

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Sharlene Harvester

Signature:



CDU 153H

BH19-11 Hot surface behind electrical panel

Directions

Greene St Hwy 62/180 3 miles mileage start 50742

757.3 Turn right US Refinery 12.3 m

759.7 Turn left Hwy 31 2.4 m end 50840

779.1 Turn Right Hwy 128 19.4 m 98 miles round

783.7 Turn Right Buckjackson 4.6 m

784.5 Turn left Buckthorn 0.8 m has x to SWD plus 1 SWD sign

— Follow main dirt road +

— go over cattle gaurd

veer towards +B to right go over 2 cattle gaurds

786.9 follow + go past caliche pit

@ ~~second~~ third xTo PLUG SWD sign 2.4 m

788.8 veer left follow to end

turn left @ frac pond 1.9 m

789.5 veer left at turn 0.7 m

789.8 then veer right at next turn 0.3 m

790.2 go over cattlegaurd w/ yellow gardrails turn left 0.4m

791.2 veer left + go over next cattlegaurd 1 m

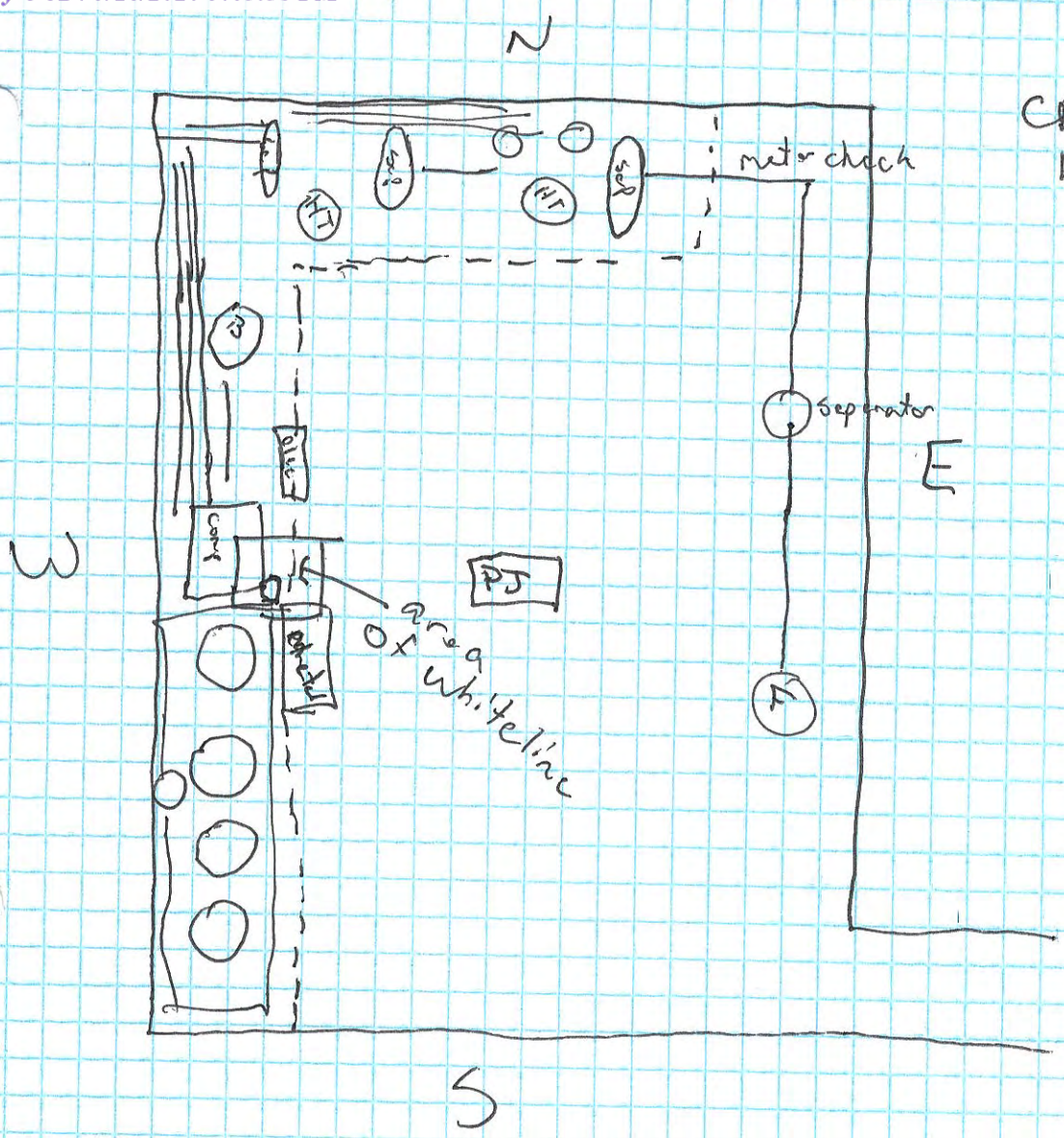
follow road + veer right 0.2 m

791.4 Arrive on location

CDU 153H Directions to location

- From off travel East on Greene St/621180 For approx 3 miles.
- Turn Right on U.S. Refinery Rd and travel 12.3 miles.
- Turn left onto HWY 31 and travel 2.4miles
- Turn Right onto HWY 128 and travel 19.4 miles
- Turn Right on Buck Jackson Rd and travel 4.6 miles
- Turn left onto BuckThorn Rd (there will be an XTO sign w/ PLU 16 SWD) and travel 0.8 miles where road Y's when you cross cattlegaurd
- Veer towards tank battery to the right continue on past two cattle gaurds with a caliche pit on the left hand side traveling 2.4 miles
- At turn veer left (there's another PLU 16 SWD sign) and continue on for 1.9 miles. Road ends at Frac Pond
- Turn left and go 0.7 miles and you will veer right on main road and travel 0.3 miles
- Go over cattlegaurd with yellow gaurd rails and turn left. Travel For 1 mile
- At end of 1mile veer ~~right~~ left go over cattlegaurd and 0.2 miles turn right
- Arrive at location

10.15


N
CDU 153
12/31/19
meter check
separator
W
E
S
PJ
ox
gas
white line

CDU 153

Monica Peppin

From: eticket@nm811.org
Sent: Tuesday, December 31, 2019 3:21 PM
To: Monica Peppin
Subject: NM811 Ticket Confirmation: 19DE310476

NM811 LOCATE REQUEST

TICKET NUMBER:	19DE310476	Update of:	
Ticket Type:	Standard Locate	For Code:	AUTOEMAIL
Creation Date:	12/31/19 15:11	Seq Num:	1

Excavator Information

Company:	VERTEX RESOURCE SERVICES	Main Contact Phone:	(575) 361-1137
Address:	1101 Callaway Drive Unit 2103	Secondary Phone:	575-361-7290
City, St, Zip:	Carlsbad, NM 88220	Main Contact Email:	Permian@vertex.ca
Company Phone:	(575) 361-1137	Alternate Contact:	MONICA PEPPIN
Company Fax:		Alternate Contact Phone:	575 - 361 - 9880
Main Contact:	Dennis Williams	Alternate Contact Email:	

Work Information

State:	NM	Work To Begin:	01/03/20 AT 15:00
County:	EDDY	Expire Date:	01/27/20 AT 15:00
Place:	RURAL EDDY		
Address:	COTTON DRAW 153 BATTERY		
Intersection:	*		
Work Type:	Oil & Gas - See Remarks	Working For:	DEVON ENERGY
Pre-marked:	Yes	Mechanical Boring:	No
Contact Prior to Locating:	No	Contact After Locating:	No

Driving Directions

FROM NM 31 AND NM 128 TRAVEL 19.4 MI ON NM 128 TRN R ON BUCKJACKSON RD FOR 4.6 MI TRN L ON TO BUCKTHORN RD TRAVEL 0.8 MI VEER R AND TRAVEL 2.4 MI VEER L AND CONT FOR 1.9 MI TRN L AND GO 0.7 MI VEER R AND GO 0.3 MI TRN L FOR 1 MI VEER L OVER A CATTLE GUARD FOR 0.2 MI TRN R TO LOCATION

Spotting Instructions

SPOT WITHIN THE WHITE LINED AREA NEXT TO THE TANK BATTERY NEXT TO GREEN GATE

Remarks

DELINEATION No Hazards - Open Access GPS 32 9 58.41 103 45 49.18

TRSQ: [W8T24SR31ES34SE] [W8T25SR31ES03NE]

Utilities Notified:

Code	Name	Manually Added
CRBD	CHEVRON EXPLORATION & PRODUCTION - CARLSBAD	False
DEVN	DEVON ENERGY CORPORATION SE NM	False

Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	1/8/2020
Site Location Name:	Cotton Draw Unit #153H	Report Run Date:	1/8/2020 9:58 PM
Project Owner:	Amanda Davis	File (Project) #:	19E-00575
Project Manager:	Natalie Gordon	API #:	30-015-38535
Client Contact Name:	Amanda Davis	Reference	Historic Spill
Client Contact Phone #:	(575) 748-0176		

Summary of Times

Left Office	1/8/2020 11:20 AM
Arrived at Site	1/8/2020 12:45 PM
Departed Site	
Returned to Office	

Summary of Daily Operations

12:48 Delineation

Next Steps & Recommendations

1

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Monica Peppin

Signature:

CDU 153H 1/8/20

Delineate sample point 11. outline possible excavation area.

Starting mileage 52150.2 52248

leave office @ 11:20 A.M

On location @ 12:45 P.M.

811 called in shows multiple electrical lines near equipment.

There are 9 lines passing through

Delineated to 4 ft

Send in 2' & 4' BS19-11

Daily Site Visit Report

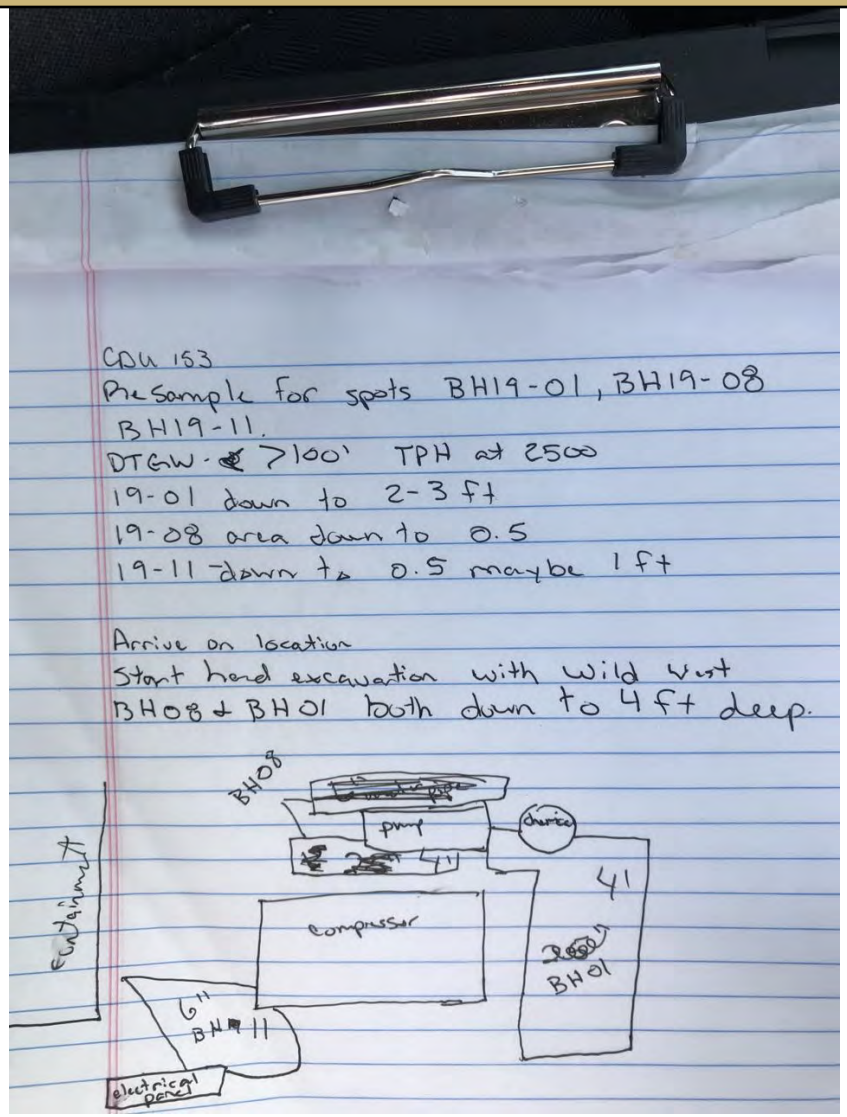
Client:	Devon Energy Corporation	Inspection Date:	1/27/2020
Site Location Name:	Cotton Draw Unit #153H	Report Run Date:	1/28/2020 1:56 AM
Project Owner:	Amanda Davis	File (Project) #:	19E-00575
Project Manager:	Natalie Gordon	API #:	30-015-38535
Client Contact Name:	Amanda Davis	Reference	Historic Spill
Client Contact Phone #:	(575) 748-0176		

Summary of Times	
Left Office	1/27/2020 8:15 AM
Arrived at Site	1/27/2020 10:05 AM
Departed Site	
Returned to Office	

Daily Site Visit Report

VERTEX

Site Sketch



Daily Site Visit Report

Summary of Daily Operations

10:06 Arrive on location
Safety paperwork
Hand excavation
Collect samples
Field screen samples
Pack samples

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: West	**Viewing Direction**: South
	
Hand excavated area for BH19-01	Hand excavated area of BH19-11
Viewing Direction: North	**Viewing Direction**: West
	
Hand excavated area of BH19-08	Area of hand excavation

Daily Site Visit Report

Viewing Direction: South

Area of hand excavation

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Monica Peppin

Signature:

CDU 153

Resample for spots BH19-01, BH19-08 BH19-11.

DTGW - >100' TPH at 2500

19-01 down to 2-3 ft

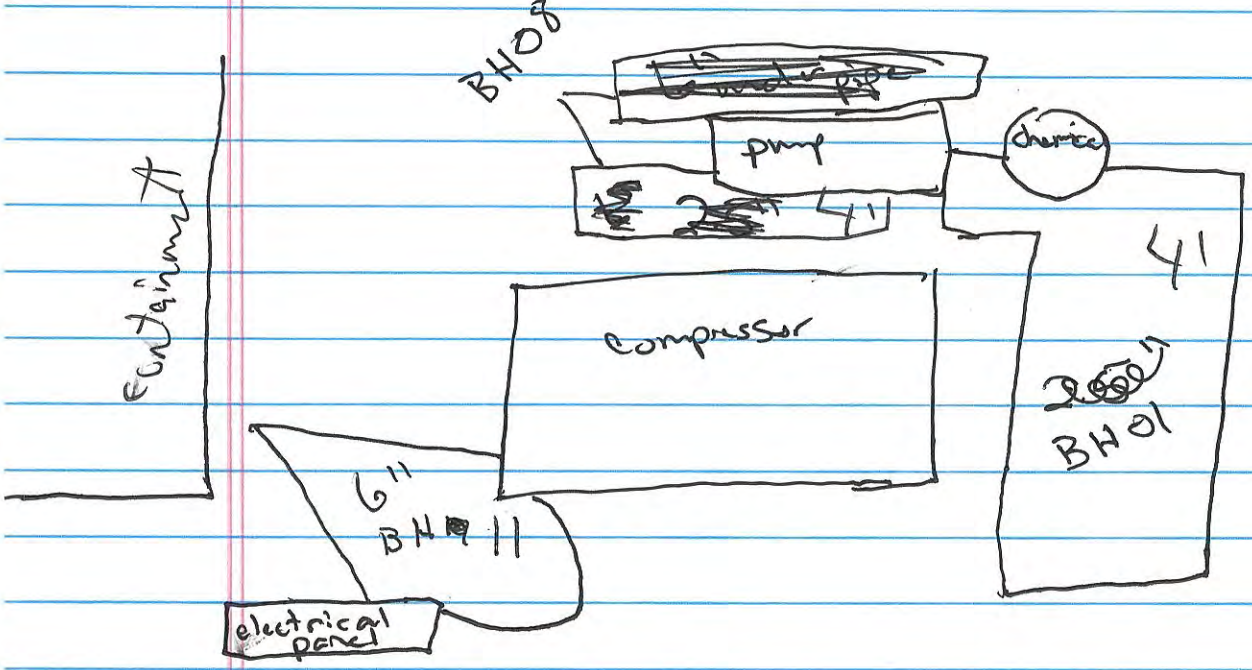
19-08 area down to 0.5

19-11 - down to 0.5 maybe 1 ft

Arrive on location

Start hand excavation with Wild West

BH08 & BH01 both down to 4 ft deep.



		PF		PF
12:30	BH01	7	side wall	111111
1:00	BH11	562		
1:30	BH08	7	side wall	

ATTACHMENT 5

Natalie Gordon

From: Natalie Gordon
Sent: Thursday, January 23, 2020 11:37 AM
To: Mike Bratcher (mike.bratcher@state.nm.us); Victoria Venegas (Victoria.Venegas@state.nm.us); Robert Hamlet (Robert.Hamlet@state.nm.us); blm_nm_cfo_spill@blm.gov; Wade , Kelsey; jamos@blm.gov
Cc: Bynum, Tom (Contract); Wesley. Mathews@dvn. com (Wesley.Mathews@dvn.com)
Subject: NAB1524750307: Cotton Draw Unit #153 48-hr Confirmation Sampling Notification - Devon Energy

All,

Please accept this email as 48-hr notification that Vertex Resource Services Inc. has scheduled final remediation activities and confirmation sampling to be conducted at Cotton Draw Unit #153 for Incident NAB1524750307, DOR: 07/19/2015, Devon Energy.

On Monday, January 27, 2020 at approximately 3:00 p.m., Monica Peppin of Vertex will be onsite to perform confirmation sampling. She can be reached at 575-361-9880. If you need directions to the site, please do not hesitate to contact her. If you have any questions or concerns regarding this notification, please give me a call at 505-506-0040.

Thank you,
Natalie

ATTACHMENT 6

Client Name: Devon Energy Production Company
Site Name: Cotton Draw Unit #153
NM OCD Incident Tracking #: NAB1524750307
Project #: 19E-00575-032
Lab Reports: 1912272, 2001395 and 2001A92

Table 2. Release Characterization and Re-Confirmatory Sampling - Depth-to-Groundwater > 100 feet

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 (Electroconductivity)	Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride
			(ppm)	(ppm)	(ppm)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
BH 19-01	0	December 3, 2019	-	**>1,000**	375	-	-	-	-	-	-	-	-
BH 19-01	4	December 3, 2019	-	**5,240**	-	-	-	-	-	-	-	-	-
BH 19-01	5	January 27, 2020	-	-	-	<0.025	<0.221	<4.9	<7.5	<38	<12.4	<50.4	78
BH 19-01	6	December 4, 2019	-	28	675	-	-	-	-	-	-	-	-
BH 19-01	8	December 4, 2019	0.1	29	375	<0.024	<0.220	<4.9	<9.6	<48	<14.5	<62.5	220
BH 19-02	0	December 3, 2019	-	-	675	-	-	-	-	-	-	-	-
BH 19-02	2	December 4, 2019	-	61	1,650	-	-	-	-	-	-	-	-
BH 19-02	4	December 4, 2019	-	34	1,275	-	-	-	-	-	-	-	-
BH 19-03	0	December 3, 2019	-	116	525	-	-	-	-	-	-	-	-
BH 19-03	0	December 4, 2019	-	-	240	<0.023	<0.210	<4.7	42	110	42	152	<60
BH 19-03	2	December 4, 2019	-	8	300	<0.025	<0.222	<4.9	<9.5	<47	<14.4	<61.4	<60
BH 19-04	0	December 3, 2019	-	-	900	-	-	-	-	-	-	-	-
BH 19-04	2	December 4, 2019	-	182	-	-	-	-	-	-	-	-	-
BH 19-04	4	December 4, 2019	-	33	750	<0.025	<0.224	<5.0	<9.8	<49	<14.8	<63.8	89
BH 19-04	6	December 4, 2019	-	-	-	-	-	-	-	-	-	-	-
BH 19-05	0	December 3, 2019	-	-	1,575	-	-	-	-	-	-	-	-
BH 19-06	0	December 3, 2019	-	91	375	<0.024	<0.216	<4.8	<9.7	<48	<14.5	<62.5	87
BH 19-07	0	December 4, 2019	-	440	9,675	-	-	-	-	-	-	-	-
BH 19-08	0	December 3, 2019	-	**>1,000**	3,300	-	-	-	-	-	-	-	-
BH 19-08	2	January 27, 2020	-	-	-	<0.025	<0.222	<4.9	<9.8	<49	<14.7	<63.7	<61
BH 19-09	0	December 4, 2019	-	320	9,600	-	-	-	-	-	-	-	-
BH 19-10	0	December 3, 2019	-	9	600	<0.024	<0.219	<4.9	<9.9	<49	<14.8	<63.8	110
BH 19-11	0	December 4, 2019	0.4	-	375	<0.023	<0.210	<4.7	5,200	3,600	**5,200**	**8,800**	120
BH 19-11	0.5	January 27, 2020	-	-	-	<0.025	<0.224	<5.0	180	190	180	370	<59
BH 19-11	2	January 8, 2020	-	-	-	<0.023	<0.208	<4.6	<9.4	<47	<14.0	<61.0	<60
BH 19-11	4	January 8, 2020	-	-	-	<0.025	<0.224	<5.0	<9.8	<49	<14.8	<63.8	580
BH 19-12	0	December 4, 2019	-	58	1,650	<0.024	<0.219	<4.9	<9.3	<47	<14.2	<61.2	710

"-" - Not assessed/analyzed
Bold and shaded indicates exceedance outside of, or near, applied action level

ATTACHMENT 7

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

December 16, 2019

Natalie Gordon

Vertex Resource Group Ltd.
213 S. Mesa St
Carlsbad, NM 88220
TEL:
FAX

RE: Cotton Draw Unit 153H OrderNo.: 1912272

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 8 sample(s) on 12/6/2019 for the analyses presented in the following report.

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

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

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

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1912272**
Date Reported: **12/16/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BH19-06 0'
Project: Cotton Draw Unit 153H **Collection Date:** 12/3/2019 3:32:00 PM
Lab ID: 1912272-001 **Matrix:** SOIL **Received Date:** 12/6/2019 9:00:00 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	12/11/2019 3:15:18 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	12/11/2019 3:15:18 PM
Surr: DNOP	90.8	70-130		%Rec	1	12/11/2019 3:15:18 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/9/2019 12:23:07 PM
Surr: BFB	81.5	66.6-105		%Rec	1	12/9/2019 12:23:07 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.024		mg/Kg	1	12/9/2019 12:23:07 PM
Toluene	ND	0.048		mg/Kg	1	12/9/2019 12:23:07 PM
Ethylbenzene	ND	0.048		mg/Kg	1	12/9/2019 12:23:07 PM
Xylenes, Total	ND	0.096		mg/Kg	1	12/9/2019 12:23:07 PM
Surr: 4-Bromofluorobenzene	92.1	80-120		%Rec	1	12/9/2019 12:23:07 PM
EPA METHOD 300.0: ANIONS						Analyst: **CJS**
Chloride	87	60		mg/Kg	20	12/11/2019 1:19:23 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 **1912272**
Date Reported: **12/16/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BH19-10 0'
Project: Cotton Draw Unit 153H **Collection Date:** 12/3/2019 5:16:00 PM
Lab ID: 1912272-002 **Matrix:** SOIL **Received Date:** 12/6/2019 9:00:00 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	12/11/2019 3:24:24 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	12/11/2019 3:24:24 PM
Surr: DNOP	71.7	70-130		%Rec	1	12/11/2019 3:24:24 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	12/9/2019 12:46:35 PM
Surr: BFB	79.0	66.6-105		%Rec	1	12/9/2019 12:46:35 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.024		mg/Kg	1	12/9/2019 12:46:35 PM
Toluene	ND	0.049		mg/Kg	1	12/9/2019 12:46:35 PM
Ethylbenzene	ND	0.049		mg/Kg	1	12/9/2019 12:46:35 PM
Xylenes, Total	ND	0.097		mg/Kg	1	12/9/2019 12:46:35 PM
Surr: 4-Bromofluorobenzene	90.6	80-120		%Rec	1	12/9/2019 12:46:35 PM
EPA METHOD 300.0: ANIONS						Analyst: **CJS**
Chloride	110	60		mg/Kg	20	12/11/2019 1:31:43 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 **1912272**
Date Reported: **12/16/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BH19-01 8'
Project: Cotton Draw Unit 153H **Collection Date:** 12/4/2019 2:20:00 PM
Lab ID: 1912272-003 **Matrix:** SOIL **Received Date:** 12/6/2019 9:00:00 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	12/11/2019 3:33:31 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	12/11/2019 3:33:31 PM
Surr: DNOP	71.3	70-130		%Rec	1	12/11/2019 3:33:31 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	12/9/2019 1:09:59 PM
Surr: BFB	82.0	66.6-105		%Rec	1	12/9/2019 1:09:59 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.024		mg/Kg	1	12/9/2019 1:09:59 PM
Toluene	ND	0.049		mg/Kg	1	12/9/2019 1:09:59 PM
Ethylbenzene	ND	0.049		mg/Kg	1	12/9/2019 1:09:59 PM
Xylenes, Total	ND	0.098		mg/Kg	1	12/9/2019 1:09:59 PM
Surr: 4-Bromofluorobenzene	93.0	80-120		%Rec	1	12/9/2019 1:09:59 PM
EPA METHOD 300.0: ANIONS						Analyst: **CJS**
Chloride	220	60		mg/Kg	20	12/11/2019 1:44:03 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	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 **1912272**
Date Reported: **12/16/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BH19-11 0'
Project: Cotton Draw Unit 153H **Collection Date:** 12/4/2019 2:38:00 PM
Lab ID: 1912272-004 **Matrix:** SOIL **Received Date:** 12/6/2019 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	5200	93		mg/Kg	10	12/11/2019 3:42:38 PM
Motor Oil Range Organics (MRO)	3600	460		mg/Kg	10	12/11/2019 3:42:38 PM
Surr: DNOP	0	70-130	S	%Rec	10	12/11/2019 3:42:38 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	12/9/2019 1:33:23 PM
Surr: BFB	81.8	66.6-105		%Rec	1	12/9/2019 1:33:23 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.023		mg/Kg	1	12/9/2019 1:33:23 PM
Toluene	ND	0.047		mg/Kg	1	12/9/2019 1:33:23 PM
Ethylbenzene	ND	0.047		mg/Kg	1	12/9/2019 1:33:23 PM
Xylenes, Total	ND	0.093		mg/Kg	1	12/9/2019 1:33:23 PM
Surr: 4-Bromofluorobenzene	94.0	80-120		%Rec	1	12/9/2019 1:33:23 PM
EPA METHOD 300.0: ANIONS						Analyst: **CJS**
Chloride	120	60		mg/Kg	20	12/11/2019 1:56:25 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 **1912272**
Date Reported: **12/16/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BH19-03 0'
Project: Cotton Draw Unit 153H **Collection Date:** 12/4/2019 4:18:00 PM
Lab ID: 1912272-005 **Matrix:** SOIL **Received Date:** 12/6/2019 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	42	9.8		mg/Kg	1	12/13/2019 10:10:18 AM
Motor Oil Range Organics (MRO)	110	49		mg/Kg	1	12/13/2019 10:10:18 AM
Surr: DNOP	124	70-130		%Rec	1	12/13/2019 10:10:18 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	12/9/2019 3:07:10 PM
Surr: BFB	82.1	66.6-105		%Rec	1	12/9/2019 3:07:10 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.023		mg/Kg	1	12/9/2019 3:07:10 PM
Toluene	ND	0.047		mg/Kg	1	12/9/2019 3:07:10 PM
Ethylbenzene	ND	0.047		mg/Kg	1	12/9/2019 3:07:10 PM
Xylenes, Total	ND	0.093		mg/Kg	1	12/9/2019 3:07:10 PM
Surr: 4-Bromofluorobenzene	95.1	80-120		%Rec	1	12/9/2019 3:07:10 PM
EPA METHOD 300.0: ANIONS						Analyst: **CJS**
Chloride	ND	60		mg/Kg	20	12/11/2019 2:08:46 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 **1912272**
Date Reported: **12/16/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BH19-12 0'
Project: Cotton Draw Unit 153H **Collection Date:** 12/4/2019 4:25:00 PM
Lab ID: 1912272-006 **Matrix:** SOIL **Received Date:** 12/6/2019 9:00:00 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	12/11/2019 4:00:50 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	12/11/2019 4:00:50 PM
Surr: DNOP	82.6	70-130		%Rec	1	12/11/2019 4:00:50 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	12/9/2019 3:30:48 PM
Surr: BFB	80.5	66.6-105		%Rec	1	12/9/2019 3:30:48 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.024		mg/Kg	1	12/9/2019 3:30:48 PM
Toluene	ND	0.049		mg/Kg	1	12/9/2019 3:30:48 PM
Ethylbenzene	ND	0.049		mg/Kg	1	12/9/2019 3:30:48 PM
Xylenes, Total	ND	0.097		mg/Kg	1	12/9/2019 3:30:48 PM
Surr: 4-Bromofluorobenzene	92.6	80-120		%Rec	1	12/9/2019 3:30:48 PM
EPA METHOD 300.0: ANIONS						Analyst: **CJS**
Chloride	710	60		mg/Kg	20	12/11/2019 2:21:07 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 **1912272**
Date Reported: **12/16/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BH19-03 2'
Project: Cotton Draw Unit 153H **Collection Date:** 12/4/2019 6:00:00 PM
Lab ID: 1912272-007 **Matrix:** SOIL **Received Date:** 12/6/2019 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	12/11/2019 4:09:55 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	12/11/2019 4:09:55 PM
Surr: DNOP	83.1	70-130		%Rec	1	12/11/2019 4:09:55 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	12/9/2019 3:54:29 PM
Surr: BFB	82.7	66.6-105		%Rec	1	12/9/2019 3:54:29 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.025		mg/Kg	1	12/9/2019 3:54:29 PM
Toluene	ND	0.049		mg/Kg	1	12/9/2019 3:54:29 PM
Ethylbenzene	ND	0.049		mg/Kg	1	12/9/2019 3:54:29 PM
Xylenes, Total	ND	0.099		mg/Kg	1	12/9/2019 3:54:29 PM
Surr: 4-Bromofluorobenzene	96.0	80-120		%Rec	1	12/9/2019 3:54:29 PM
EPA METHOD 300.0: ANIONS						Analyst: **CJS**
Chloride	ND	60		mg/Kg	20	12/11/2019 2:58:10 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 **1912272**
Date Reported: **12/16/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BH19-04 4'
Project: Cotton Draw Unit 153H **Collection Date:** 12/4/2019 6:20:00 PM
Lab ID: 1912272-008 **Matrix:** SOIL **Received Date:** 12/6/2019 9:00:00 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	12/11/2019 4:19:02 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	12/11/2019 4:19:02 PM
Surr: DNOP	73.7	70-130		%Rec	1	12/11/2019 4:19:02 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	12/9/2019 4:18:06 PM
Surr: BFB	81.6	66.6-105		%Rec	1	12/9/2019 4:18:06 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.025		mg/Kg	1	12/9/2019 4:18:06 PM
Toluene	ND	0.050		mg/Kg	1	12/9/2019 4:18:06 PM
Ethylbenzene	ND	0.050		mg/Kg	1	12/9/2019 4:18:06 PM
Xylenes, Total	ND	0.099		mg/Kg	1	12/9/2019 4:18:06 PM
Surr: 4-Bromofluorobenzene	94.1	80-120		%Rec	1	12/9/2019 4:18:06 PM
EPA METHOD 300.0: ANIONS						Analyst: **CJS**
Chloride	89	59		mg/Kg	20	12/11/2019 3:10:30 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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1912272**

16-Dec-19

Client: Vertex Resource Group Ltd.

Project: Cotton Draw Unit 153H

Sample ID: **MB-49274** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**

Client ID: **PBS** Batch ID: **49274** RunNo: **65120**

Prep Date: **12/11/2019** Analysis Date: **12/11/2019** SeqNo: **2234589** Units: **mg/Kg**

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

Sample ID: **LCS-49274** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**

Client ID: **LCSS** Batch ID: **49274** RunNo: **65120**

Prep Date: **12/11/2019** Analysis Date: **12/11/2019** SeqNo: **2234590** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.0	90	110			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1912272**

16-Dec-19

Client: Vertex Resource Group Ltd.

Project: Cotton Draw Unit 153H

Sample ID: **LCS-49218** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **LCSS** Batch ID: **49218** RunNo: **65093**

Prep Date: **12/9/2019** Analysis Date: **12/11/2019** SeqNo: **2233816** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	52	10	50.00	0	105	63.9	124			
Surr: DNOP	4.6		5.000		92.2	70	130			

Sample ID: **MB-49218** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **PBS** Batch ID: **49218** RunNo: **65093**

Prep Date: **12/9/2019** Analysis Date: **12/11/2019** SeqNo: **2233817** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	10		10.00		99.8	70	130			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1912272**

16-Dec-19

Client: Vertex Resource Group Ltd.

Project: Cotton Draw Unit 153H

Sample ID: **mb-49206**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **49206**	RunNo: **65038**
Prep Date: **12/6/2019**	Analysis Date: **12/9/2019**	SeqNo: **2231210** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	860		1000		85.8	66.6	105			

Sample ID: **lcs-49206**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **49206**	RunNo: **65038**
Prep Date: **12/6/2019**	Analysis Date: **12/9/2019**	SeqNo: **2231219** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	99.2	80	120			
Surr: BFB	930		1000		92.9	66.6	105			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1912272**

16-Dec-19

Client: Vertex Resource Group Ltd.

Project: Cotton Draw Unit 153H

Sample ID: **mb-49206**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **49206**	RunNo: **65038**
Prep Date: **12/6/2019**	Analysis Date: **12/9/2019**	SeqNo: **2231250** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.0		1.000		99.5	80	120			

Sample ID: **LCS-49206**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **49206**	RunNo: **65038**
Prep Date: **12/6/2019**	Analysis Date: **12/9/2019**	SeqNo: **2231251** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.86	0.025	1.000	0	86.1	80	120			
Toluene	0.90	0.050	1.000	0	90.1	80	120			
Ethylbenzene	0.89	0.050	1.000	0	89.5	80	120			
Xylenes, Total	2.8	0.10	3.000	0	91.9	80	120			
Surr: 4-Bromofluorobenzene	0.97		1.000		97.0	80	120			

Qualifiers:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **VERTEX CARLSBAD** Work Order Number: **1912272** RcptNo: **1**

Received By: **Yazmine Garduno** **12/6/2019 9:00:00 AM**

Completed By: **Erin Melendrez** **12/6/2019 9:38:57 AM**

Reviewed By: DAD 12/6/19

Chain of Custody

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

Log In

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

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)
Adjusted? _____
Checked by: YG 12/6/19

Special Handling (if applicable)

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

Person Notified: _____ Date: _____
By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: _____
Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.3	Good				
2	3.0	Good				

Chain-of-Custody Record

Client: VERTEX RESOURCE SERVICES

Mailing Address: ON FILE

Phone #: ON FILE

email or Fax#: ON FILE

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time: 5 Day rush
☐ Standard ☑ Rush

Project Name: COTTON DRAW UNIT 153H

Project #: 19E-00575-032

Project Manager: NATALIE GORDON

Sampler: SHANE HARVESTER

On Ice: ☒ Yes ☐ No

# of Coolers: 2

Cooler Temp(including CF): 4.4-0.1=4.3 (°C)

3.1-0.1=3.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 191277	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
12/3	15:32	S	BH19-06 0'	JAR	ICE	-001	X	X					X			
1	17:16	|	BH19-10 0'	|	|	-002	X	X					X			
12/4	14:20	|	BH19-01 8'	|	|	-003	X	X					X			
|	14:38	|	BH19-11 0'	|	|	-004	X	X					X			
|	16:18	|	BH19-03 0'	|	|	-005	X	X					X			
|	16:25	|	BH19-12 0'	|	|	-006	X	X					X			
|	18:00	|	BH19-03 2'	|	|	-007	X	X					X			
|	18:20	|	BH19-04 4'	|	|	-008	X	X					X			

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
12/4	20:09				12/5	1530
12/5	1400			COURIER	12/6/19	0700

Remarks:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

January 16, 2020

Natalie Gordon

Vertex Resource Group Ltd.
213 S. Mesa St
Carlsbad, NM 88220
TEL:
FAX

RE: CDU 153H OrderNo.: 2001395

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 2 sample(s) on 1/10/2020 for the analyses presented in the following report.

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

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

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

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2001395**
Date Reported: **1/16/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-11 2'
Project: CDU 153H **Collection Date:** 1/8/2020 1:00:00 PM
Lab ID: 2001395-001 **Matrix:** SOIL **Received Date:** 1/10/2020 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	1/14/2020 5:43:23 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	1/14/2020 5:43:23 PM
Surr: DNOP	92.6	55.1-146		%Rec	1	1/14/2020 5:43:23 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	1/13/2020 12:46:24 PM
Surr: BFB	94.9	66.6-105		%Rec	1	1/13/2020 12:46:24 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.023		mg/Kg	1	1/13/2020 12:46:24 PM
Toluene	ND	0.046		mg/Kg	1	1/13/2020 12:46:24 PM
Ethylbenzene	ND	0.046		mg/Kg	1	1/13/2020 12:46:24 PM
Xylenes, Total	ND	0.093		mg/Kg	1	1/13/2020 12:46:24 PM
Surr: 4-Bromofluorobenzene	99.7	80-120		%Rec	1	1/13/2020 12:46:24 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	ND	60		mg/Kg	20	1/15/2020 1:30:41 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 **2001395**
Date Reported: **1/16/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BS19-11 4'
Project: CDU 153H **Collection Date:** 1/8/2020 1:10:00 PM
Lab ID: 2001395-002 **Matrix:** SOIL **Received Date:** 1/10/2020 9:00:00 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	1/14/2020 6:10:51 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	1/14/2020 6:10:51 PM
Surr: DNOP	94.5	55.1-146		%Rec	1	1/14/2020 6:10:51 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	1/13/2020 1:55:19 PM
Surr: BFB	92.1	66.6-105		%Rec	1	1/13/2020 1:55:19 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.025		mg/Kg	1	1/13/2020 1:55:19 PM
Toluene	ND	0.050		mg/Kg	1	1/13/2020 1:55:19 PM
Ethylbenzene	ND	0.050		mg/Kg	1	1/13/2020 1:55:19 PM
Xylenes, Total	ND	0.099		mg/Kg	1	1/13/2020 1:55:19 PM
Surr: 4-Bromofluorobenzene	97.1	80-120		%Rec	1	1/13/2020 1:55:19 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	580	60		mg/Kg	20	1/15/2020 2:07:44 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		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2001395**

16-Jan-20

Client: Vertex Resource Group Ltd.

Project: CDU 153H

Sample ID: **2001395-001AMS** SampType: **MS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **BS19-11 2'** Batch ID: **49766** RunNo: **65773**

Prep Date: **1/13/2020** Analysis Date: **1/14/2020** SeqNo: **2259024** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	9.5	47.53	1.905	93.5	47.4	136			
Surr: DNOP	4.2		4.753		87.6	55.1	146			

Sample ID: **2001395-001AMSD** SampType: **MSD** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **BS19-11 2'** Batch ID: **49766** RunNo: **65773**

Prep Date: **1/13/2020** Analysis Date: **1/14/2020** SeqNo: **2259025** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	49	9.6	48.08	1.905	97.4	47.4	136	5.03	43.4	
Surr: DNOP	4.2		4.808		88.0	55.1	146	0	0	

Sample ID: **LCS-49766** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **LCSS** Batch ID: **49766** RunNo: **65773**

Prep Date: **1/13/2020** Analysis Date: **1/14/2020** SeqNo: **2259051** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	49	10	50.00	0	98.1	63.9	124			
Surr: DNOP	4.1		5.000		82.6	55.1	146			

Sample ID: **MB-49766** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **PBS** Batch ID: **49766** RunNo: **65773**

Prep Date: **1/13/2020** Analysis Date: **1/14/2020** SeqNo: **2259054** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.5		10.00		95.4	55.1	146			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2001395**

16-Jan-20

Client: Vertex Resource Group Ltd.

Project: CDU 153H

Sample ID: **mb-49750**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **49750**	RunNo: **65732**
Prep Date: **1/10/2020**	Analysis Date: **1/13/2020**	SeqNo: **2257935** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	950		1000		95.2	66.6	105			

Sample ID: **lcs-49750**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **49750**	RunNo: **65732**
Prep Date: **1/10/2020**	Analysis Date: **1/13/2020**	SeqNo: **2257936** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	96.6	80	120			
Surr: BFB	1100		1000		105	66.6	105			S

Sample ID: **2001395-001ams**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **BS19-11 2'**	Batch ID: **49750**	RunNo: **65732**
Prep Date: **1/10/2020**	Analysis Date: **1/13/2020**	SeqNo: **2257954** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	4.8	24.20	0	96.6	69.1	142			
Surr: BFB	1000		968.1		103	66.6	105			

Sample ID: **2001395-001amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **BS19-11 2'**	Batch ID: **49750**	RunNo: **65732**
Prep Date: **1/10/2020**	Analysis Date: **1/13/2020**	SeqNo: **2257955** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	4.8	24.08	0	94.8	69.1	142	2.45	20	
Surr: BFB	990		963.4		102	66.6	105	0	0	

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2001395**

16-Jan-20

Client: Vertex Resource Group Ltd.

Project: CDU 153H

Sample ID: **mb-49750** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **PBS** Batch ID: **49750** RunNo: **65732**

Prep Date: **1/10/2020** Analysis Date: **1/13/2020** SeqNo: **2257972** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.0		1.000		101	80	120			

Sample ID: **LCS-49750** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **LCSS** Batch ID: **49750** RunNo: **65732**

Prep Date: **1/10/2020** Analysis Date: **1/13/2020** SeqNo: **2257973** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.95	0.025	1.000	0	94.7	80	120			
Toluene	0.94	0.050	1.000	0	94.1	80	120			
Ethylbenzene	0.94	0.050	1.000	0	94.1	80	120			
Xylenes, Total	2.8	0.10	3.000	0	93.3	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		108	80	120			

Sample ID: **2001395-002ams** SampType: **MS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **BS19-11 4'** Batch ID: **49750** RunNo: **65732**

Prep Date: **1/10/2020** Analysis Date: **1/13/2020** SeqNo: **2257983** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.89	0.024	0.9662	0	92.1	78.5	119			
Toluene	0.89	0.048	0.9662	0.006240	91.5	75.7	123			
Ethylbenzene	0.91	0.048	0.9662	0.007579	93.6	74.3	126			
Xylenes, Total	2.7	0.097	2.899	0.01755	92.7	72.9	130			
Surr: 4-Bromofluorobenzene	0.90		0.9662		93.4	80	120			

Sample ID: **2001395-002amsd** SampType: **MSD** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **BS19-11 4'** Batch ID: **49750** RunNo: **65732**

Prep Date: **1/10/2020** Analysis Date: **1/13/2020** SeqNo: **2257984** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.93	0.025	0.9921	0	94.2	78.5	119	4.87	20	
Toluene	0.95	0.050	0.9921	0.006240	94.9	75.7	123	6.18	20	
Ethylbenzene	0.95	0.050	0.9921	0.007579	95.1	74.3	126	4.18	20	
Xylenes, Total	2.8	0.099	2.976	0.01755	94.4	72.9	130	4.43	20	
Surr: 4-Bromofluorobenzene	0.93		0.9921		93.9	80	120	0	0	

Qualifiers:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: VERTEX CARLSBAD Work Order Number: 2001395 RcptNo: 1

Received By: **Daniel Marquez** 1/10/2020 9:00:00 AM

Completed By: **Daniel Marquez** 1/10/2020 12:13:08 PM

Reviewed By: LB 1/10/20

Chain of Custody

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

Log In

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

# of preserved bottles checked for pH: (<2 or >12 unless noted)
Adjusted?
Checked by: DAD 1/10/20

Special Handling (if applicable)

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

Person Notified: Date:
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.2	Good				
2	4.0	Good				

Chain-of-Custody Record

Client: Vertex

Mailing Address: on File

Phone #: on file

email or Fax#: Natalie Gordon

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☑ Standard ☒ Rush 5 Day

Project Name: CDH 153H

Project #: 19E-00575 032

Project Manager: Natalie Gordon

Sampler: MJP

On Ice: ☑ Yes ☐ No

# of Coolers: 2

Cooler Temp(including CF): 2.2+0=2.2 (°C) 4.0+0=4.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2001395	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
1/8	1:00	soil	BS19-11 2'	4 oz	ice	001	✓	✓					✓			
1/8	1:10	soil	BS19-11 4'	4 oz	ice	002	✓	✓					✓			

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
1/9/20	1400				1/9/20	1400
4/9/20	1900			Courier	5/10/20	908

Remarks:
CC: Natalie Gordon

Devon

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

February 03, 2020

Natalie Gordon

Vertex Resource Group Ltd.
213 S. Mesa St
Carlsbad, NM 88220
TEL:
FAX

RE: Cotton Draw Unit 153H OrderNo.: 2001A92

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 3 sample(s) on 1/29/2020 for the analyses presented in the following report.

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

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

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

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2001A92**
Date Reported: **2/3/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BH19-01
Project: Cotton Draw Unit 153H **Collection Date:** 1/27/2020 3:30:00 PM
Lab ID: 2001A92-001 **Matrix:** SOIL **Received Date:** 1/29/2020 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**
Diesel Range Organics (DRO)	ND	7.5		mg/Kg	1	1/30/2020 11:29:03 AM
Motor Oil Range Organics (MRO)	ND	38		mg/Kg	1	1/30/2020 11:29:03 AM
Surr: DNOP	85.4	55.1-146		%Rec	1	1/30/2020 11:29:03 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	1/31/2020 1:36:15 AM
Surr: BFB	77.8	66.6-105		%Rec	1	1/31/2020 1:36:15 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.025		mg/Kg	1	1/31/2020 1:36:15 AM
Toluene	ND	0.049		mg/Kg	1	1/31/2020 1:36:15 AM
Ethylbenzene	ND	0.049		mg/Kg	1	1/31/2020 1:36:15 AM
Xylenes, Total	ND	0.098		mg/Kg	1	1/31/2020 1:36:15 AM
Surr: 4-Bromofluorobenzene	89.9	80-120		%Rec	1	1/31/2020 1:36:15 AM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	78	60		mg/Kg	20	1/31/2020 1:42:50 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 **2001A92**
Date Reported: **2/3/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BH19-08
Project: Cotton Draw Unit 153H **Collection Date:** 1/27/2020 3:45:00 PM
Lab ID: 2001A92-002 **Matrix:** SOIL **Received Date:** 1/29/2020 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	1/30/2020 11:56:19 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	1/30/2020 11:56:19 AM
Surr: DNOP	82.1	55.1-146		%Rec	1	1/30/2020 11:56:19 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	1/31/2020 2:45:46 AM
Surr: BFB	76.2	66.6-105		%Rec	1	1/31/2020 2:45:46 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.025		mg/Kg	1	1/31/2020 2:45:46 AM
Toluene	ND	0.049		mg/Kg	1	1/31/2020 2:45:46 AM
Ethylbenzene	ND	0.049		mg/Kg	1	1/31/2020 2:45:46 AM
Xylenes, Total	ND	0.099		mg/Kg	1	1/31/2020 2:45:46 AM
Surr: 4-Bromofluorobenzene	88.6	80-120		%Rec	1	1/31/2020 2:45:46 AM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	ND	61		mg/Kg	20	1/31/2020 1:55:11 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 **2001A92**
Date Reported: **2/3/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd. **Client Sample ID:** BH19-11 0.5'
Project: Cotton Draw Unit 153H **Collection Date:** 1/27/2020 1:00:00 PM
Lab ID: 2001A92-003 **Matrix:** SOIL **Received Date:** 1/29/2020 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**
Diesel Range Organics (DRO)	180	9.6		mg/Kg	1	1/30/2020 2:49:28 PM
Motor Oil Range Organics (MRO)	190	48		mg/Kg	1	1/30/2020 2:49:28 PM
Surr: DNOP	87.8	55.1-146		%Rec	1	1/30/2020 2:49:28 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	1/31/2020 3:55:13 AM
Surr: BFB	75.2	66.6-105		%Rec	1	1/31/2020 3:55:13 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.025		mg/Kg	1	1/31/2020 3:55:13 AM
Toluene	ND	0.050		mg/Kg	1	1/31/2020 3:55:13 AM
Ethylbenzene	ND	0.050		mg/Kg	1	1/31/2020 3:55:13 AM
Xylenes, Total	ND	0.099		mg/Kg	1	1/31/2020 3:55:13 AM
Surr: 4-Bromofluorobenzene	87.6	80-120		%Rec	1	1/31/2020 3:55:13 AM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	ND	59		mg/Kg	20	1/31/2020 2:32:13 PM

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

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2001A92**
03-Feb-20

Client: Vertex Resource Group Ltd.
Project: Cotton Draw Unit 153H

Sample ID: **MB-50180**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **50180**	RunNo: **66229**							
Prep Date: **1/31/2020**	Analysis Date: **1/31/2020**	SeqNo: **2275967**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-50180**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **50180**	RunNo: **66229**							
Prep Date: **1/31/2020**	Analysis Date: **1/31/2020**	SeqNo: **2275968**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	91.8	90	110			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2001A92**

03-Feb-20

Client: Vertex Resource Group Ltd.

Project: Cotton Draw Unit 153H

Sample ID: **MB-50153**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **50153**	RunNo: **66185**
Prep Date: **1/30/2020**	Analysis Date: **1/30/2020**	SeqNo: **2273551** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.8		10.00		87.8	55.1	146			

Sample ID: **LCS-50153**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **50153**	RunNo: **66185**
Prep Date: **1/30/2020**	Analysis Date: **1/30/2020**	SeqNo: **2273552** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	48	10	50.00	0	96.0	63.9	124			
Surr: DNOP	4.1		5.000		81.0	55.1	146			

Sample ID: **2001A92-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BH19-01**	Batch ID: **50153**	RunNo: **66185**
Prep Date: **1/30/2020**	Analysis Date: **1/30/2020**	SeqNo: **2273576** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	38	7.2	36.21	0	106	47.4	136			
Surr: DNOP	3.8		3.621		104	55.1	146			

Sample ID: **2001A92-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BH19-01**	Batch ID: **50153**	RunNo: **66185**
Prep Date: **1/30/2020**	Analysis Date: **1/30/2020**	SeqNo: **2273577** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	38	7.2	36.02	0	105	47.4	136	0.748	43.4	
Surr: DNOP	3.7		3.602		102	55.1	146	0	0	

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2001A92**
03-Feb-20

Client: Vertex Resource Group Ltd.
Project: Cotton Draw Unit 153H

Sample ID: **mb-50144**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **50144**	RunNo: **66183**
Prep Date: **1/29/2020**	Analysis Date: **1/31/2020**	SeqNo: **2274193** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	760		1000		76.0	66.6	105			

Sample ID: **lcs-50144**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **50144**	RunNo: **66183**
Prep Date: **1/29/2020**	Analysis Date: **1/31/2020**	SeqNo: **2274194** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	5.0	25.00	0	84.2	80	120			
Surr: BFB	850		1000		85.3	66.6	105			

Sample ID: **2001a92-001ams**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **BH19-01**	Batch ID: **50144**	RunNo: **66183**
Prep Date: **1/29/2020**	Analysis Date: **1/31/2020**	SeqNo: **2274196** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	5.0	24.78	0	85.1	69.1	142			
Surr: BFB	840		991.1		85.0	66.6	105			

Sample ID: **2001a92-001amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **BH19-01**	Batch ID: **50144**	RunNo: **66183**
Prep Date: **1/29/2020**	Analysis Date: **1/31/2020**	SeqNo: **2274197** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	4.8	24.22	0	83.8	69.1	142	3.82	20	
Surr: BFB	840		969.0		86.2	66.6	105	0	0	

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2001A92**
03-Feb-20

Client: Vertex Resource Group Ltd.
Project: Cotton Draw Unit 153H

Sample ID: **mb-50144**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **50144**	RunNo: **66183**
Prep Date: **1/29/2020**	Analysis Date: **1/31/2020**	SeqNo: **2274238** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.88		1.000		88.4	80	120			

Sample ID: **LCS-50144**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **50144**	RunNo: **66183**
Prep Date: **1/29/2020**	Analysis Date: **1/31/2020**	SeqNo: **2274239** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.91	0.025	1.000	0	90.6	80	120			
Toluene	0.91	0.050	1.000	0	90.6	80	120			
Ethylbenzene	0.89	0.050	1.000	0	89.2	80	120			
Xylenes, Total	2.7	0.10	3.000	0	89.6	80	120			
Surr: 4-Bromofluorobenzene	0.90		1.000		90.2	80	120			

Sample ID: **2001a92-002ams**	SampType: **MS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BH19-08**	Batch ID: **50144**	RunNo: **66183**
Prep Date: **1/29/2020**	Analysis Date: **1/31/2020**	SeqNo: **2274242** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.91	0.024	0.9653	0	94.5	78.5	119			
Toluene	0.92	0.048	0.9653	0.01077	94.6	75.7	123			
Ethylbenzene	0.93	0.048	0.9653	0	96.4	74.3	126			
Xylenes, Total	2.8	0.097	2.896	0.01779	95.9	72.9	130			
Surr: 4-Bromofluorobenzene	0.84		0.9653		87.3	80	120			

Sample ID: **2001a92-002amsd**	SampType: **MSD**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BH19-08**	Batch ID: **50144**	RunNo: **66183**
Prep Date: **1/29/2020**	Analysis Date: **1/31/2020**	SeqNo: **2274243** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.88	0.024	0.9756	0	89.8	78.5	119	4.13	20	
Toluene	0.94	0.049	0.9756	0.01077	94.7	75.7	123	1.19	20	
Ethylbenzene	0.95	0.049	0.9756	0	97.1	74.3	126	1.75	20	
Xylenes, Total	2.9	0.098	2.927	0.01779	97.2	72.9	130	2.38	20	
Surr: 4-Bromofluorobenzene	0.88		0.9756		90.6	80	120	0	0	

Qualifiers:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **VERTEX CARLSBAD** Work Order Number: **2001A92** RcptNo: **1**

Received By: **Desiree Dominguez** **1/29/2020 8:55:00 AM** DZ

Completed By: **Isaiah Ortiz** **1/29/2020 9:10:31 AM** I-Ox

Reviewed By: DAD 1/29/20

Chain of Custody

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

Log In

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

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

Adjusted? _____

Checked by: JR 1/29/20

Special Handling (if applicable)

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

Person Notified:	Natalie Gordon	Date	1/29/2020
By Whom:	Yazmine Garduno	Via:	☐ eMail ☑ Phone ☐ Fax ☐ In Person
Regarding:	Time different on all samples from COC. Sample 003 on bottle has 0.5' towards the end o		
Client Instructions:	Per Natalie, go along with sample bottles.		

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.7	Good	Not Present			

Chain-of-Custody Record

Client: Vertex

Mailing Address: on file

Phone #: on file

email or Fax#: Natalie Gordon

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time: 5 Day
☑ Standard ☐ Rush

Project Name: Cotton Draw Unit #153H

Project #: 19E-00575-032

Project Manager: Natalie Gordon

Sampler: MJP

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp (including CF): 2.7-0.0=2.7 (°C)

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2001A92	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	(Cl) F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
1/27	~~1100~~ 1530	Soil	BH19-01	4oz	ice	-001	✓	✓					✓			
1/27	~~1330~~ 1545	Soil	BH19-08	4oz	ice	-002	✓	✓					✓			
1/27	~~1345~~ 1600	Soil	BH19-110.5'	4oz	ice	-003	✓	✓					✓			
Y6 1/29/20			Y6 1/29/20													

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
1/28/20	1400				1/28/20	1400
1/28/20	1902			Courier	1/29/20	8:55

Remarks:
CC: Natalie Gordon

Devon

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

State of New Mexico
Oil Conservation Division

Incident ID	NAB1524750307
District RP	2RP-3241
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?	406 (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☒ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☒ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ☒ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☒ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☒ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☒ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☐ Yes ☒ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☒ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☐ Yes ☒ No

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

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

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

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

Form C-141
Page 4

State of New Mexico
Oil Conservation Division

Incident ID	NAB1524750307
District RP	2RP-3241
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: Amanda Davis Title: Environmental Representative

Signature: Amanda Davis Date: 5/18/2020

email: amanda.davis@dvn.com Telephone: 575-748-0176

OCD Only

Received by: Date:

State of New Mexico
Oil Conservation Division

Incident ID	NAB1524750307
District RP	2RP-3241
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: Amanda Davis Title: Environmental Representive

Signature: *Amanda Davis* Date: _____

email: amanda.davis@dvn.com Telephone: 575-748-0176

OCD Only

Received by: _____ Date: _____

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

Closure Approved by: _____ Date: _____

Printed Name: _____ Title: _____

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

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

CONDITIONS

Action 8347

CONDITIONS

Operator: DEVON ENERGY PRODUCTION COMPANY, LP 333 West Sheridan Ave. Oklahoma City, OK 73102	OGRID: 6137
	Action Number: 8347
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
jharimon	Depth to groundwater is inadequately justified however the data allows the OCD to grant closure to this incident. Please note that, when the well or facility is plugged or abandoned, the final remediation and reclamation shall take place in accordance with 19.15.29.12 and 19.15.29.13 NMAC once the site is no longer being used for oil and gas operations.	7/1/2022