VERTEX

October 20, 2020 Vertex Project #: 20E-00239-007

Spill Closure Report: Shinnery Oak Federal SWD #001
Unit I, Section 12, Township 21 South, Range 28 East
County: Eddy
Incident Tracking Number: NRM2009032079

Prepared For: Matador Production Company
5400 LBJ Freeway
Suite 1500
Dallas, Texas 75240

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

Matador Production Company (Matador) retained Vertex Resource Services Inc. (Vertex) to conduct a spill assessment and remediation for a produced water release that occurred at Shinnery Oak Federal SWD #001 (hereafter referred to as "Shinnery Oak"). Matador provided notification of the spill to New Mexico Oil Conservation Division (NM OCD) District 2 and the Bureau of Land Management (BLM), who own the land, via submission of an initial C-141 Release Notification (Attachment 1) on March 30, 2020. The NM OCD tracking number assigned to this incident is NRM2009032079.

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

Incident Description

On March 25, 2020, a release occurred at Matador's Shinnery Oak site when a fitting on the produced water bypass meter blew out. This incident resulted in the release of approximately 19.81 barrels (bbls) of produced water onto the engineered pad. A vac truck arrived on-site to recover free fluids; approximately 12 bbls of produced water were recovered. The spill was contained within the boundaries of the engineered pad. No produced water was released into undisturbed areas or waterways.

Site Characterization

The release at Shinnery Oak occurred on federally-owned land, N 32.49297, W 104.03371, approximately 12 miles northeast of Carlsbad, New Mexico. The legal description for the site is Unit I, Section 12, Township 21 South, Range 28 East, Eddy County, New Mexico. This location is within the Permian Basin in southeast New Mexico and has historically been used for oil and gas exploration and production, and rangeland. An aerial photograph and site schematic are included in Attachment 2.

The Shinnery Oak complex consists of saltwater disposal (SWD) equipment, a tank battery, and nearby oil and gas exploration and production wellpads, and is typical of oil and gas-related sites in the western portion of the Permian Basin. The following sections specifically describe the release area on the northern edge of the tank battery containment and towards the fence line of the lease at the north edge of the pad.

The surrounding landscape is associated with the sandy plains and interdunes typical of elevations between 2,700 and 5,500 feet above sea level. The climate is semi-arid with an average annual precipitation ranging between 5 and 15 inches. Historically, the plant communities in this area have been dominated by black grama, dropseeds, and bluestems with scattered shinnery oak and sand sage. Perennial and annual forb abundance and distribution are dependent on precipitation. Litter and, to a lesser extent, bare ground make up a significant proportion of ground cover (United States Department of Agriculture, Natural Resources Conservation Service, 2020). Limited to no vegetation is allowed to grow on the compacted facility and disposal pad area.

The Geological Map of New Mexico indicates the surface geology at Shinnery Oak is comprised of Qe – Eolian deposits of upland plains, fan piedmonts and inter-dunal areas (New Mexico Bureau of Geology and Mineral Resources, 2020). The Natural Resources Conservation Service *Web Soil Survey* characterizes the soil at Shinnery Oak as Pajarito loamy fine sand, which is characterized by loamy fine sand over deep fine sandy loam. This soil tends to be well drained with very low runoff and moderate water storage in the soil profile (United States Department of Agriculture, Natural Resources Conservation Service, 2020). There is low-to-medium potential for karst geology to be present near Shinnery Oak (United States Department of the Interior, Bureau of Land Management, 2020).

There is no surface water located on-site. The nearest significant watercourse, as defined in Subsection P of 19.15.17.7 NMAC, is Lake Avalon, located approximately 10 miles west of the site (United States Fish and Wildlife Service, 2020). There are no continuously flowing watercourses, lakebeds, sinkholes, playa lakes, or other critical water or community features at Shinnery Oak, as outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC.

The nearest recent well to the site is a United States Geological Survey-identified well, located approximately 0.8 miles south-southeast of Shinnery Oak, with a depth to groundwater of 134 feet below ground surface (bgs; United States Department of the Interior, United States Geological Survey, 2020). Documentation pertaining to site characterization and depth to groundwater determination is included in Attachment 3.

Closure Criteria Determination

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

Based on data included in the closure criteria determination worksheet, the release at Shinnery Oak 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

On March 26, 2020, Matador contracted with Vertex to complete release delineation and remediation at Shinnery Oak through field screen procedures, oversight of the remediation fieldwork and final confirmatory sampling. The initial spill inspection and site characterization activities at Shinnery Oak were completed by Vertex on March 26, 2020. The Daily Field Report (DFR) and field screening data associated with the visit is included in Attachment 4. Using initial field screening data, the release was delineated horizontally and vertically, and remediation was started. Excavation of impacted soils was conducted between March 26 and March 27, 2020, with a Vertex representative on-site to conduct field screen procedures to determine final horizontal and vertical extents of the excavation area.

On March 27, 2020, following the completion of excavation activities, Vertex provided notification of confirmation sampling to NM OCD (Attachment 5), as required by Subparagraph (a) of Paragraph (1) of Subsection D 19.15.29.12 NMAC.

On April 1, 2020, Vertex collected a total of 18 five-point composite confirmatory samples from the base and side walls of the excavation, at depths ranging between ground surface and 0.5 feet bgs. Each composite sample was representative of no more than 200 square feet per the alternate sampling method outlined in Subparagraph (c) of Paragraph (1) of Subsection D 19.15.29.12 NMAC, which does not require prior NM OCD approval. The composite samples were placed into laboratory-provided containers, preserved on ice, and submitted to a National Environmental Laboratory Accreditation Program-approved laboratory for chemical analysis.

Laboratory analyses included Method 300.0 for chlorides, Method 8021B for volatile organics, including BTEX, and EPA Method 8015 for TPH, including MRO, DRO and GRO. Confirmatory sample analytical data are summarized in Attachment 6. 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 five-point composite samples. The confirmatory sample locations are presented on Figure 1 (Attachment 2). Relevant equipment and prominent features/reference points at the site are mapped as well.

Closure Request Denial and Additional Activities

On May 7, 2020, Matador requested closure for the release at Shinnery Oak, at Vertex's recommendation. On August 18, 2020, the NM OCD denied closure for this incident based on the following reason:

- Horizontal delineation was not completed in accordance with Subparagraph (b) of Paragraph (5) of Subsection A 19.15.29.11 NMAC.

On August 24, 2020, Vertex returned to Shinnery Oak to re-delineate the horizontal boundaries of the release as required by 19.15.29.11 NMAC, to verify that the release was remediated to the extent required. A total of 4 surface samples were collected at the horizontal extents of the original release and remediation area to verify the edges of the release had been accurately identified. The surface samples were placed into laboratory-provided containers and submitted to an 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. The additional delineation sampling analytical data are summarized in the revised Table 2 (Attachment 6). Laboratory data reports and chain of custody forms are included in Attachment 7.

A GeoExplorer 7000 Series Trimble GPS unit, or equivalent, was used to map the additional release delineation samples. The additional delineation surface samples are presented along with the original confirmatory base and side wall samples on the revised Figure 1. The new samples are identified with the prefix "SS20-" (Attachment 2).

Closure Request

Vertex recommends no additional action to address the release at Shinnery Oak. Laboratory analyses of the final 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. The additional delineation samples showed constituent of concern concentration levels below the most-strict closure criteria or background level and are indicative of full horizontal delineation. There are no anticipated risks to human, ecological or hydrological receptors associated with the release site.

Vertex requests that this incident (NRM2009032079) be closed as the original closure request denial (Attachment 8) reason has been addressed and closure requirements set forth in Subsection E of 19.15.29.12 NMAC have been met. Matador certifies that all information in this report and the attachments is correct, and that they have complied with all applicable closure requirements and conditions specified in Division rules and directives to meet NM OCD requirements to obtain closure on the March 25, 2020, release at Shinnery Oak.

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 (Rev'd)
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. Confirmatory Sampling Laboratory Results (Rev'd)
Attachment 7. Laboratory Data Reports/Chain of Custody Forms
Attachment 8. NM OCD Original Closure Denial

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

United States Department of the Interior, United States Geological Survey. (2020). *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 Matador Production Company (Matador). 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 Matador. Any use of this report by a third party, or any reliance on decisions made based on it, or damages suffered as a result of the use of this report are the sole responsibility of the user.

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

ATTACHMENT 1

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

State of New Mexico
Energy Minerals and Natural Resources Department

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

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

Incident ID	NRM2009032079
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party: Matador Production Company	OGRID: 228937
Contact Name: John Hurt	Contact Telephone: 972-371-5200
Contact email: JHurt@matadorresources.com	Incident # *(assigned by OCD)*
Contact mailing address: 5400 LBJ Freeway, Suite 1500 Dallas, TX 75240	

Location of Release Source

Latitude 32.49297 Longitude -104.03371
(NAD 83 in decimal degrees to 5 decimal places)

Site Name: Shinnery Oak Federal SWD #001	Site Type: SWD
Date Release Discovered: 03/25/2020	API# *(if applicable)* 30-015-20866

Unit Letter	Section	Township	Range	County
I	12	21S	28E	Eddy

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

Nature and Volume of Release

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

☐ Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
☒ Produced Water	Volume Released (bbls) 19.81 bbls	Volume Recovered (bbls) 12 bbls
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☒ Yes ☐ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release:

A fitting on the PW bypass meter blew out.

Form C-141
Page 2

State of New Mexico
Oil Conservation Division

Incident ID	NRM2009032079
District RP	
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? ☐ Yes ☒ No	If YES, for what reason(s) does the responsible party consider this a major release?
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?	

Initial Response

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

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

If all the actions described above have not been undertaken, explain why:

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

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

Printed Name: John Hurt Title: RES Specialist

Signature: Date: 3/30/20

email: JHurt@matadorresources.com Telephone: 972- 371-5200

OCD Only

Received by: Ramona Marcus Date: 3/30/2020

State of New Mexico
Oil Conservation Division

Incident ID	NRM2009032079
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

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

What is the shallowest depth to groundwater beneath the area affected by the release?	134 (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
- ☒ Boring or excavation logs
- ☒ Photographs including date and GIS information
- ☒ Topographic/Aerial maps
- ☒ Laboratory data including chain of custody

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

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State of New Mexico
Oil Conservation Division

Incident ID	NRM2009032079
District RP	
Facility ID	
Application ID	

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

Printed Name: John Hurt . Title: RES Specialist

Signature: Date: 10/27/20

email: JHurt@matadorresources.com . Telephone: 972-371-5200 .

OCD Only

Received by: Cristina Eads Date: 10/27/2020

State of New Mexico
Oil Conservation Division

Incident ID	NRM2009032079
District RP	
Facility ID	
Application ID	

Closure

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

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

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

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

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

[x] Description of remediation activities

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

Printed Name: John Hurt Title: RES Specialist

Signature: Date: 10/27/20

email: JHurt@matadorresources.com Telephone: 972-371-5200

OCD Only

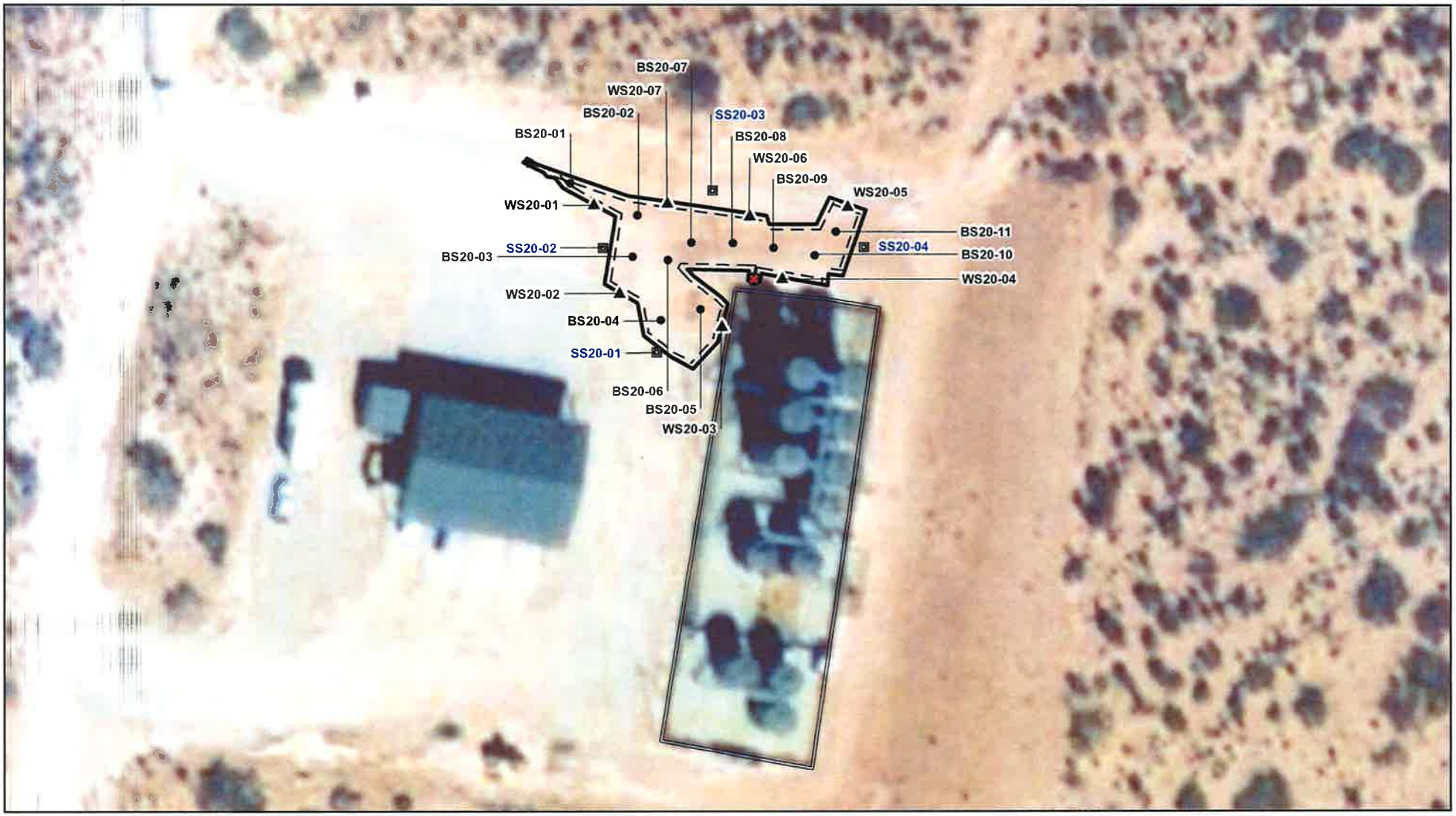
Received by: Cristina Eads Date: 10/27/2020

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

Closure Approved by: Date: 01/22/2021

Printed Name: Cristina Eads Title: Environmental Specialist

ATTACHMENT 2



Base Sample | Surface Sample | Excavation
Point of Release | Wall Sample | Tank Battery Containment

VERTEX

0 25 50 Feet

Map Center:
Lat/Long: 32.513713, -104.061825

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

N

Site Schematic and Confirmatory Sampling Locations
Shinnery Oaks SWD #001

FIGURE:
1.2

Document Path: G:\Projects_US PROJECTS\Maladar Resources\20E-002398\007 - Shinnery Oaks SWD #001\Figure 1 Confirmatory Schematic Shinnery Oaks SWD #001.mxd

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

Note: Imagery from ESRI, 2018.

VERSATILITY. EXPERTISE.

ATTACHMENT 3

Closure Criteria Worksheet			
Site Name: Shinnery Oak Federal SWD #001			
Spill Coordinates:		32.49297	Y: -104.03371
Site Specific Conditions		Value	Unit
1	Depth to Groundwater	134	feet
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	2,093	feet
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	61,776	feet
4	Within 300 feet from an occupied residence, school, hospital, institution or church	19,346	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**	4,882	feet
	ii) Within 1000 feet of any fresh water well or spring		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	4,452	feet
8	Within the area overlying a subsurface mine	No	(Y/N)
9	Within an unstable area (Karst Map)	Low	Critical High Medium Low
10	Within a 100-year Floodplain	>100	year
11	Soil Type	Pajarito loamy fine sand	
12	Ecological Classification	Loamy Sand	
13	Geology	Qe	
	NMAC 19.15.29.12 E (Table 1) Closure Criteria	>100'	<50' 51-100' >100'

OSE Shinnery Oak

USGS science for a changing world

National Water Information System: Mapper

Sites | Map

Search

Surface-Water Sites

Groundwater Sites

Active Sites
Any data
Instantaneous data
Daily data
Water-quality data
Measurements
Annual Report

Inactive Sites
Any data
Instantaneous data
Daily data
Water-quality data
Measurements
Annual Report

U.S. Fish and Wildlife Service

National Wetlands Inventory

Wetlands

April 30, 2020

Wetlands

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

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

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

Google Maps

32°29'34.7"N 104°02'01.4"W

Shinnery Oak Nearest Lake

Imagery ©2020 TerraMetrics, Map data ©2020 1 mi

Measure distance

Total distance: 11.75 mi (18.91 km)

U.S. Fish and Wildlife Service

National Wetlands Inventory

Shinnery Oak Fed

April 30, 2020

Wetlands

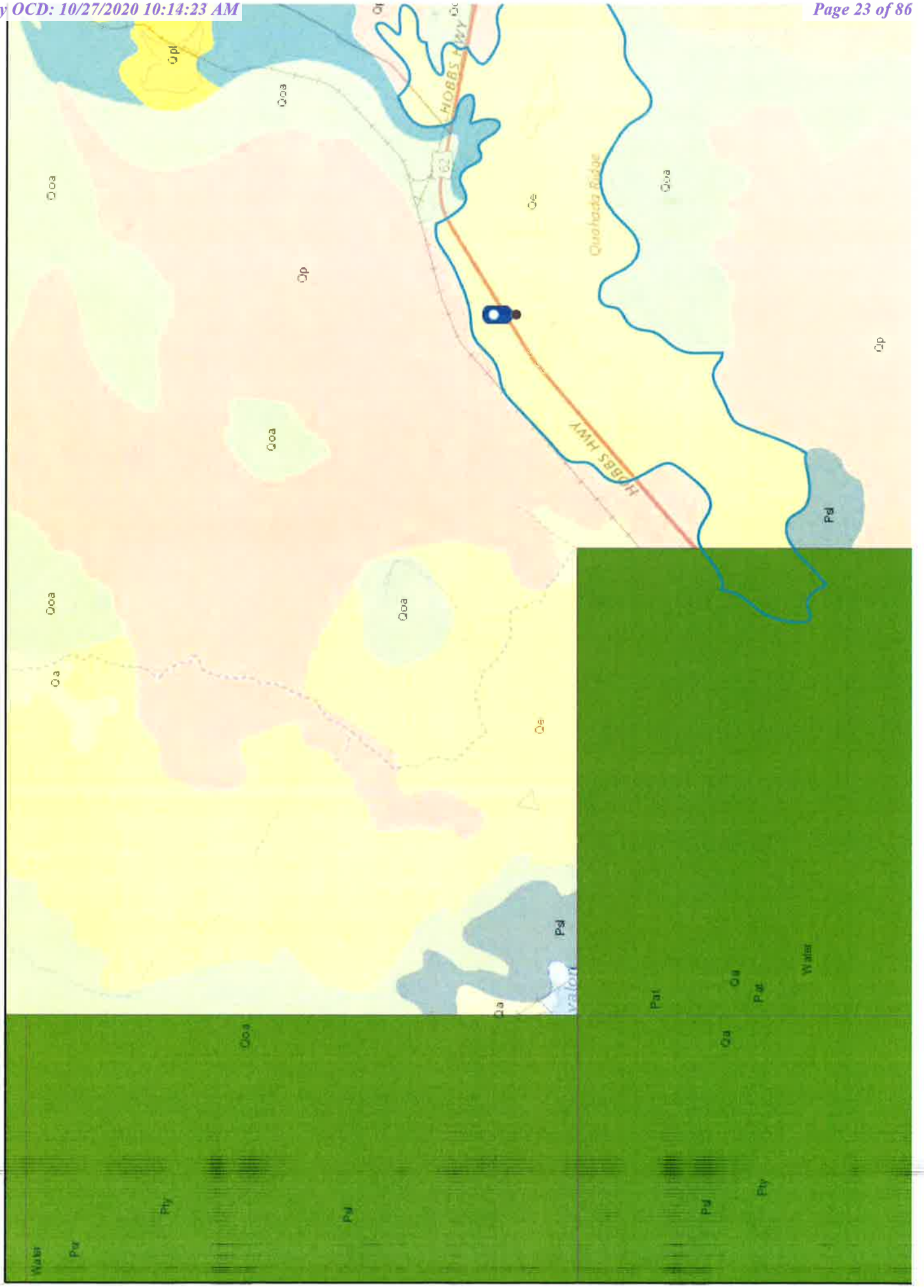
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

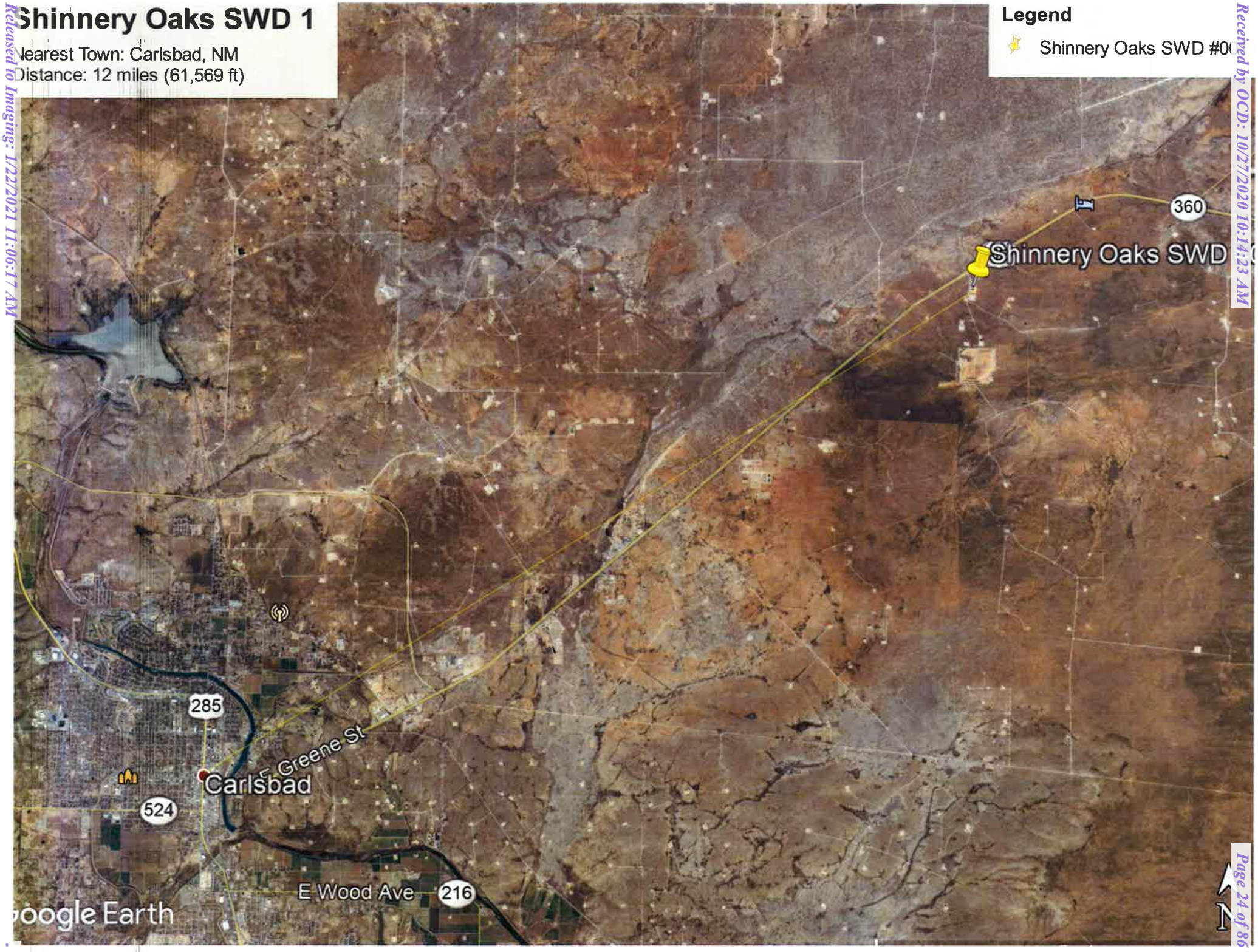
This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

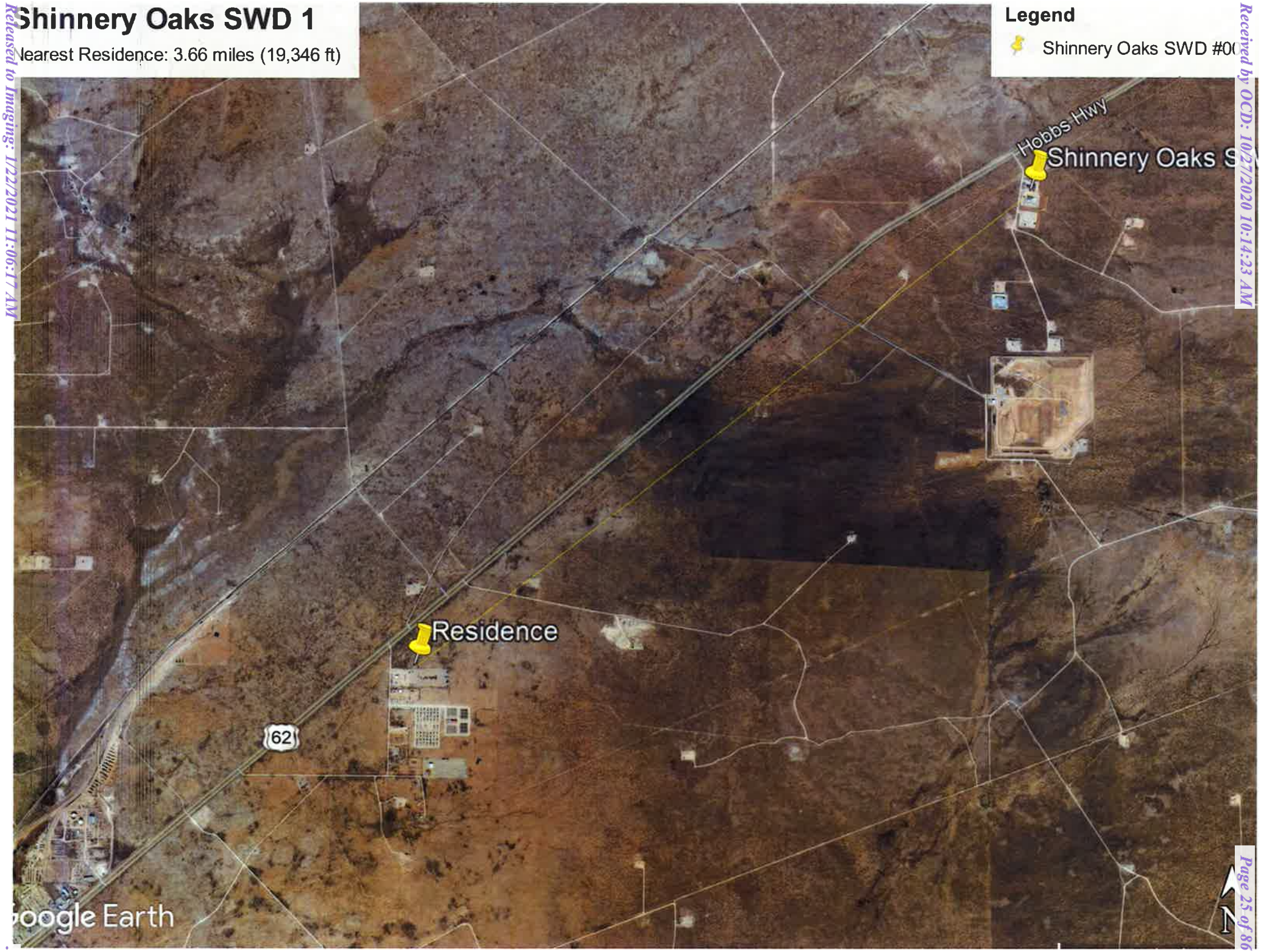
National Wetlands Inventory (NWI)

This page was produced by the NWI mapper

Shinnery Oaks SWD 1







Eddy Area, New Mexico

LA—Largo loam, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1w4y
Elevation: 2,000 to 5,700 feet
Mean annual precipitation: 6 to 14 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 180 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

Largo and similar soils: 98 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Largo

Setting

Landform: Plains, alluvial fans
Landform position (three-dimensional): Talf, rise
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Calcareous alluvium

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 47 inches: silt loam
H3 - 47 to 65 inches: loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B

Ecological site: Loamy (R042XC007NM)
Hydric soil rating: No

Minor Components

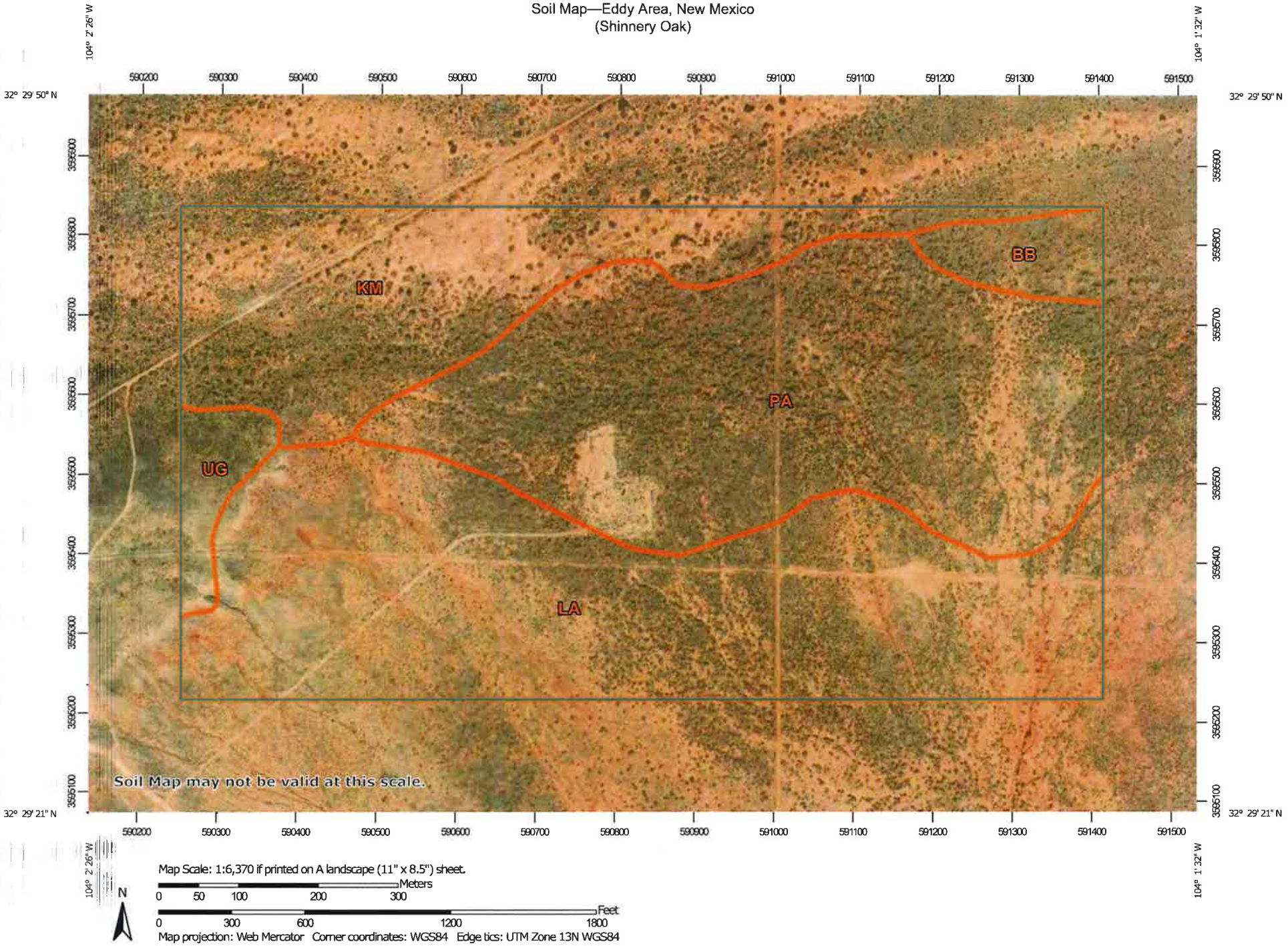
Largo
Percent of map unit: 1 percent
Ecological site: Bottomland (R042XC017NM)
Hydric soil rating: No

Pajarito
Percent of map unit: 1 percent
Ecological site: Loamy Sand (R042XC003NM)
Hydric soil rating: No

Data Source Information

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 15, Sep 15, 2019

Soil Map—Eddy Area, New Mexico
(Shinnery Oak)



Map Scale: 1:6,370 if printed on A landscape (11" x 8.5") sheet.

Meters: 0 50 100 200 300

Feet: 0 300 600 1200 1800

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 15, Sep 15, 2019

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

Date(s) aerial images were photographed: Dec 31, 2009—Sep 17, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BB	Berino complex, 0 to 3 percent slopes, eroded	5.1	2.8%
KM	Kermit-Berino fine sands, 0 to 3 percent slopes	35.6	20.0%
LA	Largo loam, 1 to 5 percent slopes	69.0	38.8%
PA	Pajarito loamy fine sand, 0 to 3 percent slopes, eroded	63.7	35.8%
UG	Upton gravelly loam, 0 to 9 percent slopes	4.5	2.5%
Totals for Area of Interest		**177.9**	**100.0%**

National Water Information System: Web Interface

USGS Water Resources

Data Category: Site Information ▼ Geographic Area: United States ▼ GO

Click to hideNews Bulletins

- **Notice** - The USGS Water Resources Mission Area's priority is to maintain the safety and well-being of our communities, including providing critical situational awareness in times of flooding in all 50 U.S. states and additional territories. Our hydrologic monitoring stations continue to send data in near real-time to NWISWeb, and we are continuing critical water monitoring activities to protect life and property on a case-by-case basis. The health and safety of the public and our employees are our highest priorities, and we continue to follow guidance from the White House, the CDC, and state and local authorities.

- Introducing The Next Generation of USGS Water Data for the Nation
- Full News

USGS 323015104032301 20S.29E.28.244111

Available data for this site SUMMARY OF ALL AVAILABLE DATA ▼ GO

Well Site

DESCRIPTION:
Latitude 32°30'15", Longitude 104°03'23" NAD27
Eddy County, New Mexico , Hydrologic Unit 13060011
Well depth: 205 feet
Land surface altitude: 3,268 feet above NGVD29.
Well completed in "Rustler Formation" (312RSLR) local aquifer

AVAILABLE DATA:

Data Type	Begin Date	End Date	Count
Field groundwater-level measurements	1994-03-02	1999-01-20	2
Revisions	Unavailable (site:0) (timeseries:0)		

OPERATION:

Record for this site is maintained by the USGS New Mexico Water Science Center
Email questions about this site to New Mexico Water Science Center Water-Data Inquiries

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Questions about sites/data?
Feedback on this web site
Automated retrievals
Help
Data Tips
Explanation of terms
Subscribe for system changes
News

Accessibility Plug-Ins FOIA Privacy Policies and Notices

U.S. Department of the Interior | U.S. Geological Survey

Title: NWIS Site Information for USA: Site Inventory
URL: https://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=323015104032301

Page Contact Information: New Mexico Water Data Support Team
Page Last Modified: 2020-04-06 15:29:01 EDT
0.44 0.43 caww02

National Water Information System: Web Interface

USGS Water Resources

Data Category: Site Information ▼ Geographic Area: United States ▼ GO

Click to hideNews Bulletins

- **Notice** - The USGS Water Resources Mission Area's priority is to maintain the safety and well-being of our communities, including providing critical situational awareness in times of flooding in all 50 U.S. states and additional territories. Our hydrologic monitoring stations continue to send data in near real-time to NWISWeb, and we are continuing critical water monitoring activities to protect life and property on a case-by-case basis. The health and safety of the public and our employees are our highest priorities, and we continue to follow guidance from the White House, the CDC, and state and local authorities.

- Introducing The Next Generation of USGS Water Data for the Nation
- Full News

USGS 323028104050001 21S.28E.04.42144

Available data for this site SUMMARY OF ALL AVAILABLE DATA ▼ GO

Well Site

DESCRIPTION:
Latitude 32°30'28", Longitude 104°05'00" NAD27
Eddy County, New Mexico , Hydrologic Unit 13060011
Well depth: 185 feet
Land surface altitude: 3,238 feet above NAVD88.
Well completed in "Rustler Formation" (312RSLR) local aquifer

AVAILABLE DATA:

Data Type	Begin Date	End Date	Count
Field groundwater-level measurements	1968-05-22	1998-01-28	8
Revisions	Unavailable (site:0) (timeseries:0)		

OPERATION:

Record for this site is maintained by the USGS New Mexico Water Science Center
Email questions about this site to New Mexico Water Science Center Water-Data Inquiries

---

Questions about sites/data?
Feedback on this web site
Automated retrievals
Help
Data Tips
Explanation of terms
Subscribe for system changes
News

Title: NWIS Site Information for USA: Site Inventory
URL: https://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=323028104050001

Page Contact Information: New Mexico Water Data Support Team
Page Last Modified: 2020-04-06 15:39:03 EDT
0.42 0.4 caww02

ATTACHMENT 4

Daily Site Visit Report

VERTEX

Client:	Matador Resources	Inspection Date:	3/26/2020
Site Location Name:	Shinnery Oak Federal SWD #001	Report Run Date:	3/26/2020 11:59 PM
Project Owner:	John Hurt	File (Project) #:	20E-00239
Project Manager:	Natalie Gordon	API #:	30-015-20866
Client Contact Name:	John Hurt	Reference	PW Release - 03/25/2020
Client Contact Phone #:			

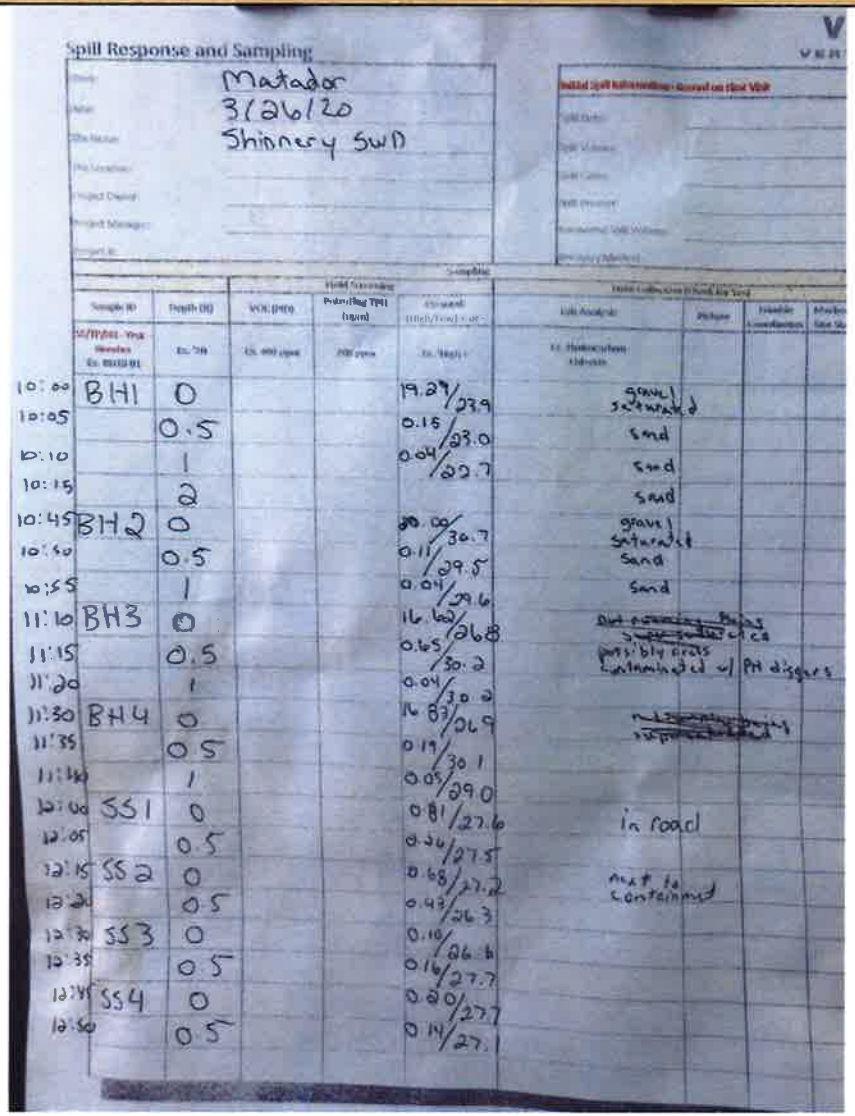
Summary of Times

Left Office	3/26/2020 7:15 AM
Arrived at Site	3/26/2020 8:21 AM
Departed Site	3/26/2020 5:11 PM
Returned to Office	

Daily Site Visit Report

VERTEX

Site Sketch



Daily Site Visit Report

VERTEX

Summary of Daily Operations

9:23 Initial characterization and delineation of produced water spill, map spill footprint and sample points, delineate horizontally and vertically at sample points to clean

9:32 Footprint is very apparent for outline of where spill went. One set of tire tracks through middle of spill due to operator getting numbers from a meter. Point of release has been repaired and put back into service, multiple flow line coming out of containment underground, lines will have to be hydrovacced before any excavation can take place

10:31 Contaminated area is cleaning up at 0.5", a recommended emergency scrape is needed to keep saturation from sinking any lower

12:38 Emergency 811 call placed for emergency scrape, operator coming with equipment to perform 0.5" scrape

Next Steps & Recommendations

1 Complete 0.5" scrape

2 Place 48 hour notice

3 Complete confirmation sampling

Daily Site Visit Report

VERTEX

Site Photos

Viewing Direction: East

Spill area

Viewing Direction: Southeast

Spill area in front of containment

Viewing Direction: North

Spill area on north side next to fence

Viewing Direction: North

Spill area next to containment on west side

Daily Site Visit Report

VERTEX

Viewing Direction: East	**Viewing Direction**: West
	
Spill area at point of release	Spill area along fence line on north side
Viewing Direction: Southwest	**Viewing Direction**: West
	
Spill area from north side to west side of containment	Spill area going back towards fence line under porta potty's

Daily Site Visit Report

VERTEX

Daily Site Visit Signature

Inspector: Monica Peppin

Signature:

Daily Site Visit Report

VERTEX

Client:	Matador Resources	Inspection Date:	4/1/2020
Site Location Name:	Shinnery Oak Federal SWD #001	Report Run Date:	4/1/2020 11:42 PM
Project Owner:	John Hurt	File (Project) #:	20E-00239
Project Manager:	Natalie Gordon	API #:	30-015-20866
Client Contact Name:	John Hurt	Reference	PW Release - 03/25/2020
Client Contact Phone #:			

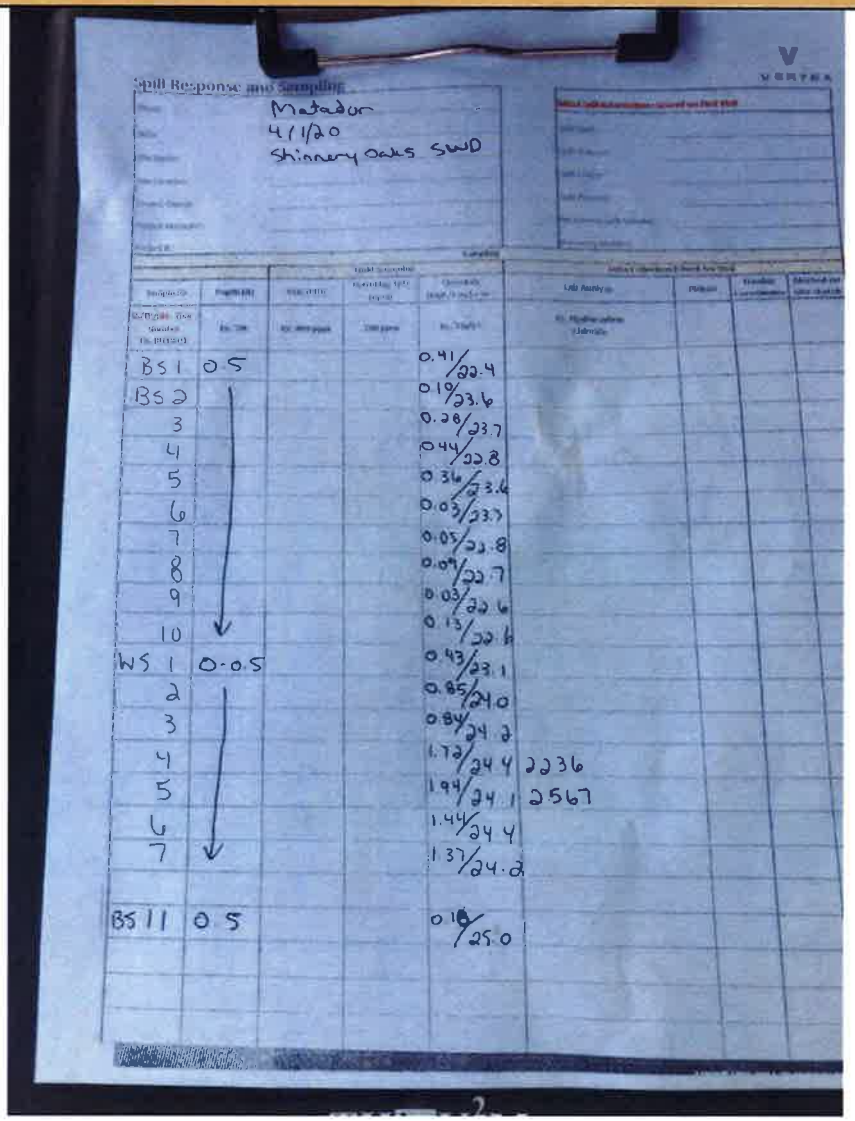
Summary of Times

Left Office	4/1/2020 1:00 PM
Arrived at Site	4/1/2020 1:39 PM
Departed Site	4/1/2020 4:32 PM
Returned to Office	

Daily Site Visit Report

VERTEX

Site Sketch



Daily Site Visit Report

VERTEX

Summary of Daily Operations

13:39 Conduct confirmation sampling around excavation area of base and side walls

Next Steps & Recommendations

1. Send samples for lab analysis
2. Schedule backfill
3. Closure report

Daily Site Visit Report

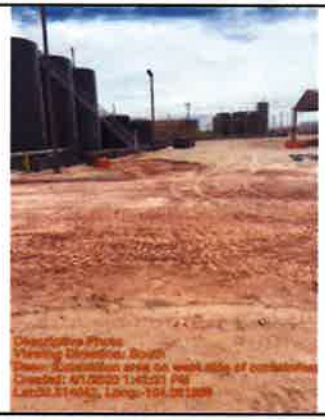
VERTEX

Site Photos

Viewing Direction: East

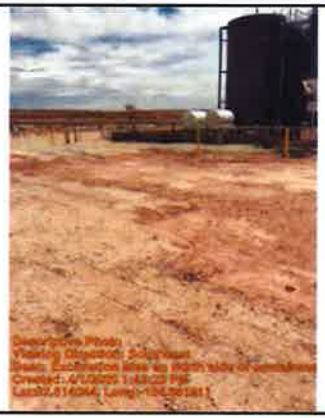
Excavation area

Viewing Direction: South



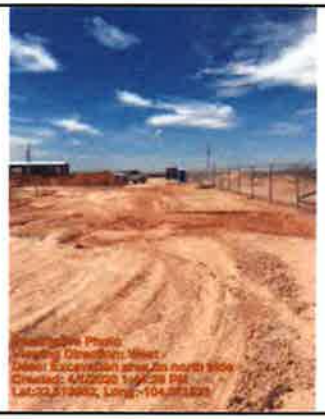
Excavation area on west side of containment

Viewing Direction: Southeast



Excavation area on north side of containment

Viewing Direction: West



Excavation area on north side

Daily Site Visit Report

Viewing Direction: North	**Viewing Direction**: Northeast
	
Excavation area on west side of containment	Excavation area

Daily Site Visit Report

VERTEX

Daily Site Visit Signature

Inspector: Monica Peppin

Signature:

ATTACHMENT 5

Natalie Gordon

From: Dhugal Hanton <vertexresourcegroupusa@gmail.com>
Sent: Friday, March 27, 2020 3:57 PM
To: Natalie Gordon
Subject: Fwd: Shinnery Oak Federal SWD #1 - DOR: 3/25/2020 - 48-hr Notification of Confirmatory Sampling

---------- Forwarded message ---------
From: **Dhugal Hanton** <vertexresourcegroupusa@gmail.com>
Date: Fri, Mar 27, 2020 at 3:56 PM
Subject: Shinnery Oak Federal SWD #1 - DOR: 3/25/2020 - 48-hr Notification of Confirmatory Sampling
To: Bratcher, Mike, EMNRD <Mike.Bratcher@state.nm.us>, Venegas, Victoria, EMNRD <Victoria.Venegas@state.nm.us>, Hamlet, Robert, EMNRD <Robert.Hamlet@state.nm.us>, <blm_nm_cfo_spill@blm.gov>, Kelsey <KWade@blm.gov>, <Jamos@blm.gov>

All,

Please accept this email as 48-hr notification that Vertex Resource Services has scheduled confirmatory sampling to be conducted at Shinnery Oak Federal SWD #001 for the produced water release that occurred on March 25, 2020 (initial C-141 notification submission pending).

This work will be completed on behalf of Matador Production Company.

On Wednesday, April 1, 2020 at approximately 8:00 a.m., Monica Peppin of Vertex will be onsite to conduct confirmatory 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

Natalie Gordon
Project Manager

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

P 575.725.5001 ext 709
C 505.506.0040
F

www.vertex.ca

ATTACHMENT 6

Client Name: Matador Production Company
Site Name: Shinnery Oak Federal SWD #001
NM OCD Incident Tracking Number: NM2009032079
Project #: 20E-00239-007
Lab Report: 2004136, 2008D86

Revised Table 2. Confirmatory Sampling Laboratory Data - Depth to Groundwater >100 ft

Sample Description			Petroleum Hydrocarbons							Inorganic
			Volatile		Extractable					
Sample ID	Depth (ft)	Sample Date	Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
SS20-01	0-0.5	August 24, 2020	<0.023	<0.207	<4.6	<10.0	<50	<14.6	<64.6	150
SS20-02	0-0.5	August 24, 2020	<0.024	<0.212	<4.7	<9.7	<48	<14.4	<62.4	<60
SS20-03	0-0.5	August 24, 2020	<0.024	<0.217	<4.8	<9.8	<49	<14.6	<63.6	<59
SS20-04	0-0.5	August 24, 2020	<0.025	<0.222	<4.9	<8.6	<43	<13.5	<56.5	79
BS20-01	0.5	April 1, 2020	<0.024	<0.22	<4.9	<9.5	<47	<14.4	<61.4	320
BS20-02	0.5	April 1, 2020	<0.025	<0.221	<4.9	<10	<51	<14.9	<65.9	70
BS20-03	0.5	April 1, 2020	<0.025	<0.221	<4.9	<9.5	<48	<14.4	<62.4	190
BS20-04	0.5	April 1, 2020	<0.025	<0.221	<4.9	<9.3	<46	<14.2	<60.2	410
BS20-05	0.5	April 1, 2020	<0.025	<0.224	<5.0	<8.8	<44	<13.8	<57.8	520
BS20-06	0.5	April 1, 2020	<0.025	<0.221	<4.9	<9.5	<47	<14.4	<61.4	<60
BS20-07	0.5	April 1, 2020	<0.025	<0.225	<5.0	<9.4	<47	<14.4	<61.4	<60
BS20-08	0.5	April 1, 2020	<0.024	<0.219	<4.9	<9.1	<46	<14	<60	<60
BS20-09	0.5	April 1, 2020	<0.025	<0.225	<5.0	<9.6	<48	<14.6	<62.6	<60
BS20-10	0.5	April 1, 2020	<0.025	<0.221	<4.9	<8.6	<43	<13.5	<56.5	240
BS20-11	0.5	April 1, 2020	<0.025	<0.222	<4.9	<8.8	<44	<13.7	<57.7	160
WS20-01	0.5	April 1, 2020	<0.025	<0.224	<5.0	<9.0	<45	<14.0	<59	370
WS20-02	0.5	April 1, 2020	<0.025	<0.222	<4.9	<8.8	<44	<13.7	<57.7	840
WS20-03	0.5	April 1, 2020	<0.024	<0.22	<4.9	<9.0	<45	<13.9	<58.9	930
WS20-04	0.5	April 1, 2020	<0.025	<0.222	<4.9	<9.4	<47	<14.3	<61.3	2,100
WS20-05	0.5	April 1, 2020	<0.025	<0.222	<4.9	<9.5	<47	<14.4	<61.4	3,300
WS20-06	0.5	April 1, 2020	<0.024	<0.216	<4.8	<8.9	<45	<13.7	<58.7	1,500
WS20-07	0.5	April 1, 2020	<0.025	<0.221	<4.9	<8.9	<44	<13.8	<57.8	1,400

"-" indicates not sampled/analyzed
Bold and shaded indicates exceedance outside of NM OCD Closure Criteria

VERTEX

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

April 10, 2020

Natalie Gordon

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

RE: Shinnery Oaks SWD 1 OrderNo.: 2004136

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 18 sample(s) on 4/3/2020 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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-001 **Matrix:** SOIL

Client Sample ID: BS20-01 0.5'
Collection Date: 4/1/2020 1:45:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	320	60		mg/Kg	20	4/6/2020 12:49:01 PM	51578
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	4/7/2020 1:57:50 PM	51553
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	4/7/2020 1:57:50 PM	51553
Surr: DNOP	103	55.1-146		%Rec	1	4/7/2020 1:57:50 PM	51553
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/7/2020 12:52:11 AM	51549
Surr: BFB	100	66.6-105		%Rec	1	4/7/2020 12:52:11 AM	51549
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	4/7/2020 12:52:11 AM	51549
Toluene	ND	0.049		mg/Kg	1	4/7/2020 12:52:11 AM	51549
Ethylbenzene	ND	0.049		mg/Kg	1	4/7/2020 12:52:11 AM	51549
Xylenes, Total	ND	0.098		mg/Kg	1	4/7/2020 12:52:11 AM	51549
Surr: 4-Bromofluorobenzene	102	80-120		%Rec	1	4/7/2020 12:52:11 AM	51549

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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-002 **Matrix:** SOIL

Client Sample ID: BS20-02 0.5'
Collection Date: 4/1/2020 1:55:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	70	60		mg/Kg	20	4/6/2020 1:26:04 PM	51578
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	4/7/2020 2:20:00 PM	51553
Motor Oil Range Organics (MRO)	ND	51		mg/Kg	1	4/7/2020 2:20:00 PM	51553
Surr: DNOP	99.6	55.1-146		%Rec	1	4/7/2020 2:20:00 PM	51553
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/7/2020 1:15:59 AM	51549
Surr: BFB	99.1	66.6-105		%Rec	1	4/7/2020 1:15:59 AM	51549
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	4/7/2020 1:15:59 AM	51549
Toluene	ND	0.049		mg/Kg	1	4/7/2020 1:15:59 AM	51549
Ethylbenzene	ND	0.049		mg/Kg	1	4/7/2020 1:15:59 AM	51549
Xylenes, Total	ND	0.098		mg/Kg	1	4/7/2020 1:15:59 AM	51549
Surr: 4-Bromofluorobenzene	100	80-120		%Rec	1	4/7/2020 1:15:59 AM	51549

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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-003 **Matrix:** SOIL

Client Sample ID: BS20-03 0.5'
Collection Date: 4/1/2020 2:05:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: **JMT**
Chloride	190	60		mg/Kg	20	4/6/2020 1:38:25 PM	51578
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	4/7/2020 2:42:04 PM	51553
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	4/7/2020 2:42:04 PM	51553
Surr: DNOP	103	55.1-146		%Rec	1	4/7/2020 2:42:04 PM	51553
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/7/2020 1:39:52 AM	51549
Surr: BFB	98.7	66.6-105		%Rec	1	4/7/2020 1:39:52 AM	51549
EPA METHOD 8021B: VOLATILES							Analyst: **NSB**
Benzene	ND	0.025		mg/Kg	1	4/7/2020 1:39:52 AM	51549
Toluene	ND	0.049		mg/Kg	1	4/7/2020 1:39:52 AM	51549
Ethylbenzene	ND	0.049		mg/Kg	1	4/7/2020 1:39:52 AM	51549
Xylenes, Total	ND	0.098		mg/Kg	1	4/7/2020 1:39:52 AM	51549
Surr: 4-Bromofluorobenzene	98.9	80-120		%Rec	1	4/7/2020 1:39:52 AM	51549

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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-004 **Matrix:** SOIL

Client Sample ID: BS20-04 0.5'
Collection Date: 4/1/2020 2:15:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	410	60		mg/Kg	20	4/6/2020 1:50:45 PM	51578
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	4/7/2020 3:04:14 PM	51553
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	4/7/2020 3:04:14 PM	51553
Surr: DNOP	108	55.1-146		%Rec	1	4/7/2020 3:04:14 PM	51553
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/7/2020 2:03:44 AM	51549
Surr: BFB	97.4	66.6-105		%Rec	1	4/7/2020 2:03:44 AM	51549
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	4/7/2020 2:03:44 AM	51549
Toluene	ND	0.049		mg/Kg	1	4/7/2020 2:03:44 AM	51549
Ethylbenzene	ND	0.049		mg/Kg	1	4/7/2020 2:03:44 AM	51549
Xylenes, Total	ND	0.098		mg/Kg	1	4/7/2020 2:03:44 AM	51549
Surr: 4-Bromofluorobenzene	98.8	80-120		%Rec	1	4/7/2020 2:03:44 AM	51549

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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-005 **Matrix:** SOIL

Client Sample ID: BS20-05 0.5'
Collection Date: 4/1/2020 2:25:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	520	60		mg/Kg	20	4/6/2020 2:03:07 PM	51578
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	17	8.8		mg/Kg	1	4/7/2020 3:26:19 PM	51553
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	4/7/2020 3:26:19 PM	51553
Surr: DNOP	111	55.1-146		%Rec	1	4/7/2020 3:26:19 PM	51553
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	4/7/2020 3:38:45 AM	51549
Surr: BFB	94.1	66.6-105		%Rec	1	4/7/2020 3:38:45 AM	51549
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	4/7/2020 3:38:45 AM	51549
Toluene	ND	0.050		mg/Kg	1	4/7/2020 3:38:45 AM	51549
Ethylbenzene	ND	0.050		mg/Kg	1	4/7/2020 3:38:45 AM	51549
Xylenes, Total	ND	0.099		mg/Kg	1	4/7/2020 3:38:45 AM	51549
Surr: 4-Bromofluorobenzene	94.8	80-120		%Rec	1	4/7/2020 3:38:45 AM	51549

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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-006 **Matrix:** SOIL

Client Sample ID: BS20-06 0.5'
Collection Date: 4/1/2020 2:35:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	60		mg/Kg	20	4/6/2020 2:15:28 PM	51578
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	4/7/2020 3:48:30 PM	51553
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	4/7/2020 3:48:30 PM	51553
Surr: DNOP	104	55.1-146		%Rec	1	4/7/2020 3:48:30 PM	51553
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/7/2020 4:02:31 AM	51549
Surr: BFB	96.2	66.6-105		%Rec	1	4/7/2020 4:02:31 AM	51549
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	4/7/2020 4:02:31 AM	51549
Toluene	ND	0.049		mg/Kg	1	4/7/2020 4:02:31 AM	51549
Ethylbenzene	ND	0.049		mg/Kg	1	4/7/2020 4:02:31 AM	51549
Xylenes, Total	ND	0.098		mg/Kg	1	4/7/2020 4:02:31 AM	51549
Surr: 4-Bromofluorobenzene	96.5	80-120		%Rec	1	4/7/2020 4:02:31 AM	51549

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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-007 **Matrix:** SOIL

Client Sample ID: BS20-07 0.5'
Collection Date: 4/1/2020 2:45:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	4/6/2020 2:52:31 PM	51578
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	4/7/2020 4:10:27 PM	51553
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	4/7/2020 4:10:27 PM	51553
Surr: DNOP	98.9	55.1-146		%Rec	1	4/7/2020 4:10:27 PM	51553
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	4/7/2020 4:26:17 AM	51549
Surr: BFB	94.8	66.6-105		%Rec	1	4/7/2020 4:26:17 AM	51549
EPA METHOD 8021B: VOLATILES							Analyst: **NSB**
Benzene	ND	0.025		mg/Kg	1	4/7/2020 4:26:17 AM	51549
Toluene	ND	0.050		mg/Kg	1	4/7/2020 4:26:17 AM	51549
Ethylbenzene	ND	0.050		mg/Kg	1	4/7/2020 4:26:17 AM	51549
Xylenes, Total	ND	0.10		mg/Kg	1	4/7/2020 4:26:17 AM	51549
Surr: 4-Bromofluorobenzene	96.0	80-120		%Rec	1	4/7/2020 4:26:17 AM	51549

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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-008 **Matrix:** SOIL

Client Sample ID: BS20-08 0.5'
Collection Date: 4/1/2020 2:55:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	60		mg/Kg	20	4/6/2020 3:04:53 PM	51578
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/6/2020 9:58:52 PM	51551
Surr: BFB	99.6	70-130		%Rec	1	4/6/2020 9:58:52 PM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	4/6/2020 1:41:32 AM	51554
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	4/6/2020 1:41:32 AM	51554
Surr: DNOP	115	55.1-146		%Rec	1	4/6/2020 1:41:32 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.024		mg/Kg	1	4/6/2020 9:58:52 PM	51551
Toluene	ND	0.049		mg/Kg	1	4/6/2020 9:58:52 PM	51551
Ethylbenzene	ND	0.049		mg/Kg	1	4/6/2020 9:58:52 PM	51551
Xylenes, Total	ND	0.097		mg/Kg	1	4/6/2020 9:58:52 PM	51551
Surr: 1,2-Dichloroethane-d4	88.1	70-130		%Rec	1	4/6/2020 9:58:52 PM	51551
Surr: 4-Bromofluorobenzene	93.6	70-130		%Rec	1	4/6/2020 9:58:52 PM	51551
Surr: Dibromofluoromethane	91.2	70-130		%Rec	1	4/6/2020 9:58:52 PM	51551
Surr: Toluene-d8	101	70-130		%Rec	1	4/6/2020 9:58:52 PM	51551

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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-009 **Matrix:** SOIL

Client Sample ID: BS20-09 0.5'
Collection Date: 4/1/2020 3:05:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	ND	60		mg/Kg	20	4/6/2020 3:17:13 PM	51578
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	4/6/2020 10:28:23 PM	51551
Surr: BFB	97.3	70-130		%Rec	1	4/6/2020 10:28:23 PM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	4/6/2020 2:53:06 AM	51554
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	4/6/2020 2:53:06 AM	51554
Surr: DNOP	99.8	55.1-146		%Rec	1	4/6/2020 2:53:06 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.025		mg/Kg	1	4/6/2020 10:28:23 PM	51551
Toluene	ND	0.050		mg/Kg	1	4/6/2020 10:28:23 PM	51551
Ethylbenzene	ND	0.050		mg/Kg	1	4/6/2020 10:28:23 PM	51551
Xylenes, Total	ND	0.10		mg/Kg	1	4/6/2020 10:28:23 PM	51551
Surr: 1,2-Dichloroethane-d4	89.1	70-130		%Rec	1	4/6/2020 10:28:23 PM	51551
Surr: 4-Bromofluorobenzene	96.2	70-130		%Rec	1	4/6/2020 10:28:23 PM	51551
Surr: Dibromofluoromethane	92.0	70-130		%Rec	1	4/6/2020 10:28:23 PM	51551
Surr: Toluene-d8	98.2	70-130		%Rec	1	4/6/2020 10:28:23 PM	51551

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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-010 **Matrix:** SOIL

Client Sample ID: BS20-10 0.5'
Collection Date: 4/1/2020 3:15:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: **JMT**
Chloride	240	60		mg/Kg	20	4/6/2020 3:29:34 PM	51578
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: **DJF**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/6/2020 11:57:03 PM	51551
Surr: BFB	97.6	70-130		%Rec	1	4/6/2020 11:57:03 PM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **CLP**
Diesel Range Organics (DRO)	ND	8.6		mg/Kg	1	4/6/2020 3:16:55 AM	51554
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	4/6/2020 3:16:55 AM	51554
Surr: DNOP	106	55.1-146		%Rec	1	4/6/2020 3:16:55 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: **DJF**
Benzene	ND	0.025		mg/Kg	1	4/6/2020 11:57:03 PM	51551
Toluene	ND	0.049		mg/Kg	1	4/6/2020 11:57:03 PM	51551
Ethylbenzene	ND	0.049		mg/Kg	1	4/6/2020 11:57:03 PM	51551
Xylenes, Total	ND	0.098		mg/Kg	1	4/6/2020 11:57:03 PM	51551
Surr: 1,2-Dichloroethane-d4	91.3	70-130		%Rec	1	4/6/2020 11:57:03 PM	51551
Surr: 4-Bromofluorobenzene	94.0	70-130		%Rec	1	4/6/2020 11:57:03 PM	51551
Surr: Dibromofluoromethane	92.9	70-130		%Rec	1	4/6/2020 11:57:03 PM	51551
Surr: Toluene-d8	96.1	70-130		%Rec	1	4/6/2020 11:57:03 PM	51551

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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-011 **Matrix:** SOIL

Client Sample ID: BS20-11 0.5'
Collection Date: 4/1/2020 3:25:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	160	60		mg/Kg	20	4/6/2020 3:41:55 PM	51578
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/7/2020 12:26:34 AM	51551
Surr: BFB	101	70-130		%Rec	1	4/7/2020 12:26:34 AM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	8.8		mg/Kg	1	4/6/2020 3:40:39 AM	51554
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	4/6/2020 3:40:39 AM	51554
Surr: DNOP	89.3	55.1-146		%Rec	1	4/6/2020 3:40:39 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.025		mg/Kg	1	4/7/2020 12:26:34 AM	51551
Toluene	ND	0.049		mg/Kg	1	4/7/2020 12:26:34 AM	51551
Ethylbenzene	ND	0.049		mg/Kg	1	4/7/2020 12:26:34 AM	51551
Xylenes, Total	ND	0.099		mg/Kg	1	4/7/2020 12:26:34 AM	51551
Surr: 1,2-Dichloroethane-d4	93.1	70-130		%Rec	1	4/7/2020 12:26:34 AM	51551
Surr: 4-Bromofluorobenzene	96.5	70-130		%Rec	1	4/7/2020 12:26:34 AM	51551
Surr: Dibromofluoromethane	94.4	70-130		%Rec	1	4/7/2020 12:26:34 AM	51551
Surr: Toluene-d8	98.9	70-130		%Rec	1	4/7/2020 12:26:34 AM	51551

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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-012 **Matrix:** SOIL

Client Sample ID: WS20-01 0-0.5
Collection Date: 4/1/2020 3:35:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	370	60		mg/Kg	20	4/6/2020 3:54:16 PM	51578
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	4/7/2020 3:53:48 AM	51551
Surr: BFB	97.9	70-130		%Rec	1	4/7/2020 3:53:48 AM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	9.0		mg/Kg	1	4/6/2020 4:04:23 AM	51554
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	4/6/2020 4:04:23 AM	51554
Surr: DNOP	104	55.1-146		%Rec	1	4/6/2020 4:04:23 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.025		mg/Kg	1	4/7/2020 3:53:48 AM	51551
Toluene	ND	0.050		mg/Kg	1	4/7/2020 3:53:48 AM	51551
Ethylbenzene	ND	0.050		mg/Kg	1	4/7/2020 3:53:48 AM	51551
Xylenes, Total	ND	0.099		mg/Kg	1	4/7/2020 3:53:48 AM	51551
Surr: 1,2-Dichloroethane-d4	89.8	70-130		%Rec	1	4/7/2020 3:53:48 AM	51551
Surr: 4-Bromofluorobenzene	94.9	70-130		%Rec	1	4/7/2020 3:53:48 AM	51551
Surr: Dibromofluoromethane	92.2	70-130		%Rec	1	4/7/2020 3:53:48 AM	51551
Surr: Toluene-d8	97.2	70-130		%Rec	1	4/7/2020 3:53:48 AM	51551

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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-013 **Matrix:** SOIL

Client Sample ID: WS20-02 0-0.5
Collection Date: 4/1/2020 3:45:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	840	61		mg/Kg	20	4/6/2020 8:13:32 PM	51590
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/7/2020 4:23:16 AM	51551
Surr: BFB	98.0	70-130		%Rec	1	4/7/2020 4:23:16 AM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	8.8		mg/Kg	1	4/6/2020 4:28:08 AM	51554
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	4/6/2020 4:28:08 AM	51554
Surr: DNOP	110	55.1-146		%Rec	1	4/6/2020 4:28:08 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.025		mg/Kg	1	4/7/2020 4:23:16 AM	51551
Toluene	ND	0.049		mg/Kg	1	4/7/2020 4:23:16 AM	51551
Ethylbenzene	ND	0.049		mg/Kg	1	4/7/2020 4:23:16 AM	51551
Xylenes, Total	ND	0.099		mg/Kg	1	4/7/2020 4:23:16 AM	51551
Surr: 1,2-Dichloroethane-d4	89.7	70-130		%Rec	1	4/7/2020 4:23:16 AM	51551
Surr: 4-Bromofluorobenzene	98.6	70-130		%Rec	1	4/7/2020 4:23:16 AM	51551
Surr: Dibromofluoromethane	92.4	70-130		%Rec	1	4/7/2020 4:23:16 AM	51551
Surr: Toluene-d8	97.7	70-130		%Rec	1	4/7/2020 4:23:16 AM	51551

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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-014 **Matrix:** SOIL

Client Sample ID: WS20-03 0-0.5
Collection Date: 4/1/2020 3:55:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	930	59		mg/Kg	20	4/6/2020 8:50:32 PM	51590
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/7/2020 4:52:07 AM	51551
Surr: BFB	96.7	70-130		%Rec	1	4/7/2020 4:52:07 AM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	70	9.0		mg/Kg	1	4/6/2020 4:51:49 AM	51554
Motor Oil Range Organics (MRO)	86	45		mg/Kg	1	4/6/2020 4:51:49 AM	51554
Surr: DNOP	99.0	55.1-146		%Rec	1	4/6/2020 4:51:49 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.024		mg/Kg	1	4/7/2020 4:52:07 AM	51551
Toluene	ND	0.049		mg/Kg	1	4/7/2020 4:52:07 AM	51551
Ethylbenzene	ND	0.049		mg/Kg	1	4/7/2020 4:52:07 AM	51551
Xylenes, Total	ND	0.098		mg/Kg	1	4/7/2020 4:52:07 AM	51551
Surr: 1,2-Dichloroethane-d4	92.1	70-130		%Rec	1	4/7/2020 4:52:07 AM	51551
Surr: 4-Bromofluorobenzene	95.5	70-130		%Rec	1	4/7/2020 4:52:07 AM	51551
Surr: Dibromofluoromethane	99.3	70-130		%Rec	1	4/7/2020 4:52:07 AM	51551
Surr: Toluene-d8	99.8	70-130		%Rec	1	4/7/2020 4:52:07 AM	51551

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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-015 **Matrix:** SOIL

Client Sample ID: WS20-04 0-0.5
Collection Date: 4/1/2020 4:05:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	2100	60		mg/Kg	20	4/6/2020 9:02:54 PM	51590
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/7/2020 5:21:19 AM	51551
Surr: BFB	99.3	70-130		%Rec	1	4/7/2020 5:21:19 AM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	4/6/2020 5:15:31 AM	51554
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	4/6/2020 5:15:31 AM	51554
Surr: DNOP	110	55.1-146		%Rec	1	4/6/2020 5:15:31 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.025		mg/Kg	1	4/7/2020 5:21:19 AM	51551
Toluene	ND	0.049		mg/Kg	1	4/7/2020 5:21:19 AM	51551
Ethylbenzene	ND	0.049		mg/Kg	1	4/7/2020 5:21:19 AM	51551
Xylenes, Total	ND	0.099		mg/Kg	1	4/7/2020 5:21:19 AM	51551
Surr: 1,2-Dichloroethane-d4	89.9	70-130		%Rec	1	4/7/2020 5:21:19 AM	51551
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	4/7/2020 5:21:19 AM	51551
Surr: Dibromofluoromethane	94.0	70-130		%Rec	1	4/7/2020 5:21:19 AM	51551
Surr: Toluene-d8	100	70-130		%Rec	1	4/7/2020 5:21:19 AM	51551

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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-016 **Matrix:** SOIL

Client Sample ID: WS20-05 0-0.5
Collection Date: 4/1/2020 4:15:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	3300	150		mg/Kg	50	4/7/2020 4:09:33 PM	51590
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/7/2020 5:50:20 AM	51551
Surr: BFB	97.0	70-130		%Rec	1	4/7/2020 5:50:20 AM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	4/6/2020 5:39:11 AM	51554
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	4/6/2020 5:39:11 AM	51554
Surr: DNOP	97.4	55.1-146		%Rec	1	4/6/2020 5:39:11 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.025		mg/Kg	1	4/7/2020 5:50:20 AM	51551
Toluene	ND	0.049		mg/Kg	1	4/7/2020 5:50:20 AM	51551
Ethylbenzene	ND	0.049		mg/Kg	1	4/7/2020 5:50:20 AM	51551
Xylenes, Total	ND	0.099		mg/Kg	1	4/7/2020 5:50:20 AM	51551
Surr: 1,2-Dichloroethane-d4	94.5	70-130		%Rec	1	4/7/2020 5:50:20 AM	51551
Surr: 4-Bromofluorobenzene	96.4	70-130		%Rec	1	4/7/2020 5:50:20 AM	51551
Surr: Dibromofluoromethane	97.9	70-130		%Rec	1	4/7/2020 5:50:20 AM	51551
Surr: Toluene-d8	97.1	70-130		%Rec	1	4/7/2020 5:50:20 AM	51551

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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-017 **Matrix:** SOIL

Client Sample ID: WS20-06 0-0.5
Collection Date: 4/1/2020 4:25:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	1500	60		mg/Kg	20	4/6/2020 9:27:34 PM	51590
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	4/7/2020 6:19:33 AM	51551
Surr: BFB	99.0	70-130		%Rec	1	4/7/2020 6:19:33 AM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	4/6/2020 6:02:47 AM	51554
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	4/6/2020 6:02:47 AM	51554
Surr: DNOP	80.5	55.1-146		%Rec	1	4/6/2020 6:02:47 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.024		mg/Kg	1	4/7/2020 6:19:33 AM	51551
Toluene	ND	0.048		mg/Kg	1	4/7/2020 6:19:33 AM	51551
Ethylbenzene	ND	0.048		mg/Kg	1	4/7/2020 6:19:33 AM	51551
Xylenes, Total	ND	0.097		mg/Kg	1	4/7/2020 6:19:33 AM	51551
Surr: 1,2-Dichloroethane-d4	90.8	70-130		%Rec	1	4/7/2020 6:19:33 AM	51551
Surr: 4-Bromofluorobenzene	97.3	70-130		%Rec	1	4/7/2020 6:19:33 AM	51551
Surr: Dibromofluoromethane	96.3	70-130		%Rec	1	4/7/2020 6:19:33 AM	51551
Surr: Toluene-d8	99.5	70-130		%Rec	1	4/7/2020 6:19:33 AM	51551

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 **2004136**
Date Reported: **4/10/2020**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 1
Lab ID: 2004136-018 **Matrix:** SOIL

Client Sample ID: WS20-07 0-0.5
Collection Date: 4/1/2020 4:35:00 PM
Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	1400	60		mg/Kg	20	4/6/2020 9:39:55 PM	51590
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: **DJF**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/7/2020 6:48:53 AM	51551
Surr: BFB	98.9	70-130		%Rec	1	4/7/2020 6:48:53 AM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	4/6/2020 6:26:24 AM	51554
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	4/6/2020 6:26:24 AM	51554
Surr: DNOP	86.3	55.1-146		%Rec	1	4/6/2020 6:26:24 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	0.025		mg/Kg	1	4/7/2020 6:48:53 AM	51551
Toluene	ND	0.049		mg/Kg	1	4/7/2020 6:48:53 AM	51551
Ethylbenzene	ND	0.049		mg/Kg	1	4/7/2020 6:48:53 AM	51551
Xylenes, Total	ND	0.098		mg/Kg	1	4/7/2020 6:48:53 AM	51551
Surr: 1,2-Dichloroethane-d4	90.9	70-130		%Rec	1	4/7/2020 6:48:53 AM	51551
Surr: 4-Bromofluorobenzene	93.8	70-130		%Rec	1	4/7/2020 6:48:53 AM	51551
Surr: Dibromofluoromethane	99.0	70-130		%Rec	1	4/7/2020 6:48:53 AM	51551
Surr: Toluene-d8	99.5	70-130		%Rec	1	4/7/2020 6:48:53 AM	51551

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#: **2004136**

10-Apr-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oaks SWD 1

Sample ID: **MB-51578**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **51578**	RunNo: **67894**							
Prep Date: **4/6/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345598**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-51578**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **51578**	RunNo: **67894**							
Prep Date: **4/6/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345599**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.6	90	110			

Sample ID: **MB-51590**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **51590**	RunNo: **67894**							
Prep Date: **4/6/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345638**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-51590**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **51590**	RunNo: **67894**							
Prep Date: **4/6/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345639**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.0	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#: **2004136**

10-Apr-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oaks SWD 1

Sample ID: **LCS-51553**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **51553**	RunNo: **67874**
Prep Date: **4/4/2020**	Analysis Date: **4/6/2020**	SeqNo: **2344829** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	10	50.00	0	99.7	70	130			
Surr: DNOP	3.8		5.000		76.7	55.1	146			

Sample ID: **MB-51553**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **51553**	RunNo: **67874**
Prep Date: **4/4/2020**	Analysis Date: **4/6/2020**	SeqNo: **2344831** 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	7.9		10.00		79.1	55.1	146			

Sample ID: **MB-51554**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **51554**	RunNo: **67859**
Prep Date: **4/4/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345130** 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		100	55.1	146			

Sample ID: **LCS-51554**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **51554**	RunNo: **67859**
Prep Date: **4/4/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345131** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	10	50.00	0	90.6	70	130			
Surr: DNOP	4.4		5.000		87.3	55.1	146			

Sample ID: **2004136-008AMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BS20-08 0.5'**	Batch ID: **51554**	RunNo: **67859**
Prep Date: **4/4/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345133** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	42	9.0	45.09	0	94.0	47.4	136			
Surr: DNOP	4.2		4.509		92.5	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#: **2004136**

10-Apr-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oaks SWD 1

Sample ID: **2004136-008AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BS20-08 0.5'**	Batch ID: **51554**	RunNo: **67859**
Prep Date: **4/4/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345134** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	44	9.3	46.69	0	93.9	47.4	136	3.37	43.4	
Surr: DNOP	4.3		4.669		93.1	55.1	146	0	0	

Sample ID: **LCS-51589**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **51589**	RunNo: **67897**
Prep Date: **4/6/2020**	Analysis Date: **4/7/2020**	SeqNo: **2347620** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.2		5.000		83.2	55.1	146			

Sample ID: **MB-51589**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **51589**	RunNo: **67897**
Prep Date: **4/6/2020**	Analysis Date: **4/7/2020**	SeqNo: **2347621** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	8.8		10.00		88.4	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#: **2004136**

10-Apr-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oaks SWD 1

Sample ID: **mb-51549**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **51549**	RunNo: **67892**
Prep Date: **4/3/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345521** 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	940		1000		93.7	66.6	105			

Sample ID: **lcs-51549**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **51549**	RunNo: **67892**
Prep Date: **4/3/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345530** 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	95.1	80	120			
Surr: BFB	1100		1000		107	66.6	105			S

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#: **2004136**

10-Apr-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oaks SWD 1

Sample ID: **mb-51549**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **51549**	RunNo: **67892**
Prep Date: **4/3/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345571** 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	0.97		1.000		97.3	80	120			

Sample ID: **LCS-51549**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **51549**	RunNo: **67892**
Prep Date: **4/3/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345572** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.89	0.025	1.000	0	89.1	80	120			
Toluene	0.94	0.050	1.000	0	94.3	80	120			
Ethylbenzene	0.95	0.050	1.000	0	95.1	80	120			
Xylenes, Total	2.9	0.10	3.000	0	95.1	80	120			
Surr: 4-Bromofluorobenzene	0.97		1.000		97.4	80	120			

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#: **2004136**

10-Apr-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oaks SWD 1

Sample ID: **lcs-51551**	SampType: **LCS**	TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **LCSS**	Batch ID: **51551**	RunNo: **67889**
Prep Date: **4/3/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345914** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.97	0.025	1.000	0	97.5	70	130			
Toluene	1.1	0.050	1.000	0	105	70	130			
Surr: 1,2-Dichloroethane-d4	0.45		0.5000		90.7	70	130			
Surr: 4-Bromofluorobenzene	0.47		0.5000		94.7	70	130			
Surr: Dibromofluoromethane	0.47		0.5000		93.7	70	130			
Surr: Toluene-d8	0.50		0.5000		99.5	70	130			

Sample ID: **mb-51551**	SampType: **MBLK**	TestCode: **EPA Method 8260B: Volatiles Short List**
Client ID: **PBS**	Batch ID: **51551**	RunNo: **67889**
Prep Date: **4/3/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345916** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 1,2-Dichloroethane-d4	0.45		0.5000		90.0	70	130			
Surr: 4-Bromofluorobenzene	0.47		0.5000		94.5	70	130			
Surr: Dibromofluoromethane	0.46		0.5000		91.2	70	130			
Surr: Toluene-d8	0.49		0.5000		98.6	70	130			

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#: **2004136**

10-Apr-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oaks SWD 1

Sample ID: **2004136-009ams**	SampType: **MS**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **BS20-09 0.5'**	Batch ID: **51551**	RunNo: **67889**
Prep Date: **4/3/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345922** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	24.93	0	89.2	70	130			
Surr: BFB	490		498.5		97.7	70	130			

Sample ID: **2004136-009amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **BS20-09 0.5'**	Batch ID: **51551**	RunNo: **67889**
Prep Date: **4/3/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345923** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	90.0	70	130	1.24	20	
Surr: BFB	490		500.0		97.8	70	130	0	0	

Sample ID: **lcs-51551**	SampType: **LCS**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **LCSS**	Batch ID: **51551**	RunNo: **67889**
Prep Date: **4/3/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345940** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	87.9	70	130			
Surr: BFB	500		500.0		99.0	70	130			

Sample ID: **mb-51551**	SampType: **MBLK**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **PBS**	Batch ID: **51551**	RunNo: **67889**
Prep Date: **4/3/2020**	Analysis Date: **4/6/2020**	SeqNo: **2345942** 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	490		500.0		98.9	70	130			

Sample ID: **lcs-51551**	SampType: **LCS**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **LCSS**	Batch ID: **51551**	RunNo: **67929**
Prep Date: **4/3/2020**	Analysis Date: **4/7/2020**	SeqNo: **2347503** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	86.3	70	130			
Surr: BFB	500		500.0		99.5	70	130			

Sample ID: **mb-51551**	SampType: **MBLK**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **PBS**	Batch ID: **51551**	RunNo: **67929**
Prep Date: **4/3/2020**	Analysis Date: **4/7/2020**	SeqNo: **2347505** Units: **mg/Kg**

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

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2004136**

10-Apr-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oaks SWD 1

Sample ID: **mb-51551**	SampType: **MBLK**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **PBS**	Batch ID: **51551**	RunNo: **67929**
Prep Date: **4/3/2020**	Analysis Date: **4/7/2020**	SeqNo: **2347505** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	510		500.0		102	70	130			

Qualifiers:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: VERTEX CARLSBAD Work Order Number: 2004136 RcptNo: 1

Received By: **Juan Rojas** 4/3/2020 8:30:00 AM

Completed By: **John Caldwell** 4/3/2020 10:05:17 AM

Reviewed By: 4/3/20

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: DAD 4/3/20

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	2.7	Good				

Chain-of-Custody Record

Client: Vertex

Mailing Address: on file

Phone #:

email or Fax#:

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time: 5 Day
☑ Standard ☐ Rush

Project Name: Shinnery Oaks SWD #1

Project #: 20E-00239

Project Manager: Natalie Gordon

Sampler: MJP

On Ice: ☑ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 2.5-0.1=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. 2004136	(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	F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
4/1	1:45	soil	BS20-01 0.5'	402	ice	-001	✓	✓					✓			
"	1:55	"	BS20-02 0.5'			-002	"	"					"			
	2:05		BS20-03 0.5'			-003										
	2:15		BS20-04 0.5'			-004										
	2:25		BS20-05 0.5'			-005										
	2:35		BS20-06 0.5'			-006										
	2:45		BS20-07 0.5'			-007										
	2:55		BS20-08 0.5'			-008										
	3:05		BS20-09 0.5'			-009										
	3:15		BS20-10 0.5'			-010										
↓	3:25	↓	BS20-11 0.5'	↓	↓	-011	↓	↓					↓			

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
4/2/20	1300				4/2/20	1300
4/2/20	1900			courier	4/3/20	8:30

Remarks: CC: Natalie Gordon

Matador

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

Chain-of-Custody Record

Client: Vertex

Mailing Address: on file

Phone #:

email or Fax#:

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☐ EDD (Type)

Turn-Around Time: 5 Day
☑ Standard ☐ Rush

Project Name: Shinnery Oaks SWD #1

Project #: 20E-00239

Project Manager: Natalie Gordon

Sampler: MJP

On Ice: ☑ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 7.8-0.1=7.7 (°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. 2004136	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)
4/1	3:35	Soil	WS20-01 0-0.5	4oz	ice	-012	✓	✓					✓			
	3:45		WS20-02 0-0.5			-013										
	3:55		WS20-03 0-0.5			-014										
	4:05		WS20-04 0-0.5			-015										
	4:15		WS20-05 0-0.5			-016										
	4:25		WS20-06 0-0.5			-017										
↓	4:35	↓	WS20-07 0-0.5	↓	↓	-018	↓	↓					↓			

Date	Time	Relinquished by	Received by	Via	Date	Time
4/2/20	1300					
4/2/20	1900			courier	4/3/20	8:30

Remarks: CC: Natalie Gordon

Matador

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

ATTACHMENT 8

Natalie Gordon

From: John Hurt <JHurt@matadorresources.com>
Sent: Tuesday, August 18, 2020 10:49 AM
To: Natalie Gordon
Subject: FW: NRM2009032079 SHINNERY OAK FEDERAL SWD #001 @ 30-015-20866
Attachments: (C-141 Closure) NRM2009032079.pdf

From: Eads, Cristina, EMNRD [mailto:Cristina.Eads@state.nm.us]
Sent: Tuesday, August 18, 2020 11:43 AM
To: John Hurt <JHurt@matadorresources.com>
Cc: CFO_Spill, BLM_NM <blm_nm_cfo_spill@blm.gov>; Bratcher, Mike, EMNRD <mike.bratcher@state.nm.us>; Hamlet, Robert, EMNRD <Robert.Hamlet@state.nm.us>; Venegas, Victoria, EMNRD <Victoria.Venegas@state.nm.us>
Subject: NRM2009032079 SHINNERY OAK FEDERAL SWD #001 @ 30-015-20866

EXTERNAL EMAIL
John,

The OCD has denied the submitted Closure Request C-141 for incident # NRM2009032079 for the following reason:

- Horizontal delineation has not been completed. The values for determination of horizontal impact are derived by either "background" value as determined appropriate to Rule 29, or, for chloride, 600 mg/Kg in soils. This is especially important for "on-pad" releases to ensure the release did not extend to the "off-pad"/pasture area. A visual footprint on the surface is not sufficient to assess the horizontal extent of the release. Lab data must be provided as evidence of delineation efforts. All sidewall samples, with the exception of WS20-01 exceed the criteria described above.

The site characterization is approved, and no additional remediation will be required, given that additional sidewall samples demonstrate the release did not extend to the off-pad area and/or do not exceed closure criteria where groundwater is greater than 100' below ground surface. This site characterization will need like approval from the BLM.

The Denied C-141 can be found in the online image file. Please review and make the required correction prior to resubmitting though the fee portal. If you have any questions or believe this denial is in error, please contact me prior to submitting an additional C-141.

Thanks,

Cristina Eads
Environmental Bureau
EMNRD – Oil Conservation Division
5200 Oakland Avenue NE, Suite 100
Albuquerque, New Mexico 87113
505.670-5601
email: Cristina.Eads@state.nm.us

OCD approval does not relieve the operator of liability should their operations fail to adequately investigate and remediate contamination that may pose a threat to groundwater, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

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 10859

CONDITIONS OF APPROVAL

Operator:	OGRID:	Action Number:	Action Type:
MATADOR PRODUCTION COMPANY One Lincoln Centre 5400 LBJ Freeway, Ste 1500 Dallas, TX75240	228937	10859	C-141

OCD Reviewer	Condition
ceads	None