



October 20, 2020

Vertex Project #: 20E-00239-014

Spill Closure Report: Shinnery Oak Federal SWD #003
Unit E, Section 2, Township 21 South, Range 28 East
County: Eddy
Incident Tracking Number: NRM2019957626

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 following a produced water release that occurred on July 8, 2020, at Shinnery Oak Federal SWD #003 (hereafter referred to as “Shinnery Oak”). Matador provided immediate notification of the spill to New Mexico Oil Conservation Division (NM OCD) District 2 on July 8, 2020, via email, followed by submission of the initial C-141 Release Notification on July 14, 2020 (Attachment 1). The NM OCD incident tracking number assigned to this incident is NRM2019957626.

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 July 8, 2020, a release occurred at Matador’s Shinnery Oak site when a nipple blew out on a strainer. This incident resulted in the release of approximately 1,124.5 barrels (bbls) of produced water onto the wellpad and into the adjacent pasture. Upon discovery of the release, the well was shut in and the strainer repaired. A hydrovac truck was dispatched to the site to recover free fluids; approximately 280 bbls of produced water were recovered. The release impacted the southwest portion of the wellpad and flowed from the southwest corner of the pad in a westerly direction along a shallow draw into the adjacent undisturbed area. No produced water was released into ecologically sensitive areas or waterways.

Site Characterization

The release at Shinnery Oak occurred on privately-owned land, N 32.51121, W 104.06254, approximately 10 miles northeast of Carlsbad, New Mexico. The legal description for the site is Unit E, Section 2, 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 (Figure 1).

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Matador Production Company
Shinnery Oak Federal SWD #003

2020 Spill Assessment and Closure
October 2020

The Shinnery Oak site consists of saltwater disposal (SWD) equipment and a tank battery. Oil and gas exploration and production wellpads are located nearby, and the site 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 south side of the wellpad and the adjacent pasture area.

The surrounding landscape is associated with the dunes, uplands and sandy plains typical of elevations between 2,000 and 5,700 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 the ground cover (United States Department of Agriculture, Natural Resources Conservation Service, 2020). Limited to no vegetation is allowed to grow on the compacted facility pad 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 Berino complex, which is moderately deep to very deep soil characterized by fine sand and sandy clay loam over loamy fine sand. This soil tends to be well drained with low runoff and moderate water storage in the soil profile (United States Department of Agriculture, Natural Resources Conservation Service, 2020). There is low potential for karst geology to be present near Shinnery Oak (United States Department of the Interior, United States Geological Survey, 2020a).

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 8 miles west of the site and an emergent wetland located approximately 2 miles to the southeast of Shinnery Oak (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 well, located approximately 0.6 miles south-southeast of Shinnery Oak, with a depth to groundwater of 70 feet below ground surface (bgs; United States Department of the Interior, United States Geological Survey, 2020b). 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.

Matador Production Company
Shinnery Oak Federal SWD #003

2020 Spill Assessment and Closure
October 2020

Table 1. Closure Criteria for Soils Impacted by a Release

Depth to Groundwater	Constituent	Limit
51-100 feet	Chloride	10,000 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

¹Total petroleum hydrocarbons (TPH) = gasoline range organics (GRO) + diesel range organics (DRO) + motor oil range organics (MRO)

²Benzene, toluene, ethylbenzene and xylenes (BTEX)

Remedial Actions

Vertex completed the initial spill inspection and emergency scrape of contaminated soil on July 8, 2020, at which time the boundaries of the release were identified and mapped using field screening methods, including a photoionization detector (PID) to determine the presence of volatile organics, the Petroflag system to estimate the level of hydrocarbons and an electroconductivity (EC) meter to approximate chloride levels in the soil. The release area was determined to be approximately 360 feet wide by 717 feet long; the total affected area was determined to be approximately 28,885 square feet (Attachment 2 – Figure 1). Characterization soil samples were collected from five boreholes (BH20-01 to BH20-05) and 13 surface soil samples (SS20-01 to SS20-13); select samples were submitted for laboratory analysis to verify the initial field screening results. Field screening results and associated laboratory data are summarized in Table 2 (Attachment 4) and in the Daily Field Reports (DFRs) included in Attachment 5.

On August 23, 2020, Vertex provided 48-hour notification of confirmation sampling to NM OCD, as required by Subparagraph (a) of Paragraph (1) of Subsection D 19.15.29.12 NMAC (Attachment 6). Between August 24 and 28, 2020, Vertex was on-site at Shinnery Oak to guide remediation via excavation of contaminated soils to depths ranging between 0.25 and 8 feet bgs.

Between August 26 and 28, 2020, Vertex collected a total of 153 five-point composite confirmatory samples from the base and side walls of the excavation, at depths ranging between ground surface and 8 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 sampling analytical data are summarized in Table 3 (Attachment 4). 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, along with final excavation depths, are presented on Figure 2 (Attachment 2).

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Matador Production Company
Shinnery Oak Federal SWD #003

2020 Spill Assessment and Closure
October 2020

Remediation efforts for the portion of the release that occurred off-site included excavation of contaminated materials to levels meeting NM OCD restoration and reclamation requirements as outlined in 19.15.29.13 NMAC. Two of the 71 confirmatory samples collected off-site initially failed to meet NM OCD reclamation levels, and, following additional minor excavation, were re-collected on September 17, 2020. The final laboratory results for these two sample points are presented alongside the original laboratory data in Table 3 (Attachment 4).

Closure Request

Vertex recommends no additional action to address the release at Shinnery Oak. Laboratory analyses of confirmatory samples showed constituent of concern concentration levels below NM OCD closure criteria for areas where depth to groundwater is greater than 51 and less than 100 feet bgs, as shown in Table 1. There are no anticipated risks to human, ecological or hydrological receptors associated with the release site.

The excavation was backfilled with non-waste-containing, uncontaminated, earthen material, sourced locally, and placed to meet the site's existing grade to prevent ponding of water and erosion, and, for the off-lease areas, to aid in the establishment of vegetation. A native seed mix appropriate for this location, and recommended by the New Mexico State Land Office, has been purchased and will be sown in the off-site remediation areas at an appropriate time of year to take advantage of seasonal rains.

Vertex requests that this incident (NRM2019957626) be closed as all closure requirements set forth in Subsection E of 19.15.29.12 NMAC, and applicable reclamation requirements set forth in 19.15.29.13 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 July 8, 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

vertex.ca

3101 Boyd Drive, Carlsbad, New Mexico 88220, USA | P 575.725.5001

Matador Production Company
Shinnery Oak Federal SWD #003

2020 Spill Assessment and Closure
October 2020

Attachments

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

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Matador Production Company
Shinnery Oak Federal SWD #003

2020 Spill Assessment and Closure
October 2020

References

- New Mexico Bureau of Geology and Mineral Resources. (2020). *Interactive Geologic Map*. Retrieved from <http://geoinfo.nmt.edu>
- New Mexico Oil Conservation Division. (2018). *New Mexico Administrative Code – Natural Resources and Wildlife Oil and Gas Releases*. Santa Fe, New Mexico.
- United States Department of Agriculture, Natural Resources Conservation Service. (2020). *Web Soil Survey*. Retrieved from <https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>
- United States Department of the Interior, United States Geological Survey. (2020a). *Caves and Karst in the U.S. National Park Service*. Retrieved from <https://www.arcgis.com/home/webmap/viewer.html?webmap=14675403c37948129acb758138f2dd1e>
- United States Department of the Interior, United States Geological Survey. (2020b). *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>

Matador Production Company
Shinnery Oak Federal SWD #003

2020 Spill Assessment and Closure
October 2020

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	NRM2019957626
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 32.51121 Longitude -104.06254
(NAD 83 in decimal degrees to 5 decimal places)

Site Name: Shinnery Oak Federal SWD #003	Site Type: SWD
Date Release Discovered: 03/25/2020	API# (if applicable) 30-015-45535

Unit Letter	Section	Township	Range	County
E	02	21S	28E	Eddy

Surface Owner: ☐ State ☐ Federal ☐ Tribal ☒ Private (Name: Matador Production Company)

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) 1,124.5 bbls	Volume Recovered (bbls) 280 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:

Nipple blew out on a strainer.

Form C-141

State of New Mexico
Oil Conservation Division

Page 2

Incident ID	NRM2019957626
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? Release was greater than 25 bbls.
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? Immediate notification was provided to Jim Griswold and Mike Bratcher of NM OCD by Natalie Gordon of Vertex Resources Group via email on Wednesday, July 8, 2020 at approximately 11:00am.	

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 <u>not</u> 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: <u>John Hurt</u>	Title: <u>RES Specialist</u>
Signature: 	Date: <u>7/14/20</u>
email: <u>JHurt@matadorresources.com</u>	Telephone: <u>972-371-5200</u>
OCD Only Received by: <u>Ramona Marcus</u> Date: <u>7/17/2020</u>	

Incident ID	NRM2019937820
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?	<u>70</u> (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.*

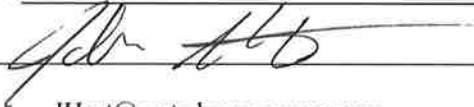
- ☒ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ☒ Field data
- ☒ Data table of soil contaminant concentration data
- ☒ Depth to water determination
- ☒ Determination of water sources and significant watercourses within ½-mile 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.

Oil Conservation Division

Incident ID	NRM2019957626
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: _____ Date: _____

Incident ID	NRM2019957020
District RP	
Facility ID	
Application ID	

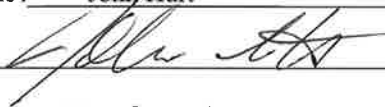
Closure

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.*

- ☒ A scaled site and sampling diagram as described in 19.15.29.11 NMAC
- ☒ 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)
- ☒ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)
- ☒ 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: Johrp Hurt Title: RES Specialist
Signature:  Date: 10/27/20
email: JHurt@matadorresources.com Telephone: 972-371-5200

OCD Only

Received by: _____ Date: _____

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

Closure Approved by: _____ Date: _____

Printed Name: _____ Title: _____

Natalie Gordon

From: Dhugal Hanton <vertexresourcegroupusa@gmail.com>
Sent: Wednesday, July 8, 2020 6:18 PM
To: Natalie Gordon
Subject: Fwd: Notice of PW Release >25 bbls (Matador Production Company)

----- Forwarded message -----

From: **Dhugal Hanton** <vertexresourcegroupusa@gmail.com>
Date: Wed, Jul 8, 2020 at 6:17 PM
Subject: Re: Notice of PW Release >25 bbls (Matador Production Company)
To: Griswold, Jim, EMNRD <jim.griswold@state.nm.us>, Bratcher, Mike, EMNRD <Mike.Bratcher@state.nm.us>, Venegas, Victoria, EMNRD <Victoria.Venegas@state.nm.us>, Hamlet, Robert, EMNRD <Robert.Hamlet@state.nm.us>, CFO_Spill, BLM_NM <blm_nm_cfo_spill@blm.gov>, Kelsey <KWade@blm.gov>, Amos, James A <Jamos@blm.gov>

All:

During my earlier notification of the produced water (PW) release that occurred on Wednesday, July 8, 2020, at the Shinnery Oak Federal SWD #3, API 30-015-45535, I mentioned that a portion of the release ran off-pad into pasture that is owned by BLM. This is actually incorrect. The area where the release ran off-pad is owned by Matador. The release approached BLM land but did not quite reach it. Coordinates for release area are: 32.49297, -104.03371.

My apologies for the mistake.

Vertex is in the process of delineating and remediating this release. An initial C-141 notification form will be submitted by Matador's environmental rep shortly followed by a closure report within 90 days.

If you have any questions or need additional information about this release, please don't hesitate to give me a call at 505-506-0040.

Thank you very much,
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

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On Wed, Jul 8, 2020 at 11:03 AM Dhugal Hanton <vertexresourcegroupusa@gmail.com> wrote:
All:

Please accept this email as immediate notification, on behalf of Matador Production Company, of a produced water (PW) release that occurred on Wednesday, July 8, 2020, at the Shinnery Oak Federal SWD #3, API 30-015-45535. Coordinates for release area are: 32.49297, -104.03371.

Early this morning at approximately 4:00a.m., it appears a nipple blew out on a strainer, resulting in the release of greater than 25 bbls of produced water. Recovery of fluids, determination of an estimated volume and initial mitigation activities are currently underway. The produced water did run off-site into an undisturbed area. The land where Shinnery Oak is located is owned by the Bureau of Land Management (BLM).

Vertex is in the process of delineating and remediating this release. An initial C-141 notification form will be submitted by Matador's environmental rep shortly followed by a closure report within 90 days.

If you have any questions or need additional information about this release, please don't hesitate to give me a call at 505-506-0040.

Thank you very much,
Natalie

Natalie Gordon
Project Manager

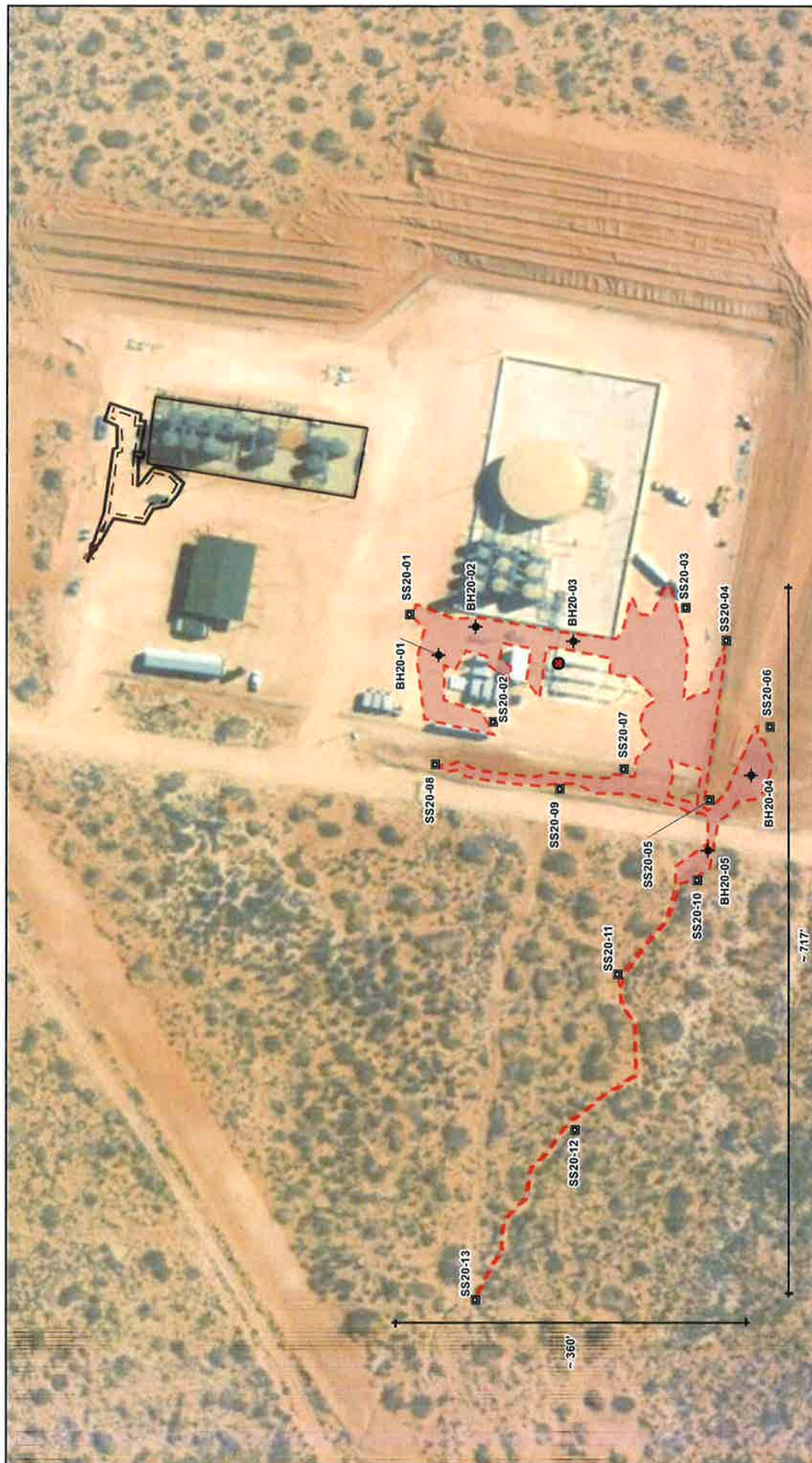
Vertex Resource Group Ltd.
213 S. Mesa Street
Carlsbad, NM 88220

P 575.725.5001 ext 709
C 505.506.0040
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ATTACHMENT 2



Approximate Spill Extent (~ 28,885 sq. ft.)

Infrastructure (Existing)

Borehole
Point of Release
Surface Sample



FIGURE:

1

Site Schematic and Characterization Sampling Locations Shinnery Oak Federal SWD #003



NAD 1983 UTM Zone 13N
Date: Jul 20/20

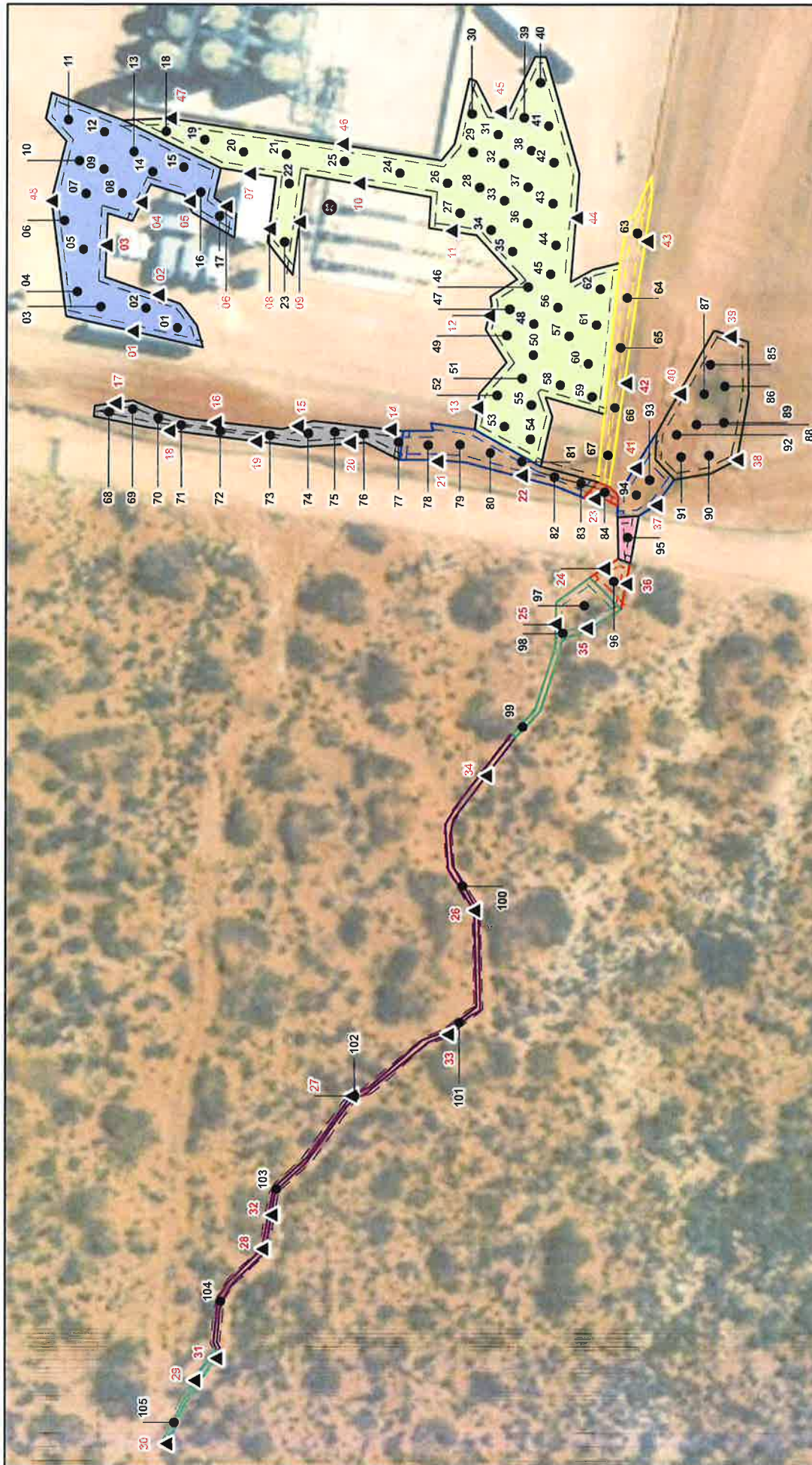
0 25 50 75 100 125 Feet
Map Center:
Lat/Long: 32.513128, -104.062708



Note: Imagery from ESRI, 2018.

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.

VERSATILITY. EXPERTISE.



Approximate Excavation Area: 58,950 sq. ft.



FIGURE:
2

Confirmatory Sampling Locations Shinnery Oak Federal SWD #003



NAD 1983 UTM Zone 13N
Date: Sep 02/20

0 12.5 25 50 75 Feet
Map Center:
Lat/Long: 32,512606, -104,063363



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ATTACHMENT 3

Closure Criteria Determination Worksheet			
Site Name: Shinnery Oak Federal SWD #003			
Spill Coordinates:		32.513128	-104.062708
Site Specific Conditions		Value	Unit
1	Depth to Groundwater	70	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		51-100'	<50' 51-100' >100'

Shinnery Oak Fed SWD #1





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site_no list =

- 322850104014201

Minimum number of levels = 1

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USGS 322850104014201 21S.29E.18.13320

Available data for this site Groundwater: Field measurements

GO

Eddy County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°28'50", Longitude 104°01'42" NAD27
Land-surface elevation 3,289 feet above NAVD88
The depth of the well is 160 feet below land surface.
This well is completed in the Rustler Formation (312RSLR) local aquifer.

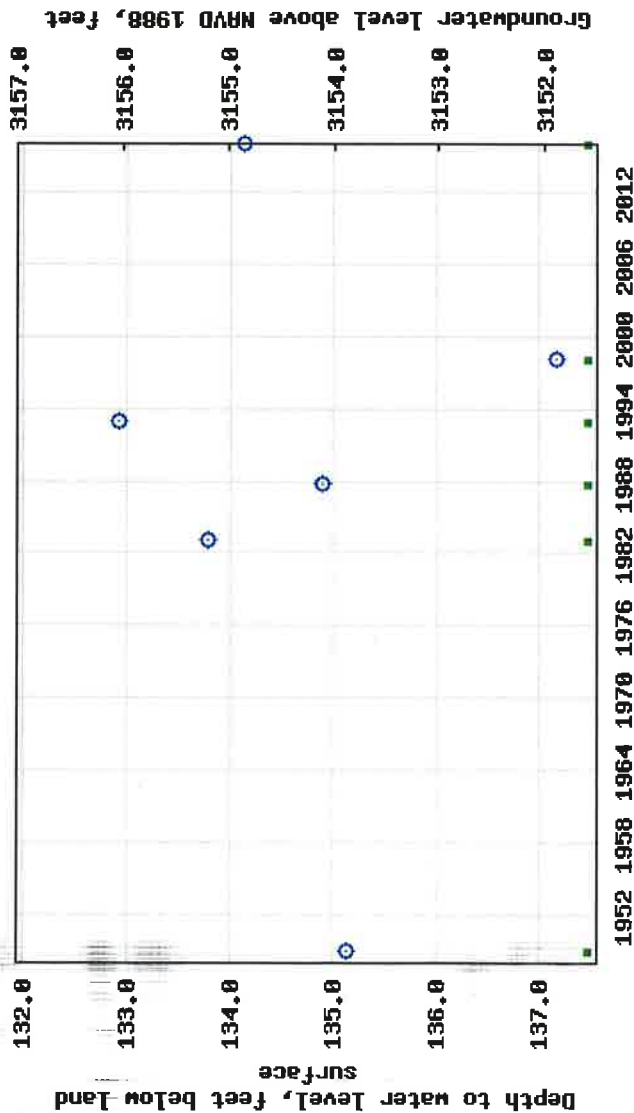
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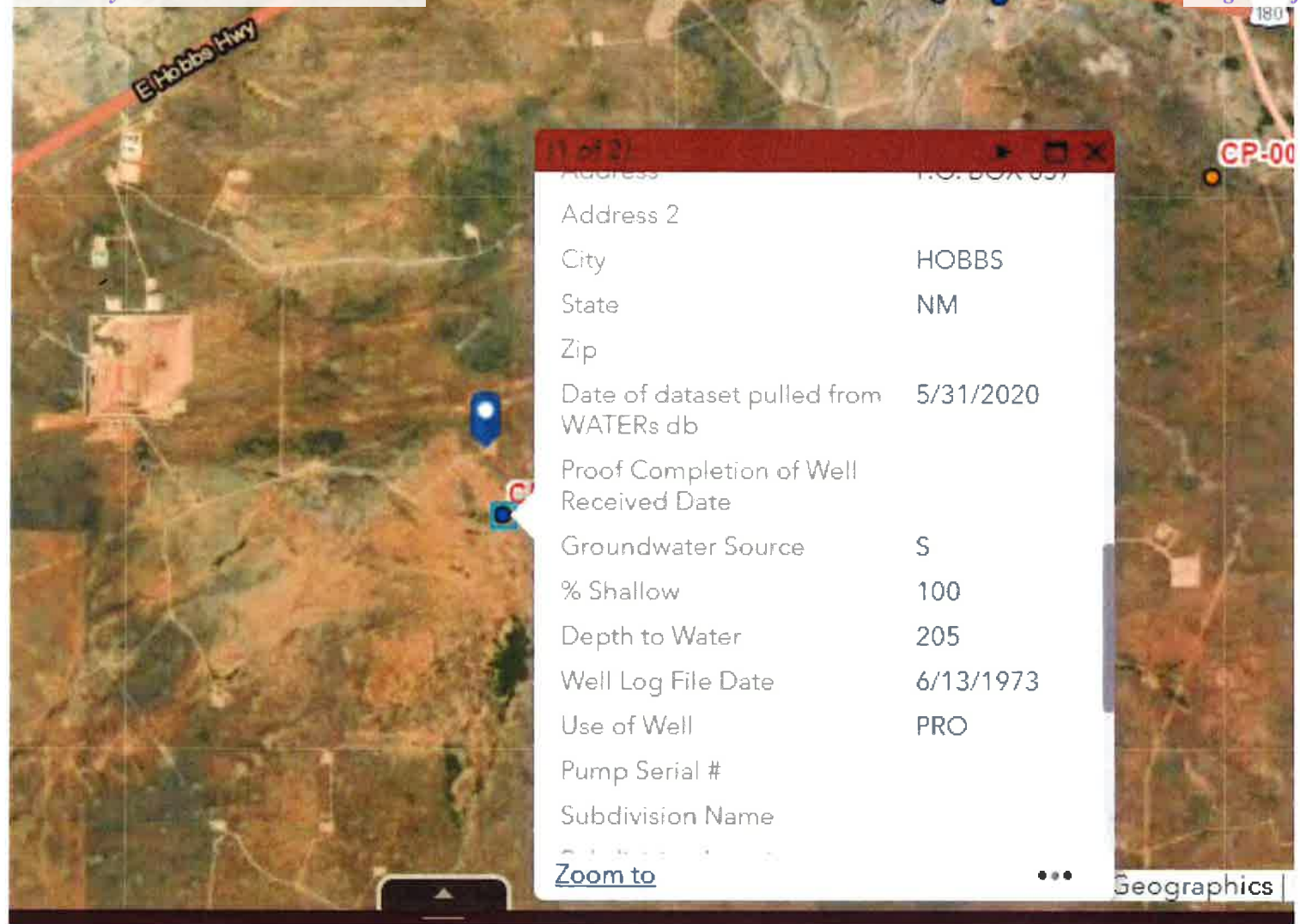
URL: <https://nwis.waterdata.usgs.gov/nwis/gwlevels/>

Page Contact Information: [USGS Water Data Support Team](#)

Page Last Modified: 2020-07-08 13:53:32 EDT

0.64 0.57 nadww02





1 of 3

Address: P.O. BOX 857

Address 2

City: HOBBS

State: NM

Zip

Date of dataset pulled from WATERS db: 5/31/2020

Proof Completion of Well Received Date

Groundwater Source: S

% Shallow: 100

Depth to Water: 205

Well Log File Date: 6/13/1973

Use of Well: PRO

Pump Serial #

Subdivision Name

[Zoom to](#)

Geographics



New Mexico Office of the State Engineer

Point of Diversion Summary

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

(quarters are smallest to largest)

(NAD83 UTM in meters)

Well Tag	POD Number	Q64	Q16	Q4	Sec	Tws	Rng	X	Y
CP 00516		4	4	4	12	21S	28E	590901	3594984*

Driller License: 46 **Driller Company:** ABBOTT BROTHERS COMPANY

Driller Name: ABBOTT, MURRELL

Drill Start Date: 05/30/1973 **Drill Finish Date:** 06/06/1973 **Plug Date:**

Log File Date: 06/14/1973 **PCW Rev Date:** **Source:** Shallow

Pump Type: **Pipe Discharge Size:** **Estimated Yield:**

Casing Size: 7.00 **Depth Well:** 275 feet **Depth Water:** 205 feet

Water Bearing Stratifications:

Top	Bottom	Description
260	275	Sandstone/Gravel/Conglomerate

Casing Perforations:

Top	Bottom
253	275

*UTM location was derived from PLSS - see Help

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7/8/20 11:58 AM

POINT OF DIVERSION SUMMARY



New Mexico Office of the State Engineer

Point of Diversion Summary

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

(NAD83 UTM in meters)

Well Tag **POD Number** **Q64 Q16 Q4 Sec Tws Rng** **X** **Y**

2214C CP 01710 POD2 1 3 4 17 21S 28E 583971 3593509

Driller License: 1708 **Driller Company:** ZIA DRILLING AND GEOTHERMAL, LLC

Driller Name: AINSWORTH, RYAN

Drill Start Date: 09/18/2018 **Drill Finish Date:** 09/19/2018 **Plug Date:**

Log File Date: 01/23/2019 **PCW Rcv Date:** **Source:** Shallow

Pump Type: **Pipe Discharge Size:** **Estimated Yield:** 25 GPM

Casing Size: 5.75 **Depth Well:** 160 feet **Depth Water:** 149 feet

Water Bearing Stratifications:

Top	Bottom	Description
149	155	Sandstone/Gravel/Conglomerate

Casing Perforations:

Top	Bottom
0	160

Meter Number: 17760 **Meter Make:** RECORD ALL

Meter Serial Number: 18058164 **Meter Multiplier:** 100.0000

Number of Dials: 6 **Meter Type:** Diversion

Unit of Measure: Gallons **Return Flow Percent:**

Usage Multiplier: **Reading Frequency:** Quarterly

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(quarters are smallest to largest)

(NAD83 UTM in meters)

Well Tag	POD Number	Q64	Q16	Q4	Sec	Tws	Rng	X	Y
2243F	CP 01800 POD1	3	3	4	32	20S	30E	594590	3598885

Driller License: 1348 **Driller Company:** TAYLOR WATER WELL SERVICE

Driller Name: TAYLOR, CLINTON E.E.ENER

Drill Start Date: 03/09/2020 **Drill Finish Date:** 03/20/2020 **Plug Date:**

Log File Date: 03/31/2020 **PCW Rev Date:** **Source:** Shallow

Pump Type: **Pipe Discharge Size:** **Estimated Yield:** 20 GPM

Casing Size: 5.00 **Depth Well:** 227 feet **Depth Water:** 214 feet

Water Bearing Stratifications:		Top	Bottom	Description
214	227	Sandstone/Gravel/Conglomerate		

Casing Perforations:		Top	Bottom
187	227		

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(quarters are smallest to largest)

(NAD83 UTM in meters)

Well Tag	POD Number	Q64	Q16	Q4	Sec	Tws	Rng	X	Y
CP 01202 POD1		4	4	3	26	20S	29E	589569	3600512

Driller License: 1348 **Driller Company:** TAYLOR WATER WELL SERVICE

Driller Name: TAYLOR, CLINTON E.

Drill Start Date: 11/21/2013 **Drill Finish Date:** 12/02/2013 **Plug Date:**

Log File Date: 01/23/2014 **PCW Rev Date:** **Source:** Shallow

Pump Type: **Pipe Discharge Size:** **Estimated Yield:** 100 GPM

Casing Size: 6.00 **Depth Well:** 173 feet **Depth Water:** 158 feet

Water Bearing Stratifications:	Top	Bottom	Description
	158	173	Other/Unknown

Casing Perforations:	Top	Bottom
	153	173

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- 323015104032301

Minimum number of levels = 1

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USGS 323015104032301 20S.29E.28.244111

Available data for this site Groundwater: Field measurements

GO

Eddy County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°30'15", Longitude 104°03'23" NAD27
Land-surface elevation 3,268 feet above NGVD29
The depth of the well is 205 feet below land surface.
This well is completed in the Rustler Formation (312RSLR) local aquifer.

Output formats

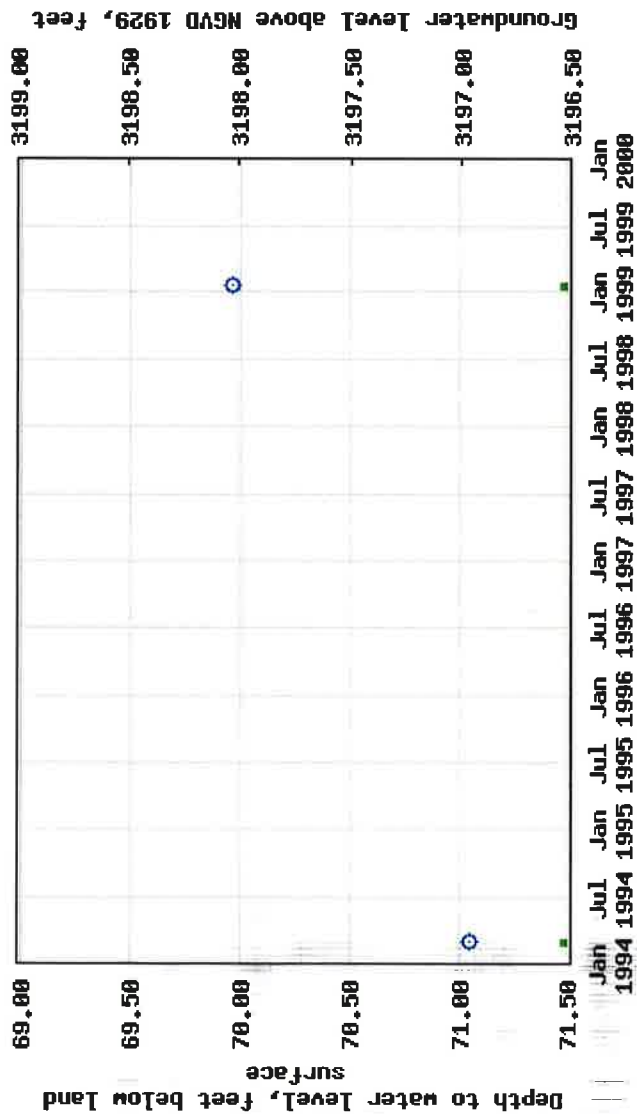
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0.83 0.7 nadww01





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- 323028104050001

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Available data for this site Groundwater: Field measurements

Eddy County, New Mexico

Hydrologic Unit Code 13060011

Latitude 32°30'28", Longitude 104°05'00" NAD27

Land-surface elevation 3,238 feet above NAVD88

The depth of the well is 185 feet below land surface.

This well is completed in the Rustler Formation (312RSLR) local aquifer.

Output formats

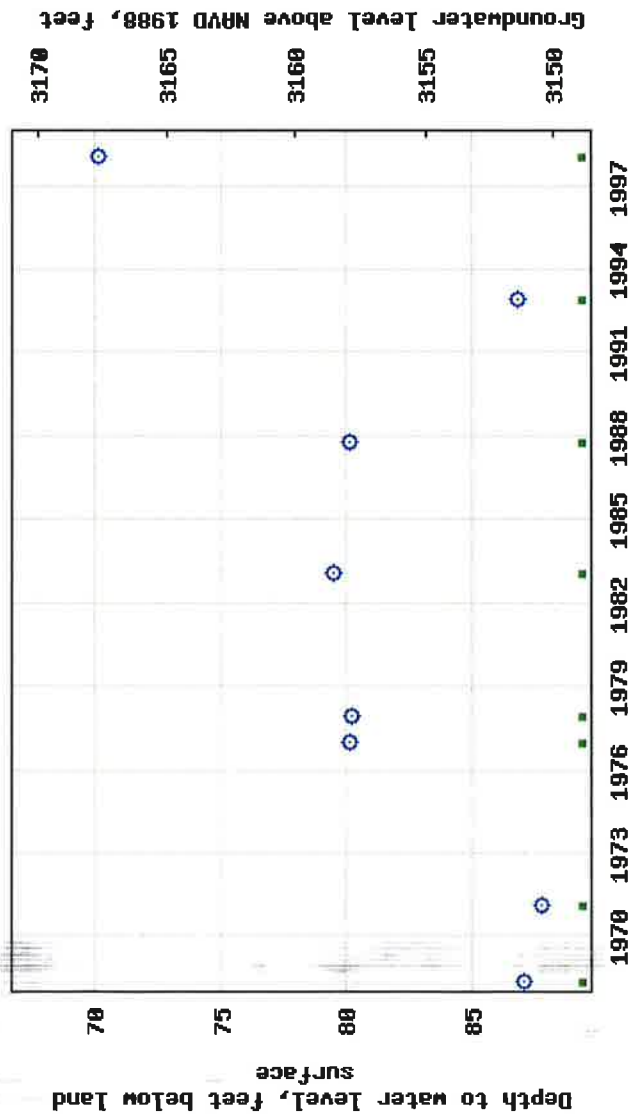
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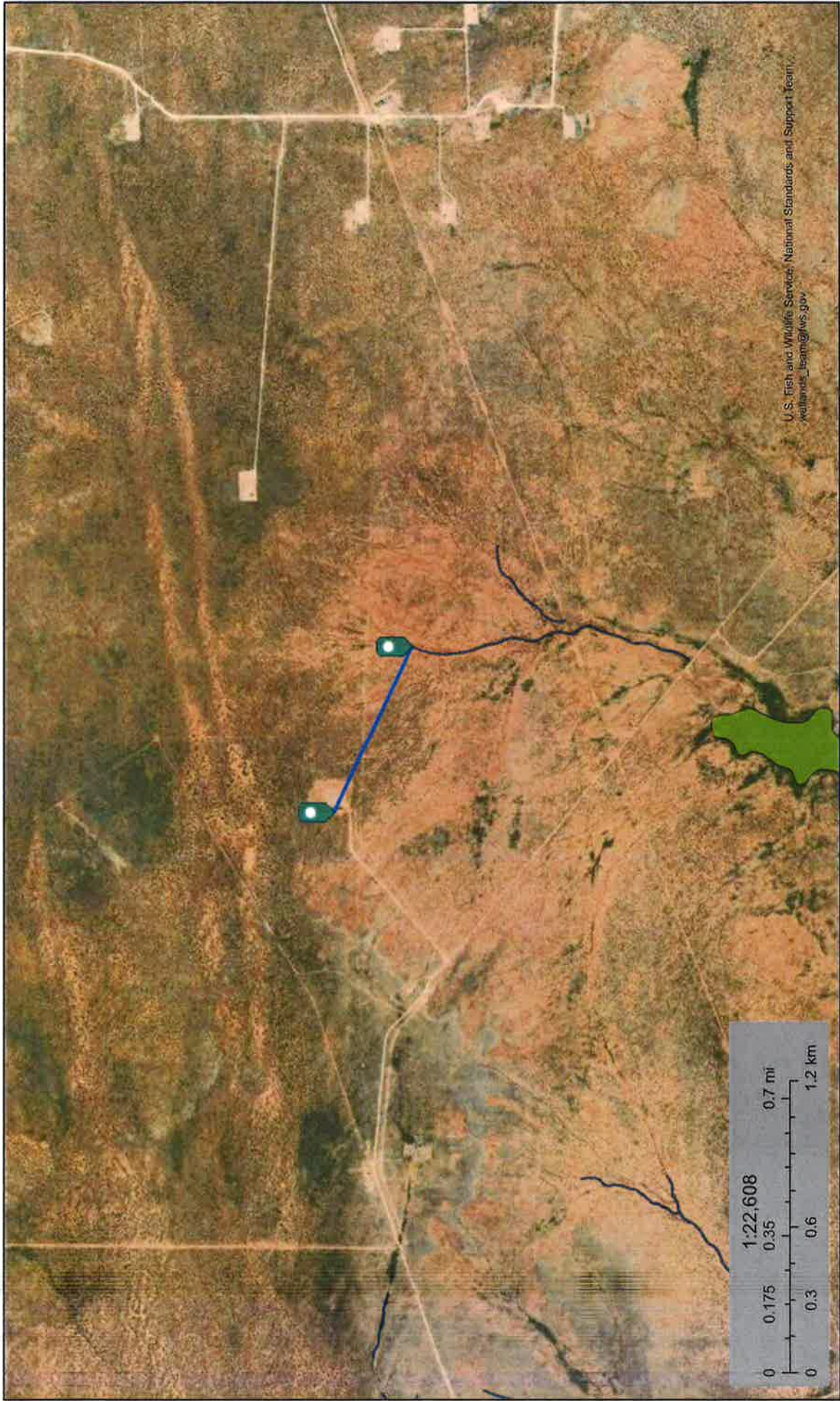
Page Last Modified: 2020-08-11 17:14:07 EDT

0.54 0.48 nadww01





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 map was produced by the NWI team

32°29'34.7"N 104°02'01.4"W - Google Maps

32°29'34.7"N 104°02'01.4"W

Shinnery Oak Nearest Lake



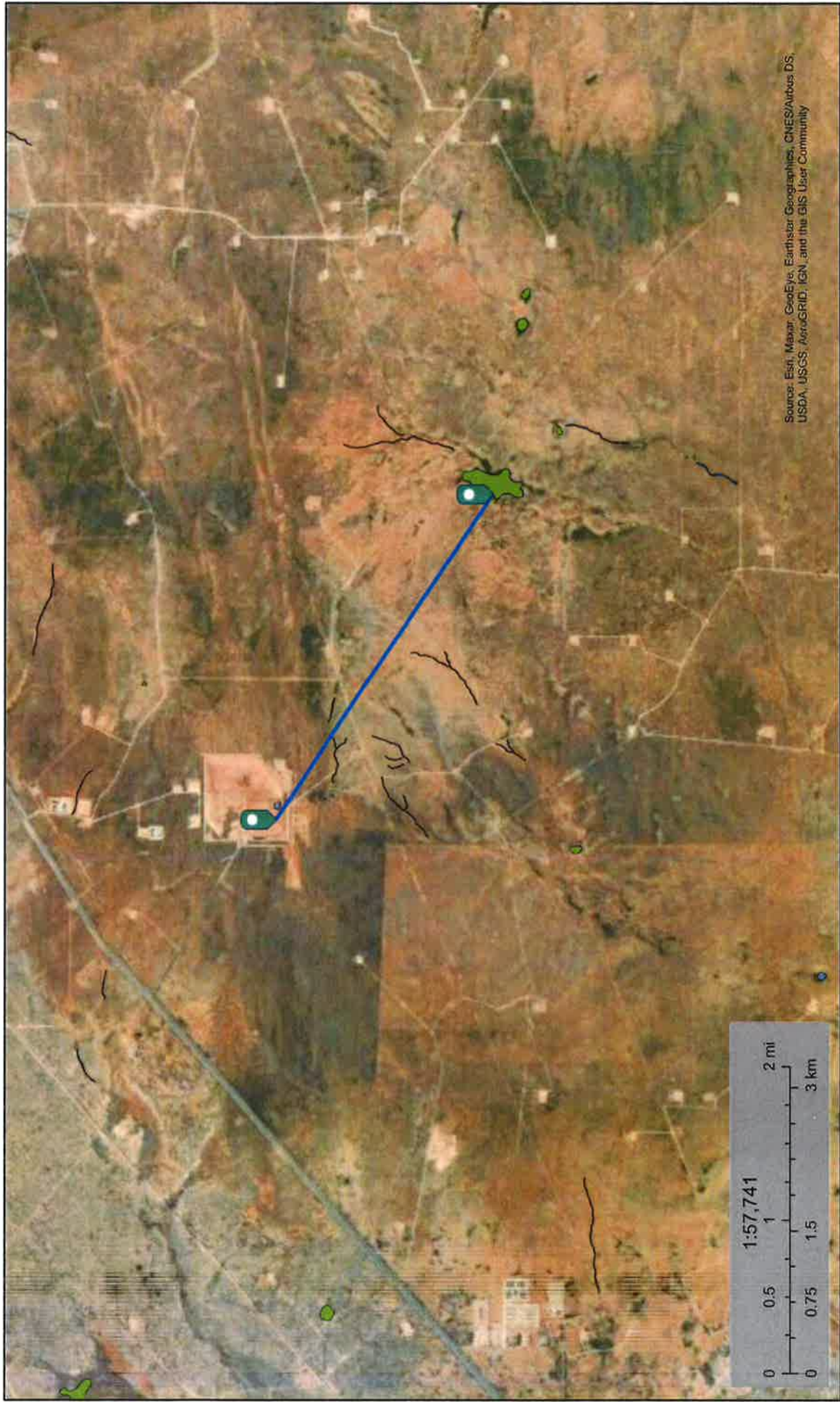
Measure distance

Total distance: 11.75 mi (18.91 km)

4/30/2020



Shinnery Oak - Nearest Wetland



Source: Esri, Mapbox, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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.

October 16, 2020

Wetlands

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

National Wetlands Inventory (NWI)
This map was produced by the NWI team

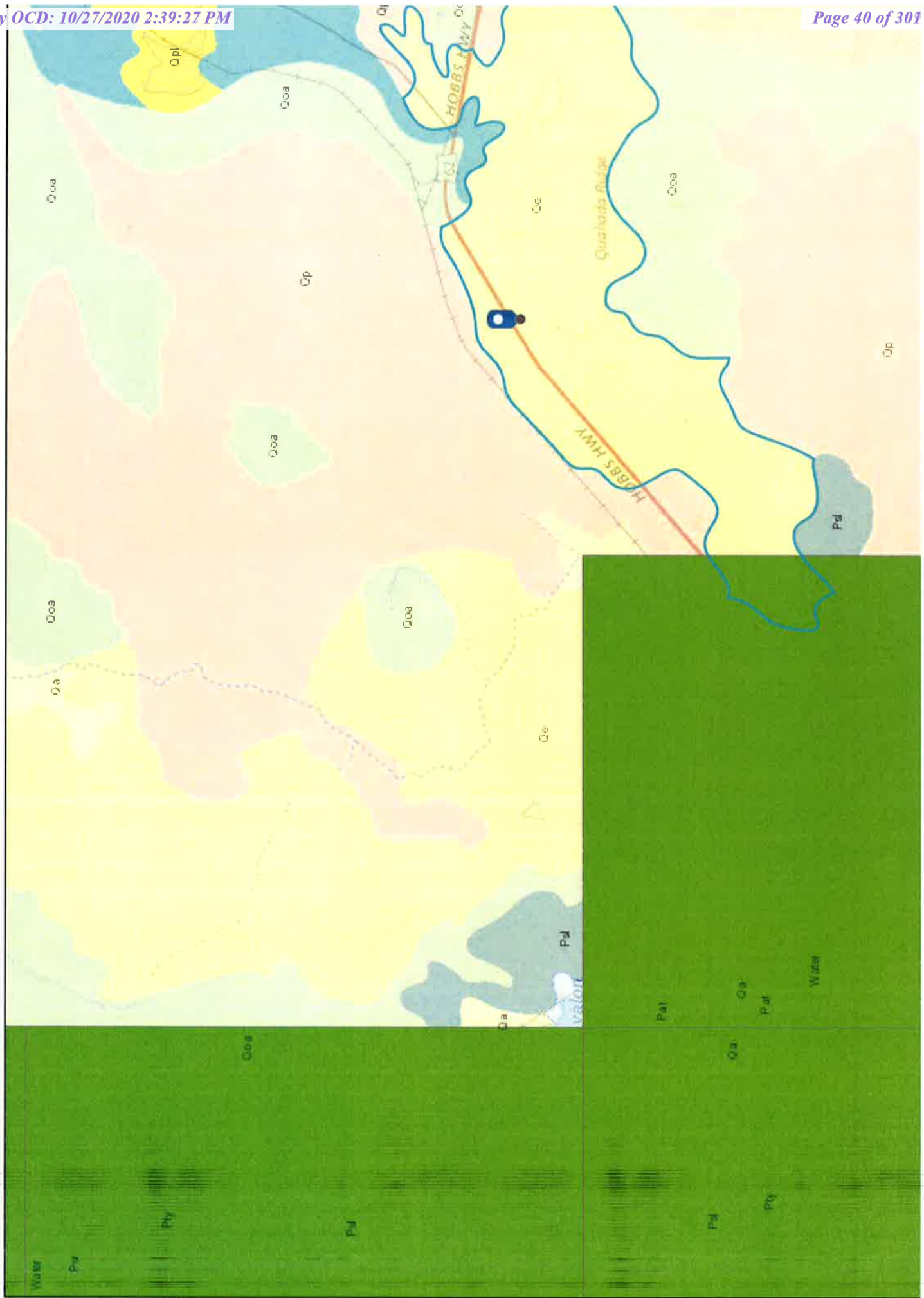
USA Karst



A map showing karst areas in the United States based on the U.S. Geological Survey Open-File Report 2004-1352

Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS | U.S. Geological Survey Open-File Report 2004-1352, Caves and Karst in the U.S. National Park Service, AGI Karst Map of the US.

Shinnery Oaks SWD 1

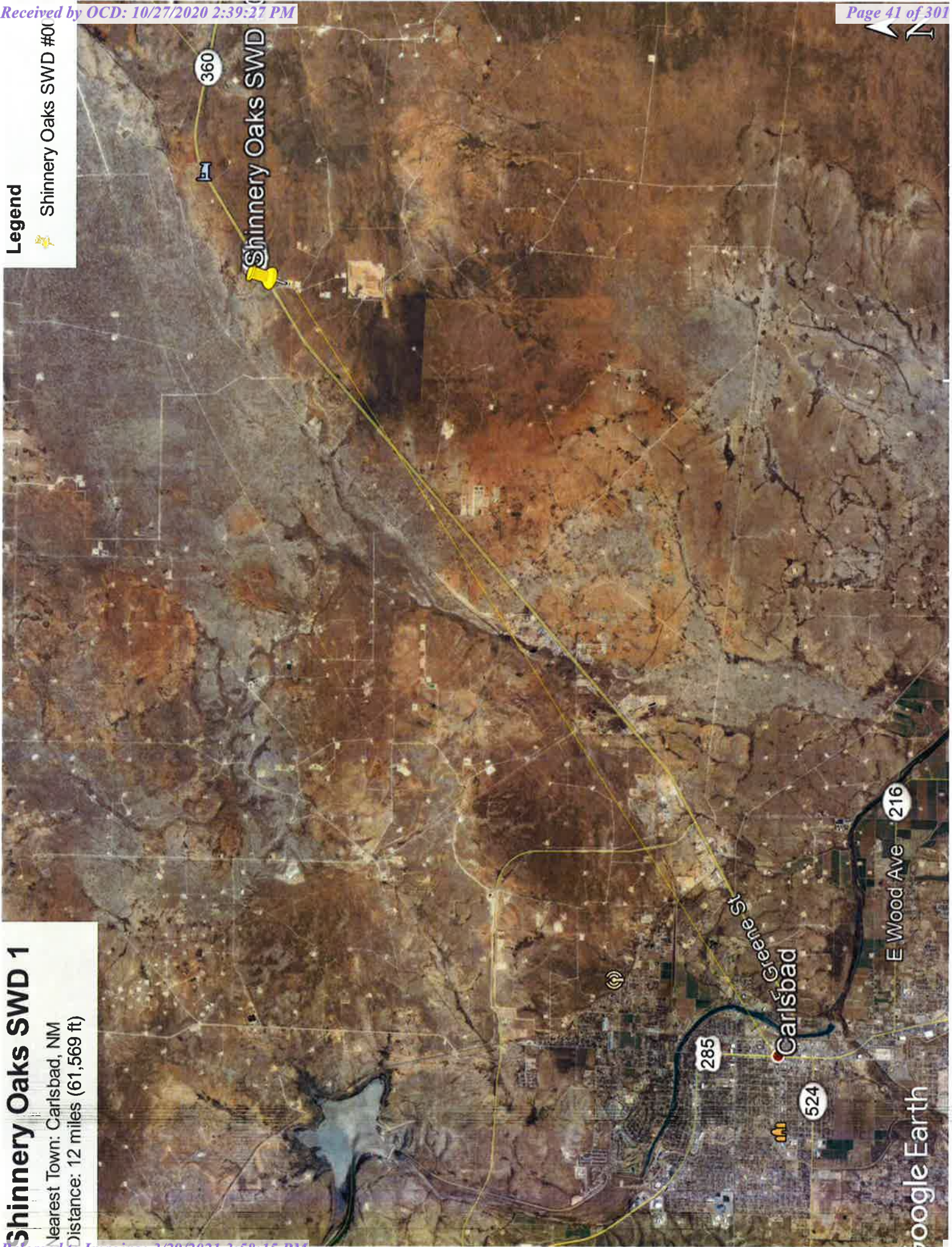


Legend

Shinnery Oaks SWD #01

Shinnery Oaks SWD 1

Nearest Town: Carlsbad, NM
Distance: 12 miles (61,569 ft)



Legend

Shinnery Oaks SWD #00



Shinnery Oaks SWD 1
Nearest Residence: 3.66 miles (19,346 ft)

Shinnery Oaks S
Hobbs Hwy

Residence

62

Google Earth

Ecological site R042XC003NM Loamy Sand

Accessed: 10/16/2020

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

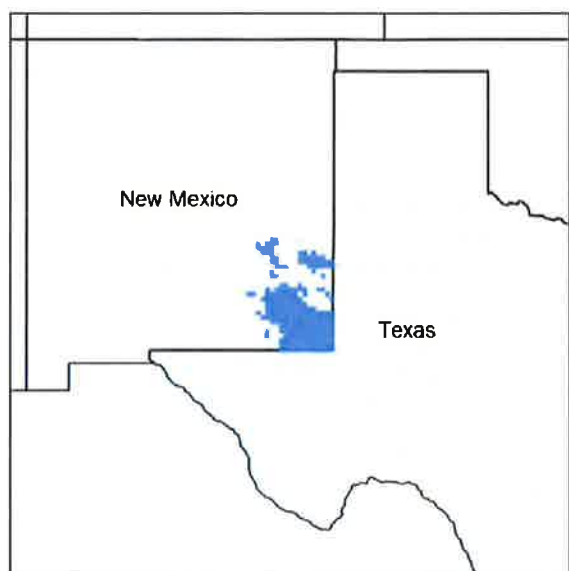


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Associated sites

R042XC004NM	Sandy Sandy
R042XC005NM	Deep Sand Deep Sand

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site is on uplands, plains, dunes, fan piedmonts and in inter dunal areas. The parent material consists of mixed alluvium and or eolian sands derived from sedimentary rock. Slope range on this site range from 0 to 9 percent with the average of 5 percent.

Table 2. Representative physiographic features

Landforms	(1) Fan piedmont (2) Alluvial fan (3) Dune
Elevation	2,800–5,000 ft
Slope	0–9%
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation ranges from 8 to 13 inches. Variations of 5 inches, more or less, are common. Over 80 percent of the precipitation falls from April through October. Most of the summer precipitation comes in the form of high intensity-short duration thunderstorms.

Temperatures are characterized by distinct seasonal changes and large annual and diurnal temperature changes. The average annual temperature is 61 degrees with extremes of 25 degrees below zero in the winter to 112 degrees in the summer.

The average frost-free season is 207 to 220 days. The last killing frost being late March or early April and the first killing frost being in later October or early November.

Temperature and rainfall both favor warm season perennial plant growth. In years of abundant spring moisture, annual forbs and cool season grasses can make up an important component of this site. Strong winds blow from the southwest from January through June, which accelerates soil drying during a critical period for cool season plant growth.

Climate data was obtained from <http://www.wrcc.sage.dri.edu/summary/climsmnm.html> web site using 50% probability for freeze-free and frost-free seasons using 28.5 degrees F and 32.5 degrees F respectively.

Table 3. Representative climatic features

Frost-free period (average)	221 days
Freeze-free period (average)	240 days
Precipitation total (average)	13 in

Influencing water features

This site is not influenced from water from wetlands or streams.

Soil features

Soils are moderately deep or very deep. Surface textures are loamy fine sand, fine sandy loam, loamy very fine sand or gravelly sandy loam.

Subsurface is a loamy fine sand, coarse sandy loam, fine sandy loam or loam that averages less than 18 percent clay and less than 15 percent carbonates.

Substratum is a fine sandy loam or gravelly fine sandy loam with less than 15 percent gravel and with less than 40 percent calcium carbonate. Some layers high in lime or with caliche fragments may occur at depths of 20 to 30 inches.

These soils, if unprotected by plant cover and organic residue, become wind blown and low hummocks are formed.

Minimum and maximum values listed below represent the characteristic soils for this site.

Maljamar
Berino
Parjarito
Palomas
Wink
Pyote

Table 4. Representative soil features

Surface texture	(1) Fine sand (2) Fine sandy loam (3) Loamy fine sand
Family particle size	(1) Sandy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate to moderately rapid
Soil depth	40–72 in
Surface fragment cover $\leq 3"$	0–10%
Surface fragment cover $> 3"$	0%
Available water capacity (0–40in)	5–7 in
Calcium carbonate equivalent (0–40in)	3–40%
Electrical conductivity (0–40in)	2–4 mmhos/cm
Sodium adsorption ratio (0–40in)	0–2
Soil reaction (1:1 water) (0–40in)	6.6–8.4
Subsurface fragment volume $\leq 3"$ (Depth not specified)	4–12%
Subsurface fragment volume $> 3"$ (Depth not specified)	0%

Ecological dynamics

Overview

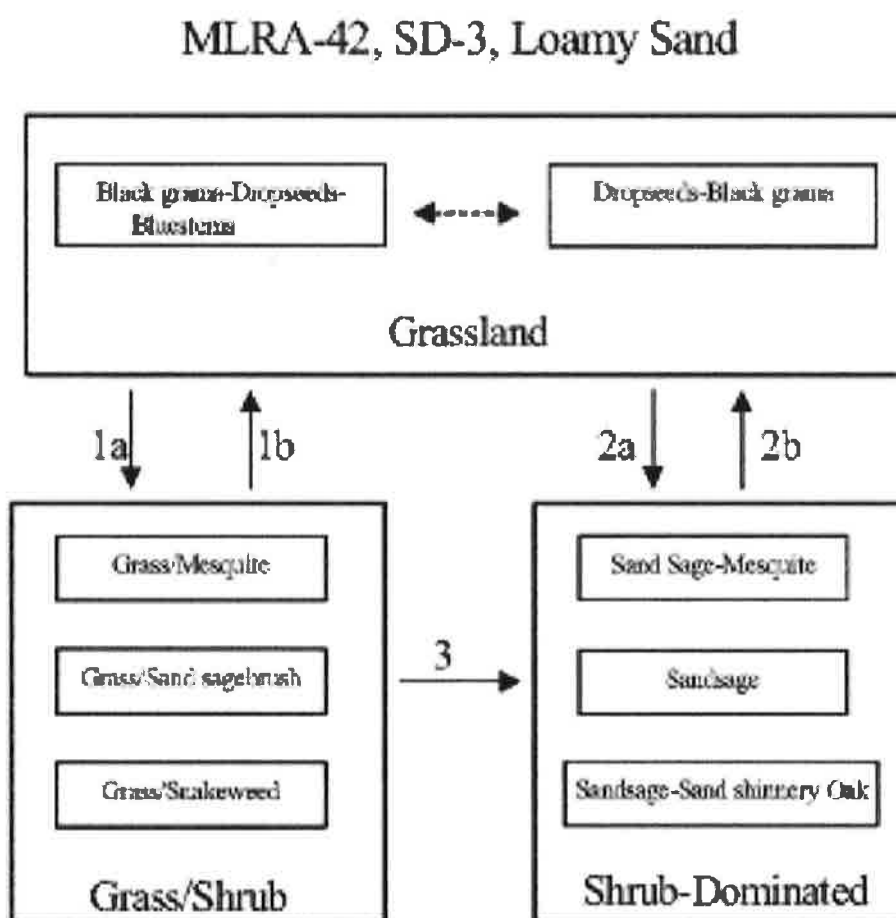
The Loamy Sand site intergrades with the Deep Sand and Sandy sites (SD-3). These sites can be differentiated by surface soil texture and depth to a textural change. Loamy Sand and Deep Sand sites have coarse textured (sands and loamy sand) surface soils while Sandy sites have moderately coarse textured (sandy loam and fine sandy loam) surfaces. Although Loamy Sand and Deep Sand sites have similar surface textures, the depth to a textural change is different—Loamy Sand sub-surface textures typically increase in clay at approximately 20 to 30 inches, and Deep Sand sites not until around 40 inches.

The historic plant community of Loamy Sand sites is dominated by black grama (*Bouteloua eriopoda*), dropseeds (*Sporobolus flexuosus*, *S. contractus*, *S. cryptandrus*), and bluestems (*Schizachyrium scoparium* and *Andropogon hallii*), with scattered shinnery oak (*Quercus havardii*) and sand sage (*Artemisia filifolia*). Perennial and annual forb abundance and distribution are dependent on precipitation. Litter and to a lesser extent, bare ground, are a significant proportion of ground cover while grasses compose the remainder. Decreases in black grama indicate a transition to either a grass/shrub or shrub-dominated state. The grass/shrub state is composed of grasses/honey mesquite (*Prosopis glandulosa*), grasses/broom snakeweed (*Gutierrezia sarothrae*), or grasses/sand sage. The shrub-dominated state covers loss of grass cover and a prevalence of sand sage with secondary

encourages shrub pervasiveness and a competitive advantage over grass species (McPherson 1995). Brush and grazing management, however, may reverse grass/shrub and shrub-dominated states toward the grassland-dominated historic plant community.

State and transition model

Plant Communities and Transitional Pathways (diagram):



1a. Drought, over grazing, fire suppression.

1b. Brush control, prescribed grazing

2a Severe loss of grass cover, fire suppression, erosion.

2b. Brush control, seeding, prescribed grazing.

3. Continued loss of grass cover, erosion.

Figure 4.

Historic Climax Plant Community

Community 1.1

Historic Climax Plant Community

Grassland: The historic plant community is a uniformly distributed grassland dominated by black grama, dropseeds, and bluestems. Sand sage and shinnery oak are evenly dispersed throughout the grassland due to the coarse soil surface texture. Perennial and annual forbs are common but their abundance and distribution are reflective of precipitation. Bluestems initially, followed by black grama, decrease with drought and heavy grazing intensity. Historical fire frequency is unknown but likely occurred enough to remove small shrubs to the competitive advantage of grass species. Fire suppression, drought conditions, and excessive grazing drive most grass species out of competition with shrub species.

Diagnosis: Grassland dominated by black grama, dropseeds, and bluestems. Shrubs, such as sand sage, shinnery oak, and mesquite are dispersed throughout the grassland. Forbs are present and populations fluctuate with precipitation variability.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	442	833	1224
Forb	110	208	306
Shrub/Vine	98	184	270
Total	650	1225	1800

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	28%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	50%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	22%

Figure 6. Plant community growth curve (percent production by month).
NM2803, R042XC003NM-Loamy Sand-HCPC. SD-3 Loamy Sand - Warm
season plant community .

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	5	10	10	25	30	12	5	0	0

Grass/Shrub



• Black grama/mesquite community,
with some dropseeds, threeawns, and
scattered sand shinnery oak
• Grass cover low to moderate

Grass/Shrub State: The grass/shrub state is dominated by communities of grasses/mesquite, grasses/snakeweed, or grasses/sand sage. Decreases in black grama and bluestem species lead to an increase in bare patches and mesquite which further competes with grass species. An increase of dropseeds and threeawns occurs. Grass distribution becomes more patchy with an absence or severe decrease in black grama and bluestems. Mesquite provides nitrogen and soil organic matter to co-dominant grasses (Ansley and Jacoby 1998, Ansley et al. 1998). Mesquite mortality when exposed to fire is low due to aggressive resprouting abilities. Herbicide application combined with subsequent prescribed fire may be more effective in mesquite reduction (Britton and Wright 1971).

Diagnosis: This state is dominated by an increased abundance of communities including grass/mesquite, grass/snakeweed, or grass/sand sage. Dropseeds and threeawns have a patchy distribution.

Transition to Grass/Shrub State (1a): The historic plant community begins to shift toward the grass/shrub state as drivers such as drought, fire suppression, interspecific competition, and excessive grazing contribute to alterations in soil properties and herbaceous cover. Cover loss and surface soil erosion are initial indicators of transition followed by a decrease in black grama with a subsequent increase of dropseeds, threeawns, mesquite, and snakeweed. Snakeweed has been documented to outcompete black grama especially under conditions of fire suppression and drought (McDaniel et al. 1984).

Key indicators of approach to transition:

- Loss of black grama cover
- Surface soil erosion
- Bare patch expansion
- Increased dropseed/threeawn and mesquite, snakeweed, or sand sage abundances

Transition to Historic Plant Community (1b): Brush and grazing management may restore the grassland component and reverse shrub or grass/shrub dominated states back toward the historic plant community.

Community 3.1

Shrub Dominated

Shrub-Dominated State: The shrub-dominated state results from a severe loss of grass cover. This state's primary species is sand sage. Shinnery oak and mesquite also occur; however, grass cover is limited to intershrub distribution. Sand sage stabilizes light sandy soils from wind erosion, which enhances protected grass/forb cover (Davis and Bonham 1979). However, shinnery oak also responds to the sandy soils with dense stands due to an aggressive rhizome system. Shinnery oak's extensive root system promotes competitive exclusion of grasses and forbs. Sand sage, shinnery oak, and mesquite can be controlled with herbicide (Herbel et al. 1979, Pettit 1986).

Transition to Shrub-Dominated (2a): Severe loss of grass species with increased erosion and fire suppression will result in a transition to a shrub-dominated state with sand sage, Shin oak, and honey mesquite directly from the grassland-dominated state.

Key indicators of approach to transition:

- Severe loss of grass species cover
- Surface soil erosion
- Bare patch expansion
- Increased sand sage, shinnery oak, and mesquite abundance

Transition to Historic Plant Community (2b): Brush and grazing management may restore the grassland component and reverse shrub or grass/shrub dominated states back toward the historic plant community. In addition, seeding with native grass species will augment the transition to a grassland-dominated state.

Transition to Shrub-Dominated (3): If the grass/shrub site continues to lose grass cover with soil erosion, the site will transition to a shrub-dominated state with sand sage, shinnery oak, and honey mesquite.

Key indicators of approach to transition:

- Continual loss of dropseeds/threawns cover
- Surface soil erosion
- Bare patch expansion
- Increased sand sage, shinnery oak, and mesquite/dropseed/threawn and mesquite/snakeweed abundance

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Warm Season			61–123	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	61–123	—
2	Warm Season			37–61	
	sand bluestem	ANHA	<i>Andropogon hallii</i>	37–61	—
3	Warm Season			37–61	
	cane bluestem	BOBA3	<i>Bothriochloa barbinodis</i>	37–61	—
	silver bluestem	BOSA	<i>Bothriochloa saccharoides</i>	37–61	—
4	Warm Season			123–184	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	123–184	—
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	123–184	—

	plains shrubgrass	SEVU2	<i>Setaria vuipiseta</i>	123-184	
	fringed signalgrass	URCI	<i>Urochloa ciliatissima</i>	123-184	-
6	Warm Season			123-184	
	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	123-184	-
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	123-184	-
	mesa dropseed	SPFL2	<i>Sporobolus flexuosus</i>	123-184	-
7	Warm Season			61-123	
	hooded windmill grass	CHCU2	<i>Chloris cucullata</i>	61-123	-
	Arizona cottontop	DICA8	<i>Digitaria californica</i>	61-123	-
9	Other Perennial Grasses			37-61	
	Grass, perennial	2GP	<i>Grass, perennial</i>	37-61	-
Shrub/Vine					
8	Warm Season			37-61	
	New Mexico feathergrass	HENE5	<i>Hesperostipa neomexicana</i>	37-61	-
	giant dropseed	SPGI	<i>Sporobolus giganteus</i>	37-61	-
10	Shrub			61-123	
	sand sagebrush	ARFI2	<i>Artemisia filifolia</i>	61-123	-
	Havard oak	QUHA3	<i>Quercus havardii</i>	61-123	-
11	Shrub			34-61	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	37-61	-
	featherplume	DAFO	<i>Dalea formosa</i>	37-61	-
12	Shrub			37-61	
	jointfir	EPHED	<i>Ephedra</i>	37-61	-
	littleleaf ratany	KRER	<i>Krameria erecta</i>	37-61	-
13	Other Shrubs			37-61	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	37-61	-
Forb					
14	Forb			61-123	
	leatherweed	CRPOP	<i>Croton pottsii var. pottsii</i>	61-123	-
	Indian blanket	GAPU	<i>Gaillardia pulchella</i>	61-123	-
	globemallow	SPHAE	<i>Sphaeralcea</i>	61-123	-
15	Forb			12-37	
	woolly groundsel	PACA15	<i>Packera cana</i>	12-37	-
16	Forb			61-123	
	touristplant	DIWI2	<i>Dimorphocarpa wislizeni</i>	61-123	-
	woolly plantain	PLPA2	<i>Plantago patagonica</i>	61-123	-
17	Other Forbs			37-61	
	Forb (herbaceous, not grass nor grass-like)	2FORB	<i>Forb (herbaceous, not grass nor grass-like)</i>	37-61	-

Animal community

This Ecological Site provides habitat which supports a resident animal community that is characterized by _____ pronghorn antelope, desert cottontail, spotted ground squirrel, black-tailed prairie dog, yellow faced pocket gopher

lizard, marbled whiptail, Texas horned lizard, western diamondback rattlesnake, dusty hognose snake and ornate box turtle.

Where mesquite has invaded, most resident birds and scissor-tailed flycatcher, morning dove and Swainson's hawk, nest. Vesper and grasshopper sparrows utilize the site during migration.

Hydrological functions

The runoff curve numbers are determined by field investigations using hydraulic cover conditions and hydrologic soil groups.

Hydrologic Interpretations

Soil Series Hydrologic Group

Berino B

Kinco A

Maljamar B

Pajarito B

Palomas B

Wink B

Pyote A

Recreational uses

This site offers recreation potential for hiking, borseback riding, nature observation, photography and hunting. During years of abundant spring moisture, this site displays a colorful array of wildflowers during May and June.

Wood products

This site has no potential for wood products.

Other products

This site is suitable for grazing by all kinds and classes of livestock at any time of year. In cases where this site has been invaded by brush species it is especially suited for goats. Mismanagement of this site will cause a decrease in species such as the bluestems, black grama, bush muhly, plains bristlegrass, New Mexico feathergrass, Arizona cottontop and fourwing saltbush. A corresponding increase in the dropseeds, windmill grass, fall witchgrass, silver bluestem, sand sagebrush, shiner oak and ephedra will occur. This will also cause an increase in bare ground which will increase soil erodibility. This site will respond well to a system of management that rotates the season of use.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month

Similarity Index Ac/AUM

100 - 76 2.3 - 3.5

75 - 51 3.0 - 4.5

50 - 26 4.6 - 9.0

25 - 0 9.1 +

Inventory data references

Data collection for this site was done in conjunction with the progressive soil surveys within the Southern Desertic Basins, Plains and Mountains, Major Land Resource Areas of New Mexico. This site has been mapped and correlated with soils in the following soil surveys. Eddy County, Lea County, and Chaves County.

Other references

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Contributors

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

2. Presence of water flow patterns:

3. Number and height of erosional pedestals or terracettes:

4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):

5. Number of gullies and erosion associated with gullies:

6. Extent of wind scoured, blowouts and/or depositional areas:

7. Amount of litter movement (describe size and distance expected to travel):

8. Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:

11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):

12. Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):

Dominant:

Sub-dominant:

Other:

Additional:

13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or

14. **Average percent litter cover (%) and depth (in):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

17. **Perennial plant reproductive capability:**

Closure Criteria Determination Worksheet			
Site Name: Shinnery Oak Federal SWD #003			
Spill Coordinates:		32.513128	-104.062708
Site Specific Conditions		Value	Unit
1	Depth to Groundwater	70	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		51-100'	<50' 51-100' >100'

Eddy Area, New Mexico

BB—Berino complex, 0 to 3 percent slopes, eroded

Map Unit Setting

National map unit symbol: 1w43
Elevation: 2,000 to 5,700 feet
Mean annual precipitation: 5 to 15 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

Berino and similar soils: 60 percent
Pajarito and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berino

Setting

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

Typical profile

H1 - 0 to 17 inches: fine sand
H2 - 17 to 58 inches: sandy clay loam
H3 - 58 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e

Map Unit Description: Berino complex, 0 to 3 percent slopes, eroded---Eddy Area, New Mexico

Shinnery Oak SWD #001

Hydrologic Soil Group: B
Ecological site: R042XC003NM - Loamy Sand
Hydric soil rating: No

Description of Pajarito**Setting**

Landform: Interdunes, plains, dunes
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Mixed alluvium and/or eolian sands

Typical profile

H1 - 0 to 9 inches: loamy fine sand
H2 - 9 to 72 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High
(2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water capacity: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R042XC003NM - Loamy Sand
Hydric soil rating: No

Minor Components**Cacique**

Percent of map unit: 4 percent
Ecological site: R042XC004NM - Sandy
Hydric soil rating: No

Pajarito

Percent of map unit: 4 percent
Ecological site: R042XC003NM - Loamy Sand
Hydric soil rating: No

Wink

Percent of map unit: 4 percent
Ecological site: R042XC003NM - Loamy Sand
Hydric soil rating: No



Map Unit Description: Berino complex, 0 to 3 percent slopes, eroded---Eddy Area, New Mexico

Shinnery Oak SWD #001

Kermi

Percent of map unit: 3 percent

Ecological site: R042XC005NM - Deep Sand

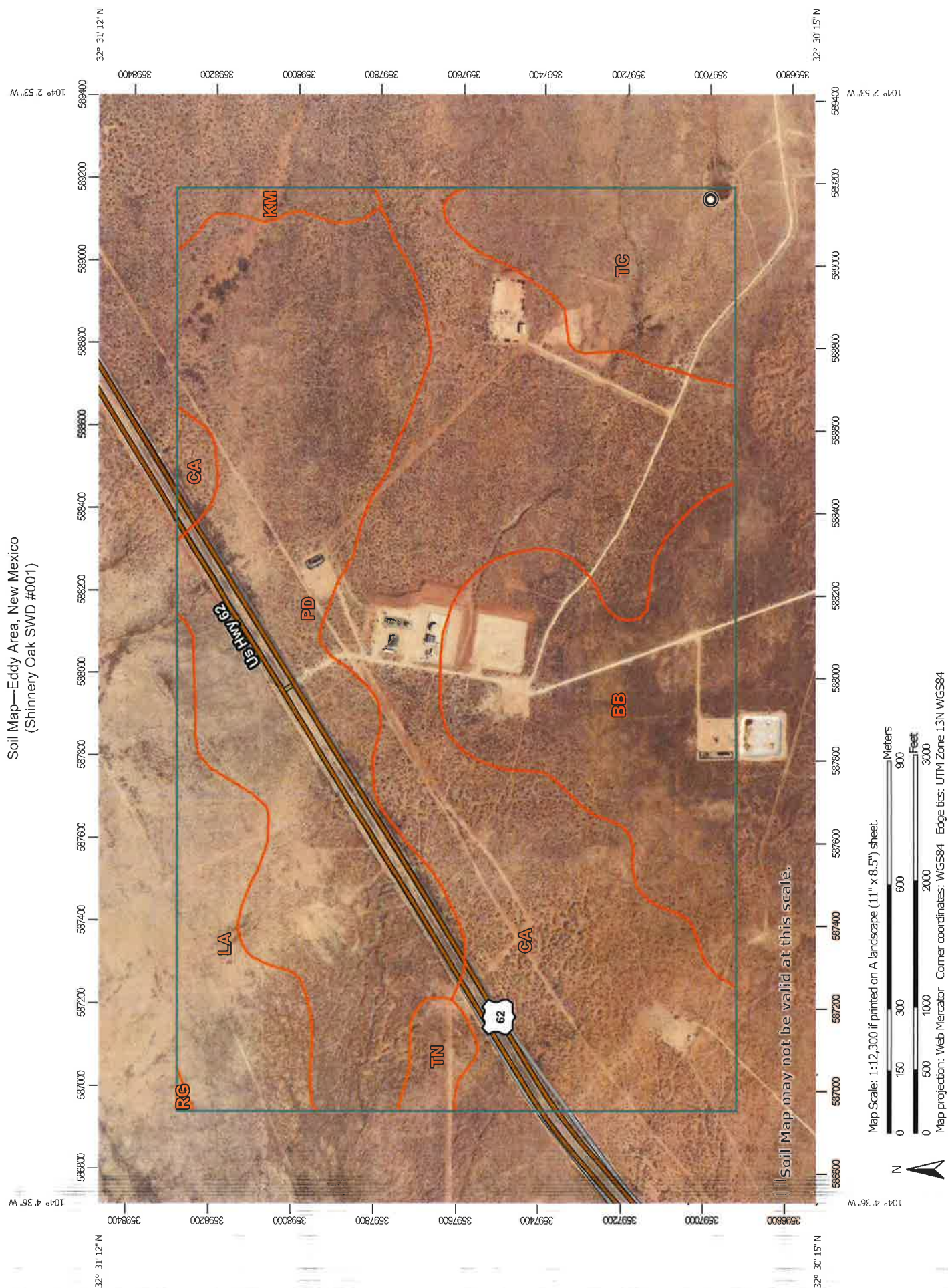
Hydric soil rating: No

Data Source Information

Soil Survey Area: Eddy Area, New Mexico

Survey Area Data: Version 16, Jun 8, 2020





Soil Map—Eddy Area, New Mexico
(Shinnery Oak SWD #001)

MAP LEGEND

Area of Interest (AOI)		Area of Interest (AOI)		Spoil Area
Soils		Soil Map Unit Polygons		Stony Spot
		Soil Map Unit Lines		Very Stony Spot
		Soil Map Unit Points		Wet Spot
Special Point Features		Blowout		Other
		Borrow Pit		Special Line Features
		Clay Spot	Water Features	
		Closed Depression		Streams and Canals
		Gravel Pit	Transportation	
		Gravelly Spot		Rails
		Landfill		Interstate Highways
		Lava Flow		US Routes
		Marsh or swamp		Major Roads
		Mine or Quarry		Local Roads
		Miscellaneous Water	Background	
		Perennial Water		Aerial Photography
		Rock Outcrop		
		Saline Spot		
		Sandy Spot		
		Severely Eroded Spot		
		Sinkhole		
		Slide or Slip		
		Sodic Spot		

MAP INFORMATION

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

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

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

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

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

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

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

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

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

Date(s) aerial images were photographed: Feb 27, 2020—Feb 28, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BB	Berino complex, 0 to 3 percent slopes, eroded	118.6	15.7%
CA	Cacique loamy sand, 0 to 3 percent slopes, eroded	278.8	37.0%
KM	Kermit-Berino fine sands, 0 to 3 percent slopes	9.5	1.3%
LA	Largo loam, 1 to 5 percent slopes	52.5	7.0%
PD	Pajarito-Dune land complex, 0 to 3 percent slopes	227.2	30.1%
RG	Reeves-Gypsum land complex, 0 to 3 percent slopes	0.6	0.1%
TC	Tonuco loamy sand, 0 to 3 percent slopes, eroded	57.4	7.6%
TN	Tonuco loamy fine sand, 0 to 3 percent slopes, eroded	9.3	1.2%
Totals for Area of Interest		754.0	100.0%



ATTACHMENT 4

Client Name: Matador Production Company
 Site Name: Shinnery Oak Federal SWD #003
 NM OCD Incident Tracking #: NRM2019957626
 Project #: 20E-00239-014
 Lab Reports: 2007733 and 2007731

Table 2. Characterization Sampling Field Screening and Laboratory Results													
Sample Description			Field Screening			Petroleum Hydrocarbons							Inorganic Chloride (mg/kg)
Sample ID	Depth (ft)	Sample Date	Volatile Organic Compounds (PID)	Extractable Organic Compounds (Petro Flag)	Inorganics (Electroconductivity)	Volatile		Extractable					
						Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	GRO + DRO	Total Petroleum Hydrocarbons (TPH)	
			(ppm)	(ppm)	(ppm)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
BH20-01	0.0	July 8, 2020	-	-	15,796	-	-	-	-	-	-	-	-
BH20-01	0.5	July 8, 2020	-	-	1,653	-	-	-	-	-	-	-	-
BH20-01	1.5	July 8, 2020	-	-	<0	<0.025	<0.224	<5.0	<9.4	<47	<14.4	<61.4	<60
BH20-02	0.0	July 8, 2020	-	-	9,639	-	-	-	-	-	-	-	-
BH20-02	0.5	July 8, 2020	-	-	4,832	-	-	-	-	-	-	-	-
BH20-02	1.0	July 8, 2020	-	-	3,156	-	-	-	-	-	-	-	-
BH20-02	1.5	July 8, 2020	-	-	114	<0.024	<0.219	<4.9	<9.6	<48	<14.5	<62.5	100
BH20-03	0.0	July 8, 2020	-	-	28,391	-	-	-	-	-	-	-	-
BH20-03	0.5	July 8, 2020	-	-	5,729	-	-	-	-	-	-	-	-
BH20-03	1	July 8, 2020	-	-	2,067	-	-	-	-	-	-	-	-
BH20-03	2	July 8, 2020	-	-	<0	<0.023	<0.208	<4.6	<9.4	<47	<14.0	<61.0	71
BH20-04	0	July 8, 2020	-	-	15,703	-	-	-	-	-	-	-	-
BH20-04	0.5	July 8, 2020	-	-	14,998	-	-	-	-	-	-	-	-
BH20-04	1	July 8, 2020	-	-	15,475	-	-	-	-	-	-	-	-
BH20-04	2	July 8, 2020	-	-	11,517	-	-	-	-	-	-	-	-
BH20-04	3	July 8, 2020	-	-	<0	-	-	-	-	-	-	-	-
BH20-04	4	July 8, 2020	-	-	<0	<0.024	<0.217	<4.8	<9.5	<47	<14.3	<61.3	<60
BH20-05	0	July 8, 2020	-	-	-	-	-	-	-	-	-	-	-
BH20-05	0.5	July 8, 2020	-	-	-	-	-	-	-	-	-	-	-
BH20-05	1	July 8, 2020	-	-	-	-	-	-	-	-	-	-	-
BH20-05	2	July 8, 2020	-	-	9,363	-	-	-	-	-	-	-	-
BH20-05	4	July 8, 2020	-	-	14,574	-	-	-	-	-	-	-	-
BH20-05	6	July 8, 2020	-	-	10,256	-	-	-	-	-	-	-	-
BH20-05	8	July 8, 2020	-	-	6,939	-	-	-	-	-	-	-	-
BH20-05	10	July 8, 2020	-	-	<0	<0.025	<0.222	<4.9	<9.7	<48	<14.6	<62.6	130
SS20-01	0.5	July 13, 2020	3	12	100	<0.024	<0.213	<4.7	<9.6	<48	<14.3	<62.3	66
SS20-02	0.5	July 13, 2020	5	-	320	<0.024	<0.220	<4.9	<9.7	<48	<14.6	<62.6	250
SS20-03	0.5	July 13, 2020	1	-	150	<0.025	<0.221	<4.9	<9.6	<48	<14.5	<62.5	130
SS20-04	0.5	July 13, 2020	0	-	80	<0.024	<0.219	<4.9	<9.5	<47	<14.4	<61.4	<60
SS20-05	0.5	July 13, 2020	2	-	50	<0.023	<0.208	<4.6	<9.8	<49	<14.4	<63.4	<60
SS20-06	0.5	July 13, 2020	3	-	35	<0.023	<0.211	<4.7	<9.8	<49	<14.5	<63.5	<60
SS20-07	0.5	July 13, 2020	0	-	190	<0.023	<0.207	<4.6	<9.7	<48	<14.3	<62.3	140
SS20-08	0.5	July 13, 2020	0	9	75	<0.024	<0.213	<4.7	<9.7	<49	<14.4	<63.4	<60
SS20-09	0.5	July 13, 2020	0	-	55	<0.024	<0.219	<4.9	<9.2	<46	<14.1	<60.1	<60
SS20-10	0.5	July 13, 2020	0	-	30	<0.025	<0.222	<4.9	<9.7	<48	<14.6	<62.6	<60
SS20-11	0.5	July 13, 2020	0	-	40	<0.024	<0.220	<4.9	<9.8	<49	<14.7	<63.7	<60
SS20-12	0.5	July 13, 2020	0	-	60	<0.025	<0.221	<4.9	<9.7	<49	<14.6	<63.6	<60
SS20-13	0.5	July 13, 2020	0	-	20	<0.023	<0.208	<4.6	<9.7	<48	<14.3	<62.3	<60

"-" - Not assessed/analyzed

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

Client Name: Matador Production Company
 Site Name: Shinnery Oak Federal SWD #003
 NM OCD Incident Tracking #: NRM2019957626
 Project #: 20E-00239-014
 Lab Reports: 2008G04 and 2009B11

Table 3. Confirmatory Sampling Laboratory Results - Depth to Groundwater 51-100 feet													
Sample Description			Field Screening			Petroleum Hydrocarbons							Inorganic
Sample ID	Depth (ft)	Sample Date	Volatile Organic Compounds (PID)	Extractable Organic Compounds (Petro Flag)	Inorganics (Electroconductivity)	Volatile		Extractable					Chloride
						Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	
			(ppm)	(ppm)	(ppm)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
On-lease Samples													
BS20-01	0.25	August 26, 2020	-	-	233	<0.025	<0.225	<5.0	<9.9	<50	<14.9	<64.9	120
BS20-02	0.25	August 26, 2020	-	-	2,464	<0.025	<0.222	<4.9	<9.8	<49	<14.7	<63.7	3,200
BS20-03	0.25	August 26, 2020	-	-	1,617	<0.025	<0.224	<5.0	<9.7	<49	<14.7	<63.7	1,700
BS20-04	0.25	August 26, 2020	-	-	3,747	<0.025	<0.224	<5.0	<9.2	<46	<14.2	<60.2	4,300
BS20-05	0.25	August 26, 2020	-	-	2,473	<0.025	<0.224	<5.0	<9.7	<49	<14.7	<63.7	2,000
BS20-06	0.25	August 26, 2020	-	-	1,838	<0.025	<0.225	<5.0	<9.2	<46	<14.2	<60.2	1,600
BS20-07	0.25	August 26, 2020	-	-	994	<0.025	<0.225	<5.0	<9.2	<46	<14.2	<60.2	1,100
BS20-08	0.25	August 26, 2020	-	-	3,046	<0.025	<0.224	<5.0	<9.5	<47	<14.5	<61.5	3,500
BS20-09	0.25	August 26, 2020	-	-	3,955	<0.025	<0.224	<5.0	<9.3	<46	<14.3	<60.3	5,200
BS20-10	0.25	August 26, 2020	-	-	2,599	<0.024	<0.217	<4.8	<9.7	<48	<14.5	<62.2	2,700
BS20-11	0.25	August 26, 2020	-	-	3,021	<0.025	<0.224	<5.0	<9.7	<48	<14.7	<62.7	2,900
BS20-12	0.25	August 26, 2020	-	-	965	<0.025	<0.225	<5.0	<9.5	<47	<14.5	<61.5	600
BS20-13	0.25	August 26, 2020	-	-	1,708	<0.025	<0.225	<5.0	<9.8	<49	<14.8	<63.8	1,900
BS20-14	0.25	August 26, 2020	-	-	1,459	<0.025	<0.225	<5.0	<9.3	<47	<14.3	<61.3	2,200
BS20-15	0.25	August 26, 2020	-	-	2,799	<0.024	<0.219	<4.9	<9.6	<48	<14.5	<62.5	2,900
BS20-16	0.25	August 26, 2020	-	-	274	<0.024	<0.220	<4.9	<8.9	<45	<13.8	<58.8	170
BS20-17	0.25	August 28, 2020	-	-	4,640	<0.025	<0.221	<4.9	<9.7	<48	<14.6	<62.6	3,500
BS20-18	0.5	August 28, 2020	-	-	415	<0.025	<0.224	<5.0	<9.1	<45	<14.1	<59.1	250
BS20-19	0.5	August 27, 2020	-	-	3,244	<0.025	<0.222	<4.9	<9.0	<45	<13.9	<58.9	9,500
BS20-20	0.5	August 28, 2020	-	-	813	<0.025	<0.224	<5.0	<9.3	<46	<14.3	<60.3	440
BS20-21	0.5	August 28, 2020	-	-	1,593	<0.025	<0.225	<5.0	<9.4	<47	<14.4	<61.4	2,200
BS20-22	0.5	August 27, 2020	-	-	570	<0.024	<0.219	<4.9	<10.0	<50	<14.9	<64.9	2,200
BS20-23	0.5	August 28, 2020	-	-	3,755	<0.025	<0.224	<5.0	<9.5	<48	<14.5	<62.5	5,200
BS20-24	0.5	August 28, 2020	-	-	252	<0.025	<0.222	<4.9	<9.7	<49	<14.6	<63.6	150
BS20-25	0.5	August 28, 2020	-	-	2,665	<0.025	<0.224	<5.0	<9.4	<47	<14.4	<61.4	2,600
BS20-26	0.5	August 28, 2020	-	-	3,124	<0.024	<0.220	<4.9	<8.5	<42	<13.4	<55.4	360
BS20-27	0.5	August 28, 2020	-	-	2,240	<0.024	<0.219	<4.9	<9.8	<49	<14.7	<63.7	2,300
BS20-28	0.5	August 27, 2020	-	-	2,251	<0.025	<0.221	<4.9	<8.4	<42	<13.3	<55.3	4,700
BS20-29	0.5	August 27, 2020	-	-	121	<0.025	<0.221	<4.9	<9.7	<48	<14.6	<62.6	440
BS20-30	0.5	August 27, 2020	-	-	-	<0.025	<0.222	<4.9	<9.8	<49	<14.7	<63.7	2,800
BS20-31	0.5	August 28, 2020	-	-	1,589	<0.025	<0.222	<4.9	<9.5	<48	<14.4	<62.4	1,800
BS20-32	0.5	August 28, 2020	-	-	547	<0.025	<0.224	<5.0	<9.3	<46	<14.3	<60.3	540
BS20-33	0.5	August 28, 2020	-	-	476	<0.024	<0.220	<4.9	<10.0	<50	<14.9	<64.9	360
BS20-34	0.5	August 28, 2020	-	-	480	<0.025	<0.222	<4.9	<9.7	<48	<14.6	<62.6	410
BS20-35	0.5	August 28, 2020	-	-	1,050	<0.025	<0.221	<4.9	<9.9	<50	<14.8	<64.8	1,400
BS20-36	0.5	August 28, 2020	-	-	313	<0.025	<0.222	<4.9	<10.0	<50	<14.9	<64.9	410
BS20-37	0.5	August 28, 2020	-	-	1,476	<0.025	<0.224	<5.0	<9.8	<49	<14.8	<63.8	1,000
BS20-38	0.5	August 28, 2020	-	-	4,159	<0.025	<0.225	<5.0	<10.0	<50	<15.0	<65.0	2,400
BS20-39	0.5	August 27, 2020	-	-	571	<0.024	<0.219	<4.9	<10.0	<50	<14.9	<64.9	1,200
BS20-40	0.5	August 28, 2020	-	-	587	<0.025	<0.222	<4.9	<9.4	<47	<14.3	<61.3	840
BS20-41	0.5	August 28, 2020	-	-	855	<0.025	<0.221	<4.9	<9.9	<49	<14.8	<63.8	930
BS20-42	0.5	August 27, 2020	-	-	2,076	<0.025	<0.225	<5.0	<9.3	<47	<14.3	<61.3	3,000
BS20-43	0.5	August 28, 2020	-	-	2,779	<0.025	<0.221	<4.9	<9.9	<49	<14.8	<63.8	3,700
BS20-44	0.5	August 28, 2020	-	-	730	<0.025	<0.221	<4.9	<9.7	<48	<14.6	<62.6	1,200
BS20-45	0.5	August 28, 2020	-	-	2,916	<0.025	<0.222	<4.9	<9.8	<49	<14.7	<63.7	2,700
BS20-46	0.5	August 28, 2020	-	-	8	<0.024	<0.219	<4.9	<9.3	<47	<14.2	<61.2	73
BS20-47	0.5	August 28, 2020	-	-	837	<0.024	<0.220	<4.9	<9.3	<47	<14.2	<61.2	640
BS20-48	0.5	August 28, 2020	-	-	667	<0.025	<0.225	<5.0	<9.8	<49	<14.8	<63.8	650
BS20-49	0.5	August 28, 2020	-	-	<0	<0.025	<0.225	<5.0	<9.7	<48	<14.7	<62.7	<60
BS20-50	0.5	August 28, 2020	-	-	202	<0.024	<0.219	<4.9	<9.1	<45	<14.0	<59.0	210
BS20-51	0.5	August 28, 2020	-	-	672	<0.025	<0.222	<4.9	<9.7	<48	<14.6	<62.6	710
BS20-52	0.5	August 28, 2020	-	-	565	<0.025	<0.221	<4.9	<9.8	<49	<14.7	<63.7	710
BS20-53	0.5	August 28, 2020	-	-	<0	<0.025	<0.222	<4.9	<9.9	<49	<14.8	<63.8	<59
BS20-54	0.5	August 28, 2020	-	-	2,711	<0.025	<0.224	<5.0	<9.3	<47	<14.3	<61.3	2,300

Client Name: Matador Production Company
 Site Name: Shinnery Oak Federal SWD #003
 NM OCD Incident Tracking #: NRM2019957626
 Project #: 20E-00239-014
 Lab Reports: 2008G04 and 2009B11

Table 3. Confirmatory Sampling Laboratory Results - Depth to Groundwater 51-100 feet													
Sample Description			Field Screening			Petroleum Hydrocarbons							Inorganic
Sample ID	Depth (ft)	Sample Date	Volatile Organic Compounds (PID)	Extractable Organic Compounds (Petro Flag)	Inorganics (Electroconductivity)	Volatile		Extractable					Chloride
						Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	
			(ppm)	(ppm)	(ppm)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
On-lease Samples													
BS20-55	0.5	August 28, 2020	-	-	2,898	<0.025	<0.225	<5.0	<9.0	<45	<14.0	<59.0	83
BS20-56	0.5	August 28, 2020	-	-	<0	<0.025	<0.221	<4.9	<9.6	<48	<14.5	<62.5	<60
BS20-57	0.5	August 28, 2020	-	-	<0	<0.025	<0.225	<5.0	<9.3	<47	<14.3	<61.3	<60
BS20-58	0.5	August 28, 2020	-	-	30	<0.025	0.222	<4.9	<9.8	<49	<14.7	<63.7	<60
BS20-59	0.5	August 28, 2020	-	-	396	<0.025	<0.224	<5.0	<9.7	<48	<14.7	<62.7	470
BS20-60	0.5	August 28, 2020	-	-	637	<0.025	<0.222	<4.9	<9.0	<45	<13.9	<58.9	190
BS20-61	0.5	August 28, 2020	-	-	1,932	<0.025	<0.222	<4.9	<8.7	<44	<13.6	<57.6	1,500
BS20-62	0.5	August 28, 2020	-	-	41	<0.025	<0.224	<5.0	<8.7	<44	<13.7	<57.7	550
WS20-01	0-0.25	August 28, 2020	-	-	652	<0.024	<0.220	<4.9	<8.4	<42	<13.3	<55.3	450
WS20-02	0-0.25	August 28, 2020	-	-	873	<0.024	<0.220	<4.9	<9.7	<49	<14.6	<63.6	670
WS20-03	0-0.25	August 27, 2020	-	-	3,697	<0.025	<0.222	<4.9	<9.4	<47	<14.3	<61.3	3,800
WS20-04	0-0.25	August 27, 2020	-	-	3,458	<0.025	<0.225	<5.0	<10.0	<51	<15.0	<66.0	3,000
WS20-05	0-0.25	August 27, 2020	-	-	1,850	<0.025	<0.225	<5.0	<9.3	<46	<14.3	<60.3	2,300
WS20-06	0-0.25	August 27, 2020	-	-	620	<0.025	<0.225	<5.0	<10.0	<50.0	<15.0	<65.0	570
WS20-07	0-0.25	August 27, 2020	-	-	1,854	<0.025	<0.225	<5.0	<9.6	<48	<14.6	<62.6	2,200
WS20-08	0-0.5	August 27, 2020	-	-	3,434	<0.024	<0.219	<4.9	<9.5	<48	<14.4	<62.4	2,000
WS20-09	0-0.5	August 27, 2020	-	-	3,458	<0.024	<0.217	<4.8	<10.0	<50	<14.8	<64.8	3,700
WS20-10	0-0.5	August 27, 2020	-	-	1,278	<0.025	<0.222	<4.9	<8.9	<44	<13.8	<57.8	970
WS20-11	0-0.5	August 27, 2020	-	-	-	<0.025	<0.225	<5.0	<9.4	<47	<14.4	<61.4	970
WS20-12	0-0.5	August 27, 2020	-	-	108	<0.025	<0.222	<4.9	<9.8	<49	<14.7	<63.7	130
WS20-13	0-0.5	August 27, 2020	-	-	-	<0.025	<0.224	<5.0	<9.9	<50	<14.9	<64.9	440
Adjacent Pasture Samples													
WS20-14	0-1	August 27, 2020	-	-	<0	<0.024	<0.217	<4.8	<9.8	<49	<14.6	<63.6	<59
WS20-15	0-1	August 27, 2020	-	-	<0	<0.024	<0.220	<4.9	<9.8	<49	<14.7	<63.7	150
WS20-16	0-1	August 27, 2020	-	-	181	<0.025	<0.221	<4.9	<9.3	<47	<14.2	<61.2	250
WS20-17	0-1	August 27, 2020	-	-	60	<0.025	<0.225	<5.0	<9.8	<49	<14.8	<63.8	180
WS20-18	0-1	August 28, 2020	-	-	<0	<0.025	<0.222	<4.9	<10.0	<50	<14.9	<64.9	<60
WS20-19	0-1	August 28, 2020	-	-	41	<0.025	<0.221	<4.9	<8.8	<44	<13.7	<57.7	730
WS20-19	0-1	September 17, 2020	-	-	-	<0.023	<0.210	<4.7	<9.7	<49	<14.4	<63.4	180
WS20-20	0-1	August 28, 2020	-	-	<0	<0.025	<0.222	<4.9	<9.1	<46	<14.0	<60.0	<60
WS20-21	0-3	August 28, 2020	-	-	144	<0.025	<0.221	<4.9	<10.0	<50	<14.9	<64.9	290
WS20-22	0-3	August 28, 2020	-	-	30	<0.025	<0.224	<5.0	<9.4	<47	<14.4	<61.4	71
WS20-23	0-8	August 27, 2020	-	-	<0	<0.025	<0.222	<4.9	<8.7	<44	<13.6	<57.6	<60
WS20-24	0-13	August 28, 2020	-	-	<0	<0.025	<0.221	<4.9	<9.6	<48	<14.5	<62.5	<60
WS20-25	0-1.5	August 28, 2020	-	-	<0	<0.025	<0.222	<4.9	<9.8	<49	<14.7	<63.7	100
WS20-26	0-4	August 28, 2020	-	-	26	<0.025	<0.225	<5.0	<9.2	<46	<14.2	<60.2	260
WS20-27	0-4	August 28, 2020	-	-	109	<0.025	<0.221	<4.9	<9.9	<50	<14.8	<64.8	200
WS20-28	0-4	August 28, 2020	-	-	<0	<0.025	<0.222	<4.9	<9.6	<48	<14.5	<62.5	120
WS20-29	0-1.5	August 27, 2020	-	-	<0	<0.025	<0.224	<5.0	<9.8	<49	<14.8	<63.8	<61
WS20-30	0-1.5	August 27, 2020	-	-	<0	<0.025	<0.222	<4.9	<9.0	<45	<13.9	<58.9	<60
WS20-31	0-1.5	August 27, 2020	-	-	<0	<0.025	<0.222	<4.9	<9.2	<46	<14.1	<60.1	<60
WS20-32	0-4	August 28, 2020	-	-	50	<0.025	<0.222	<4.9	<9.5	<47	<14.4	<61.4	160
WS20-33	0-4	August 28, 2020	-	-	166	<0.025	<0.222	<4.9	<9.9	<49	<14.8	<63.8	180
WS20-34	0-1.5	August 27, 2020	-	-	75	<0.025	<0.225	<5.0	<9.3	<46	<14.3	<60.3	96
WS20-35	0-1.5	August 27, 2020	-	-	<0	<0.025	<0.222	<4.9	<9.6	<48	<14.5	<62.5	<60
WS20-36	0-13	August 27, 2020	-	-	360	<0.025	<0.222	<4.9	<8.7	<43	<13.6	<56.6	730
WS20-36	0-13	September 17, 2020	-	-	-	<0.024	<0.216	<4.8	<9.9	<49	<14.7	<63.7	140
WS20-37	0-3	August 26, 2020	-	-	<0	<0.025	<0.221	<4.9	<9.9	<50	<14.8	<64.8	<60
WS20-38	0-4.5	August 26, 2020	-	-	<0	<0.025	<0.221	<4.9	<9.8	<49	<14.7	<63.7	130
WS20-39	0-4.5	August 26, 2020	-	-	<0	<0.024	<0.219	<4.9	<10.0	<50	<14.9	<64.9	<60
WS20-40	0-4.5	August 26, 2020	-	-	1	<0.025	<0.224	<5.0	<9.8	<49	<14.8	<63.8	120
WS20-41	0-3	August 26, 2020	-	-	<0	<0.025	<0.222	<4.9	<9.6	<48	<14.5	<62.5	<60
WS20-42	0-2.5	August 27, 2020	-	-	194	<0.025	<0.222	<4.9	<8.6	<43	<13.5	<56.5	250
WS20-43	0-0.5	August 27, 2020	-	-	<0	<0.025	<0.224	<5.0	<9.3	<47	<14.3	<61.3	62

Client Name: Matador Production Company
 Site Name: Shinnery Oak Federal SWD #003
 NM OCD Incident Tracking #: NRM2019957626
 Project #: ZOE-00239-014
 Lab Reports: 2008G04 and 2009B11

Table 3. Confirmatory Sampling Laboratory Results - Depth to Groundwater 51-100 feet													
Sample Description			Field Screening			Petroleum Hydrocarbons							Inorganic
Sample ID	Depth (ft)	Sample Date	Volatile Organic Compounds (PID)	Extractable Organic Compounds (Petro Flag)	Inorganics (Electroconductivity)	Volatile		Extractable					Chloride
						Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	
			(ppm)	(ppm)	(ppm)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
On-lease Samples													
WS20-44	0-0.5	August 27, 2020	-	-	1,753	<0.025	<0.224	<5.0	<10.0	<50	<15.0	<65.0	1,200
WS20-45	0-0.5	August 27, 2020	-	-	1,010	<0.025	<0.224	<5.0	<9.2	<46	<14.2	<60.2	410
WS20-46	0-0.5	August 27, 2020	-	-	349	<0.025	<0.222	<4.9	<8.4	<42	<13.3	<55.3	320
WS20-47	0-0.5	August 27, 2020	-	-	3,668	<0.025	<0.224	<5.0	<9.5	<48	<14.5	<62.5	3,600
WS20-48	0-0.25	August 27, 2020	-	-	3,697	<0.025	<0.224	<5.0	<9.5	<47	<14.5	<61.5	3,700
Adjacent Pasture Samples													
BS20-63	2.5	August 28, 2020	-	-	<0	<0.025	<0.221	<4.9	<9.3	<47	<14.2	<61.2	<60
BS20-64	2.5	August 28, 2020	-	-	<0	<0.024	<0.220	<4.9	<9.4	<47	<14.3	<61.3	<60
BS20-65	2.5	August 27, 2020	-	-	85	<0.025	<0.222	<4.9	<9.2	<46	<14.1	<60.1	<60
BS20-66	2.5	August 28, 2020	-	-	<0	<0.025	<0.225	<5.0	<9.6	<48	<14.6	<62.6	<60
BS20-67	2.5	August 28, 2020	-	-	194	<0.025	<0.224	<5.0	<9.2	<46	<14.2	<60.2	200
BS20-68	1	August 26, 2020	-	-	<0	<0.025	<0.221	<4.9	<8.8	<44	<13.7	<57.7	220
BS20-69	1	August 26, 2020	-	-	86	<0.025	<0.221	<4.9	<9.1	<46	<14.0	<60.0	300
BS20-70	1	August 26, 2020	-	-	36	<0.025	<0.221	<4.9	<9.1	<46	<14.0	<60.0	380
BS20-71	1	August 26, 2020	-	-	<0	<0.025	<0.224	<5.0	<9.7	<49	<14.7	<63.7	190
BS20-72	1	August 26, 2020	-	-	<0	<0.025	<0.225	<5.0	<9.9	<50	<14.9	<64.9	91
BS20-73	1	August 26, 2020	-	-	92	<0.024	<0.220	<4.9	<9.0	<45	<13.9	<58.9	96
BS20-74	1	August 28, 2020	-	-	<0	<0.024	<0.220	<4.9	<9.4	<47	<14.3	<61.3	<60
BS20-75	1	August 28, 2020	-	-	<0	<0.025	<0.225	<5.0	<8.8	<44	<13.8	<57.8	<60
BS20-76	2.5	August 26, 2020	-	-	142	<0.024	<0.217	<4.8	<9.6	<48	<14.4	<62.4	130
BS20-77	1	August 28, 2020	-	-	<0	<0.025	<0.222	<4.9	<8.6	<43	<13.5	<56.5	<60
BS20-78	3	August 28, 2020	-	-	<0	<0.025	<0.221	<4.9	<9.6	<48	<14.5	<62.5	<60
BS20-79	3	August 28, 2020	-	-	<0	<0.025	<0.224	<5.0	<9.8	<49	<14.8	<63.8	<60
BS20-80	3	August 28, 2020	-	-	212	<0.025	<0.221	<4.9	<9.5	<48	<14.4	<62.4	270
BS20-81	3	August 28, 2020	-	-	<0	<0.025	<0.224	<5.0	<10.0	<50	<15.0	<65.0	<61
BS20-82	3	August 28, 2020	-	-	<0	<0.025	<0.225	<5.0	<9.7	<49	<14.7	<63.7	460
BS20-83	3	August 28, 2020	-	-	<0	<0.025	<0.224	<5.0	<9.5	<47	<14.5	<61.5	<60
BS20-84	8	August 27, 2020	-	-	<0	<0.025	<0.224	<5.0	<9.6	<48	<14.6	<62.6	330
BS20-85	4.5	August 26, 2020	-	-	<0	<0.025	<0.225	<5.0	<9.5	<47	<14.5	<61.5	<60
BS20-86	4.5	August 26, 2020	-	-	<0	<0.025	<0.222	<4.9	<9.3	<47	<14.2	<61.2	<60
BS20-87	4.5	August 26, 2020	-	-	<0	<0.025	<0.222	<4.9	<9.7	<48	<14.6	<62.6	<60
BS20-88	4.5	August 26, 2020	-	-	<0	<0.025	<0.225	<5.0	<9.0	<45	<14.0	<59.0	110
BS20-89	4.5	August 26, 2020	-	-	245	<0.025	<0.222	<4.9	<9.2	<46	<14.1	<60.1	230
BS20-90	4.5	August 26, 2020	-	-	220	<0.025	<0.221	<4.9	<9.6	<48	<14.5	<62.5	140
BS20-91	4.5	August 26, 2020	-	-	<0	<0.024	<0.216	<4.8	<9.6	<48	<14.4	<62.4	110
BS20-92	4.5	August 26, 2020	-	-	<0	<0.025	<0.222	<4.9	<9.3	<47	<14.2	<61.2	<60
BS20-93	3	August 26, 2020	-	-	301	<0.025	<0.225	<5.0	<9.8	<49	<14.8	<63.8	310
BS20-94	3	August 27, 2020	-	-	<0	<0.025	<0.222	<4.9	<10.0	<50	<14.9	<64.9	96
BS20-95	0.5	August 27, 2020	-	-	<0	<0.024	<0.217	<4.8	<10.0	<50	<14.8	<64.8	<60
BS20-96	13	August 28, 2020	-	-	54	<0.025	<0.221	<4.9	<9.9	<50	<14.8	<63.8	<60
BS20-97	1.5	August 28, 2020	-	-	<0	<0.025	<0.222	<4.9	<9.6	<48	<14.5	<62.5	93
BS20-98	1.5	August 27, 2020	-	-	<0	<0.025	<0.224	<5.0	<9.9	<49	<14.9	<63.9	<61
BS20-99	1.5	August 27, 2020	-	-	<0	<0.024	<0.217	<4.8	<9.4	<47	<14.2	<61.2	<60
BS20-100	4	August 28, 2020	-	-	<0	<0.025	<0.224	<5.0	<9.7	<49	<14.7	<63.7	71
BS20-101	4	August 28, 2020	-	-	167	<0.024	<0.220	<4.9	<9.5	<48	<14.4	<62.4	280
BS20-102	4	August 28, 2020	-	-	86	<0.025	<0.222	<4.9	<9.4	<47	<14.3	<61.3	190
BS20-103	4	August 28, 2020	-	-	<0	<0.025	<0.224	<5.0	<9.2	<46	<14.2	<60.2	130
BS20-104	4	August 27, 2020	-	-	160	<0.024	<0.220	<4.9	<10.0	<50	<14.9	<64.9	180
BS20-105	1.5	August 27, 2020	-	-	144	<0.025	<0.222	<4.9	<9.1	<46	<14.0	<60.0	230

"-" Not analyzed/assessed

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

Bold and green shaded indicates a re-sample of areas previously exceeding NM OCD closure or reclamation criteria

ATTACHMENT 5



Daily Site Visit Report

Client:	Matador Resources	Inspection Date:	7/8/2020
Site Location Name:	Shinnery Oak Federal SWD #003	Report Run Date:	7/9/2020 1:04 AM
Client Contact Name:	John Hurt	API #:	30-015-20866
Client Contact Phone #:			
Unique Project ID	-Shinnery Oak Federal SWD #003	Project Owner:	John Hurt
Project Reference #	7/8/20 - Large PW Release	Project Manager:	Natalie Gordon

Summary of Times

Arrived at Site	7/8/2020 9:04 AM
Departed Site	7/8/2020 6:45 PM

Field Notes

10:44 Spill footprint follows low spots after leaving the pad and follows down a riverine towards the west

18:17 Emergency 811 called in to complete emergency scrape.

18:18 Pasture area seems to have soaked in a majority of the brine and a deeper depth than on pad. Pasture is very fine sand.

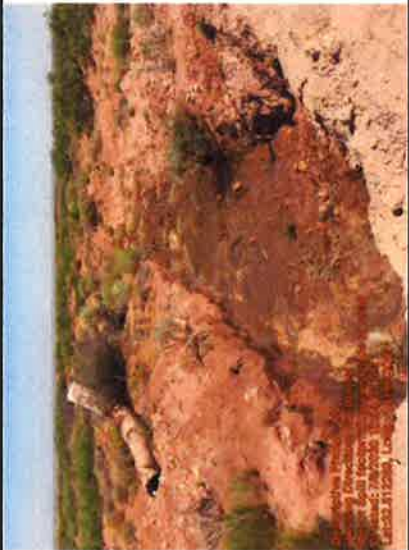
Next Steps & Recommendations

- 1 Finish 0.5" scrape on pad.
- 2 Come up with a plan for pasture area
- 3 Complete excavation
- 4 Confirmation sample
- 5 Finish horizontal delineation

Daily Site Visit Report



Site Photos

Viewing Direction: West 	Viewing Direction: East 
Spill area on south side of release	Spill area south of location
Viewing Direction: North 	Viewing Direction: Northwest 
Spill on west side of fence line	Spill footprint on west side of road



Daily Site Visit Report

Viewing Direction: East 	Viewing Direction: Northeast 
Spill along fence line on south side of pad	Spill area on pad
Viewing Direction: East 	Viewing Direction: North 
Spill area alongside containment on south side	Spill runoff towards low spot

Daily Site Visit Report



Viewing Direction: South  Descriptive Photo - 4 Viewing Direction: South Event: Spill area on west side of equipment Created: 7/9/2020 1:04:00 AM Location: 11/100, Longo-100-0001	Viewing Direction: West  Descriptive Photo - 1 Viewing Direction: West Event: Spill area on north side of equipment Created: 7/9/2020 1:04:00 AM Location: 11/100, Longo-100-0001
Spill along containment on west side	Spill area on north side of equipment
Viewing Direction: South  Descriptive Photo - 3 Viewing Direction: South Event: Spill area on west side of equipment Created: 7/9/2020 1:04:00 AM Location: 11/100, Longo-100-0001	Viewing Direction: South  Descriptive Photo - 2 Viewing Direction: South Event: Spill area outside of fence line to the west Created: 7/9/2020 1:04:00 AM Location: 11/100, Longo-100-0001
Spill area on west side of equipment	Spill area outside of fence line to the west

Daily Site Visit Report



Daily Site Visit Signature

Inspector: Monica Peppin

Signature:

A handwritten signature in black ink, appearing to be 'MP', written over a horizontal line. Below the line, the word 'Signature' is printed in a small font.

VERTEX

VEATE

Initial Spill Information - Record on First Visit

Spill Date: _____

Spill Volume: _____

Spill Cause: _____

Spill Product: _____

Recovered Spill Volume: _____

Recovery Method: _____

[illegible]

VERSATILITY. EXPERTISE.

VEATEX

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

VERSATILITY EXPERTISE

Spill Response and Sampling

VERTEX

Client: Matador

Date: 7/8/20

Site Name: Shinnery Oaks

Site Location: _____

Project Owner: _____

Project Manager: _____

Project #: _____

Initial Spill Information - Record on First Visit

Spill Date: _____

Spill Volume: _____

Spill Cause: _____

Spill Product: _____

Recovered Spill Volume: _____

Recovery Method: _____

Sampling

Sample ID	Depth (ft)	Field Screening			Data Collection (Check for Yes)			
		VOC (PID)	PetroFlag TPH (ppm)	Quantab (High/Low) + or -	Lab Analysis	Picture	Trimble Coordinates	Marked on Site Sketch
SS/TP/BH - Year - Number Ex. BH18-01	Ex. '2ft	Ex. 400 ppm	200 ppm	Ex. 'High +	Ex. Hydrocarbon Chloride			
BH1	0			11.22/27.9	15796 caliche			
	0.5			1.49/27.2	1653 caliche			
	1			0.50/26.1	caliche			
	1.5			0.04/25.8	sand			
BH2	0			6.93/27.1	caliche/sand			
	0.5			3.62/27.8	caliche/sand			
	1			2.42/26.5	sand			
	1.5			0.30/26.1	sand			
BH3	0			207/29.7	caliche			
	0.5			4.29/29.4	caliche			
	1			1.65/26.0	caliche			
	2			0.22/27.0	caliche			
BH4	0			11.17/28.4	pasture			
	0.5			10.67/28.0				
	1			12.05/28.7				
	2			8.30/29.4				
	3			0.15/26.4				
	4			0.12/26.3				
BH5	0							
	0.5							
	1							
	2			6.76/27.8				



Daily Site Visit Report

Client:	Matador Resources	Inspection Date:	8/24/2020
Site Location Name:	Shinnery Oak Federal SWD #003	Report Run Date:	8/24/2020 10:24 PM
Client Contact Name:	John Hurt	API #:	30-015-20866
Client Contact Phone #:			
Unique Project ID	-Shinnery Oak Federal SWD #003	Project Owner:	John Hurt
Project Reference #	7/8/20 - Large PW Release	Project Manager:	Natalie Gordon

Summary of Times

Arrived at Site	8/24/2020 7:30 AM
Departed Site	8/24/2020 3:53 PM

Field Notes

11:49 Emergency scrape had not been previously completed. Crew finishing on pad area

Next Steps & Recommendations

1 Finish excavation

Daily Site Visit Report



Site Photos

Viewing Direction: South  On pad area scraped	Viewing Direction: East  Pad area scraped 0.5"
Viewing Direction: North  Excavated area	Viewing Direction: West  Excavation area

Daily Site Visit Report

Daily Site Visit Signature



Inspector: Monica Peppin

Signature:

A handwritten signature in black ink, appearing to be 'Monica Peppin', written over a light blue signature line.



Daily Site Visit Report

Client:	Matador Resources	Inspection Date:	8/25/2020
Site Location Name:	Shinnery Oak Federal SWD #003	Report Run Date:	8/26/2020 2:01 AM
Client Contact Name:	John Hurt	API #:	30-015-20866
Client Contact Phone #:			
Unique Project ID	-Shinnery Oak Federal SWD #003	Project Owner:	John Hurt
Project Reference #	7/8/20 - Large PW Release	Project Manager:	Natalie Gordon

Summary of Times

Arrived at Site	8/25/2020 7:00 AM
Departed Site	8/25/2020 6:21 PM

Field Notes

7:14 Start excavation on northern side of spill. Guide with field screens

9:47 Aiming to take out around 0.25" on north side of spill area except where fluid was heavier settled

15:48 Along containment wall crew hand excavated 0.5" out due to a heavy coverage of contamination.

17:08 Area south in pasture to be excavated down to 4.5'

Next Steps & Recommendations

- 1 Finish pasture excavation
- 2 Collect confirmation samples

Daily Site Visit Report



Site Photos

Viewing Direction: South  West side of excavation	Viewing Direction: North  Scraped area along west side of pad
Viewing Direction: Northwest  Area near culvert excavated	Viewing Direction: East  Northern side of excavation



Daily Site Visit Report

Viewing Direction: South  Descriptive Photo - 1 Viewing Direction: South Date: 8/26/2020 2:01 AM Camera: 6000000 6000000 Location: 10000, Loop 10000	Viewing Direction: East  Descriptive Photo - 4 Viewing Direction: East Date: 8/26/2020 2:01 AM Camera: 6000000 6000000 Location: 10000, Loop 10000
Excavation area	Excavation area
Viewing Direction: South  Descriptive Photo - 2 Viewing Direction: South Date: 8/26/2020 2:01 AM Camera: 6000000 6000000 Location: 10000, Loop 10000	Viewing Direction: West  Descriptive Photo - 3 Viewing Direction: West Date: 8/26/2020 2:01 AM Camera: 6000000 6000000 Location: 10000, Loop 10000
Hand excavated area	Hand excavated area



Daily Site Visit Report

Viewing Direction: South	 Photograph taken on 8/26/2020 at 2:01 AM UTC. The image shows a large, deep pit with a concrete wall on the left and a yellow crane or derrick in the background. The ground is sandy and uneven.
Excavation area	
Viewing Direction: North	 Photograph taken on 8/26/2020 at 2:01 AM UTC. The image shows a large, deep pit with a concrete wall on the left and a yellow crane or derrick in the background. The ground is sandy and uneven.
Excavation area	

Viewing Direction: East	 Photograph taken on 8/26/2020 at 2:01 AM UTC. The image shows a large, deep pit with a concrete wall on the left and a yellow crane or derrick in the background. The ground is sandy and uneven.
Low point where fluid puddled. Excavation down to 4.5'	

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-58 0.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 11:10:00 AM

Lab ID: 2008G98-041

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/3/2020 11:55:53 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/3/2020 11:55:53 PM
Surr: DNOP	78.9	30.4-154		%Rec	1	9/3/2020 11:55:53 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 5:26:22 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/4/2020 12:31:33 AM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 12:31:33 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 12:31:33 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 12:31:33 AM
Surr: 1,2-Dichloroethane-d4	100	70-130		%Rec	1	9/4/2020 12:31:33 AM
Surr: 4-Bromofluorobenzene	98.2	70-130		%Rec	1	9/4/2020 12:31:33 AM
Surr: Dibromofluoromethane	98.4	70-130		%Rec	1	9/4/2020 12:31:33 AM
Surr: Toluene-d8	105	70-130		%Rec	1	9/4/2020 12:31:33 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 12:31:33 AM
Surr: BFB	97.3	70-130		%Rec	1	9/4/2020 12:31:33 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 41 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-59 0.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 11:15:00 AM

Lab ID: 2008G98-042

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/4/2020 12:45:09 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/4/2020 12:45:09 AM
Surr: DNOP	85.0	30.4-154		%Rec	1	9/4/2020 12:45:09 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	470	60		mg/Kg	20	9/5/2020 5:38:43 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/4/2020 2:00:29 AM
Toluene	ND	0.050		mg/Kg	1	9/4/2020 2:00:29 AM
Ethylbenzene	ND	0.050		mg/Kg	1	9/4/2020 2:00:29 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 2:00:29 AM
Surr: 1,2-Dichloroethane-d4	95.8	70-130		%Rec	1	9/4/2020 2:00:29 AM
Surr: 4-Bromofluorobenzene	98.8	70-130		%Rec	1	9/4/2020 2:00:29 AM
Surr: Dibromofluoromethane	95.9	70-130		%Rec	1	9/4/2020 2:00:29 AM
Surr: Toluene-d8	106	70-130		%Rec	1	9/4/2020 2:00:29 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/4/2020 2:00:29 AM
Surr: BFB	96.0	70-130		%Rec	1	9/4/2020 2:00:29 AM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level,
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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

Page 42 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-60 0.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 11:20:00 AM

Lab ID: 2008G98-043

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.0		mg/Kg	1	9/4/2020 1:09:37 AM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	9/4/2020 1:09:37 AM
Surr: DNOP	89.5	30.4-154		%Rec	1	9/4/2020 1:09:37 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	190	60		mg/Kg	20	9/5/2020 5:51:03 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/4/2020 3:28:52 AM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 3:28:52 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 3:28:52 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 3:28:52 AM
Surr: 1,2-Dichloroethane-d4	99.3	70-130		%Rec	1	9/4/2020 3:28:52 AM
Surr: 4-Bromofluorobenzene	94.7	70-130		%Rec	1	9/4/2020 3:28:52 AM
Surr: Dibromofluoromethane	97.1	70-130		%Rec	1	9/4/2020 3:28:52 AM
Surr: Toluene-d8	103	70-130		%Rec	1	9/4/2020 3:28:52 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 3:28:52 AM
Surr: BFB	95.0	70-130		%Rec	1	9/4/2020 3:28:52 AM

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

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

Page 43 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-61 0.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 7:00:00 AM

Lab ID: 2008G98-044

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.7		mg/Kg	1	9/4/2020 1:34:29 AM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	9/4/2020 1:34:29 AM
Surr: DNOP	91.1	30.4-154		%Rec	1	9/4/2020 1:34:29 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	1500	60		mg/Kg	20	9/5/2020 6:03:23 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/4/2020 3:58:36 AM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 3:58:36 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 3:58:36 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 3:58:36 AM
Surr: 1,2-Dichloroethane-d4	100	70-130		%Rec	1	9/4/2020 3:58:36 AM
Surr: 4-Bromofluorobenzene	96.2	70-130		%Rec	1	9/4/2020 3:58:36 AM
Surr: Dibromofluoromethane	96.4	70-130		%Rec	1	9/4/2020 3:58:36 AM
Surr: Toluene-d8	102	70-130		%Rec	1	9/4/2020 3:58:36 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 3:58:36 AM
Surr: BFB	95.4	70-130		%Rec	1	9/4/2020 3:58:36 AM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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

Page 44 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-62 0.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 7:05:00 AM

Lab ID: 2008G98-045

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.7		mg/Kg	1	9/4/2020 1:58:53 AM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	9/4/2020 1:58:53 AM
Surr: DNOP	88.2	30.4-154		%Rec	1	9/4/2020 1:58:53 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	550	61		mg/Kg	20	9/5/2020 6:40:24 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/4/2020 4:28:04 AM
Toluene	ND	0.050		mg/Kg	1	9/4/2020 4:28:04 AM
Ethylbenzene	ND	0.050		mg/Kg	1	9/4/2020 4:28:04 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 4:28:04 AM
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	9/4/2020 4:28:04 AM
Surr: 4-Bromofluorobenzene	98.5	70-130		%Rec	1	9/4/2020 4:28:04 AM
Surr: Dibromofluoromethane	101	70-130		%Rec	1	9/4/2020 4:28:04 AM
Surr: Toluene-d8	105	70-130		%Rec	1	9/4/2020 4:28:04 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/4/2020 4:28:04 AM
Surr: BFB	97.5	70-130		%Rec	1	9/4/2020 4:28:04 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 45 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-63 2.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 11:35:00 AM

Lab ID: 2008G98-046

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	9/3/2020 5:23:45 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/3/2020 5:23:45 AM
Surr: DNOP	88.5	30.4-154		%Rec	1	9/3/2020 5:23:45 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 6:52:44 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/4/2020 4:57:25 AM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 4:57:25 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 4:57:25 AM
Xylenes, Total	ND	0.098		mg/Kg	1	9/4/2020 4:57:25 AM
Surr: 1,2-Dichloroethane-d4	99.3	70-130		%Rec	1	9/4/2020 4:57:25 AM
Surr: 4-Bromofluorobenzene	93.5	70-130		%Rec	1	9/4/2020 4:57:25 AM
Surr: Dibromofluoromethane	98.7	70-130		%Rec	1	9/4/2020 4:57:25 AM
Surr: Toluene-d8	104	70-130		%Rec	1	9/4/2020 4:57:25 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 4:57:25 AM
Surr: BFB	94.8	70-130		%Rec	1	9/4/2020 4:57:25 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative 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

Page 46 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-64 2.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 11:40:00 AM

Lab ID: 2008G98-047

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	9/3/2020 5:52:43 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/3/2020 5:52:43 AM
Surr: DNOP	61.3	30.4-154		%Rec	1	9/3/2020 5:52:43 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 7:05:05 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	9/4/2020 5:27:34 AM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 5:27:34 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 5:27:34 AM
Xylenes, Total	ND	0.098		mg/Kg	1	9/4/2020 5:27:34 AM
Surr: 1,2-Dichloroethane-d4	99.6	70-130		%Rec	1	9/4/2020 5:27:34 AM
Surr: 4-Bromofluorobenzene	97.2	70-130		%Rec	1	9/4/2020 5:27:34 AM
Surr: Dibromofluoromethane	95.2	70-130		%Rec	1	9/4/2020 5:27:34 AM
Surr: Toluene-d8	105	70-130		%Rec	1	9/4/2020 5:27:34 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 5:27:34 AM
Surr: BFB	95.3	70-130		%Rec	1	9/4/2020 5:27:34 AM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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

Page 47 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-65 2.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 3:35:00 PM

Lab ID: 2008G98-048

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	9/3/2020 6:02:23 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/3/2020 6:02:23 AM
Surr: DNOP	76.8	30.4-154		%Rec	1	9/3/2020 6:02:23 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 7:17:26 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/4/2020 5:57:13 AM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 5:57:13 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 5:57:13 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 5:57:13 AM
Surr: 1,2-Dichloroethane-d4	99.6	70-130		%Rec	1	9/4/2020 5:57:13 AM
Surr: 4-Bromofluorobenzene	98.8	70-130		%Rec	1	9/4/2020 5:57:13 AM
Surr: Dibromofluoromethane	93.3	70-130		%Rec	1	9/4/2020 5:57:13 AM
Surr: Toluene-d8	101	70-130		%Rec	1	9/4/2020 5:57:13 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 5:57:13 AM
Surr: BFB	95.6	70-130		%Rec	1	9/4/2020 5:57:13 AM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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

Page 48 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-66 2.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 11:50:00 AM

Lab ID: 2008G98-049

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/3/2020 6:11:59 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/3/2020 6:11:59 AM
Surr: DNOP	76.4	30.4-154		%Rec	1	9/3/2020 6:11:59 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 7:29:46 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/4/2020 6:26:42 AM
Toluene	ND	0.050		mg/Kg	1	9/4/2020 6:26:42 AM
Ethylbenzene	ND	0.050		mg/Kg	1	9/4/2020 6:26:42 AM
Xylenes, Total	ND	0.10		mg/Kg	1	9/4/2020 6:26:42 AM
Surr: 1,2-Dichloroethane-d4	98.9	70-130		%Rec	1	9/4/2020 6:26:42 AM
Surr: 4-Bromofluorobenzene	97.5	70-130		%Rec	1	9/4/2020 6:26:42 AM
Surr: Dibromofluoromethane	98.7	70-130		%Rec	1	9/4/2020 6:26:42 AM
Surr: Toluene-d8	104	70-130		%Rec	1	9/4/2020 6:26:42 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/4/2020 6:26:42 AM
Surr: BFB	95.6	70-130		%Rec	1	9/4/2020 6:26:42 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 49 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-67 2.5

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 11:55:00 AM

Lab ID: 2008G98-050

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	9/3/2020 6:21:32 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/3/2020 6:21:32 AM
Surr: DNOP	64.5	30.4-154		%Rec	1	9/3/2020 6:21:32 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	200	60		mg/Kg	20	9/5/2020 7:42:07 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/4/2020 6:56:32 AM
Toluene	ND	0.050		mg/Kg	1	9/4/2020 6:56:32 AM
Ethylbenzene	ND	0.050		mg/Kg	1	9/4/2020 6:56:32 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 6:56:32 AM
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	9/4/2020 6:56:32 AM
Surr: 4-Bromofluorobenzene	97.4	70-130		%Rec	1	9/4/2020 6:56:32 AM
Surr: Dibromofluoromethane	103	70-130		%Rec	1	9/4/2020 6:56:32 AM
Surr: Toluene-d8	103	70-130		%Rec	1	9/4/2020 6:56:32 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/4/2020 6:56:32 AM
Surr: BFB	95.7	70-130		%Rec	1	9/4/2020 6:56:32 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQE Practical Quantitative 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

Page 50 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-74 1'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 7:10:00 AM

Lab ID: 2008G98-051

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	9/3/2020 6:31:04 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/3/2020 6:31:04 AM
Surr: DNOP	67.9	30.4-154		%Rec	1	9/3/2020 6:31:04 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 7:54:27 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	9/4/2020 11:34:32 PM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 11:34:32 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 11:34:32 PM
Xylenes, Total	ND	0.098		mg/Kg	1	9/4/2020 11:34:32 PM
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	9/4/2020 11:34:32 PM
Surr: 4-Bromofluorobenzene	94.2	70-130		%Rec	1	9/4/2020 11:34:32 PM
Surr: Dibromofluoromethane	99.6	70-130		%Rec	1	9/4/2020 11:34:32 PM
Surr: Toluene-d8	103	70-130		%Rec	1	9/4/2020 11:34:32 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 11:34:32 PM
Surr: BFB	94.5	70-130		%Rec	1	9/4/2020 11:34:32 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 II Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 51 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-75 1'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 7:15:00 AM

Lab ID: 2008G98-052

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.8		mg/Kg	1	9/3/2020 6:40:34 AM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	9/3/2020 6:40:34 AM
Surr: DNOP	78.5	30.4-154		%Rec	1	9/3/2020 6:40:34 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 8:06:48 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/5/2020 12:03:59 AM
Toluene	ND	0.050		mg/Kg	1	9/5/2020 12:03:59 AM
Ethylbenzene	ND	0.050		mg/Kg	1	9/5/2020 12:03:59 AM
Xylenes, Total	ND	0.10		mg/Kg	1	9/5/2020 12:03:59 AM
Surr: 1,2-Dichloroethane-d4	99.2	70-130		%Rec	1	9/5/2020 12:03:59 AM
Surr: 4-Bromofluorobenzene	95.5	70-130		%Rec	1	9/5/2020 12:03:59 AM
Surr: Dibromofluoromethane	97.6	70-130		%Rec	1	9/5/2020 12:03:59 AM
Surr: Toluene-d8	104	70-130		%Rec	1	9/5/2020 12:03:59 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/5/2020 12:03:59 AM
Surr: BFB	93.3	70-130		%Rec	1	9/5/2020 12:03:59 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 52 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-77 1'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 7:20:00 AM

Lab ID: 2008G98-053

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.6		mg/Kg	1	9/3/2020 6:50:05 AM
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	9/3/2020 6:50:05 AM
Surr: DNOP	78.6	30.4-154		%Rec	1	9/3/2020 6:50:05 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 8:19:08 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/5/2020 12:33:27 AM
Toluene	ND	0.049		mg/Kg	1	9/5/2020 12:33:27 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/5/2020 12:33:27 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/5/2020 12:33:27 AM
Surr: 1,2-Dichloroethane-d4	94.4	70-130		%Rec	1	9/5/2020 12:33:27 AM
Surr: 4-Bromofluorobenzene	96.8	70-130		%Rec	1	9/5/2020 12:33:27 AM
Surr: Dibromofluoromethane	94.7	70-130		%Rec	1	9/5/2020 12:33:27 AM
Surr: Toluene-d8	104	70-130		%Rec	1	9/5/2020 12:33:27 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/5/2020 12:33:27 AM
Surr: BFB	95.0	70-130		%Rec	1	9/5/2020 12:33:27 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 53 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-78 3'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 7:25:00 AM

Lab ID: 2008G98-054

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/3/2020 6:59:34 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/3/2020 6:59:34 AM
Surr: DNOP	71.5	30.4-154		%Rec	1	9/3/2020 6:59:34 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 8:31:29 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/5/2020 1:03:00 AM
Toluene	ND	0.049		mg/Kg	1	9/5/2020 1:03:00 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/5/2020 1:03:00 AM
Xylenes, Total	ND	0.098		mg/Kg	1	9/5/2020 1:03:00 AM
Surr: 1,2-Dichloroethane-d4	99.1	70-130		%Rec	1	9/5/2020 1:03:00 AM
Surr: 4-Bromofluorobenzene	93.9	70-130		%Rec	1	9/5/2020 1:03:00 AM
Surr: Dibromofluoromethane	97.1	70-130		%Rec	1	9/5/2020 1:03:00 AM
Surr: Toluene-d8	103	70-130		%Rec	1	9/5/2020 1:03:00 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/5/2020 1:03:00 AM
Surr: BFB	95.5	70-130		%Rec	1	9/5/2020 1:03:00 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 54 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-79 3'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 7:30:00 AM

Lab ID: 2008G98-055

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/3/2020 7:09:08 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/3/2020 7:09:08 AM
Surr: DNOP	80.8	30.4-154		%Rec	1	9/3/2020 7:09:08 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 9:08:30 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/5/2020 1:32:26 AM
Toluene	ND	0.050		mg/Kg	1	9/5/2020 1:32:26 AM
Ethylbenzene	ND	0.050		mg/Kg	1	9/5/2020 1:32:26 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/5/2020 1:32:26 AM
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	9/5/2020 1:32:26 AM
Surr: 4-Bromofluorobenzene	95.3	70-130		%Rec	1	9/5/2020 1:32:26 AM
Surr: Dibromofluoromethane	102	70-130		%Rec	1	9/5/2020 1:32:26 AM
Surr: Toluene-d8	102	70-130		%Rec	1	9/5/2020 1:32:26 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/5/2020 1:32:26 AM
Surr: BFB	92.9	70-130		%Rec	1	9/5/2020 1:32:26 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level,
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 55 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-80 3'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 7:35:00 AM

Lab ID: 2008G98-056

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/3/2020 7:18:42 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/3/2020 7:18:42 AM
Surr: DNOP	105	30.4-154		%Rec	1	9/3/2020 7:18:42 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	270	60		mg/Kg	20	9/5/2020 9:20:50 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/5/2020 2:01:53 AM
Toluene	ND	0.049		mg/Kg	1	9/5/2020 2:01:53 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/5/2020 2:01:53 AM
Xylenes, Total	ND	0.098		mg/Kg	1	9/5/2020 2:01:53 AM
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	9/5/2020 2:01:53 AM
Surr: 4-Bromofluorobenzene	95.3	70-130		%Rec	1	9/5/2020 2:01:53 AM
Surr: Dibromofluoromethane	99.4	70-130		%Rec	1	9/5/2020 2:01:53 AM
Surr: Toluene-d8	105	70-130		%Rec	1	9/5/2020 2:01:53 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/5/2020 2:01:53 AM
Surr: BFB	94.2	70-130		%Rec	1	9/5/2020 2:01:53 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 56 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-81 3'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 7:40:00 AM

Lab ID: 2008G98-057

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/3/2020 7:28:20 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/3/2020 7:28:20 AM
Surr: DNOP	71.0	30.4-154		%Rec	1	9/3/2020 7:28:20 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	61		mg/Kg	20	9/5/2020 9:33:10 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/5/2020 2:31:43 AM
Toluene	ND	0.050		mg/Kg	1	9/5/2020 2:31:43 AM
Ethylbenzene	ND	0.050		mg/Kg	1	9/5/2020 2:31:43 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/5/2020 2:31:43 AM
Surr: 1,2-Dichloroethane-d4	100	70-130		%Rec	1	9/5/2020 2:31:43 AM
Surr: 4-Bromofluorobenzene	95.8	70-130		%Rec	1	9/5/2020 2:31:43 AM
Surr: Dibromofluoromethane	96.9	70-130		%Rec	1	9/5/2020 2:31:43 AM
Surr: Toluene-d8	102	70-130		%Rec	1	9/5/2020 2:31:43 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/5/2020 2:31:43 AM
Surr: BFB	94.0	70-130		%Rec	1	9/5/2020 2:31:43 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 57 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-82 3'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 7:45:00 AM

Lab ID: 2008G98-058

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/3/2020 7:37:57 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/3/2020 7:37:57 AM
Surr: DNOP	73.9	30.4-154		%Rec	1	9/3/2020 7:37:57 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	460	60		mg/Kg	20	9/5/2020 3:48:25 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/5/2020 3:01:27 AM
Toluene	ND	0.050		mg/Kg	1	9/5/2020 3:01:27 AM
Ethylbenzene	ND	0.050		mg/Kg	1	9/5/2020 3:01:27 AM
Xylenes, Total	ND	0.10		mg/Kg	1	9/5/2020 3:01:27 AM
Surr: 1,2-Dichloroethane-d4	100	70-130		%Rec	1	9/5/2020 3:01:27 AM
Surr: 4-Bromofluorobenzene	97.6	70-130		%Rec	1	9/5/2020 3:01:27 AM
Surr: Dibromofluoromethane	99.4	70-130		%Rec	1	9/5/2020 3:01:27 AM
Surr: Toluene-d8	103	70-130		%Rec	1	9/5/2020 3:01:27 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/5/2020 3:01:27 AM
Surr: BFB	93.8	70-130		%Rec	1	9/5/2020 3:01:27 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 58 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-83 3'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 7:50:00 AM

Lab ID: 2008G98-059

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/3/2020 7:47:38 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/3/2020 7:47:38 AM
Surr: DNOP	75.7	30.4-154		%Rec	1	9/3/2020 7:47:38 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 4:50:27 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/5/2020 3:30:59 AM
Toluene	ND	0.050		mg/Kg	1	9/5/2020 3:30:59 AM
Ethylbenzene	ND	0.050		mg/Kg	1	9/5/2020 3:30:59 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/5/2020 3:30:59 AM
Surr: 1,2-Dichloroethane-d4	98.4	70-130		%Rec	1	9/5/2020 3:30:59 AM
Surr: 4-Bromofluorobenzene	94.3	70-130		%Rec	1	9/5/2020 3:30:59 AM
Surr: Dibromofluoromethane	97.6	70-130		%Rec	1	9/5/2020 3:30:59 AM
Surr: Toluene-d8	102	70-130		%Rec	1	9/5/2020 3:30:59 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/5/2020 3:30:59 AM
Surr: BFB	93.4	70-130		%Rec	1	9/5/2020 3:30:59 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 59 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-94 3'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 8:40:00 AM

Lab ID: 2008G98-060

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/3/2020 7:57:20 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/3/2020 7:57:20 AM
Surr: DNOP	74.9	30.4-154		%Rec	1	9/3/2020 7:57:20 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	96	60		mg/Kg	20	9/5/2020 5:27:41 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/5/2020 4:00:22 AM
Toluene	ND	0.049		mg/Kg	1	9/5/2020 4:00:22 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/5/2020 4:00:22 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/5/2020 4:00:22 AM
Surr: 1,2-Dichloroethane-d4	100	70-130		%Rec	1	9/5/2020 4:00:22 AM
Surr: 4-Bromofluorobenzene	95.8	70-130		%Rec	1	9/5/2020 4:00:22 AM
Surr: Dibromofluoromethane	96.5	70-130		%Rec	1	9/5/2020 4:00:22 AM
Surr: Toluene-d8	104	70-130		%Rec	1	9/5/2020 4:00:22 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/5/2020 4:00:22 AM
Surr: BFB	95.7	70-130		%Rec	1	9/5/2020 4:00:22 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 60 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-95 0.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 8:45:00 AM

Lab ID: 2008G98-061

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/3/2020 8:07:04 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/3/2020 8:07:04 AM
Surr: DNOP	79.0	30.4-154		%Rec	1	9/3/2020 8:07:04 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/4/2020 1:54:53 AM
Surr: BFB	94.9	75.3-105		%Rec	1	9/4/2020 1:54:53 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	9/4/2020 1:54:53 AM
Toluene	ND	0.048		mg/Kg	1	9/4/2020 1:54:53 AM
Ethylbenzene	ND	0.048		mg/Kg	1	9/4/2020 1:54:53 AM
Xylenes, Total	ND	0.097		mg/Kg	1	9/4/2020 1:54:53 AM
Surr: 4-Bromofluorobenzene	100	80-120		%Rec	1	9/4/2020 1:54:53 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 5:40:05 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level,
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 61 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-12 0-0.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 8:40:00 AM

Lab ID: 2008G98-062

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/3/2020 8:16:54 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/3/2020 8:16:54 AM
Surr: DNOP	68.6	30.4-154		%Rec	1	9/3/2020 8:16:54 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 3:05:26 AM
Surr: BFB	94.7	75.3-105		%Rec	1	9/4/2020 3:05:26 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	9/4/2020 3:05:26 AM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 3:05:26 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 3:05:26 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 3:05:26 AM
Surr: 4-Bromofluorobenzene	99.6	80-120		%Rec	1	9/4/2020 3:05:26 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	130	60		mg/Kg	20	9/5/2020 5:52:29 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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 pI Not In Range
 RL Reporting Limit

Page 62 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-13 0-0.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 8:45:00 AM

Lab ID: 2008G98-063

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	9/3/2020 8:27:03 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/3/2020 8:27:03 AM
Surr: DNOP	70.9	30.4-154		%Rec	1	9/3/2020 8:27:03 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/4/2020 4:15:38 AM
Surr: BFB	93.3	75.3-105		%Rec	1	9/4/2020 4:15:38 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	9/4/2020 4:15:38 AM
Toluene	ND	0.050		mg/Kg	1	9/4/2020 4:15:38 AM
Ethylbenzene	ND	0.050		mg/Kg	1	9/4/2020 4:15:38 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 4:15:38 AM
Surr: 4-Bromofluorobenzene	98.2	80-120		%Rec	1	9/4/2020 4:15:38 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	440	60		mg/Kg	20	9/5/2020 6:04:54 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 63 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-01 0-0.25'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 7:55:00 AM

Lab ID: 2008G98-064

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.4		mg/Kg	1	9/3/2020 8:36:52 AM
Motor Oil Range Organics (MRO)	ND	42		mg/Kg	1	9/3/2020 8:36:52 AM
Surr: DNOP	69.8	30.4-154		%Rec	1	9/3/2020 8:36:52 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 4:39:03 AM
Surr: BFB	96.3	75.3-105		%Rec	1	9/4/2020 4:39:03 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	9/4/2020 4:39:03 AM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 4:39:03 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 4:39:03 AM
Xylenes, Total	ND	0.098		mg/Kg	1	9/4/2020 4:39:03 AM
Surr: 4-Bromofluorobenzene	99.3	80-120		%Rec	1	9/4/2020 4:39:03 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	450	61		mg/Kg	20	9/5/2020 6:17:19 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 64 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-02 0-0.25'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/28/2020 8:00:00 AM

Lab ID: 2008G98-065

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/3/2020 8:46:40 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/3/2020 8:46:40 AM
Surr: DNOP	59.3	30.4-154		%Rec	1	9/3/2020 8:46:40 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 5:02:31 AM
Surr: BFB	94.7	75.3-105		%Rec	1	9/4/2020 5:02:31 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	9/4/2020 5:02:31 AM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 5:02:31 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 5:02:31 AM
Xylenes, Total	ND	0.098		mg/Kg	1	9/4/2020 5:02:31 AM
Surr: 4-Bromofluorobenzene	97.5	80-120		%Rec	1	9/4/2020 5:02:31 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	670	60		mg/Kg	20	9/5/2020 6:54:32 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 65 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-23 0-8'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 11:30:00 AM

Lab ID: 2008G98-066

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.7		mg/Kg	1	9/4/2020 2:32:10 AM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	9/4/2020 2:32:10 AM
Surr: DNOP	89.2	30.4-154		%Rec	1	9/4/2020 2:32:10 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 5:26:19 AM
Surr: BFB	94.4	75.3-105		%Rec	1	9/4/2020 5:26:19 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	9/4/2020 5:26:19 AM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 5:26:19 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 5:26:19 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 5:26:19 AM
Surr: 4-Bromofluorobenzene	97.4	80-120		%Rec	1	9/4/2020 5:26:19 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 7:06:56 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 66 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-28 0-4'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 2:50:00 PM

Lab ID: 2008G98-067

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/4/2020 3:01:52 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/4/2020 3:01:52 AM
Surr: DNOP	94.7	30.4-154		%Rec	1	9/4/2020 3:01:52 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 5:50:14 AM
Surr: BFB	96.8	75.3-105		%Rec	1	9/4/2020 5:50:14 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	9/4/2020 5:50:14 AM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 5:50:14 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 5:50:14 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 5:50:14 AM
Surr: 4-Bromofluorobenzene	100	80-120		%Rec	1	9/4/2020 5:50:14 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	120	60		mg/Kg	20	9/5/2020 7:19:21 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 67 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-29 0-1.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 10:30:00 AM

Lab ID: 2008G98-068

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/4/2020 3:11:44 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/4/2020 3:11:44 AM
Surr: DNOP	84.0	30.4-154		%Rec	1	9/4/2020 3:11:44 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/4/2020 6:13:37 AM
Surr: BFB	93.9	75.3-105		%Rec	1	9/4/2020 6:13:37 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	9/4/2020 6:13:37 AM
Toluene	ND	0.050		mg/Kg	1	9/4/2020 6:13:37 AM
Ethylbenzene	ND	0.050		mg/Kg	1	9/4/2020 6:13:37 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 6:13:37 AM
Surr: 4-Bromofluorobenzene	97.7	80-120		%Rec	1	9/4/2020 6:13:37 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	61		mg/Kg	20	9/5/2020 7:31:46 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 68 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-30 0-1.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 10:35:00 AM

Lab ID: 2008G98-069

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.0		mg/Kg	1	9/4/2020 3:21:35 AM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	9/4/2020 3:21:35 AM
Surr: DNOP	93.5	30.4-154		%Rec	1	9/4/2020 3:21:35 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 6:37:07 AM
Surr: BFB	93.9	75.3-105		%Rec	1	9/4/2020 6:37:07 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	9/4/2020 6:37:07 AM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 6:37:07 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 6:37:07 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 6:37:07 AM
Surr: 4-Bromofluorobenzene	97.2	80-120		%Rec	1	9/4/2020 6:37:07 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 7:44:10 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 69 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-31 0-1.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 10:40:00 AM

Lab ID: 2008G98-070

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	9/4/2020 3:31:30 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/4/2020 3:31:30 AM
Surr: DNOP	90.3	30.4-154		%Rec	1	9/4/2020 3:31:30 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 7:00:35 AM
Surr: BFB	98.5	75.3-105		%Rec	1	9/4/2020 7:00:35 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	9/4/2020 7:00:35 AM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 7:00:35 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 7:00:35 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 7:00:35 AM
Surr: 4-Bromofluorobenzene	100	80-120		%Rec	1	9/4/2020 7:00:35 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 7:56:34 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative Limit
 S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
 E Value above quantitation range
 F Analyte detected below quantitation limits
 P Sample pH Not In Range
 RL Reporting Limit

Page 70 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-34 0-1.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 10:45:00 AM

Lab ID: 2008G98-071

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	9/4/2020 3:41:24 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/4/2020 3:41:24 AM
Surr: DNOP	91.2	30.4-154		%Rec	1	9/4/2020 3:41:24 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/4/2020 12:03:57 PM
Surr: BFB	96.9	75.3-105		%Rec	1	9/4/2020 12:03:57 PM
EPA METHOD 8021B: VOLATILES						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/4/2020 12:03:57 PM
Toluene	ND	0.050		mg/Kg	1	9/4/2020 12:03:57 PM
Ethylbenzene	ND	0.050		mg/Kg	1	9/4/2020 12:03:57 PM
Xylenes, Total	ND	0.10		mg/Kg	1	9/4/2020 12:03:57 PM
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	9/4/2020 12:03:57 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	96	60		mg/Kg	20	9/5/2020 8:08:58 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative 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

Page 71 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-35 0-1.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 10:50:00 AM

Lab ID: 2008G98-072

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/4/2020 3:51:18 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/4/2020 3:51:18 AM
Surr: DNOP	97.1	30.4-154		%Rec	1	9/4/2020 3:51:18 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 12:27:25 PM
Surr: BFB	95.1	75.3-105		%Rec	1	9/4/2020 12:27:25 PM
EPA METHOD 8021B: VOLATILES						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/4/2020 12:27:25 PM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 12:27:25 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 12:27:25 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 12:27:25 PM
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	9/4/2020 12:27:25 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 8:21:22 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 72 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-36 0-13'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 10:55:00 AM

Lab ID: 2008G98-073

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.7		mg/Kg	1	9/4/2020 4:01:12 AM
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	9/4/2020 4:01:12 AM
Surr: DNOP	131	30.4-154		%Rec	1	9/4/2020 4:01:12 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 12:50:53 PM
Surr: BFB	95.1	75.3-105		%Rec	1	9/4/2020 12:50:53 PM
EPA METHOD 8021B: VOLATILES						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/4/2020 12:50:53 PM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 12:50:53 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 12:50:53 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 12:50:53 PM
Surr: 4-Bromofluorobenzene	97.9	80-120		%Rec	1	9/4/2020 12:50:53 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	730	59		mg/Kg	20	9/5/2020 8:33:47 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 73 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-42 0-2.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 2:55:00 PM

Lab ID: 2008G98-074

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.6		mg/Kg	1	9/4/2020 4:11:06 AM
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	9/4/2020 4:11:06 AM
Surr: DNOP	146	30.4-154		%Rec	1	9/4/2020 4:11:06 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 1:14:24 PM
Surr: BFB	94.8	75.3-105		%Rec	1	9/4/2020 1:14:24 PM
EPA METHOD 8021B: VOLATILES						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/4/2020 1:14:24 PM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 1:14:24 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 1:14:24 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 1:14:24 PM
Surr: 4-Bromofluorobenzene	98.6	80-120		%Rec	1	9/4/2020 1:14:24 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	250	60		mg/Kg	20	9/5/2020 8:46:12 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 74 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-09 0-0.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 8:50:00 AM

Lab ID: 2008G98-075

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/4/2020 4:21:02 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/4/2020 4:21:02 AM
Surr: DNOP	92.8	30.4-154		%Rec	1	9/4/2020 4:21:02 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/4/2020 1:37:54 PM
Surr: BFB	95.8	75.3-105		%Rec	1	9/4/2020 1:37:54 PM
EPA METHOD 8021B: VOLATILES						Analyst: RAA
Benzene	ND	0.024		mg/Kg	1	9/4/2020 1:37:54 PM
Toluene	ND	0.048		mg/Kg	1	9/4/2020 1:37:54 PM
Ethylbenzene	ND	0.048		mg/Kg	1	9/4/2020 1:37:54 PM
Xylenes, Total	ND	0.097		mg/Kg	1	9/4/2020 1:37:54 PM
Surr: 4-Bromofluorobenzene	99.7	80-120		%Rec	1	9/4/2020 1:37:54 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	3700	150		mg/Kg	50	9/8/2020 6:41:51 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 75 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-10 0-0.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 8:55:00 AM

Lab ID: 2008G98-076

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	9/4/2020 4:31:07 AM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	9/4/2020 4:31:07 AM
Surr: DNOP	83.6	30.4-154		%Rec	1	9/4/2020 4:31:07 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/4/2020 2:01:22 PM
Surr: BFB	97.4	75.3-105		%Rec	1	9/4/2020 2:01:22 PM
EPA METHOD 8021B: VOLATILES						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/4/2020 2:01:22 PM
Toluene	ND	0.049		mg/Kg	1	9/4/2020 2:01:22 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/4/2020 2:01:22 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 2:01:22 PM
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	9/4/2020 2:01:22 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	970	60		mg/Kg	20	9/5/2020 9:35:49 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 76 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-11 0-0.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 9:00:00 AM

Lab ID: 2008G98-077

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	9/4/2020 4:41:06 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/4/2020 4:41:06 AM
Surr: DNOP	79.3	30.4-154		%Rec	1	9/4/2020 4:41:06 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/4/2020 2:24:54 PM
Surr: BFB	97.8	75.3-105		%Rec	1	9/4/2020 2:24:54 PM
EPA METHOD 8021B: VOLATILES						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/4/2020 2:24:54 PM
Toluene	ND	0.050		mg/Kg	1	9/4/2020 2:24:54 PM
Ethylbenzene	ND	0.050		mg/Kg	1	9/4/2020 2:24:54 PM
Xylenes, Total	ND	0.10		mg/Kg	1	9/4/2020 2:24:54 PM
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	9/4/2020 2:24:54 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	970	61		mg/Kg	20	9/5/2020 9:48:14 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 77 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-43 0-0.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 10:00:00 AM

Lab ID: 2008G98-078

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	9/4/2020 4:51:01 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/4/2020 4:51:01 AM
Surr: DNOP	95.7	30.4-154		%Rec	1	9/4/2020 4:51:01 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/4/2020 2:48:26 PM
Surr: BFB	98.8	75.3-105		%Rec	1	9/4/2020 2:48:26 PM
EPA METHOD 8021B: VOLATILES						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/4/2020 2:48:26 PM
Toluene	ND	0.050		mg/Kg	1	9/4/2020 2:48:26 PM
Ethylbenzene	ND	0.050		mg/Kg	1	9/4/2020 2:48:26 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 2:48:26 PM
Surr: 4-Bromofluorobenzene	102	80-120		%Rec	1	9/4/2020 2:48:26 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	62	60		mg/Kg	20	9/5/2020 10:25:27 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 78 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-84 8'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 2:40:00 PM

Lab ID: 2008G98-079

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/4/2020 5:00:53 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/4/2020 5:00:53 AM
Surr: DNOP	78.7	30.4-154		%Rec	1	9/4/2020 5:00:53 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/4/2020 3:12:02 PM
Surr: BFB	96.8	75.3-105		%Rec	1	9/4/2020 3:12:02 PM
EPA METHOD 8021B: VOLATILES						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/4/2020 3:12:02 PM
Toluene	ND	0.050		mg/Kg	1	9/4/2020 3:12:02 PM
Ethylbenzene	ND	0.050		mg/Kg	1	9/4/2020 3:12:02 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 3:12:02 PM
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	9/4/2020 3:12:02 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	330	61		mg/Kg	20	9/5/2020 11:02:40 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative Limit
 S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
 E Value above quantitation range
 F Analyte detected below quantitation limits
 P Sample pfi Not In Range
 RL Reporting Limit

Page 79 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-98 1.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 11:00:00 AM

Lab ID: 2008G98-080

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	9/4/2020 5:10:43 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/4/2020 5:10:43 AM
Surr: DNOP	94.5	30.4-154		%Rec	1	9/4/2020 5:10:43 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/4/2020 3:35:39 PM
Surr: BFB	97.1	75.3-105		%Rec	1	9/4/2020 3:35:39 PM
EPA METHOD 8021B: VOLATILES						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/4/2020 3:35:39 PM
Toluene	ND	0.050		mg/Kg	1	9/4/2020 3:35:39 PM
Ethylbenzene	ND	0.050		mg/Kg	1	9/4/2020 3:35:39 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/4/2020 3:35:39 PM
Surr: 4-Bromofluorobenzene	100	80-120		%Rec	1	9/4/2020 3:35:39 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	61		mg/Kg	20	9/5/2020 11:15:04 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level,
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 80 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-99 1.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 11:05:00 AM

Lab ID: 2008G98-081

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	9/4/2020 5:20:31 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/4/2020 5:20:31 AM
Surr: DNOP	98.0	30.4-154		%Rec	1	9/4/2020 5:20:31 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/2/2020 5:42:51 PM
Surr: BFB	93.7	75.3-105		%Rec	1	9/2/2020 5:42:51 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	9/2/2020 5:42:51 PM
Toluene	ND	0.048		mg/Kg	1	9/2/2020 5:42:51 PM
Ethylbenzene	ND	0.048		mg/Kg	1	9/2/2020 5:42:51 PM
Xylenes, Total	ND	0.097		mg/Kg	1	9/2/2020 5:42:51 PM
Surr: 4-Bromofluorobenzene	97.7	80-120		%Rec	1	9/2/2020 5:42:51 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 11:52:18 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level,
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 81 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-104 4'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 2:30:00 PM

Lab ID: 2008G98-082

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/4/2020 5:30:19 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/4/2020 5:30:19 AM
Surr: DNOP	82.9	30.4-154		%Rec	1	9/4/2020 5:30:19 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/2/2020 6:53:20 PM
Surr: BFB	95.0	75.3-105		%Rec	1	9/2/2020 6:53:20 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	9/2/2020 6:53:20 PM
Toluene	ND	0.049		mg/Kg	1	9/2/2020 6:53:20 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/2/2020 6:53:20 PM
Xylenes, Total	ND	0.098		mg/Kg	1	9/2/2020 6:53:20 PM
Surr: 4-Bromofluorobenzene	98.8	80-120		%Rec	1	9/2/2020 6:53:20 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	180	60		mg/Kg	20	9/6/2020 12:04:42 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level,
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
F Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

Page 82 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-105 1.5

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 11:10:00 AM

Lab ID: 2008G98-083

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	9/4/2020 5:40:07 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/4/2020 5:40:07 AM
Surr: DNOP	120	30.4-154		%Rec	1	9/4/2020 5:40:07 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/2/2020 8:03:37 PM
Surr: BFB	93.8	75.3-105		%Rec	1	9/2/2020 8:03:37 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	9/2/2020 8:03:37 PM
Toluene	ND	0.049		mg/Kg	1	9/2/2020 8:03:37 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/2/2020 8:03:37 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/2/2020 8:03:37 PM
Surr: 4-Bromofluorobenzene	99.5	80-120		%Rec	1	9/2/2020 8:03:37 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	230	60		mg/Kg	20	9/6/2020 12:17:07 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 83 of 102

Analytical Report

Lab Order 2008G98

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-28 0.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 8/27/2020 3:15:00 PM

Lab ID: 2008G98-084

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.4		mg/Kg	1	9/4/2020 5:49:53 AM
Motor Oil Range Organics (MRO)	ND	42		mg/Kg	1	9/4/2020 5:49:53 AM
Surr: DNOP	36.8	30.4-154		%Rec	1	9/4/2020 5:49:53 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/2/2020 9:13:54 PM
Surr: BFB	94.1	75.3-105		%Rec	1	9/2/2020 9:13:54 PM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.025		mg/Kg	1	9/2/2020 9:13:54 PM
Toluene	ND	0.049		mg/Kg	1	9/2/2020 9:13:54 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/2/2020 9:13:54 PM
Xylenes, Total	ND	0.098		mg/Kg	1	9/2/2020 9:13:54 PM
Surr: 4-Bromofluorobenzene	97.9	80-120		%Rec	1	9/2/2020 9:13:54 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	4700	150		mg/Kg	50	9/8/2020 6:54:11 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 84 of 102

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oak Federal SWD 001

Sample ID: MB-54974		SampType: mblk		TestCode: EPA Method 300.0: Anions							
Client ID: PBS		Batch ID: 54974		RunNo: 71655							
Prep Date: 9/5/2020		Analysis Date: 9/5/2020		SeqNo: 2505219		Units: mg/Kg					
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		ND	1.5								

Sample ID: LCS-54974		SampType: Ics		TestCode: EPA Method 300.0: Anions						
Client ID: LCSS		Batch ID: 54974		RunNo: 71655						
Prep Date: 9/5/2020		Analysis Date: 9/5/2020		SeqNo: 2505220		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.4	90	110			

Sample ID: MB-54976		SampType: mblk		TestCode: EPA Method 300.0: Anions						
Client ID: PBS		Batch ID: 54976		RunNo: 71655						
Prep Date: 9/5/2020		Analysis Date: 9/5/2020		SeqNo: 2505249		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-54976		SampType: Ics		TestCode: EPA Method 300.0: Anions						
Client ID: LCSS		Batch ID: 54976		RunNo: 71655						
Prep Date: 9/5/2020		Analysis Date: 9/5/2020		SeqNo: 2505250		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	15	1.5	15.00	0	96.9	90	110			

Sample ID: MB-54979		SampType: mblk		TestCode: EPA Method 300.0: Anions						
Client ID: PBS		Batch ID: 54979		RunNo: 71656						
Prep Date: 9/5/2020		Analysis Date: 9/5/2020		SeqNo: 2505307		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-54979		SampType: ics		TestCode: EPA Method 300.0: Anions						
Client ID: LCSS		Batch ID: 54979		RunNo: 71656						
Prep Date: 9/5/2020		Analysis Date: 9/5/2020		SeqNo: 2505308			Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	95.9	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 Quantitative 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#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oak Federal SWD 001

Sample ID: MB-54975	SampType: mblik	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 54975	RunNo: 71656								
Prep Date: 9/5/2020	Analysis Date: 9/5/2020	SeqNo: 2505323 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-54975		SampType: lcs		TestCode: EPA Method 300.0: Anions						
Client ID: LCSS		Batch ID: 54975		RunNo: 71656						
Prep Date: 9/5/2020		Analysis Date: 9/5/2020		SeqNo: 2505324		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	96.0	90	110			

Sample ID: MB-54977		SampType: mbk		TestCode: EPA Method 300.0: Anions						
Client ID: PBS		Batch ID: 54977		RunNo: 71656						
Prep Date: 9/5/2020		Analysis Date: 9/5/2020		SeqNo: 2505353		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-54977		SampType: lcs		TestCode: EPA Method 300.0: Anions						
Client ID: LCSS		Batch ID: 54977		RunNo: 71656						
Prep Date: 9/5/2020		Analysis Date: 9/5/2020		SeqNo: 2505354		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	95.4	90	110			

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oak Federal SWD 001

Sample ID: LCS-54824	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 54824	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499589 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	36	10	50.00	0	72.0	70	130			
Surr: DNOP	3.2		5.000		63.0	30.4	154			

Sample ID: MB-54824	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 54824	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499594 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	6.4		10.00		63.6	30.4	154			

Sample ID: 2008G98-010AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BS20-26 0.5'	Batch ID: 54860	RunNo: 71526								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2500747 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	9.3	46.73	0	95.3	47.4	136			
Surr: DNOP	3.5		4.673		75.9	30.4	154			

Sample ID: 2008G98-010AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BS20-26 0.5'	Batch ID: 54860	RunNo: 71526								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2500748 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	44	9.5	47.53	0	92.5	47.4	136	1.19	43.4	
Surr: DNOP	3.1		4.753		65.6	30.4	154	0	0	

Sample ID: LCS-54860	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 54860	RunNo: 71526								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2500762 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	48	10	50.00	0	95.0	70	130			
Surr: DNOP	4.5		5.000		89.3	30.4	154			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak Federal SWD 001

Sample ID: MB-54860	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 54860	RunNo: 71526								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2500764 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.2		10.00		92.0	30.4	154			

Sample ID: 2008G98-046AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BS20-63 2.5'	Batch ID: 54861	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2501909 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	38	9.2	46.13	3.810	74.2	47.4	136			
Surr: DNOP	2.9		4.613		63.8	30.4	154			

Sample ID: 2008G98-046AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BS20-63 2.5'	Batch ID: 54861	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2501910 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	42	9.5	47.53	3.810	79.4	47.4	136	8.77	43.4	
Surr: DNOP	3.4		4.753		70.8	30.4	154	0	0	

Sample ID: LCS-54859	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 54859	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2501938 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	89.8	70	130			
Surr: DNOP	3.3		5.000		66.0	30.4	154			

Sample ID: LCS-54861	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 54861	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2501939 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	42	10	50.00	0	83.9	70	130			
Surr: DNOP	3.4		5.000		67.6	30.4	154			

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oak Federal SWD 001

Sample ID: MB-54859	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 54859	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2501946 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	7.2		10.00		71.6	30.4	154			

Sample ID: MB-54861	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 54861	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2501947 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	7.8		10.00		78.2	30.4	154			

Sample ID: 2008G98-066AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: WS20-23 0-8'	Batch ID: 54866	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/4/2020	SeqNo: 2503474 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	9.9	49.31	2.872	86.2	47.4	136			
Surr: DNOP	3.7		4.931		75.3	30.4	154			

Sample ID: 2008G98-066AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: WS20-23 0-8'	Batch ID: 54866	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/4/2020	SeqNo: 2503475 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	49	8.4	42.16	2.872	109	47.4	136	7.57	43.4	
Surr: DNOP	4.1		4.216		97.8	30.4	154	0	0	

Sample ID: LCS-54866	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 54866	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/4/2020	SeqNo: 2503518 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	58	10	50.00	0	116	70	130			
Surr: DNOP	5.2		5.000		104	30.4	154			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 89 of 102

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak Federal SWD 001Sample ID: **MB-54866** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**Client ID: **PBS** Batch ID: **54866** RunNo: **71591**Prep Date: **9/1/2020** Analysis Date: **9/4/2020** SeqNo: **2503522** 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		101	30.4	154			

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quantitative 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

Page 90 of 102

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oak Federal SWD 001

Sample ID: mb-54841		SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: PBS		Batch ID: 54841		RunNo: 71546							
Prep Date: 9/1/2020		Analysis Date: 9/2/2020		SeqNo: 2500649		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		970		1000		97.1	75.3	105			

Sample ID: lcs-54841		SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range						
Client ID: LCSS		Batch ID: 54841		RunNo: 71546						
Prep Date: 9/1/2020		Analysis Date: 9/2/2020		SeqNo: 2500650		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	5.0	25.00	0	85.7	72.5	106			
Surr: BFB	1100		1000		107	75.3	105			S

Sample ID: 2008g98-081ams	SampType: MS			TestCode: EPA Method 8015D: Gasoline Range						
Client ID: BS20-99 1.5'	Batch ID: 54841			RunNo: 71546						
Prep Date: 9/1/2020	Analysis Date: 9/2/2020			SeqNo: 2500654		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	4.7	23.52	0	89.7	61.3	114			
Surr: BFB	970		940.7		103	75.3	105			

Sample ID: 2008g98-081amsd		SampType: MSD		TestCode: EPA Method 8015D: Gasoline Range						
Client ID: BS20-99 1.5'		Batch ID: 54841		RunNo: 71546						
Prep Date: 9/1/2020		Analysis Date: 9/2/2020		SeqNo: 2500655		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	4.9	24.30	0	86.2	61.3	114	0.798	20	
Surr: BFB	1000		971.8		106	75.3	105	0	0	S

Sample ID: mb-54816		SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range						
Client ID: PBS		Batch ID: 54816		RunNo: 71546						
Prep Date: 8/31/2020		Analysis Date: 9/3/2020		SeqNo: 2500673		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	960		1000		95.5	75.3	105			

Sample ID: lcs-54816	SampType: LCS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: LCSS	Batch ID: 54816	RunNo: 71546								
Prep Date: 8/31/2020	Analysis Date: 9/2/2020	SeqNo: 2500674 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 Quantitative 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

Page 91 of 102

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak Federal SWD 001

Sample ID: lcs-54816	SampType: LCS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: LCSS	Batch ID: 54816	RunNo: 71546								
Prep Date: 8/31/2020	Analysis Date: 9/2/2020	SeqNo: 2500674 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	5.0	25.00	0	81.2	72.5	106			
Surr: BFB	1000		1000		102	75.3	105			

Sample ID: 2008g98-002ams	SampType: MS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: BS20-18 0.5'	Batch ID: 54816	RunNo: 71546								
Prep Date: 8/31/2020	Analysis Date: 9/3/2020	SeqNo: 2500677 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	19	5.0	24.95	0	75.2	61.3	114			
Surr: BFB	1000		998.0		101	75.3	105			

Sample ID: 2008g98-002amsd	SampType: MSD	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: BS20-18 0.5'	Batch ID: 54816	RunNo: 71546								
Prep Date: 8/31/2020	Analysis Date: 9/3/2020	SeqNo: 2500678 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	4.9	24.37	0	81.0	61.3	114	5.01	20	
Surr: BFB	1000		974.7		105	75.3	105	0	0	

Sample ID: 2008g98-062ams	SampType: MS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: WS20-12 0-0.5'	Batch ID: 54825	RunNo: 71590								
Prep Date: 8/31/2020	Analysis Date: 9/4/2020	SeqNo: 2503186 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	4.9	24.53	0	82.0	61.3	114			
Surr: BFB	1000		981.4		102	75.3	105			

Sample ID: 2008g98-062amsd	SampType: MSD	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: WS20-12 0-0.5'	Batch ID: 54825	RunNo: 71590								
Prep Date: 8/31/2020	Analysis Date: 9/4/2020	SeqNo: 2503187 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	5.0	24.90	0	79.2	61.3	114	1.94	20	
Surr: BFB	1000		996.0		103	75.3	105	0	0	

Sample ID: lcs-54825	SampType: LCS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: LCSS	Batch ID: 54825	RunNo: 71590								
Prep Date: 8/31/2020	Analysis Date: 9/3/2020	SeqNo: 2503198 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 Quantitative 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

Page 92 of 102

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak Federal SWD 001

Sample ID: lcs-54825	SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: LCSS	Batch ID: 54825		RunNo: 71590							
Prep Date: 8/31/2020	Analysis Date: 9/3/2020		SeqNo: 2503198		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	5.0	25.00	0	79.0	72.5	106			
Surr: BFB	1000		1000		103	75.3	105			

Sample ID: mb-54825	SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: PBS	Batch ID: 54825		RunNo: 71590							
Prep Date: 8/31/2020	Analysis Date: 9/4/2020		SeqNo: 2503200		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	960		1000		95.6	75.3	105			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 93 of 102

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oak Federal SWD 001

Sample ID: mb-54841	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBS	Batch ID: 54841	RunNo: 71546								
Prep Date: 9/1/2020	Analysis Date: 9/2/2020	SeqNo: 2500692			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.0		1.000		101	80	120			

Sample ID: LCS-54841	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batch ID: 54841			RunNo: 71546						
Prep Date: 9/1/2020	Analysis Date: 9/2/2020			SeqNo: 2500693			Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.90	0.025	1.000	0	90.2	80	120			
Toluene	0.91	0.050	1.000	0	91.5	80	120			
Ethylbenzene	0.92	0.050	1.000	0	92.1	80	120			
Xylenes, Total	2.8	0.10	3.000	0	92.2	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		101	80	120			

Sample ID: 2008g98-082ams	SampType: MS		TestCode: EPA Method 8021B: Volatiles							
Client ID: BS20-104 4'	Batch ID: 54841		RunNo: 71546							
Prep Date: 9/1/2020	Analysis Date: 9/2/2020		SeqNo: 2500700		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.94	0.024	0.9709	0	96.6	76.3	120			
Toluene	0.96	0.049	0.9709	0.01034	98.1	78.5	120			
Ethylbenzene	0.99	0.049	0.9709	0	102	78.1	124			
Xylenes, Total	3.0	0.097	2.913	0	102	79.3	125			
Surr: 4-Bromofluorobenzene	0.98		0.9709		101	80	120			

Sample ID: 2008g98-082amsd		SampType: MSD		TestCode: EPA Method 8021B: Volatiles						
Client ID: BS20-104 4'		Batch ID: 54841		RunNo: 71546						
Prep Date: 9/1/2020		Analysis Date: 9/2/2020		SeqNo: 2500701		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.94	0.024	0.9569	0	98.4	76.3	120	0.370	20	
Toluene	0.97	0.048	0.9569	0.01034	101	78.5	120	1.12	20	
Ethylbenzene	1.0	0.048	0.9569	0	104	78.1	124	0.945	20	
Xylenes, Total	3.0	0.096	2.871	0	104	79.3	125	0.845	20	
Surr: 4-Bromofluorobenzene	0.96		0.9569		101	80	120	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 94 of 102

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak Federal SWD 001

Sample ID: mb-54816		SampType: MBLK		TestCode: EPA Method 8021B: Volatiles						
Client ID: PBS		Batch ID: 54816		RunNo: 71546						
Prep Date: 8/31/2020		Analysis Date: 9/3/2020		SeqNo: 2500706			Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	0.10								
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.98		1.000		97.9	80	120			

Sample ID: LCS-54816	SampType: LCS		TestCode: EPA Method 8021B: Volatiles							
Client ID: LCSS	Batch ID: 54816		RunNo: 71546							
Prep Date: 8/31/2020	Analysis Date: 9/2/2020		SeqNo: 2500707		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	1.0	0.10	1.000	0	100	70.9	141			
Benzene	0.89	0.025	1.000	0	89.4	80	120			
Toluene	0.91	0.050	1.000	0	90.8	80	120			
Ethylbenzene	0.91	0.050	1.000	0	91.1	80	120			
Xylenes, Total	2.8	0.10	3.000	0	91.8	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		100	80	120			

Sample ID: 2008g98-001ams	SampType: MS		TestCode: EPA Method 8021B: Volatiles							
Client ID: BS20-17 0.25'	Batch ID: 54816		RunNo: 71546							
Prep Date: 8/31/2020	Analysis Date: 9/2/2020		SeqNo: 2500709		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	1.1	0.10	0.9960	0	107	78.1	153			
Benzene	0.93	0.025	0.9960	0	93.8	76.3	120			
Toluene	0.97	0.050	0.9960	0.01090	95.8	78.5	120			
Ethylbenzene	0.97	0.050	0.9960	0	97.4	78.1	124			
Xylenes, Total	3.0	0.10	2.988	0	98.9	79.3	125			
Surr: 4-Bromofluorobenzene	1.0		0.9960		103	80	120			

Sample ID: 2008g98-001amsd		SampType: MSD		TestCode: EPA Method 8021B: Volatiles						
Client ID: BS20-17 0.25'		Batch ID: 54816		RunNo: 71546						
Prep Date: 8/31/2020		Analysis Date: 9/2/2020		SeqNo: 2500710		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	1.0	0.099	0.9862	0	103	78.1	153	4.65	20	
Benzene	0.90	0.025	0.9862	0	91.0	76.3	120	4.02	20	
Toluene	0.92	0.049	0.9862	0.01090	91.8	78.5	120	5.23	20	
Ethylbenzene	0.93	0.049	0.9862	0	94.8	78.1	124	3.71	20	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 95 of 102

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oak Federal SWD 001

Sample ID: 2008g98-001amsd	SampType: MSD	TestCode: EPA Method 8021B: Volatiles								
Client ID: BS20-17 0.25'	Batch ID: 54816	RunNo: 71546								
Prep Date: 8/31/2020	Analysis Date: 9/2/2020	SeqNo: 2500710 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Xylenes, Total	2.8	0.099	2.959	0	94.8	79.3	125	5.25	20	
Surr: 4-Bromofluorobenzene	1.0		0.9862		101	80	120	0	0	

Sample ID: 2008g98-061ams	SampType: MS	TestCode: EPA Method 8021B: Volatiles								
Client ID: BS20-95 0.5'	Batch ID: 54825	RunNo: 71590								
Prep Date: 8/31/2020	Analysis Date: 9/4/2020	SeqNo: 2503219 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.88	0.025	0.9960	0	88.5	76.3	120			
Toluene	0.91	0.050	0.9960	0	90.9	78.5	120			
Ethylbenzene	0.92	0.050	0.9960	0	92.0	78.1	124			
Xylenes, Total	2.8	0.10	2.988	0	92.3	79.3	125			
Surr: 4-Bromofluorobenzene	1.0		0.9960		101	80	120			

Sample ID: 2008g98-061amsd	SampType: MSD	TestCode: EPA Method 8021B: Volatiles								
Client ID: BS20-95 0.5'	Batch ID: 54825	RunNo: 71590								
Prep Date: 8/31/2020	Analysis Date: 9/4/2020	SeqNo: 2503220 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.84	0.024	0.9737	0	86.8	76.3	120	4.28	20	
Toluene	0.86	0.049	0.9737	0	88.5	78.5	120	4.92	20	
Ethylbenzene	0.87	0.049	0.9737	0	89.5	78.1	124	5.05	20	
Xylenes, Total	2.6	0.097	2.921	0	89.8	79.3	125	5.01	20	
Surr: 4-Bromofluorobenzene	0.98		0.9737		101	80	120	0	0	

Sample ID: LCS-54825	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSS	Batch ID: 54825	RunNo: 71590								
Prep Date: 8/31/2020	Analysis Date: 9/4/2020	SeqNo: 2503232 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.88	0.025	1.000	0	88.5	80	120			
Toluene	0.90	0.050	1.000	0	90.0	80	120			
Ethylbenzene	0.91	0.050	1.000	0	90.6	80	120			
Xylenes, Total	2.8	0.10	3.000	0	91.7	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		99.8	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 96 of 102

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak Federal SWD 001

Sample ID: mb-54825	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBS	Batch ID: 54825	RunNo: 71590								
Prep Date: 8/31/2020	Analysis Date: 9/4/2020	SeqNo: 2503234			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.0		1.000		100	80	120			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 97 of 102

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak Federal SWD 001

Sample ID: lcs-54819	SampType: LCS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BatchQC	Batch ID: 54819	RunNo: 71581								
Prep Date: 8/31/2020	Analysis Date: 9/3/2020	SeqNo: 2500853	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	1.000	0	102	80	120			
Toluene	1.0	0.050	1.000	0	100	80	120			
Ethylbenzene	1.0	0.050	1.000	0	102	80	120			
Xylenes, Total	3.2	0.10	3.000	0	107	80	120			
Surr: 1,2-Dichloroethane-d4	0.47		0.5000		94.1	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.5000		101	70	130			
Surr: Dibromofluoromethane	0.56		0.5000		111	70	130			
Surr: Toluene-d8	0.48		0.5000		95.5	70	130			

Sample ID: mb-54819	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBS	Batch ID: 54819	RunNo: 71581								
Prep Date: 8/31/2020	Analysis Date: 9/3/2020	SeqNo: 2500858	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	0.47		0.5000		94.4	70	130			
Surr: 4-Bromofluorobenzene	0.52		0.5000		103	70	130			
Surr: Dibromofluoromethane	0.54		0.5000		109	70	130			
Surr: Toluene-d8	0.49		0.5000		98.1	70	130			

Sample ID: 2008g98-021ams	SampType: MS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BS20-38 0.5'	Batch ID: 54819	RunNo: 71581								
Prep Date: 8/31/2020	Analysis Date: 9/3/2020	SeqNo: 2500906	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	0.9833	0	105	71.1	115			
Toluene	1.1	0.049	0.9833	0	107	79.6	132			
Ethylbenzene	1.1	0.049	0.9833	0	109	83.8	134			
Xylenes, Total	3.3	0.098	2.950	0	113	82.4	132			
Surr: 1,2-Dichloroethane-d4	0.49		0.4916		100	70	130			
Surr: 4-Bromofluorobenzene	0.52		0.4916		105	70	130			
Surr: Dibromofluoromethane	0.56		0.4916		114	70	130			
Surr: Toluene-d8	0.49		0.4916		98.7	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 Quantitative 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

Page 98 of 102

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oak Federal SWD 001

Sample ID: 2008g98-021amsd	SampType: MSD4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BS20-38 0.5'	Batch ID: 54819	RunNo: 71581								
Prep Date: 8/31/2020	Analysis Date: 9/3/2020	SeqNo: 2500908	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.024	0.9737	0	107	71.1	115	0.996	20	
Toluene	1.0	0.049	0.9737	0	106	79.6	132	2.03	20	
Ethylbenzene	1.0	0.049	0.9737	0	107	83.8	134	2.81	20	
Xylenes, Total	3.2	0.097	2.921	0	110	82.4	132	3.83	20	
Surr: 1,2-Dichloroethane-d4	0.48		0.4869		99.3	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.51		0.4869		104	70	130	0	0	
Surr: Dibromofluoromethane	0.55		0.4869		114	70	130	0	0	
Surr: Toluene-d8	0.45		0.4869		92.8	70	130	0	0	

Sample ID: mb-54822	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBS	Batch ID: 54822	RunNo: 71606								
Prep Date: 8/31/2020	Analysis Date: 9/3/2020	SeqNo: 2502961	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	0.51		0.5000		102	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.5000		96.0	70	130			
Surr: Dibromofluoromethane	0.49		0.5000		97.3	70	130			
Surr: Toluene-d8	0.50		0.5000		101	70	130			

Sample ID: lcs-54822	SampType: LCS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BatchQC	Batch ID: 54822	RunNo: 71606								
Prep Date: 8/31/2020	Analysis Date: 9/3/2020	SeqNo: 2502962	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.91	0.025	1.000	0	90.6	80	120			
Toluene	1.0	0.050	1.000	0	100	80	120			
Ethylbenzene	1.0	0.050	1.000	0	102	80	120			
Xylenes, Total	3.0	0.10	3.000	0	100	80	120			
Surr: 1,2-Dichloroethane-d4	0.51		0.5000		101	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.5000		96.4	70	130			
Surr: Dibromofluoromethane	0.49		0.5000		97.6	70	130			
Surr: Toluene-d8	0.51		0.5000		103	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 99 of 102

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak Federal SWD 001

Sample ID: 2008g98-041ams	SampType: MS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BS20-58 0.5'	Batch ID: 54822	RunNo: 71606								
Prep Date: 8/31/2020	Analysis Date: 9/4/2020	SeqNo: 2502964 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.92	0.025	0.9823	0	93.5	71.1	115			
Toluene	1.0	0.049	0.9823	0	105	79.6	132			
Ethylbenzene	1.1	0.049	0.9823	0	108	83.8	134			
Xylenes, Total	3.1	0.098	2.947	0	105	82.4	132			
Surr: 1,2-Dichloroethane-d4	0.49		0.4912		99.9	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.4912		98.3	70	130			
Surr: Dibromofluoromethane	0.49		0.4912		99.4	70	130			
Surr: Toluene-d8	0.51		0.4912		105	70	130			

Sample ID: 2008g98-041amsd	SampType: MSD4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BS20-58 0.5'	Batch ID: 54822	RunNo: 71606								
Prep Date: 8/31/2020	Analysis Date: 9/4/2020	SeqNo: 2502965 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.92	0.025	0.9921	0	92.3	71.1	115	0.269	20	
Toluene	1.0	0.050	0.9921	0	105	79.6	132	0.0969	20	
Ethylbenzene	1.1	0.050	0.9921	0	107	83.8	134	0.111	20	
Xylenes, Total	3.1	0.099	2.976	0	104	82.4	132	0.271	20	
Surr: 1,2-Dichloroethane-d4	0.51		0.4960		102	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.47		0.4960		95.2	70	130	0	0	
Surr: Dibromofluoromethane	0.50		0.4960		101	70	130	0	0	
Surr: Toluene-d8	0.52		0.4960		105	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative Limit
 S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
 F Value above quantitation range
 J Analyte detected below quantitation limits
 P Sample pH Not In Range
 RL Reporting Limit

Page 100 of 102

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oak Federal SWD 001

Sample ID: lcs-54819	SampType: LCS	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: LCSS	Batch ID: 54819	RunNo: 71581								
Prep Date: 8/31/2020	Analysis Date: 9/3/2020	SeqNo: 2500950 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	5.0	25.00	0	83.7	70	130			
Surr: BFB	510		500.0		102	70	130			

Sample ID: mb-54819	SampType: MBLK	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: PBS	Batch ID: 54819	RunNo: 71581								
Prep Date: 8/31/2020	Analysis Date: 9/3/2020	SeqNo: 2500951 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	520		500.0		105	70	130			

Sample ID: mb-54822	SampType: MBLK	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: PBS	Batch ID: 54822	RunNo: 71606								
Prep Date: 8/31/2020	Analysis Date: 9/3/2020	SeqNo: 2502976 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	480		500.0		95.8	70	130			

Sample ID: lcs-54822	SampType: LCS	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: LCSS	Batch ID: 54822	RunNo: 71606								
Prep Date: 8/31/2020	Analysis Date: 9/3/2020	SeqNo: 2502977 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	5.0	25.00	0	84.1	70	130			
Surr: BFB	470		500.0		93.6	70	130			

Sample ID: 2008g98-042ams	SampType: MS	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: BS20-59 0.5'	Batch ID: 54822	RunNo: 71606								
Prep Date: 8/31/2020	Analysis Date: 9/4/2020	SeqNo: 2502980 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	19	5.0	24.78	0	77.6	49.2	122			
Surr: BFB	470		495.5		94.2	70	130			

Sample ID: 2008g98-042amsd	SampType: MSD	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: BS20-59 0.5'	Batch ID: 54822	RunNo: 71606								
Prep Date: 8/31/2020	Analysis Date: 9/4/2020	SeqNo: 2502981 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 Quantitative 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

Page 101 of 102

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G98

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak Federal SWD 001

Sample ID: 2008g98-042amsd		SampType: MSD		TestCode: EPA Method 8015D Mod: Gasoline Range						
Client ID: BS20-59 0.5'		Batch ID: 54822		RunNo: 71606						
Prep Date: 8/31/2020		Analysis Date: 9/4/2020		SeqNo: 2502981		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	4.9	24.58	0	80.8	49.2	122	3.15	20	
Surr: BFB	460		491.6		93.2	70	130	0	0	

Sample ID: 2008g98-022ams		SampType: MS		TestCode: EPA Method 8015D Mod: Gasoline Range						
Client ID: BS20-39 0.5'		Batch ID: 54819		RunNo: 71605						
Prep Date: 8/31/2020		Analysis Date: 9/3/2020		SeqNo: 2503548		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	4.9	24.56	0	89.9	49.2	122			
Surr: BFB	530		491.2		109	70	130			

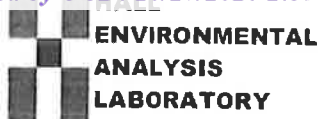
Sample ID: 2008g98-022amsd	SampType: MSD			TestCode: EPA Method 8015D Mod: Gasoline Range						
Client ID: BS20-39 0.5'	Batch ID: 54819			RunNo: 71605						
Prep Date: 8/31/2020	Analysis Date: 9/3/2020			SeqNo: 2503549		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	4.9	24.53	0	88.2	49.2	122	2.07	20	
Surr: BFB	520		490.7		106	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level,
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 102 of 102



Sample Log-In Check List

Client Name: Vertex Resource Group Lt

Work Order Number: 2008G98

RcptNo: 1

Received By: Cheyenne Cason 8/29/2020 8:30:00 AM

Completed By: Isaiah Ortiz 8/31/2020 8:16:11 AM

Reviewed By: EM 8/31/20

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ 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: JRE 8/31/20

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

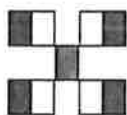
Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.4	Good	Not Present			
2	1	Good	Not Present			



**HALL ENVIRONMENTAL
ANALYSIS LABORATORY**

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Chain-of-Custody Record

Chain-of-Custody Record									
Client: <u>Vertex</u>		Turn-Around Time: <u>5 day Turn</u>							
Mailing Address: <u>on file</u>		☒ Standard		☐ Rush		Project Name:			
Phone #: <u> </u>		Project #: <u>Shinnery Oak Federal SWD14001</u>							
email or Fax#: <u> </u>		Project Manager: <u>Natalie Gordon</u>							
QA/QC Package:		Sampler: <u>Monica Peppin</u>							
☐ Standard		☐ Level 4 (Full Validation)		On Ice: ☒ Yes ☐ No		# of Coolers: <u>2</u>			
Accreditation: ☐ Az Compliance		☐ NELAC		☐ Other <u> </u>		Cooler Temp (including CF): <u>See Profile</u> (°C)			
☐ EDD (Type) <u> </u>									
Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.			
8/28/20	7:40	Soil	BS20-17 0.25'	4 oz jar	ice	2008698			
8/28/20	7:45		BS20-18 0.5'			2008698			
8/28/20	7:40		BS20-19 0.5'			2008698			
8/28/20	7:50		BS20-20 0.5'			2008698			
8/28/20	8:30		BS20-21 0.5'			2008698			
8/28/20	8:20		BS20-22 0.5'			2008698			
8/28/20	8:35		BS20-23 0.5'			2008698			
8/28/20	8:40		BS20-24 0.5'			2008698			
8/28/20	8:45		BS20-25 0.5'			2008698			
8/28/20	8:50		BS20-26 0.5'			2008698			
8/28/20	8:55		BS20-27 0.5'			2008698			
8/28/20	9:00		BS20-28 0.5'			2008698			
Date: <u>8/28/20</u>	Time: <u>1250</u>	Relinquished by: <u>[Signature]</u>		Received by: <u>Alumina</u>		Date: <u>8/28/20</u>		Time: <u>1250</u>	
Date: <u>8/28/20</u>	Time: <u>1900</u>	Relinquished by: <u>Alumina</u>		Received by: <u>cm</u>		Date: <u>8/29/20</u>		Time: <u>0830</u>	

necessarily, 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.

Page 4 of 4

Chain-of-Custody Record

Client: Vertex

Turn-Around Time: 5 day turn ☒ Standard ☐ Rush

Project Name: Shinnery Oak Federal SWD #001

Project #: 20E-00239-014

Project Manager: Natalie Gordon

Sampler: Monica Peppin

On Ice: ☒ Yes ☐ No

of Coolers: 2

Cooler Temp (including CFI): See Remarks (°C)

Container Type and # 4 oz jar Preservative Type ice HEAL No. 20080418

Container Type and # 4 oz jar Preservative Type ice HEAL No. 036

Container Type and # 4 oz jar Preservative Type ice HEAL No. 037

Container Type and # 4 oz jar Preservative Type ice HEAL No. 038

Container Type and # 4 oz jar Preservative Type ice HEAL No. 039

Container Type and # 4 oz jar Preservative Type ice HEAL No. 040

Container Type and # 4 oz jar Preservative Type ice HEAL No. 041

Container Type and # 4 oz jar Preservative Type ice HEAL No. 042

Container Type and # 4 oz jar Preservative Type ice HEAL No. 043

Container Type and # 4 oz jar Preservative Type ice HEAL No. 044

Container Type and # 4 oz jar Preservative Type ice HEAL No. 045

Container Type and # 4 oz jar Preservative Type ice HEAL No. 046

Container Type and # 4 oz jar Preservative Type ice HEAL No. 047

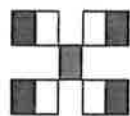
Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.
10/28/20	11:45	Soil	BS20-53	0.5'	ice	036
10/28/20	10:50	Soil	BS20-54	0.5'	ice	037
10/28/20	10:55	Soil	BS20-55	0.5'	ice	038
10/28/20	11:00	Soil	BS20-56	0.5'	ice	039
10/28/20	11:05	Soil	BS20-57	0.5'	ice	040
10/28/20	11:10	Soil	BS20-58	0.5'	ice	041
10/28/20	11:15	Soil	BS20-59	0.5'	ice	042
10/28/20	11:20	Soil	BS20-60	0.5'	ice	043
10/28/20	11:25	Soil	BS20-61	0.5'	ice	044
10/28/20	11:30	Soil	BS20-62	0.5'	ice	045
10/28/20	11:35	Soil	BS20-63	0.5'	ice	046
10/28/20	11:40	Soil	BS20-64	0.5'	ice	047

Date: 10/28/20 Time: 12:00 Relinquished by: [Signature]

Date: 10/28/20 Time: 19:00 Relinquished by: [Signature]

Received by: Adumming Date: 8/28/20 Time: 12:00

Received by: CME CARD Date: 8/29/20 Time: 08:30



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

BTEX / MTBE / TMBs (8021)	X
TPH:8015D(GRO / DRO / MRO)	X
8081 Pesticides/8082 PCBs	
EDB (Method 504.1)	
PAHs by 8310 or 8270SIMS	
RCRA 8 Metals	
Cl, F, Br, NO ₃ , NO ₂ , PO ₄ , SO ₄	X
8260 (VOA)	
8270 (Semi-VOA)	
Total Coliform (Present/Absent)	

Remarks:

345033.4 Send to Natalie Gordon
 8.1.50 = C.I.
 Bill Vertex

Chain-of-Custody Record

Client:

V. L. L. L.

Mailing Address:

on file

Phone #:

email or Fax#:

QA/QC Package:

☐ StandardAccreditation: ☐ Az Compliance☐ NELAC ☐ Other☐ EDD (Type)☐ Level 4 (Full Validation)

Project Manager:

Natalie Gordon

Sampler:

Monica Peppin

On Ice:

☒ Yes ☐ No

of Coolers: 2

Cooler Temp (including CF): See Data (°C)

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.
8/27/20	8:40	Soil	B520-94	902 jar	ice	2008698
8/27/20	8:45		B520-95			060
8/27/20	8:40		W520-12			061
8/27/20	8:45		W520-13			062
8/27/20	7:55		W520-01			063
8/27/20	8:00		W520-02			064
8/27/20	11:30		W520-02			065
8/27/20	2:50		W520-23			066
8/27/20	10:30		W520-28			067
8/27/20	10:35		W520-29			068
8/27/20	10:35		W520-30			069
8/27/20	10:40		W520-31			070
8/27/20	10:45		W520-34			071

Relinquished by:

Date:

1250

8/28/20

Received by:

Date:

8/28/20 1900

Remarks:

3.4 to 0.34 send reports to Natalie Gordon

Via:

Date:

8/28/20 0830

Relinquished by:

Date:

1900

8/28/20

Received by:

Date:

8/28/20 0830

Remarks:

3.4 to 0.34 send reports to Natalie Gordon

Via:

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Via:

Date:

8/28/20 0830

Relinquished by:

Date:

1900

8/28/20

Received by:

Date:

8/28/20 0830

Remarks:

3.4 to 0.34 send reports to Natalie Gordon

Via:

Date:

8/28/20 0830

Relinquished by:

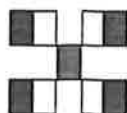
Date:

1900

8/28/20

Received by:

Page 7 of 7



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Chain-of-Custody Record

Chain-of-Custody Record						
Client: <u>Vertex</u>		Turn-Around Time: ☒ Standard ☐ Rush				
Mailing Address: <u>on file</u>		Project Name: <u>Shinnery Oak Federal SWD #101</u>				
Phone #: <u> </u>		Project #: <u>20E-00234-017</u>				
email or Fax#: <u> </u>		Project Manager: <u>Walter C. Gordon</u>				
QA/QC Package: ☐ Standard ☐ Level 4 (Full Validation)		Sampler: <u>Marian Peppin</u>				
Accreditation: ☐ Az Compliance ☐ NELAC ☐ Other <u> </u>		On Ice: ☒ Yes ☐ No				
☐ EDD (Type) <u> </u>		# of Coolers: <u>2</u>				
Cooler Temp (including CF): <u>See Below</u> (°C)						
Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No
8/27/20	10:50	Soil	WS20-35 0-1.5'	42 jar	ice	2008298 072
8/27/20	10:55		WS20-36 0-1.5'			073
8/27/20	2:55		WS20-42 0-2.5'			074
8/27/20	8:50		WS20-09 0-0.5'			075
8/27/20	8:55		WS20-10 0-0.5'			076
8/27/20	4:00		WS20-11 0-0.5'	20 N6		077
8/27/20	10:00		WS20-43 0-0.5'	0-2.5' 1B 1/11/20		078
8/27/20	4:20		BS20-84 8'			079
8/27/20	11:00		BS20-98 1.5'			080
8/27/20	11:05		BS20-99 1.5'			081
8/27/20	2:30		BS20-104 4'			087
8/27/20	11:10		BS20-105 1.5'			083
Date: <u>8/28/20</u> Time: <u>10:50</u>		Relinquished by: <u>[Signature]</u>		Received by: <u>OCunning</u> Date: <u>8/28/20</u> Time: <u>12:50</u>		
Date: <u>8/28/20</u> Time: <u>1900</u>		Relinquished by: <u>[Signature]</u>		Received by: <u>OCunning</u> Date: <u>8/29/20</u> Time: <u>08:30</u>		

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



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

September 11, 2020

Natalie Gordon

Vertex Resource Group Ltd.

3101 Boyd Drive

Carlsbad, NM 88220

TEL: (505) 506-0040

FAX:

RE: Shinnery Oak SWD

OrderNo.: 2008G97

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 17 sample(s) on 8/29/2020 for the analyses presented in the following report.

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

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

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

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a horizontal line.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Analytical Report

Lab Order 2008G97

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-96 13'

Project: Shinnery Oak SWD

Collection Date: 8/28/2020 2:20:00 PM

Lab ID: 2008G97-001

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	9/3/2020 2:25:33 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/3/2020 2:25:33 AM
Surr: DNOP	71.9	30.4-154		%Rec	1	9/3/2020 2:25:33 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/4/2020 9:23:19 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	9/2/2020 11:01:48 PM
Toluene	ND	0.049		mg/Kg	1	9/2/2020 11:01:48 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/2/2020 11:01:48 PM
Xylenes, Total	ND	0.098		mg/Kg	1	9/2/2020 11:01:48 PM
Surr: 1,2-Dichloroethane-d4	95.7	70-130		%Rec	1	9/2/2020 11:01:48 PM
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	9/2/2020 11:01:48 PM
Surr: Dibromofluoromethane	110	70-130		%Rec	1	9/2/2020 11:01:48 PM
Surr: Toluene-d8	97.0	70-130		%Rec	1	9/2/2020 11:01:48 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/2/2020 11:01:48 PM
Surr: BFB	103	70-130		%Rec	1	9/2/2020 11:01:48 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative Limit
 S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
 E Value above quantitation range
 F Analyte detected below quantitation limits
 P Sample pH Not In Range
 RL Reporting Limit

Page 1 of 23

Analytical Report

Lab Order 2008G97

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-97 1.5'

Project: Shinnery Oak SWD

Collection Date: 8/28/2020 2:25:00 PM

Lab ID: 2008G97-002

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/3/2020 2:35:26 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/3/2020 2:35:26 AM
Surr: DNOP	87.2	30.4-154		%Rec	1	9/3/2020 2:35:26 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	93	60		mg/Kg	20	9/4/2020 10:25:22 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	9/3/2020 2:21:22 AM
Toluene	ND	0.049		mg/Kg	1	9/3/2020 2:21:22 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/3/2020 2:21:22 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/3/2020 2:21:22 AM
Surr: 1,2-Dichloroethane-d4	98.9	70-130		%Rec	1	9/3/2020 2:21:22 AM
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	9/3/2020 2:21:22 AM
Surr: Dibromofluoromethane	113	70-130		%Rec	1	9/3/2020 2:21:22 AM
Surr: Toluene-d8	97.8	70-130		%Rec	1	9/3/2020 2:21:22 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/3/2020 2:21:22 AM
Surr: BFB	104	70-130		%Rec	1	9/3/2020 2:21:22 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative 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

Page 2 of 23

Analytical Report

Lab Order 2008G97

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-100 4'

Project: Shinnery Oak SWD

Collection Date: 8/28/2020 2:30:00 PM

Lab ID: 2008G97-003

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/3/2020 2:45:22 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/3/2020 2:45:22 AM
Surr: DNOP	63.5	30.4-154		%Rec	1	9/3/2020 2:45:22 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	71	60		mg/Kg	20	9/4/2020 10:37:46 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	9/3/2020 2:49:59 AM
Toluene	ND	0.050		mg/Kg	1	9/3/2020 2:49:59 AM
Ethylbenzene	ND	0.050		mg/Kg	1	9/3/2020 2:49:59 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/3/2020 2:49:59 AM
Surr: 1,2-Dichloroethane-d4	95.0	70-130		%Rec	1	9/3/2020 2:49:59 AM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	9/3/2020 2:49:59 AM
Surr: Dibromofluoromethane	109	70-130		%Rec	1	9/3/2020 2:49:59 AM
Surr: Toluene-d8	96.8	70-130		%Rec	1	9/3/2020 2:49:59 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/3/2020 2:49:59 AM
Surr: BFB	105	70-130		%Rec	1	9/3/2020 2:49:59 AM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- F Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Page 3 of 23

Analytical Report

Lab Order 2008G97

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-101 4'

Project: Shinnery Oak SWD

Collection Date: 8/28/2020 2:35:00 PM

Lab ID: 2008G97-004

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/3/2020 2:55:16 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/3/2020 2:55:16 AM
Surr: DNOP	71.4	30.4-154		%Rec	1	9/3/2020 2:55:16 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	280	60		mg/Kg	20	9/4/2020 10:50:11 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	9/3/2020 3:18:29 AM
Toluene	ND	0.049		mg/Kg	1	9/3/2020 3:18:29 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/3/2020 3:18:29 AM
Xylenes, Total	ND	0.098		mg/Kg	1	9/3/2020 3:18:29 AM
Surr: 1,2-Dichloroethane-d4	96.6	70-130		%Rec	1	9/3/2020 3:18:29 AM
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	9/3/2020 3:18:29 AM
Surr: Dibromofluoromethane	113	70-130		%Rec	1	9/3/2020 3:18:29 AM
Surr: Toluene-d8	100	70-130		%Rec	1	9/3/2020 3:18:29 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/3/2020 3:18:29 AM
Surr: BFB	106	70-130		%Rec	1	9/3/2020 3:18:29 AM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- D Sample Diluted Due to Matrix
- HE Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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

Page 4 of 23

Analytical Report

Lab Order 2008G97

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-102 4'

Project: Shinnery Oak SWD

Collection Date: 8/28/2020 2:40:00 PM

Lab ID: 2008G97-005

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	9/3/2020 3:05:10 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/3/2020 3:05:10 AM
Surr: DNOP	73.2	30.4-154		%Rec	1	9/3/2020 3:05:10 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	190	59		mg/Kg	20	9/4/2020 11:02:35 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	9/3/2020 3:46:55 AM
Toluene	ND	0.049		mg/Kg	1	9/3/2020 3:46:55 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/3/2020 3:46:55 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/3/2020 3:46:55 AM
Surr: 1,2-Dichloroethane-d4	94.5	70-130		%Rec	1	9/3/2020 3:46:55 AM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	9/3/2020 3:46:55 AM
Surr: Dibromofluoromethane	107	70-130		%Rec	1	9/3/2020 3:46:55 AM
Surr: Toluene-d8	99.7	70-130		%Rec	1	9/3/2020 3:46:55 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/3/2020 3:46:55 AM
Surr: BFB	103	70-130		%Rec	1	9/3/2020 3:46:55 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 5 of 23

Analytical Report

Lab Order 2008G97

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-103 4'

Project: Shinnery Oak SWD

Collection Date: 8/28/2020 2:45:00 PM

Lab ID: 2008G97-006

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	9/3/2020 3:15:16 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/3/2020 3:15:16 AM
Surr: DNOP	69.8	30.4-154		%Rec	1	9/3/2020 3:15:16 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	130	60		mg/Kg	20	9/4/2020 11:15:00 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	9/3/2020 4:15:25 AM
Toluene	ND	0.050		mg/Kg	1	9/3/2020 4:15:25 AM
Ethylbenzene	ND	0.050		mg/Kg	1	9/3/2020 4:15:25 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/3/2020 4:15:25 AM
Surr: 1,2-Dichloroethane-d4	94.7	70-130		%Rec	1	9/3/2020 4:15:25 AM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	9/3/2020 4:15:25 AM
Surr: Dibromofluoromethane	112	70-130		%Rec	1	9/3/2020 4:15:25 AM
Surr: Toluene-d8	98.5	70-130		%Rec	1	9/3/2020 4:15:25 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/3/2020 4:15:25 AM
Surr: BFB	105	70-130		%Rec	1	9/3/2020 4:15:25 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 6 of 23

Analytical Report

Lab Order 2008G97

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-18 0-1

Project: Shinnery Oak SWD

Collection Date: 8/28/2020 1:30:00 PM

Lab ID: 2008G97-007

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/1/2020 9:14:00 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/1/2020 9:14:00 PM
Surr: DNOP	70.4	30.4-154		%Rec	1	9/1/2020 9:14:00 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/4/2020 11:27:24 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	9/3/2020 4:43:55 AM
Toluene	ND	0.049		mg/Kg	1	9/3/2020 4:43:55 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/3/2020 4:43:55 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/3/2020 4:43:55 AM
Surr: 1,2-Dichloroethane-d4	94.9	70-130		%Rec	1	9/3/2020 4:43:55 AM
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	9/3/2020 4:43:55 AM
Surr: Dibromofluoromethane	113	70-130		%Rec	1	9/3/2020 4:43:55 AM
Surr: Toluene-d8	98.1	70-130		%Rec	1	9/3/2020 4:43:55 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/3/2020 4:43:55 AM
Surr: BFB	105	70-130		%Rec	1	9/3/2020 4:43:55 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 7 of 23

Analytical Report

Lab Order 2008G97

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-19 0-1

Project: Shinnery Oak SWD

Collection Date: 8/28/2020 2:50:00 PM

Lab ID: 2008G97-008

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.8		mg/Kg	1	9/1/2020 9:23:56 PM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	9/1/2020 9:23:56 PM
Surr: DNOP	121	30.4-154		%Rec	1	9/1/2020 9:23:56 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	730	60		mg/Kg	20	9/4/2020 11:39:48 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	9/3/2020 5:12:29 AM
Toluene	ND	0.049		mg/Kg	1	9/3/2020 5:12:29 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/3/2020 5:12:29 AM
Xylenes, Total	ND	0.098		mg/Kg	1	9/3/2020 5:12:29 AM
Surr: 1,2-Dichloroethane-d4	95.3	70-130		%Rec	1	9/3/2020 5:12:29 AM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	9/3/2020 5:12:29 AM
Surr: Dibromofluoromethane	111	70-130		%Rec	1	9/3/2020 5:12:29 AM
Surr: Toluene-d8	96.4	70-130		%Rec	1	9/3/2020 5:12:29 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/3/2020 5:12:29 AM
Surr: BFB	104	70-130		%Rec	1	9/3/2020 5:12:29 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H ~~Holding times~~ for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 8 of 23

Analytical Report

Lab Order 2008G97

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-20 0-1

Project: Shinnery Oak SWD

Collection Date: 8/28/2020 1:35:00 PM

Lab ID: 2008G97-009

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	9/1/2020 9:33:57 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/1/2020 9:33:57 PM
Surr: DNOP	65.6	30.4-154		%Rec	1	9/1/2020 9:33:57 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/4/2020 11:52:13 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/2/2020 4:08:46 PM
Toluene	ND	0.049		mg/Kg	1	9/2/2020 4:08:46 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/2/2020 4:08:46 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/2/2020 4:08:46 PM
Surr: 1,2-Dichloroethane-d4	97.0	70-130		%Rec	1	9/2/2020 4:08:46 PM
Surr: 4-Bromofluorobenzene	95.5	70-130		%Rec	1	9/2/2020 4:08:46 PM
Surr: Dibromofluoromethane	94.7	70-130		%Rec	1	9/2/2020 4:08:46 PM
Surr: Toluene-d8	105	70-130		%Rec	1	9/2/2020 4:08:46 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/2/2020 4:08:46 PM
Surr: BFB	96.5	70-130		%Rec	1	9/2/2020 4:08:46 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level,
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

Analytical Report

Lab Order 2008G97

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-21 0-3

Project: Shinnery Oak SWD

Collection Date: 8/28/2020 1:40:00 PM

Lab ID: 2008G97-010

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/1/2020 9:44:00 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/1/2020 9:44:00 PM
Surr: DNOP	83.7	30.4-154		%Rec	1	9/1/2020 9:44:00 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	290	60		mg/Kg	20	9/5/2020 12:04:38 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/2/2020 5:37:56 PM
Toluene	ND	0.049		mg/Kg	1	9/2/2020 5:37:56 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/2/2020 5:37:56 PM
Xylenes, Total	ND	0.098		mg/Kg	1	9/2/2020 5:37:56 PM
Surr: 1,2-Dichloroethane-d4	98.0	70-130		%Rec	1	9/2/2020 5:37:56 PM
Surr: 4-Bromofluorobenzene	94.2	70-130		%Rec	1	9/2/2020 5:37:56 PM
Surr: Dibromofluoromethane	95.2	70-130		%Rec	1	9/2/2020 5:37:56 PM
Surr: Toluene-d8	105	70-130		%Rec	1	9/2/2020 5:37:56 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/2/2020 5:37:56 PM
Surr: BFB	96.0	70-130		%Rec	1	9/2/2020 5:37:56 PM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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

Page 10 of 23

Analytical Report

Lab Order 2008G97

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-22 0-3

Project: Shinnery Oak SWD

Collection Date: 8/28/2020 1:45:00 PM

Lab ID: 2008G97-011

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	9/1/2020 9:54:00 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/1/2020 9:54:00 PM
Surr: DNOP	51.3	30.4-154		%Rec	1	9/1/2020 9:54:00 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	71	60		mg/Kg	20	9/5/2020 12:17:02 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/2/2020 7:06:48 PM
Toluene	ND	0.050		mg/Kg	1	9/2/2020 7:06:48 PM
Ethylbenzene	ND	0.050		mg/Kg	1	9/2/2020 7:06:48 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/2/2020 7:06:48 PM
Surr: 1,2-Dichloroethane-d4	99.1	70-130		%Rec	1	9/2/2020 7:06:48 PM
Surr: 4-Bromofluorobenzene	97.4	70-130		%Rec	1	9/2/2020 7:06:48 PM
Surr: Dibromofluoromethane	97.0	70-130		%Rec	1	9/2/2020 7:06:48 PM
Surr: Toluene-d8	104	70-130		%Rec	1	9/2/2020 7:06:48 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/2/2020 7:06:48 PM
Surr: BFB	96.4	70-130		%Rec	1	9/2/2020 7:06:48 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level,
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 11 of 23

Analytical Report

Lab Order 2008G97

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-24 0-13

Project: Shinnery Oak SWD

Collection Date: 8/28/2020 1:15:00 PM

Lab ID: 2008G97-012

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/1/2020 10:04:13 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/1/2020 10:04:13 PM
Surr: DNOP	67.8	30.4-154		%Rec	1	9/1/2020 10:04:13 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/5/2020 12:54:17 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/2/2020 7:36:16 PM
Toluene	ND	0.049		mg/Kg	1	9/2/2020 7:36:16 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/2/2020 7:36:16 PM
Xylenes, Total	ND	0.098		mg/Kg	1	9/2/2020 7:36:16 PM
Surr: 1,2-Dichloroethane-d4	98.4	70-130		%Rec	1	9/2/2020 7:36:16 PM
Surr: 4-Bromofluorobenzene	97.3	70-130		%Rec	1	9/2/2020 7:36:16 PM
Surr: Dibromofluoromethane	94.6	70-130		%Rec	1	9/2/2020 7:36:16 PM
Surr: Toluene-d8	104	70-130		%Rec	1	9/2/2020 7:36:16 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/2/2020 7:36:16 PM
Surr: BFB	99.8	70-130		%Rec	1	9/2/2020 7:36:16 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 12 of 23

Analytical Report

Lab Order 2008G97

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-25 0-1.5

Project: Shinnery Oak SWD

Collection Date: 8/28/2020 1:55:00 PM

Lab ID: 2008G97-013

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/1/2020 10:14:25 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/1/2020 10:14:25 PM
Surr: DNOP	73.5	30.4-154		%Rec	1	9/1/2020 10:14:25 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	100	60		mg/Kg	20	9/5/2020 1:06:41 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/2/2020 8:05:42 PM
Toluene	ND	0.049		mg/Kg	1	9/2/2020 8:05:42 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/2/2020 8:05:42 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/2/2020 8:05:42 PM
Surr: 1,2-Dichloroethane-d4	97.8	70-130		%Rec	1	9/2/2020 8:05:42 PM
Surr: 4-Bromofluorobenzene	96.8	70-130		%Rec	1	9/2/2020 8:05:42 PM
Surr: Dibromofluoromethane	96.6	70-130		%Rec	1	9/2/2020 8:05:42 PM
Surr: Toluene-d8	107	70-130		%Rec	1	9/2/2020 8:05:42 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/2/2020 8:05:42 PM
Surr: BFB	97.6	70-130		%Rec	1	9/2/2020 8:05:42 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative 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

Page 13 of 23

Analytical Report

Lab Order 2008G97

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-26 0-4

Project: Shinnery Oak SWD

Collection Date: 8/28/2020 2:00:00 PM

Lab ID: 2008G97-014

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	9/1/2020 10:24:33 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/1/2020 10:24:33 PM
Surr: DNOP	108	30.4-154		%Rec	1	9/1/2020 10:24:33 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	260	60		mg/Kg	20	9/5/2020 1:19:05 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/2/2020 8:35:20 PM
Toluene	ND	0.050		mg/Kg	1	9/2/2020 8:35:20 PM
Ethylbenzene	ND	0.050		mg/Kg	1	9/2/2020 8:35:20 PM
Xylenes, Total	ND	0.10		mg/Kg	1	9/2/2020 8:35:20 PM
Surr: 1,2-Dichloroethane-d4	97.4	70-130		%Rec	1	9/2/2020 8:35:20 PM
Surr: 4-Bromofluorobenzene	99.3	70-130		%Rec	1	9/2/2020 8:35:20 PM
Surr: Dibromofluoromethane	94.6	70-130		%Rec	1	9/2/2020 8:35:20 PM
Surr: Toluene-d8	103	70-130		%Rec	1	9/2/2020 8:35:20 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/2/2020 8:35:20 PM
Surr: BFB	95.1	70-130		%Rec	1	9/2/2020 8:35:20 PM

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

Qualifiers:		*	Value exceeds Maximum Contaminant Level,
	D		Sample Diluted Due to Matrix
	H		Holding times for preparation or analysis exceeded
	ND		Not Detected at the Reporting Limit
	PQL		Practical Quantitative 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

Page 14 of 23

Analytical Report

Lab Order 2008G97

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-27 0-4

Project: Shinnery Oak SWD

Collection Date: 8/28/2020 2:05:00 PM

Lab ID: 2008G97-015

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	9/1/2020 10:34:40 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/1/2020 10:34:40 PM
Surr: DNOP	70.9	30.4-154		%Rec	1	9/1/2020 10:34:40 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	200	60		mg/Kg	20	9/5/2020 9:25:00 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/2/2020 9:05:11 PM
Toluene	ND	0.049		mg/Kg	1	9/2/2020 9:05:11 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/2/2020 9:05:11 PM
Xylenes, Total	ND	0.098		mg/Kg	1	9/2/2020 9:05:11 PM
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	9/2/2020 9:05:11 PM
Surr: 4-Bromofluorobenzene	97.9	70-130		%Rec	1	9/2/2020 9:05:11 PM
Surr: Dibromofluoromethane	99.5	70-130		%Rec	1	9/2/2020 9:05:11 PM
Surr: Toluene-d8	103	70-130		%Rec	1	9/2/2020 9:05:11 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/2/2020 9:05:11 PM
Surr: BFB	95.1	70-130		%Rec	1	9/2/2020 9:05:11 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 15 of 23

Analytical Report

Lab Order 2008G97

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-32 0-4

Project: Shinnery Oak SWD

Collection Date: 8/28/2020 2:10:00 PM

Lab ID: 2008G97-016

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/1/2020 10:44:47 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/1/2020 10:44:47 PM
Surr: DNOP	66.4	30.4-154		%Rec	1	9/1/2020 10:44:47 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	160	60		mg/Kg	20	9/5/2020 10:02:01 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/2/2020 9:34:59 PM
Toluene	ND	0.049		mg/Kg	1	9/2/2020 9:34:59 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/2/2020 9:34:59 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/2/2020 9:34:59 PM
Surr: 1,2-Dichloroethane-d4	98.2	70-130		%Rec	1	9/2/2020 9:34:59 PM
Surr: 4-Bromofluorobenzene	98.7	70-130		%Rec	1	9/2/2020 9:34:59 PM
Surr: Dibromofluoromethane	96.6	70-130		%Rec	1	9/2/2020 9:34:59 PM
Surr: Toluene-d8	104	70-130		%Rec	1	9/2/2020 9:34:59 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/2/2020 9:34:59 PM
Surr: BFB	96.4	70-130		%Rec	1	9/2/2020 9:34:59 PM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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

Page 16 of 23

Analytical Report

Lab Order 2008G97

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-33 0-4

Project: Shinnery Oak SWD

Collection Date: 8/28/2020 2:15:00 PM

Lab ID: 2008G97-017

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	9/1/2020 10:54:53 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/1/2020 10:54:53 PM
Surr: DNOP	71.4	30.4-154		%Rec	1	9/1/2020 10:54:53 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	180	60		mg/Kg	20	9/5/2020 10:14:21 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: RAA
Benzene	ND	0.025		mg/Kg	1	9/2/2020 10:04:45 PM
Toluene	ND	0.049		mg/Kg	1	9/2/2020 10:04:45 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/2/2020 10:04:45 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/2/2020 10:04:45 PM
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	9/2/2020 10:04:45 PM
Surr: 4-Bromofluorobenzene	97.6	70-130		%Rec	1	9/2/2020 10:04:45 PM
Surr: Dibromofluoromethane	99.4	70-130		%Rec	1	9/2/2020 10:04:45 PM
Surr: Toluene-d8	104	70-130		%Rec	1	9/2/2020 10:04:45 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: RAA
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/2/2020 10:04:45 PM
Surr: BFB	96.6	70-130		%Rec	1	9/2/2020 10:04:45 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 17 of 23

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G97

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak SWD

Sample ID: MB-54968	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 54968	RunNo: 71643								
Prep Date: 9/4/2020	Analysis Date: 9/4/2020	SeqNo: 2504427	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-54968	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSS	Batch ID: 54968	RunNo: 71643								
Prep Date: 9/4/2020	Analysis Date: 9/4/2020	SeqNo: 2504428	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	15	1.5	15.00	0	97.1	90	110			

Sample ID: MB-54974	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 54974	RunNo: 71655								
Prep Date: 9/5/2020	Analysis Date: 9/5/2020	SeqNo: 2505219	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-54974	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSS	Batch ID: 54974	RunNo: 71655								
Prep Date: 9/5/2020	Analysis Date: 9/5/2020	SeqNo: 2505220	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.4	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- II Folding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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

Page 18 of 23

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G97

11-Sep-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oak SWD

Sample ID: LCS-54804	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 54804	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499587 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	39	10	50.00	0	79.0	70	130			
Surr: DNOP	2.4		5.000		47.5	30.4	154			

Sample ID: MB-54804	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 54804	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499592 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	5.1		10.00		51.1	30.4	154			

Sample ID: LCS-54859	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 54859	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2501938 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	89.8	70	130			
Surr: DNOP	3.3		5.000		66.0	30.4	154			

Sample ID: MB-54859	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 54859	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2501946 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	7.2		10.00		71.6	30.4	154			

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 19 of 23

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G97

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak SWD

Sample ID: lcs-54791	SampType: LCS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BatchQC	Batch ID: 54791	RunNo: 71581								
Prep Date: 8/30/2020	Analysis Date: 9/2/2020	SeqNo: 2500836 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	1.000	0	103	80	120			
Toluene	1.0	0.050	1.000	0	102	80	120			
Ethylbenzene	1.0	0.050	1.000	0	100	80	120			
Xylenes, Total	3.3	0.10	3.000	0	109	80	120			
Surr: 1,2-Dichloroethane-d4	0.49		0.5000		98.0	70	130			
Surr: 4-Bromofluorobenzene	0.52		0.5000		103	70	130			
Surr: Dibromofluoromethane	0.55		0.5000		109	70	130			
Surr: Toluene-d8	0.48		0.5000		96.2	70	130			

Sample ID: mb-54791	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBS	Batch ID: 54791	RunNo: 71581								
Prep Date: 8/30/2020	Analysis Date: 9/2/2020	SeqNo: 2500842 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	0.49		0.5000		97.8	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.5000		102	70	130			
Surr: Dibromofluoromethane	0.55		0.5000		110	70	130			
Surr: Toluene-d8	0.51		0.5000		101	70	130			

Sample ID: lcs-54792	SampType: LCS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BatchQC	Batch ID: 54792	RunNo: 71583								
Prep Date: 8/30/2020	Analysis Date: 9/2/2020	SeqNo: 2501052 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.90	0.025	1.000	0	90.4	80	120			
Toluene	1.1	0.050	1.000	0	109	80	120			
Ethylbenzene	1.1	0.050	1.000	0	111	80	120			
Xylenes, Total	3.3	0.10	3.000	0	109	80	120			
Surr: 1,2-Dichloroethane-d4	0.49		0.5000		97.1	70	130			
Surr: 4-Bromofluorobenzene	0.49		0.5000		98.7	70	130			
Surr: Dibromofluoromethane	0.46		0.5000		92.2	70	130			
Surr: Toluene-d8	0.52		0.5000		105	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 20 of 23

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G97

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak SWD

Sample ID: mb-54792	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBS	Batch ID: 54792	RunNo: 71583								
Prep Date: 8/30/2020	Analysis Date: 9/2/2020	SeqNo: 2501053	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	0.48		0.5000		96.6	70	130			
Surr: 4-Bromofluorobenzene	0.47		0.5000		94.4	70	130			
Surr: Dibromofluoromethane	0.47		0.5000		93.6	70	130			
Surr: Toluene-d8	0.51		0.5000		102	70	130			

Sample ID: 2008g97-009ams	SampType: MS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: WS20-20 0-1	Batch ID: 54792	RunNo: 71583								
Prep Date: 8/30/2020	Analysis Date: 9/2/2020	SeqNo: 2501055	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.92	0.025	0.9970	0	92.2	71.1	115			
Toluene	1.1	0.050	0.9970	0	108	79.6	132			
Ethylbenzene	1.1	0.050	0.9970	0	112	83.8	134			
Xylenes, Total	3.3	0.10	2.991	0	109	82.4	132			
Surr: 1,2-Dichloroethane-d4	0.49		0.4985		98.4	70	130			
Surr: 4-Bromofluorobenzene	0.49		0.4985		99.2	70	130			
Surr: Dibromofluoromethane	0.47		0.4985		95.0	70	130			
Surr: Toluene-d8	0.53		0.4985		105	70	130			

Sample ID: 2008g97-009amsd	SampType: MSD4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: WS20-20 0-1	Batch ID: 54792	RunNo: 71583								
Prep Date: 8/30/2020	Analysis Date: 9/2/2020	SeqNo: 2501056	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.89	0.025	0.9843	0	90.4	71.1	115	3.25	20	
Toluene	1.0	0.049	0.9843	0	105	79.6	132	4.12	20	
Ethylbenzene	1.1	0.049	0.9843	0	108	83.8	134	5.44	20	
Xylenes, Total	3.1	0.098	2.953	0	104	82.4	132	5.47	20	
Surr: 1,2-Dichloroethane-d4	0.49		0.4921		99.9	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.47		0.4921		96.1	70	130	0	0	
Surr: Dibromofluoromethane	0.47		0.4921		94.9	70	130	0	0	
Surr: Toluene-d8	0.50		0.4921		101	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level,
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 21 of 23

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G97

11-Sep-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oak SWD

Sample ID: lcs-54791	SampType: LCS		TestCode: EPA Method 8015D Mod: Gasoline Range							
Client ID: LCSS	Batch ID: 54791		RunNo: 71581							
Prep Date: 8/30/2020	Analysis Date: 9/2/2020		SeqNo: 2500948		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	88.5	70	130			
Surr: BFB	520		500.0		105	70	130			

Sample ID: mb-54791	SampType: MBLK		TestCode: EPA Method 8015D Mod: Gasoline Range							
Client ID: PBS	Batch ID: 54791		RunNo: 71581							
Prep Date: 8/30/2020	Analysis Date: 9/2/2020		SeqNo: 2500949		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	520		500.0		104	70	130			

Sample ID: 2008g97-010ams	SampType: MS		TestCode: EPA Method 8015D Mod: Gasoline Range							
Client ID: WS20-21 0-3	Batch ID: 54792		RunNo: 71583							
Prep Date: 8/30/2020	Analysis Date: 9/2/2020		SeqNo: 2501067		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	4.9	24.68	0	85.2	49.2	122			
Surr: BFB	450		493.6		92.0	70	130			

Sample ID: 2008g97-010amsd	SampType: MSD		TestCode: EPA Method 8015D Mod: Gasoline Range							
Client ID: WS20-21 0-3	Batch ID: 54792		RunNo: 71583							
Prep Date: 8/30/2020	Analysis Date: 9/2/2020		SeqNo: 2501068		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	4.9	24.51	0	87.8	49.2	122	2.32	20	
Surr: BFB	460		490.2		94.3	70	130	0	0	

Sample ID: lcs-54792	SampType: LCS		TestCode: EPA Method 8015D Mod: Gasoline Range							
Client ID: LCSS	Batch ID: 54792		RunNo: 71583							
Prep Date: 8/30/2020	Analysis Date: 9/2/2020		SeqNo: 2501076		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	90.4	70	130			
Surr: BFB	470		500.0		93.5	70	130			

Sample ID: mb-54792	SampType: MBLK		TestCode: EPA Method 8015D Mod: Gasoline Range							
Client ID: PBS	Batch ID: 54792		RunNo: 71583							
Prep Date: 8/30/2020	Analysis Date: 9/2/2020		SeqNo: 2501077		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 Quantitative 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

Page 22 of 23

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G97

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak SWD

Sample ID: mb-54792		SampType: MBLK		TestCode: EPA Method 8015D Mod: Gasoline Range						
Client ID: PBS		Batch ID: 54792		RunNo: 71583						
Prep Date: 8/30/2020		Analysis Date: 9/2/2020		SeqNo: 2501077		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	480		500.0		95.5	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 Quantitative 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

Page 23 of 23



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

Sample Log-In Check List

Client Name: Vertex Resource Group Ltd.

Work Order Number: 2008G97

RcptNo: 1

Received By: Cheyenne Cason 8/29/2020 8:30:00 AM

Completed By: Desiree Dominguez 8/29/2020 10:55:49 AM

Reviewed By: *WVZ 8/29*

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☐ No ☒ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐ Not required
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? Yes ☒ No ☐
(Note discrepancies on chain of custody)
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? Yes ☒ No ☐
(If no, notify customer for authorization.)

of preserved
bottles checked
for pH:

(<2 or >12 unless noted)

Adjusted?

Checked by: DAD 8/29/20

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

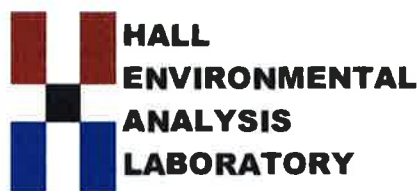
Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.4	Good	Not Present			
2	6.1	Good	Not Present			



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

September 11, 2020

Natalie Gordon

Vertex Resource Group Ltd.

3101 Boyd Drive

Carlsbad, NM 88220

TEL: (505) 506-0040

FAX:

RE: Shinnery Oak SWD

OrderNo.: 2008G96

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 15 sample(s) on 8/29/2020 for the analyses presented in the following report.

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

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

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

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman'.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Analytical Report

Lab Order 2008G96

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-03

Project: Shinnery Oak SWD

Collection Date: 8/27/2020 8:20:00 AM

Lab ID: 2008G96-001

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	9/4/2020 12:23:07 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/4/2020 12:23:07 AM
Surr: DNOP	86.3	30.4-154		%Rec	1	9/4/2020 12:23:07 AM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	3800	150		mg/Kg	50	9/8/2020 1:33:16 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/1/2020 5:27:56 AM
Toluene	ND	0.049		mg/Kg	1	9/1/2020 5:27:56 AM
Ethylbenzene	ND	0.049		mg/Kg	1	9/1/2020 5:27:56 AM
Xylenes, Total	ND	0.099		mg/Kg	1	9/1/2020 5:27:56 AM
Surr: 1,2-Dichloroethane-d4	98.4	70-130		%Rec	1	9/1/2020 5:27:56 AM
Surr: 4-Bromofluorobenzene	96.2	70-130		%Rec	1	9/1/2020 5:27:56 AM
Surr: Dibromofluoromethane	96.0	70-130		%Rec	1	9/1/2020 5:27:56 AM
Surr: Toluene-d8	104	70-130		%Rec	1	9/1/2020 5:27:56 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/1/2020 5:27:56 AM
Surr: BFB	97.2	70-130		%Rec	1	9/1/2020 5:27:56 AM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level,
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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

Page 1 of 22

Analytical Report

Lab Order 2008G96

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-04

Project: Shinnery Oak SWD

Collection Date: 8/27/2020 8:25:00 AM

Lab ID: 2008G96-002

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/4/2020 12:33:05 AM
Motor Oil Range Organics (MRO)	ND	51		mg/Kg	1	9/4/2020 12:33:05 AM
Surr: DNOP	93.1	30.4-154		%Rec	1	9/4/2020 12:33:05 AM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	3000	150		mg/Kg	50	9/8/2020 1:45:37 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/1/2020 5:57:43 AM
Toluene	ND	0.050		mg/Kg	1	9/1/2020 5:57:43 AM
Ethylbenzene	ND	0.050		mg/Kg	1	9/1/2020 5:57:43 AM
Xylenes, Total	ND	0.10		mg/Kg	1	9/1/2020 5:57:43 AM
Surr: 1,2-Dichloroethane-d4	93.8	70-130		%Rec	1	9/1/2020 5:57:43 AM
Surr: 4-Bromofluorobenzene	95.9	70-130		%Rec	1	9/1/2020 5:57:43 AM
Surr: Dibromofluoromethane	93.7	70-130		%Rec	1	9/1/2020 5:57:43 AM
Surr: Toluene-d8	105	70-130		%Rec	1	9/1/2020 5:57:43 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/1/2020 5:57:43 AM
Surr: BFB	96.9	70-130		%Rec	1	9/1/2020 5:57:43 AM

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

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

Analytical Report

Lab Order 2008G96

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-05

Project: Shinnery Oak SWD

Collection Date: 8/27/2020 8:30:00 AM

Lab ID: 2008G96-003

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	9/4/2020 12:43:03 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/4/2020 12:43:03 AM
Surr: DNOP	102	30.4-154		%Rec	1	9/4/2020 12:43:03 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	2300	60		mg/Kg	20	9/5/2020 5:01:35 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	9/1/2020 6:27:19 AM
Toluene	ND	0.050		mg/Kg	1	9/1/2020 6:27:19 AM
Ethylbenzene	ND	0.050		mg/Kg	1	9/1/2020 6:27:19 AM
Xylenes, Total	ND	0.10		mg/Kg	1	9/1/2020 6:27:19 AM
Surr: 1,2-Dichloroethane-d4	98.6	70-130		%Rec	1	9/1/2020 6:27:19 AM
Surr: 4-Bromofluorobenzene	95.5	70-130		%Rec	1	9/1/2020 6:27:19 AM
Surr: Dibromofluoromethane	97.9	70-130		%Rec	1	9/1/2020 6:27:19 AM
Surr: Toluene-d8	105	70-130		%Rec	1	9/1/2020 6:27:19 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/1/2020 6:27:19 AM
Surr: BFB	95.4	70-130		%Rec	1	9/1/2020 6:27:19 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 3 of 22

Analytical Report

Lab Order 2008G96

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-06

Project: Shinnery Oak SWD

Collection Date: 8/27/2020 8:35:00 AM

Lab ID: 2008G96-004

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/4/2020 12:53:00 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/4/2020 12:53:00 AM
Surr: DNOP	49.3	30.4-154		%Rec	1	9/4/2020 12:53:00 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	570	60		mg/Kg	20	9/5/2020 5:13:59 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	9/2/2020 3:24:53 PM
Toluene	ND	0.050		mg/Kg	1	9/2/2020 3:24:53 PM
Ethylbenzene	ND	0.050		mg/Kg	1	9/2/2020 3:24:53 PM
Xylenes, Total	ND	0.10		mg/Kg	1	9/2/2020 3:24:53 PM
Surr: 1,2-Dichloroethane-d4	97.8	70-130		%Rec	1	9/2/2020 3:24:53 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	9/2/2020 3:24:53 PM
Surr: Dibromofluoromethane	108	70-130		%Rec	1	9/2/2020 3:24:53 PM
Surr: Toluene-d8	98.4	70-130		%Rec	1	9/2/2020 3:24:53 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/2/2020 3:24:53 PM
Surr: BFB	103	70-130		%Rec	1	9/2/2020 3:24:53 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level,
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 4 of 22

Analytical Report

Lab Order 2008G96

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-07

Project: Shinnery Oak SWD

Collection Date: 8/27/2020 8:40:00 AM

Lab ID: 2008G96-005

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/4/2020 1:02:54 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/4/2020 1:02:54 AM
Surr: DNOP	48.2	30.4-154		%Rec	1	9/4/2020 1:02:54 AM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	2200	150		mg/Kg	50	9/8/2020 1:57:58 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	9/2/2020 4:50:26 PM
Toluene	ND	0.050		mg/Kg	1	9/2/2020 4:50:26 PM
Ethylbenzene	ND	0.050		mg/Kg	1	9/2/2020 4:50:26 PM
Xylenes, Total	ND	0.10		mg/Kg	1	9/2/2020 4:50:26 PM
Surr: 1,2-Dichloroethane-d4	93.1	70-130		%Rec	1	9/2/2020 4:50:26 PM
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	9/2/2020 4:50:26 PM
Surr: Dibromofluoromethane	107	70-130		%Rec	1	9/2/2020 4:50:26 PM
Surr: Toluene-d8	100	70-130		%Rec	1	9/2/2020 4:50:26 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/2/2020 4:50:26 PM
Surr: BFB	103	70-130		%Rec	1	9/2/2020 4:50:26 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level,
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 5 of 22

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2008G96

Date Reported: 9/11/2020

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-08

Project: Shinnery Oak SWD

Collection Date: 8/27/2020 8:45:00 AM

Lab ID: 2008G96-006

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/4/2020 1:12:51 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/4/2020 1:12:51 AM
Surr: DNOP	64.6	30.4-154		%Rec	1	9/4/2020 1:12:51 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	2000	60		mg/Kg	20	9/5/2020 5:38:48 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	9/2/2020 6:16:09 PM
Toluene	ND	0.049		mg/Kg	1	9/2/2020 6:16:09 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/2/2020 6:16:09 PM
Xylenes, Total	ND	0.097		mg/Kg	1	9/2/2020 6:16:09 PM
Surr: 1,2-Dichloroethane-d4	96.8	70-130		%Rec	1	9/2/2020 6:16:09 PM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	9/2/2020 6:16:09 PM
Surr: Dibromofluoromethane	108	70-130		%Rec	1	9/2/2020 6:16:09 PM
Surr: Toluene-d8	92.9	70-130		%Rec	1	9/2/2020 6:16:09 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/2/2020 6:16:09 PM
Surr: BFB	103	70-130		%Rec	1	9/2/2020 6:16:09 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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 pHI Not In Range
 RL Reporting Limit

Page 6 of 22

Analytical Report

Lab Order 2008G96

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-14 0-1

Project: Shinnery Oak SWD

Collection Date: 8/27/2020 2:00:00 PM

Lab ID: 2008G96-007

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/4/2020 1:22:48 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/4/2020 1:22:48 AM
Surr: DNOP	90.4	30.4-154		%Rec	1	9/4/2020 1:22:48 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	59		mg/Kg	20	9/5/2020 5:51:13 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	9/2/2020 6:44:43 PM
Toluene	ND	0.048		mg/Kg	1	9/2/2020 6:44:43 PM
Ethylbenzene	ND	0.048		mg/Kg	1	9/2/2020 6:44:43 PM
Xylenes, Total	ND	0.097		mg/Kg	1	9/2/2020 6:44:43 PM
Surr: 1,2-Dichloroethane-d4	93.5	70-130		%Rec	1	9/2/2020 6:44:43 PM
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	9/2/2020 6:44:43 PM
Surr: Dibromofluoromethane	108	70-130		%Rec	1	9/2/2020 6:44:43 PM
Surr: Toluene-d8	96.4	70-130		%Rec	1	9/2/2020 6:44:43 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	9/2/2020 6:44:43 PM
Surr: BFB	105	70-130		%Rec	1	9/2/2020 6:44:43 PM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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

Page 7 of 22

Analytical Report

Lab Order 2008G96

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-15 0-1

Project: Shinnery Oak SWD

Collection Date: 8/27/2020 2:05:00 PM

Lab ID: 2008G96-008

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/4/2020 1:32:47 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/4/2020 1:32:47 AM
Surr: DNOP	90.9	30.4-154		%Rec	1	9/4/2020 1:32:47 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	150	60		mg/Kg	20	9/5/2020 6:03:37 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	9/2/2020 7:13:14 PM
Toluene	ND	0.049		mg/Kg	1	9/2/2020 7:13:14 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/2/2020 7:13:14 PM
Xylenes, Total	ND	0.098		mg/Kg	1	9/2/2020 7:13:14 PM
Surr: 1,2-Dichloroethane-d4	97.4	70-130		%Rec	1	9/2/2020 7:13:14 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	9/2/2020 7:13:14 PM
Surr: Dibromofluoromethane	110	70-130		%Rec	1	9/2/2020 7:13:14 PM
Surr: Toluene-d8	97.0	70-130		%Rec	1	9/2/2020 7:13:14 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/2/2020 7:13:14 PM
Surr: BFB	102	70-130		%Rec	1	9/2/2020 7:13:14 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 8 of 22

Analytical Report

Lab Order 2008G96

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-16 0-1

Project: Shinnery Oak SWD

Collection Date: 8/27/2020 2:10:00 PM

Lab ID: 2008G96-009

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	9/4/2020 1:42:40 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/4/2020 1:42:40 AM
Surr: DNOP	100	30.4-154		%Rec	1	9/4/2020 1:42:40 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	250	60		mg/Kg	20	9/5/2020 6:16:02 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	9/2/2020 7:41:46 PM
Toluene	ND	0.049		mg/Kg	1	9/2/2020 7:41:46 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/2/2020 7:41:46 PM
Xylenes, Total	ND	0.098		mg/Kg	1	9/2/2020 7:41:46 PM
Surr: 1,2-Dichloroethane-d4	93.8	70-130		%Rec	1	9/2/2020 7:41:46 PM
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	9/2/2020 7:41:46 PM
Surr: Dibromofluoromethane	108	70-130		%Rec	1	9/2/2020 7:41:46 PM
Surr: Toluene-d8	103	70-130		%Rec	1	9/2/2020 7:41:46 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/2/2020 7:41:46 PM
Surr: BFB	108	70-130		%Rec	1	9/2/2020 7:41:46 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 9 of 22

Hall Environmental Analysis Laboratory, Inc.**Analytical Report**

Lab Order 2008G96

Date Reported: 9/11/2020

CLIENT: Vertex Resource Group Ltd.**Client Sample ID:** WS20-17 0-1**Project:** Shinnery Oak SWD**Collection Date:** 8/27/2020 2:15:00 PM**Lab ID:** 2008G96-010**Matrix:** SOIL**Received Date:** 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/4/2020 1:52:35 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/4/2020 1:52:35 AM
Surr: DNOP	90.7	30.4-154		%Rec	1	9/4/2020 1:52:35 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	180	60		mg/Kg	20	9/4/2020 7:19:15 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	9/2/2020 8:10:15 PM
Toluene	ND	0.050		mg/Kg	1	9/2/2020 8:10:15 PM
Ethylbenzene	ND	0.050		mg/Kg	1	9/2/2020 8:10:15 PM
Xylenes, Total	ND	0.10		mg/Kg	1	9/2/2020 8:10:15 PM
Surr: 1,2-Dichloroethane-d4	99.0	70-130		%Rec	1	9/2/2020 8:10:15 PM
Surr: 4-Bromofluorobenzene	107	70-130		%Rec	1	9/2/2020 8:10:15 PM
Surr: Dibromofluoromethane	109	70-130		%Rec	1	9/2/2020 8:10:15 PM
Surr: Toluene-d8	93.3	70-130		%Rec	1	9/2/2020 8:10:15 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/2/2020 8:10:15 PM
Surr: BFB	104	70-130		%Rec	1	9/2/2020 8:10:15 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level,
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 10 of 22

Analytical Report

Lab Order 2008G96

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-44 0-0.5

Project: Shinnery Oak SWD

Collection Date: 8/27/2020 11:55:00 AM

Lab ID: 2008G96-011

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/3/2020 1:16:16 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/3/2020 1:16:16 AM
Surr: DNOP	64.4	30.4-154		%Rec	1	9/3/2020 1:16:16 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	1200	60		mg/Kg	20	9/4/2020 8:21:17 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	9/2/2020 8:38:45 PM
Toluene	ND	0.050		mg/Kg	1	9/2/2020 8:38:45 PM
Ethylbenzene	ND	0.050		mg/Kg	1	9/2/2020 8:38:45 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/2/2020 8:38:45 PM
Surr: 1,2-Dichloroethane-d4	98.9	70-130		%Rec	1	9/2/2020 8:38:45 PM
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	9/2/2020 8:38:45 PM
Surr: Dibromofluoromethane	113	70-130		%Rec	1	9/2/2020 8:38:45 PM
Surr: Toluene-d8	99.1	70-130		%Rec	1	9/2/2020 8:38:45 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/2/2020 8:38:45 PM
Surr: BFB	106	70-130		%Rec	1	9/2/2020 8:38:45 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 11 of 22

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2008G96

Date Reported: 9/11/2020

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-45 0-0.5

Project: Shinnery Oak SWD

Collection Date: 8/27/2020 12:00:00 PM

Lab ID: 2008G96-012

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	9/3/2020 1:45:53 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/3/2020 1:45:53 AM
Surr: DNOP	48.7	30.4-154		%Rec	1	9/3/2020 1:45:53 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	410	60		mg/Kg	20	9/4/2020 8:33:42 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	9/2/2020 9:07:21 PM
Toluene	ND	0.050		mg/Kg	1	9/2/2020 9:07:21 PM
Ethylbenzene	ND	0.050		mg/Kg	1	9/2/2020 9:07:21 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/2/2020 9:07:21 PM
Surr: 1,2-Dichloroethane-d4	98.9	70-130		%Rec	1	9/2/2020 9:07:21 PM
Surr: 4-Bromofluorobenzene	99.9	70-130		%Rec	1	9/2/2020 9:07:21 PM
Surr: Dibromofluoromethane	111	70-130		%Rec	1	9/2/2020 9:07:21 PM
Surr: Toluene-d8	95.0	70-130		%Rec	1	9/2/2020 9:07:21 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/2/2020 9:07:21 PM
Surr: BFB	100	70-130		%Rec	1	9/2/2020 9:07:21 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 12 of 22

Analytical Report

Lab Order 2008G96

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-46

Project: Shinnery Oak SWD

Collection Date: 8/27/2020 12:05:00 PM

Lab ID: 2008G96-013

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.4		mg/Kg	1	9/3/2020 1:55:48 AM
Motor Oil Range Organics (MRO)	ND	42		mg/Kg	1	9/3/2020 1:55:48 AM
Surr: DNOP	48.2	30.4-154		%Rec	1	9/3/2020 1:55:48 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	320	60		mg/Kg	20	9/4/2020 8:46:06 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	9/2/2020 9:35:59 PM
Toluene	ND	0.049		mg/Kg	1	9/2/2020 9:35:59 PM
Ethylbenzene	ND	0.049		mg/Kg	1	9/2/2020 9:35:59 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/2/2020 9:35:59 PM
Surr: 1,2-Dichloroethane-d4	92.1	70-130		%Rec	1	9/2/2020 9:35:59 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	9/2/2020 9:35:59 PM
Surr: Dibromofluoromethane	114	70-130		%Rec	1	9/2/2020 9:35:59 PM
Surr: Toluene-d8	97.6	70-130		%Rec	1	9/2/2020 9:35:59 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	9/2/2020 9:35:59 PM
Surr: BFB	103	70-130		%Rec	1	9/2/2020 9:35:59 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 13 of 22

Analytical Report

Lab Order 2008G96

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-47

Project: Shinnery Oak SWD

Collection Date: 8/27/2020 12:10:00 PM

Lab ID: 2008G96-014

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/3/2020 2:05:39 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/3/2020 2:05:39 AM
Surr: DNOP	51.9	30.4-154		%Rec	1	9/3/2020 2:05:39 AM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	3600	150		mg/Kg	50	9/8/2020 2:10:19 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	9/2/2020 10:04:36 PM
Toluene	ND	0.050		mg/Kg	1	9/2/2020 10:04:36 PM
Ethylbenzene	ND	0.050		mg/Kg	1	9/2/2020 10:04:36 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/2/2020 10:04:36 PM
Surr: 1,2-Dichloroethane-d4	97.6	70-130		%Rec	1	9/2/2020 10:04:36 PM
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	9/2/2020 10:04:36 PM
Surr: Dibromofluoromethane	111	70-130		%Rec	1	9/2/2020 10:04:36 PM
Surr: Toluene-d8	96.1	70-130		%Rec	1	9/2/2020 10:04:36 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/2/2020 10:04:36 PM
Surr: BFB	104	70-130		%Rec	1	9/2/2020 10:04:36 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 14 of 22

Analytical Report

Lab Order 2008G96

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-48

Project: Shinnery Oak SWD

Collection Date: 8/27/2020 12:15:00 PM

Lab ID: 2008G96-015

Matrix: SOIL

Received Date: 8/29/2020 8:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/3/2020 2:15:34 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/3/2020 2:15:34 AM
Surr: DNOP	71.1	30.4-154		%Rec	1	9/3/2020 2:15:34 AM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	3700	150		mg/Kg	50	9/8/2020 2:22:39 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	9/2/2020 10:33:12 PM
Toluene	ND	0.050		mg/Kg	1	9/2/2020 10:33:12 PM
Ethylbenzene	ND	0.050		mg/Kg	1	9/2/2020 10:33:12 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/2/2020 10:33:12 PM
Surr: 1,2-Dichloroethane-d4	100	70-130		%Rec	1	9/2/2020 10:33:12 PM
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	1	9/2/2020 10:33:12 PM
Surr: Dibromofluoromethane	113	70-130		%Rec	1	9/2/2020 10:33:12 PM
Surr: Toluene-d8	96.9	70-130		%Rec	1	9/2/2020 10:33:12 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	9/2/2020 10:33:12 PM
Surr: BFB	106	70-130		%Rec	1	9/2/2020 10:33:12 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 15 of 22

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G96

11-Sep-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oak SWD

Sample ID: MB-54966	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 54966	RunNo: 71641								
Prep Date: 9/4/2020	Analysis Date: 9/5/2020	SeqNo: 2504340 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-54966	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSS	Batch ID: 54966	RunNo: 71641								
Prep Date: 9/4/2020	Analysis Date: 9/5/2020	SeqNo: 2504341 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.6	90	110			

Sample ID: MB-54968		SampType: mblk		TestCode: EPA Method 300.0: Anions						
Client ID: PBS		Batch ID: 54968		RunNo: 71643						
Prep Date: 9/4/2020		Analysis Date: 9/4/2020		SeqNo: 2504427		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-54968		SampType: lcs		TestCode: EPA Method 300.0: Anions						
Client ID: LCSS		Batch ID: 54968		RunNo: 71643						
Prep Date: 9/4/2020		Analysis Date: 9/4/2020		SeqNo: 2504428		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	15	1.5	15.00	0	97.1	90	110			

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 IF Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 16 of 22

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G96

11-Sep-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oak SWD

Sample ID: 2008G96-011AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: WS20-44 0-0.5	Batch ID: 54859	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2501887 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	42	9.8	49.16	4.571	76.7	47.4	136			
Surr: DNOP	3.3		4.916		68.0	30.4	154			

Sample ID: 2008G96-011AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: WS20-44 0-0.5	Batch ID: 54859	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2501888 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	39	9.6	47.76	4.571	72.3	47.4	136	7.87	43.4	
Surr: DNOP	2.7		4.776		56.9	30.4	154	0	0	

Sample ID: LCS-54859	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 54859	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2501938 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	89.8	70	130			
Surr: DNOP	3.3		5.000		66.0	30.4	154			

Sample ID: MB-54859	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 54859	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2501946 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	7.2		10.00		71.6	30.4	154			

Sample ID: 2008G95-006AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BatchQC	Batch ID: 54858	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2503452 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	54	9.8	48.92	7.645	95.2	47.4	136			
Surr: DNOP	3.8		4.892		77.8	30.4	154			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
B Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

Page 17 of 22

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G96

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak SWD

Sample ID: 2008G95-006AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BatchQC	Batch ID: 54858	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2503453 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	47	9.2	45.87	7.645	84.9	47.4	136	15.1	43.4	
Surr: DNOP	3.6		4.587		78.6	30.4	154	0	0	

Sample ID: LCS-54858	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 54858	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2503517 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	56	10	50.00	0	112	70	130			
Surr: DNOP	4.8		5.000		95.6	30.4	154			

Sample ID: MB-54858	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 54858	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/3/2020	SeqNo: 2503521 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.6		10.00		96.3	30.4	154			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 18 of 22

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G96

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak SWD

Sample ID: lcs-54790	SampType: LCS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BatchQC	Batch ID: 54790	RunNo: 71497								
Prep Date: 8/30/2020	Analysis Date: 8/31/2020	SeqNo: 2498258	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	88.6	80	120			
Toluene	1.1	0.050	1.000	0	106	80	120			
Ethylbenzene	1.1	0.050	1.000	0	111	80	120			
Xylenes, Total	3.2	0.10	3.000	0	107	80	120			
Surr: 1,2-Dichloroethane-d4	0.49		0.5000		98.4	70	130			
Surr: 4-Bromofluorobenzene	0.46		0.5000		92.1	70	130			
Surr: Dibromofluoromethane	0.46		0.5000		92.0	70	130			
Surr: Toluene-d8	0.52		0.5000		105	70	130			

Sample ID: mb-54790	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBS	Batch ID: 54790	RunNo: 71497								
Prep Date: 8/30/2020	Analysis Date: 8/31/2020	SeqNo: 2498259	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	0.49		0.5000		97.2	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.5000		96.6	70	130			
Surr: Dibromofluoromethane	0.47		0.5000		93.8	70	130			
Surr: Toluene-d8	0.52		0.5000		104	70	130			

Sample ID: lcs-54791	SampType: LCS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BatchQC	Batch ID: 54791	RunNo: 71581								
Prep Date: 8/30/2020	Analysis Date: 9/2/2020	SeqNo: 2500836	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	1.000	0	103	80	120			
Toluene	1.0	0.050	1.000	0	102	80	120			
Ethylbenzene	1.0	0.050	1.000	0	100	80	120			
Xylenes, Total	3.3	0.10	3.000	0	109	80	120			
Surr: 1,2-Dichloroethane-d4	0.49		0.5000		98.0	70	130			
Surr: 4-Bromofluorobenzene	0.52		0.5000		103	70	130			
Surr: Dibromofluoromethane	0.55		0.5000		109	70	130			
Surr: Toluene-d8	0.48		0.5000		96.2	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 Quantitative Limit	RL Reporting Limit
S % Recovery outside of range due to dilution or matrix	

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2008G96

11-Sep-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oak SWD

Sample ID: mb-54791	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBS	Batch ID: 54791	RunNo: 71581								
Prep Date: 8/30/2020	Analysis Date: 9/2/2020	SeqNo: 2500842	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	0.49		0.5000		97.8	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.5000		102	70	130			
Surr: Dibromofluoromethane	0.55		0.5000		110	70	130			
Surr: Toluene-d8	0.51		0.5000		101	70	130			

Sample ID: 2008g96-004ams	SampType: MS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: WS20-06	Batch ID: 54791	RunNo: 71581								
Prep Date: 8/30/2020	Analysis Date: 9/2/2020	SeqNo: 2500876	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	0.9911	0	102	71.1	115			
Toluene	1.0	0.050	0.9911	0	106	79.6	132			
Ethylbenzene	1.0	0.050	0.9911	0	105	83.8	134			
Xylenes, Total	3.2	0.099	2.973	0	109	82.4	132			
Surr: 1,2-Dichloroethane-d4	0.49		0.4955		98.9	70	130			
Surr: 4-Bromofluorobenzene	0.52		0.4955		106	70	130			
Surr: Dibromofluoromethane	0.56		0.4955		112	70	130			
Surr: Toluene-d8	0.49		0.4955		98.5	70	130			

Sample ID: 2008g96-004amsd	SampType: MSD4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: WS20-06	Batch ID: 54791	RunNo: 71581								
Prep Date: 8/30/2020	Analysis Date: 9/2/2020	SeqNo: 2500878	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.99	0.024	0.9728	0	101	71.1	115	2.08	20	
Toluene	1.0	0.049	0.9728	0	105	79.6	132	2.04	20	
Ethylbenzene	1.0	0.049	0.9728	0	107	83.8	134	0.206	20	
Xylenes, Total	3.2	0.097	2.918	0	110	82.4	132	1.18	20	
Surr: 1,2-Dichloroethane-d4	0.47		0.4864		97.1	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.50		0.4864		103	70	130	0	0	
Surr: Dibromofluoromethane	0.54		0.4864		112	70	130	0	0	
Surr: Toluene-d8	0.49		0.4864		101	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 20 of 22

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G96

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak SWD

Sample ID: lcs-54790	SampType: LCS	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: LCSS	Batch ID: 54790	RunNo: 71497								
Prep Date: 8/30/2020	Analysis Date: 8/31/2020	SeqNo: 2498306 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	89.2	70	130			
Surr: BFB	480		500.0		95.1	70	130			

Sample ID: mb-54790	SampType: MBLK	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: PBS	Batch ID: 54790	RunNo: 71497								
Prep Date: 8/30/2020	Analysis Date: 8/31/2020	SeqNo: 2498307 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	480		500.0		96.1	70	130			

Sample ID: 2008g95-001ams	SampType: MS	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: BatchQC	Batch ID: 54790	RunNo: 71497								
Prep Date: 8/30/2020	Analysis Date: 8/31/2020	SeqNo: 2498312 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	4.9	24.49	0	96.1	49.2	122			
Surr: BFB	450		489.7		92.1	70	130			

Sample ID: 2008g95-001amsd	SampType: MSD	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: BatchQC	Batch ID: 54790	RunNo: 71497								
Prep Date: 8/30/2020	Analysis Date: 8/31/2020	SeqNo: 2498313 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	4.9	24.56	0	90.0	49.2	122	6.28	20	
Surr: BFB	460		491.2		93.3	70	130	0	0	

Sample ID: lcs-54791	SampType: LCS	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: LCSS	Batch ID: 54791	RunNo: 71581								
Prep Date: 8/30/2020	Analysis Date: 9/2/2020	SeqNo: 2500948 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	88.5	70	130			
Surr: BFB	520		500.0		105	70	130			

Sample ID: mb-54791	SampType: MBLK	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: PBS	Batch ID: 54791	RunNo: 71581								
Prep Date: 8/30/2020	Analysis Date: 9/2/2020	SeqNo: 2500949 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
- II Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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#: 2008G96

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak SWD

Sample ID: mb-54791	SampType: MBLK	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: PBS	Batch ID: 54791	RunNo: 71581								
Prep Date: 8/30/2020	Analysis Date: 9/2/2020	SeqNo: 2500949	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	520		500.0		104	70	130			

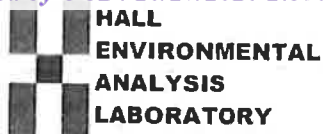
Sample ID: 2008g96-005ams	SampType: MS	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: WS20-07	Batch ID: 54791	RunNo: 71581								
Prep Date: 8/30/2020	Analysis Date: 9/2/2020	SeqNo: 2500957	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	24.98	0	89.9	49.2	122			
Surr: BFB	520		499.5		104	70	130			

Sample ID: 2008g96-005amsd	SampType: MSD	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: WS20-07	Batch ID: 54791	RunNo: 71581								
Prep Date: 8/30/2020	Analysis Date: 9/2/2020	SeqNo: 2500958	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	4.9	24.65	0	90.8	49.2	122	0.361	20	
Surr: BFB	520		493.1		105	70	130	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

Sample Log-In Check List

Client Name: **Vertex Resource Group Ltd.**

Work Order Number: **2008G96**

RcptNo: 1

Received By: **Cheyenne Cason** 8/29/2020 8:30:00 AM

Completed By: **Desiree Dominguez** 8/29/2020 10:41:39 AM

Reviewed By: **VVZ 8/29**

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☒ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐ Not required
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? Yes ☒ No ☐
(Note discrepancies on chain of custody)
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? Yes ☒ No ☐
(If no, notify customer for authorization.)

of preserved
bottles checked
for pH:

(<2 or >12 unless noted)

Adjusted?

Checked by: **DAD 8/29/20**

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	3.4	Good	Not Present			
2	6.1	Good	Not Present			

Chain-of-Custody Record

Client: Vortex

Mailing Address:

Phone #:

email or Fax#:

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)Accreditation: ☐ Az Compliance☐ NELAC ☐ Other☐ EDD (Type)

Turn-Around Time:

☒ Standard ☐ Rush

Project Name:

Shinnery Oak SWD

Project #:

20E-00239

Project Manager:

Natalie Gordon

Sampler:

MJP

On Ice:

☒ Yes ☐ No# of Coolers: 2Cooler Temp (including CFI): See Rems (°C)

Container Type and #

Preservative Type

HEAL No.

2008696

-001

-002

-003

-004

-005

-006

-007

-008

-009

-010

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Chain-of-Custody Record

Client: Vertex

Mailing Address:

Phone #:

Email or Fax#:

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)Accreditation: ☐ Az Compliance☐ NELAC ☐ Other☐ EDD (Type)

Turn-Around Time:

☒ Standard ☐ Rush

Project Name:

Shinnery Oak SWD

Project #:

20E-00239

Project Manager:

Natalie GordonSampler: MJPOn Ice: ☒ Yes ☐ No# of Coolers: 2Cooler Temp (including CFI): See Papers (°C)

Container Type and #

Preservative Type

HEAL No.

Date Time Matrix Sample Name

8/27 12:05 50.1 W520-46

12:10 1 W520-47

12:15 1 W520-48

Date:

Relinquished by:

Received by:

Date Time

Via: Winnings 8/28/20 12:00

Date:

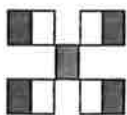
Relinquished by:

Received by:

Date Time

Via: Cue Carver 8/29/20 0830

Remarks:

3440-3.1 CC Natalie
6.1 10-8.1
MetadorHALL ENVIRONMENTAL
ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

Total Coliform (Present/Absent)

8270 (Semi-VOA)

8260 (VOA)

Cl, F, Br, NO₃, NO₂, PO₄, SO₄

RCRA 8 Metals

PAHs by 8310 or 8270SIMS

EDB (Method 504.1)

8081 Pesticides/8082 PCBs

TPH:8015D(GRO / DRO / MRO)

BTX: MTBE / TMBs (8021)



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

September 11, 2020

Natalie Gordon

Vertex Resource Group Ltd.

3101 Boyd Drive

Carlsbad, NM 88220

TEL: (505) 506-0040

FAX:

RE: Shinnery Oaks SWD 003 Pasture

OrderNo.: 2008G08

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 21 sample(s) on 8/28/2020 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,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a horizontal line.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Analytical Report

Lab Order 2008G08

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-68 1'

Project: Shinnery Oaks SWD 003 Pasture

Collection Date: 8/26/2020 11:00:00 AM

Lab ID: 2008G08-001

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.8		mg/Kg	1	9/1/2020 1:11:45 PM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	9/1/2020 1:11:45 PM
Surr: DNOP	92.6	30.4-154		%Rec	1	9/1/2020 1:11:45 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	220	60		mg/Kg	20	9/4/2020 4:49:26 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/31/2020 4:34:51 AM
Toluene	ND	0.049		mg/Kg	1	8/31/2020 4:34:51 AM
Ethylbenzene	ND	0.049		mg/Kg	1	8/31/2020 4:34:51 AM
Xylenes, Total	ND	0.098		mg/Kg	1	8/31/2020 4:34:51 AM
Surr: 1,2-Dichloroethane-d4	98.2	70-130		%Rec	1	8/31/2020 4:34:51 AM
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	8/31/2020 4:34:51 AM
Surr: Dibromofluoromethane	111	70-130		%Rec	1	8/31/2020 4:34:51 AM
Surr: Toluene-d8	98.5	70-130		%Rec	1	8/31/2020 4:34:51 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/31/2020 4:34:51 AM
Surr: BFB	105	70-130		%Rec	1	8/31/2020 4:34:51 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding time for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 1 of 24

Analytical Report

Lab Order 2008G08

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-69 1'

Project: Shinnery Oaks SWD 003 Pasture

Collection Date: 8/26/2020 11:05:00 AM

Lab ID: 2008G08-002

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	9/1/2020 1:21:22 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/1/2020 1:21:22 PM
Surr: DNOP	93.6	30.4-154		%Rec	1	9/1/2020 1:21:22 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	300	60		mg/Kg	20	9/4/2020 5:01:50 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/31/2020 5:03:27 AM
Toluene	ND	0.049		mg/Kg	1	8/31/2020 5:03:27 AM
Ethylbenzene	ND	0.049		mg/Kg	1	8/31/2020 5:03:27 AM
Xylenes, Total	ND	0.098		mg/Kg	1	8/31/2020 5:03:27 AM
Surr: 1,2-Dichloroethane-d4	95.8	70-130		%Rec	1	8/31/2020 5:03:27 AM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	8/31/2020 5:03:27 AM
Surr: Dibromofluoromethane	111	70-130		%Rec	1	8/31/2020 5:03:27 AM
Surr: Toluene-d8	98.1	70-130		%Rec	1	8/31/2020 5:03:27 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/31/2020 5:03:27 AM
Surr: BFB	106	70-130		%Rec	1	8/31/2020 5:03:27 AM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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

Page 2 of 24

Analytical Report

Lab Order 2008G08

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-70 1'

Project: Shinnery Oaks SWD 003 Pasture

Collection Date: 8/26/2020 11:10:00 AM

Lab ID: 2008G08-003

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	9/1/2020 1:30:58 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/1/2020 1:30:58 PM
Surr: DNOP	95.1	30.4-154		%Rec	1	9/1/2020 1:30:58 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	380	60		mg/Kg	20	9/4/2020 5:14:15 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/31/2020 5:32:14 AM
Toluene	ND	0.049		mg/Kg	1	8/31/2020 5:32:14 AM
Ethylbenzene	ND	0.049		mg/Kg	1	8/31/2020 5:32:14 AM
Xylenes, Total	ND	0.098		mg/Kg	1	8/31/2020 5:32:14 AM
Surr: 1,2-Dichloroethane-d4	100	70-130		%Rec	1	8/31/2020 5:32:14 AM
Surr: 4-Bromofluorobenzene	96.2	70-130		%Rec	1	8/31/2020 5:32:14 AM
Surr: Dibromofluoromethane	115	70-130		%Rec	1	8/31/2020 5:32:14 AM
Surr: Toluene-d8	103	70-130		%Rec	1	8/31/2020 5:32:14 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/31/2020 5:32:14 AM
Surr: BFB	103	70-130		%Rec	1	8/31/2020 5:32:14 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 3 of 24

Analytical Report

Lab Order 2008G08

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-71 1'

Project: Shinnery Oaks SWD 003 Pasture

Collection Date: 8/26/2020 11:15:00 AM

Lab ID: 2008G08-004

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/1/2020 1:40:35 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/1/2020 1:40:35 PM
Surr: DNOP	94.4	30.4-154		%Rec	1	9/1/2020 1:40:35 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	190	60		mg/Kg	20	9/4/2020 5:26:40 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/31/2020 6:00:44 AM
Toluene	ND	0.050		mg/Kg	1	8/31/2020 6:00:44 AM
Ethylbenzene	ND	0.050		mg/Kg	1	8/31/2020 6:00:44 AM
Xylenes, Total	ND	0.099		mg/Kg	1	8/31/2020 6:00:44 AM
Surr: 1,2-Dichloroethane-d4	95.7	70-130		%Rec	1	8/31/2020 6:00:44 AM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	8/31/2020 6:00:44 AM
Surr: Dibromofluoromethane	108	70-130		%Rec	1	8/31/2020 6:00:44 AM
Surr: Toluene-d8	99.4	70-130		%Rec	1	8/31/2020 6:00:44 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/31/2020 6:00:44 AM
Surr: BFB	104	70-130		%Rec	1	8/31/2020 6:00:44 AM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Analytical Report

Lab Order 2008G08

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-72 1'

Project: Shinnery Oaks SWD 003 Pasture

Collection Date: 8/26/2020 11:20:00 AM

Lab ID: 2008G08-005

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	9/1/2020 1:50:13 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/1/2020 1:50:13 PM
Surr: DNOP	97.3	30.4-154		%Rec	1	9/1/2020 1:50:13 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	91	60		mg/Kg	20	9/4/2020 1:07:02 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/31/2020 6:29:19 AM
Toluene	ND	0.050		mg/Kg	1	8/31/2020 6:29:19 AM
Ethylbenzene	ND	0.050		mg/Kg	1	8/31/2020 6:29:19 AM
Xylenes, Total	ND	0.10		mg/Kg	1	8/31/2020 6:29:19 AM
Surr: 1,2-Dichloroethane-d4	99.7	70-130		%Rec	1	8/31/2020 6:29:19 AM
Surr: 4-Bromofluorobenzene	99.2	70-130		%Rec	1	8/31/2020 6:29:19 AM
Surr: Dibromofluoromethane	110	70-130		%Rec	1	8/31/2020 6:29:19 AM
Surr: Toluene-d8	96.6	70-130		%Rec	1	8/31/2020 6:29:19 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/31/2020 6:29:19 AM
Surr: BFB	101	70-130		%Rec	1	8/31/2020 6:29:19 AM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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

Page 5 of 24

Analytical Report

Lab Order 2008G08

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-73 1'

Project: Shinnery Oaks SWD 003 Pasture

Collection Date: 8/26/2020 11:25:00 AM

Lab ID: 2008G08-006

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.0		mg/Kg	1	9/1/2020 1:59:50 PM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	9/1/2020 1:59:50 PM
Surr: DNOP	92.5	30.4-154		%Rec	1	9/1/2020 1:59:50 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	96	60		mg/Kg	20	9/4/2020 1:44:16 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	8/31/2020 6:57:49 AM
Toluene	ND	0.049		mg/Kg	1	8/31/2020 6:57:49 AM
Ethylbenzene	ND	0.049		mg/Kg	1	8/31/2020 6:57:49 AM
Xylenes, Total	ND	0.098		mg/Kg	1	8/31/2020 6:57:49 AM
Surr: 1,2-Dichloroethane-d4	94.7	70-130		%Rec	1	8/31/2020 6:57:49 AM
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	8/31/2020 6:57:49 AM
Surr: Dibromofluoromethane	110	70-130		%Rec	1	8/31/2020 6:57:49 AM
Surr: Toluene-d8	99.3	70-130		%Rec	1	8/31/2020 6:57:49 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/31/2020 6:57:49 AM
Surr: BFB	104	70-130		%Rec	1	8/31/2020 6:57:49 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 6 of 24

Hall Environmental Analysis Laboratory, Inc.**Analytical Report**

Lab Order 2008G08

Date Reported: 9/11/2020

CLIENT: Vertex Resource Group Ltd.**Client Sample ID:** BS20-76 2.5'**Project:** Shinnery Oaks SWD 003 Pasture**Collection Date:** 8/26/2020 11:40:00 AM**Lab ID:** 2008G08-007**Matrix:** SOIL**Received Date:** 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/1/2020 2:09:31 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/1/2020 2:09:31 PM
Surr: DNOP	106	30.4-154		%Rec	1	9/1/2020 2:09:31 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	130	60		mg/Kg	20	9/4/2020 1:56:40 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	8/31/2020 7:26:26 AM
Toluene	ND	0.048		mg/Kg	1	8/31/2020 7:26:26 AM
Ethylbenzene	ND	0.048		mg/Kg	1	8/31/2020 7:26:26 AM
Xylenes, Total	ND	0.097		mg/Kg	1	8/31/2020 7:26:26 AM
Surr: 1,2-Dichloroethane-d4	96.6	70-130		%Rec	1	8/31/2020 7:26:26 AM
Surr: 4-Bromofluorobenzene	99.9	70-130		%Rec	1	8/31/2020 7:26:26 AM
Surr: Dibromofluoromethane	114	70-130		%Rec	1	8/31/2020 7:26:26 AM
Surr: Toluene-d8	99.7	70-130		%Rec	1	8/31/2020 7:26:26 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/31/2020 7:26:26 AM
Surr: BFB	106	70-130		%Rec	1	8/31/2020 7:26:26 AM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- D Sample Diluted Due to Matrix
- HF Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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

Page 7 of 24

Analytical Report

Lab Order 2008G08

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-85 4.5'

Project: Shinnery Oaks SWD 003 Pasture

Collection Date: 8/26/2020 9:45:00 AM

Lab ID: 2008G08-008

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/1/2020 2:19:10 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/1/2020 2:19:10 PM
Surr: DNOP	96.8	30.4-154		%Rec	1	9/1/2020 2:19:10 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/4/2020 2:09:04 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/31/2020 7:55:10 AM
Toluene	ND	0.050		mg/Kg	1	8/31/2020 7:55:10 AM
Ethylbenzene	ND	0.050		mg/Kg	1	8/31/2020 7:55:10 AM
Xylenes, Total	ND	0.10		mg/Kg	1	8/31/2020 7:55:10 AM
Surr: 1,2-Dichloroethane-d4	97.5	70-130		%Rec	1	8/31/2020 7:55:10 AM
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	8/31/2020 7:55:10 AM
Surr: Dibromofluoromethane	113	70-130		%Rec	1	8/31/2020 7:55:10 AM
Surr: Toluene-d8	102	70-130		%Rec	1	8/31/2020 7:55:10 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/31/2020 7:55:10 AM
Surr: BFB	103	70-130		%Rec	1	8/31/2020 7:55:10 AM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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

Page 8 of 24

Analytical Report

Lab Order 2008G08

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-86 4.5'

Project: Shinnery Oaks SWD 003 Pasture

Collection Date: 8/26/2020 9:50:00 AM

Lab ID: 2008G08-009

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	9/1/2020 2:28:53 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/1/2020 2:28:53 PM
Surr: DNOP	99.5	30.4-154		%Rec	1	9/1/2020 2:28:53 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/4/2020 2:21:29 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/31/2020 8:23:42 AM
Toluene	ND	0.049		mg/Kg	1	8/31/2020 8:23:42 AM
Ethylbenzene	ND	0.049		mg/Kg	1	8/31/2020 8:23:42 AM
Xylenes, Total	ND	0.099		mg/Kg	1	8/31/2020 8:23:42 AM
Surr: 1,2-Dichloroethane-d4	99.0	70-130		%Rec	1	8/31/2020 8:23:42 AM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	8/31/2020 8:23:42 AM
Surr: Dibromofluoromethane	110	70-130		%Rec	1	8/31/2020 8:23:42 AM
Surr: Toluene-d8	98.6	70-130		%Rec	1	8/31/2020 8:23:42 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/31/2020 8:23:42 AM
Surr: BFB	102	70-130		%Rec	1	8/31/2020 8:23:42 AM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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

Page 9 of 24

Analytical Report

Lab Order 2008G08

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-87 4.5'

Project: Shinnery Oaks SWD 003 Pasture

Collection Date: 8/26/2020 9:55:00 AM

Lab ID: 2008G08-010

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/1/2020 2:38:35 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/1/2020 2:38:35 PM
Surr: DNOP	98.3	30.4-154		%Rec	1	9/1/2020 2:38:35 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/4/2020 2:33:53 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/31/2020 8:52:11 AM
Toluene	ND	0.049		mg/Kg	1	8/31/2020 8:52:11 AM
Ethylbenzene	ND	0.049		mg/Kg	1	8/31/2020 8:52:11 AM
Xylenes, Total	ND	0.099		mg/Kg	1	8/31/2020 8:52:11 AM
Surr: 1,2-Dichloroethane-d4	97.2	70-130		%Rec	1	8/31/2020 8:52:11 AM
Surr: 4-Bromofluorobenzene	97.2	70-130		%Rec	1	8/31/2020 8:52:11 AM
Surr: Dibromofluoromethane	106	70-130		%Rec	1	8/31/2020 8:52:11 AM
Surr: Toluene-d8	97.5	70-130		%Rec	1	8/31/2020 8:52:11 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/31/2020 8:52:11 AM
Surr: BFB	100	70-130		%Rec	1	8/31/2020 8:52:11 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 10 of 24

Hall Environmental Analysis Laboratory, Inc.**Analytical Report**

Lab Order 2008G08

Date Reported: 9/11/2020

CLIENT: Vertex Resource Group Ltd.**Client Sample ID:** BS20-88 4.5'**Project:** Shinnery Oaks SWD 003 Pasture**Collection Date:** 8/26/2020 10:00:00 AM**Lab ID:** 2008G08-011**Matrix:** SOIL**Received Date:** 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.0		mg/Kg	1	9/1/2020 2:48:25 PM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	9/1/2020 2:48:25 PM
Surr: DNOP	91.2	30.4-154		%Rec	1	9/1/2020 2:48:25 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	110	60		mg/Kg	20	9/4/2020 3:11:06 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/31/2020 9:20:38 AM
Toluene	ND	0.050		mg/Kg	1	8/31/2020 9:20:38 AM
Ethylbenzene	ND	0.050		mg/Kg	1	8/31/2020 9:20:38 AM
Xylenes, Total	ND	0.10		mg/Kg	1	8/31/2020 9:20:38 AM
Surr: 1,2-Dichloroethane-d4	96.3	70-130		%Rec	1	8/31/2020 9:20:38 AM
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	1	8/31/2020 9:20:38 AM
Surr: Dibromofluoromethane	108	70-130		%Rec	1	8/31/2020 9:20:38 AM
Surr: Toluene-d8	101	70-130		%Rec	1	8/31/2020 9:20:38 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/31/2020 9:20:38 AM
Surr: BFB	105	70-130		%Rec	1	8/31/2020 9:20:38 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 11 of 24

Analytical Report

Lab Order 2008G08

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-89 4.5'

Project: Shinnery Oaks SWD 003 Pasture

Collection Date: 8/26/2020 10:05:00 AM

Lab ID: 2008G08-012

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	9/1/2020 2:58:17 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/1/2020 2:58:17 PM
Surr: DNOP	88.2	30.4-154		%Rec	1	9/1/2020 2:58:17 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	230	61		mg/Kg	20	9/4/2020 3:23:30 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/31/2020 9:49:10 AM
Toluene	ND	0.049		mg/Kg	1	8/31/2020 9:49:10 AM
Ethylbenzene	ND	0.049		mg/Kg	1	8/31/2020 9:49:10 AM
Xylenes, Total	ND	0.099		mg/Kg	1	8/31/2020 9:49:10 AM
Surr: 1,2-Dichloroethane-d4	99.4	70-130		%Rec	1	8/31/2020 9:49:10 AM
Surr: 4-Bromofluorobenzene	98.1	70-130		%Rec	1	8/31/2020 9:49:10 AM
Surr: Dibromofluoromethane	111	70-130		%Rec	1	8/31/2020 9:49:10 AM
Surr: Toluene-d8	98.2	70-130		%Rec	1	8/31/2020 9:49:10 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/31/2020 9:49:10 AM
Surr: BFB	99.6	70-130		%Rec	1	8/31/2020 9:49:10 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level,
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative 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

Page 12 of 24

Analytical Report

Lab Order 2008G08

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-37 0-3

Project: Shinnery Oaks SWD 003 Pasture

Collection Date: 8/26/2020 10:15:00 AM

Lab ID: 2008G08-013

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	9/1/2020 11:35:11 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/1/2020 11:35:11 PM
Surr: DNOP	73.4	30.4-154		%Rec	1	9/1/2020 11:35:11 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/4/2020 3:35:54 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	8/30/2020 11:50:34 PM
Toluene	ND	0.049		mg/Kg	1	8/30/2020 11:50:34 PM
Ethylbenzene	ND	0.049		mg/Kg	1	8/30/2020 11:50:34 PM
Xylenes, Total	ND	0.098		mg/Kg	1	8/30/2020 11:50:34 PM
Surr: 1,2-Dichloroethane-d4	95.7	70-130		%Rec	1	8/30/2020 11:50:34 PM
Surr: 4-Bromofluorobenzene	92.9	70-130		%Rec	1	8/30/2020 11:50:34 PM
Surr: Dibromofluoromethane	95.8	70-130		%Rec	1	8/30/2020 11:50:34 PM
Surr: Toluene-d8	104	70-130		%Rec	1	8/30/2020 11:50:34 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/30/2020 11:50:34 PM
Surr: BFB	95.4	70-130		%Rec	1	8/30/2020 11:50:34 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative 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

Page 13 of 24

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2008G08

Date Reported: 9/11/2020

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-38 0-4.5

Project: Shinnery Oaks SWD 003 Pasture

Collection Date: 8/26/2020 10:20:00 AM

Lab ID: 2008G08-014

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/2/2020 12:05:08 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/2/2020 12:05:08 AM
Surr: DNOP	75.0	30.4-154		%Rec	1	9/2/2020 12:05:08 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	130	60		mg/Kg	20	9/4/2020 3:48:19 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	8/31/2020 1:19:23 AM
Toluene	ND	0.049		mg/Kg	1	8/31/2020 1:19:23 AM
Ethylbenzene	ND	0.049		mg/Kg	1	8/31/2020 1:19:23 AM
Xylenes, Total	ND	0.098		mg/Kg	1	8/31/2020 1:19:23 AM
Surr: 1,2-Dichloroethane-d4	97.8	70-130		%Rec	1	8/31/2020 1:19:23 AM
Surr: 4-Bromofluorobenzene	94.0	70-130		%Rec	1	8/31/2020 1:19:23 AM
Surr: Dibromofluoromethane	94.2	70-130		%Rec	1	8/31/2020 1:19:23 AM
Surr: Toluene-d8	103	70-130		%Rec	1	8/31/2020 1:19:23 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/31/2020 1:19:23 AM
Surr: BFB	95.8	70-130		%Rec	1	8/31/2020 1:19:23 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative 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

Page 14 of 24

Hall Environmental Analysis Laboratory, Inc.**Analytical Report**

Lab Order 2008G08

Date Reported: 9/11/2020

CLIENT: Vertex Resource Group Ltd.**Client Sample ID:** WS20-39 0-4.5**Project:** Shinnery Oaks SWD 003 Pasture**Collection Date:** 8/26/2020 10:25:00 AM**Lab ID:** 2008G08-015**Matrix:** SOIL**Received Date:** 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	9/2/2020 12:15:06 AM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/2/2020 12:15:06 AM
Surr: DNOP	67.1	30.4-154		%Rec	1	9/2/2020 12:15:06 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/4/2020 4:00:43 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	8/31/2020 2:48:16 AM
Toluene	ND	0.049		mg/Kg	1	8/31/2020 2:48:16 AM
Ethylbenzene	ND	0.049		mg/Kg	1	8/31/2020 2:48:16 AM
Xylenes, Total	ND	0.097		mg/Kg	1	8/31/2020 2:48:16 AM
Surr: 1,2-Dichloroethane-d4	97.5	70-130		%Rec	1	8/31/2020 2:48:16 AM
Surr: 4-Bromofluorobenzene	93.5	70-130		%Rec	1	8/31/2020 2:48:16 AM
Surr: Dibromofluoromethane	94.8	70-130		%Rec	1	8/31/2020 2:48:16 AM
Surr: Toluene-d8	103	70-130		%Rec	1	8/31/2020 2:48:16 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/31/2020 2:48:16 AM
Surr: BFB	97.0	70-130		%Rec	1	8/31/2020 2:48:16 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 15 of 24

Hall Environmental Analysis Laboratory, Inc.**Analytical Report**

Lab Order 2008G08

Date Reported: 9/11/2020

CLIENT: Vertex Resource Group Ltd.**Client Sample ID:** WS20-40 0-4.5**Project:** Shinnery Oaks SWD 003 Pasture**Collection Date:** 8/26/2020 10:20:00 AM**Lab ID:** 2008G08-016**Matrix:** SOIL**Received Date:** 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/2/2020 12:25:03 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/2/2020 12:25:03 AM
Surr: DNOP	74.6	30.4-154		%Rec	1	9/2/2020 12:25:03 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	120	60		mg/Kg	20	9/4/2020 4:13:08 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	8/31/2020 3:18:06 AM
Toluene	ND	0.050		mg/Kg	1	8/31/2020 3:18:06 AM
Ethylbenzene	ND	0.050		mg/Kg	1	8/31/2020 3:18:06 AM
Xylenes, Total	ND	0.099		mg/Kg	1	8/31/2020 3:18:06 AM
Surr: 1,2-Dichloroethane-d4	98.4	70-130		%Rec	1	8/31/2020 3:18:06 AM
Surr: 4-Bromofluorobenzene	91.0	70-130		%Rec	1	8/31/2020 3:18:06 AM
Surr: Dibromofluoromethane	98.6	70-130		%Rec	1	8/31/2020 3:18:06 AM
Surr: Toluene-d8	103	70-130		%Rec	1	8/31/2020 3:18:06 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/31/2020 3:18:06 AM
Surr: BFB	92.5	70-130		%Rec	1	8/31/2020 3:18:06 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 16 of 24

Analytical Report

Lab Order 2008G08

Date Reported: 9/11/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: WS20-41 0-3

Project: Shinnery Oaks SWD 003 Pasture

Collection Date: 8/26/2020 10:00:00 AM

Lab ID: 2008G08-017

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/2/2020 12:08:33 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/2/2020 12:08:33 PM
Surr: DNOP	84.0	30.4-154		%Rec	1	9/2/2020 12:08:33 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/4/2020 4:25:32 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	8/31/2020 3:47:31 AM
Toluene	ND	0.049		mg/Kg	1	8/31/2020 3:47:31 AM
Ethylbenzene	ND	0.049		mg/Kg	1	8/31/2020 3:47:31 AM
Xylenes, Total	ND	0.099		mg/Kg	1	8/31/2020 3:47:31 AM
Surr: 1,2-Dichloroethane-d4	98.7	70-130		%Rec	1	8/31/2020 3:47:31 AM
Surr: 4-Bromofluorobenzene	92.5	70-130		%Rec	1	8/31/2020 3:47:31 AM
Surr: Dibromofluoromethane	98.0	70-130		%Rec	1	8/31/2020 3:47:31 AM
Surr: Toluene-d8	103	70-130		%Rec	1	8/31/2020 3:47:31 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/31/2020 3:47:31 AM
Surr: BFB	95.5	70-130		%Rec	1	8/31/2020 3:47:31 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative Limit
	S	% Recovery outside of range due to dilution or matrix

	B	Analyte detected in the associated Method Blank
	E	Value above quantitation range
	F	Analyte detected below quantitation limits
	P	Sample pH Not In Range
	RL	Reporting Limit

Page 17 of 24

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G08

11-Sep-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 003 Pasture

Sample ID: MB-54954	SampType: mbk	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 54954	RunNo: 71641								
Prep Date: 9/4/2020	Analysis Date: 9/4/2020	SeqNo: 2504278	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-54954	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSS	Batch ID: 54954	RunNo: 71641								
Prep Date: 9/4/2020	Analysis Date: 9/4/2020	SeqNo: 2504279	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.6	90	110			

Sample ID: MB-54956	SampType: mbk	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 54956	RunNo: 71643								
Prep Date: 9/4/2020	Analysis Date: 9/4/2020	SeqNo: 2504397	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-54956	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSS	Batch ID: 54956	RunNo: 71643								
Prep Date: 9/4/2020	Analysis Date: 9/4/2020	SeqNo: 2504398	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.4	90	110			

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 Quantitative Limit	RL Reporting Limit
S % Recovery outside of range due to dilution or matrix	

Page 18 of 24

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G08

11-Sep-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 003 Pasture

Sample ID: 2008G08-013AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: WS20-37 0-3	Batch ID: 54824	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499537 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	39	9.5	47.48	4.320	73.3	47.4	136			
Surr: DNOP	3.4		4.748		72.1	30.4	154			

Sample ID: 2008G08-013AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: WS20-37 0-3	Batch ID: 54824	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499538 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	37	10	49.95	4.320	64.6	47.4	136	6.71	43.4	
Surr: DNOP	3.7		4.995		73.1	30.4	154	0	0	

Sample ID: LCS-54795	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 54795	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499585 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	35	10	50.00	0	70.1	70	130			
Surr: DNOP	4.8		5.000		96.7	30.4	154			

Sample ID: LCS-54824	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 54824	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499589 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	36	10	50.00	0	72.0	70	130			
Surr: DNOP	3.2		5.000		63.0	30.4	154			

Sample ID: MB-54795	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 54795	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499590 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		101	30.4	154			

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 Quantitative Limit	RL Reporting Limit
S % Recovery outside of range due to dilution or matrix	

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2008G08

11-Sep-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 003 Pasture

Sample ID: MB-54824	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 54824	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499594 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	6.4		10.00		63.6	30.4	154			

Sample ID: 2008G08-017AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: WS20-41 0-3	Batch ID: 54844	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/2/2020	SeqNo: 2501821 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	42	9.3	46.69	3.756	81.0	47.4	136			
Surr: DNOP	4.1		4.669		87.6	30.4	154			

Sample ID: 2008G08-017AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: WS20-41 0-3	Batch ID: 54844	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/2/2020	SeqNo: 2501822 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	39	9.7	48.40	3.756	73.8	47.4	136	5.15	43.4	
Surr: DNOP	3.8		4.840		77.8	30.4	154	0	0	

Sample ID: LCS-54844	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 54844	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/2/2020	SeqNo: 2501935 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	10	50.00	0	92.5	70	130			
Surr: DNOP	4.6		5.000		91.4	30.4	154			

Sample ID: MB-54844	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 54844	RunNo: 71591								
Prep Date: 9/1/2020	Analysis Date: 9/2/2020	SeqNo: 2501943 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.7		10.00		86.9	30.4	154			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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#: 2008G08

11-Sep-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 003 Pasture

Sample ID: mb-54782	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBS	Batch ID: 54782	RunNo: 71485								
Prep Date: 8/29/2020	Analysis Date: 8/30/2020	SeqNo: 2496278 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	0.48		0.5000		95.6	70	130			
Surr: 4-Bromofluorobenzene	0.47		0.5000		93.2	70	130			
Surr: Dibromofluoromethane	0.48		0.5000		96.5	70	130			
Surr: Toluene-d8	0.52		0.5000		104	70	130			

Sample ID: lcs-54782	SampType: LCS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BatchQC	Batch ID: 54782	RunNo: 71485								
Prep Date: 8/29/2020	Analysis Date: 8/30/2020	SeqNo: 2496289 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.94	0.025	1.000	0	94.2	80	120			
Toluene	1.0	0.050	1.000	0	104	80	120			
Ethylbenzene	1.1	0.050	1.000	0	106	80	120			
Xylenes, Total	3.1	0.10	3.000	0	104	80	120			
Surr: 1,2-Dichloroethane-d4	0.49		0.5000		97.3	70	130			
Surr: 4-Bromofluorobenzene	0.46		0.5000		91.3	70	130			
Surr: Dibromofluoromethane	0.48		0.5000		95.5	70	130			
Surr: Toluene-d8	0.51		0.5000		102	70	130			

Sample ID: 2008g08-013ams	SampType: MS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: WS20-37 0-3	Batch ID: 54782	RunNo: 71485								
Prep Date: 8/29/2020	Analysis Date: 8/31/2020	SeqNo: 2496291 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.99	0.024	0.9766	0	102	71.1	115			
Toluene	1.1	0.049	0.9766	0	114	79.6	132			
Ethylbenzene	1.2	0.049	0.9766	0	119	83.8	134			
Xylenes, Total	3.4	0.098	2.930	0	115	82.4	132			
Surr: 1,2-Dichloroethane-d4	0.48		0.4883		98.5	70	130			
Surr: 4-Bromofluorobenzene	0.46		0.4883		95.2	70	130			
Surr: Dibromofluoromethane	0.47		0.4883		96.5	70	130			
Surr: Toluene-d8	0.51		0.4883		104	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation of analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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#: 2008G08

11-Sep-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oaks SWD 003 Pasture

Sample ID: 2008G08-013AMSD	SampType: MSD4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: WS20-37 0-3	Batch ID: 54782	RunNo: 71485								
Prep Date: 8/29/2020	Analysis Date: 8/31/2020	SeqNo: 2496292	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.82	0.025	0.9872	0	83.3	71.1	115	18.9	20	
Toluene	0.90	0.049	0.9872	0	91.6	79.6	132	20.5	20	R
Ethylbenzene	0.91	0.049	0.9872	0	91.8	83.8	134	24.7	20	R
Xylenes, Total	2.7	0.099	2.962	0	90.5	82.4	132	22.7	20	R
Surr: 1,2-Dichloroethane-d4	0.49		0.4936		98.6	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.45		0.4936		91.5	70	130	0	0	
Surr: Dibromofluoromethane	0.47		0.4936		95.0	70	130	0	0	
Surr: Toluene-d8	0.52		0.4936		105	70	130	0	0	

Sample ID: lcs-54779	SampType: LCS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BatchQC	Batch ID: 54779	RunNo: 71493								
Prep Date: 8/29/2020	Analysis Date: 8/30/2020	SeqNo: 2496739	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	96.7	80	120			
Toluene	1.0	0.050	1.000	0	104	80	120			
Ethylbenzene	1.1	0.050	1.000	0	110	80	120			
Xylenes, Total	3.4	0.10	3.000	0	113	80	120			
Surr: 1,2-Dichloroethane-d4	0.47		0.5000		93.0	70	130			
Surr: 4-Bromofluorobenzene	0.54		0.5000		108	70	130			
Surr: Dibromofluoromethane	0.52		0.5000		105	70	130			
Surr: Toluene-d8	0.51		0.5000		102	70	130			

Sample ID: mb-54779	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBS	Batch ID: 54779	RunNo: 71493								
Prep Date: 8/29/2020	Analysis Date: 8/30/2020	SeqNo: 2496740	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	0.49		0.5000		98.4	70	130			
Surr: 4-Bromofluorobenzene	0.50		0.5000		100	70	130			
Surr: Dibromofluoromethane	0.53		0.5000		106	70	130			
Surr: Toluene-d8	0.49		0.5000		97.2	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 Quantitative Limit	RL Reporting Limit
S % Recovery outside of range due to dilution or matrix	

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G08

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oaks SWD 003 Pasture

Sample ID: mb-54782	SampType: MBLK	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: PBS	Batch ID: 54782	RunNo: 71485								
Prep Date: 8/29/2020	Analysis Date: 8/30/2020	SeqNo: 2496301 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	480		500.0		95.5	70	130			

Sample ID: lcs-54782	SampType: LCS	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: LCSS	Batch ID: 54782	RunNo: 71485								
Prep Date: 8/29/2020	Analysis Date: 8/30/2020	SeqNo: 2496302 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	87.6	70	130			
Surr: BFB	460		500.0		91.8	70	130			

Sample ID: 2008g08-014ams	SampType: MS	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: WS20-38 0-4.5	Batch ID: 54782	RunNo: 71485								
Prep Date: 8/29/2020	Analysis Date: 8/31/2020	SeqNo: 2496305 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	4.9	24.51	0	90.2	49.2	122			
Surr: BFB	460		490.2		93.4	70	130			

Sample ID: 2008g08-014amsd	SampType: MSD	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: WS20-38 0-4.5	Batch ID: 54782	RunNo: 71485								
Prep Date: 8/29/2020	Analysis Date: 8/31/2020	SeqNo: 2496306 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	4.9	24.63	0	89.4	49.2	122	0.444	20	
Surr: BFB	460		492.6		93.0	70	130	0	0	

Sample ID: lcs-54779	SampType: LCS	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: LCSS	Batch ID: 54779	RunNo: 71493								
Prep Date: 8/29/2020	Analysis Date: 8/30/2020	SeqNo: 2496787 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	5.0	25.00	0	85.2	70	130			
Surr: BFB	520		500.0		103	70	130			

Sample ID: mb-54779	SampType: MBLK	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: PBS	Batch ID: 54779	RunNo: 71493								
Prep Date: 8/29/2020	Analysis Date: 8/30/2020	SeqNo: 2496794 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 Quantitative 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#: 2008G08

11-Sep-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oaks SWD 003 Pasture

Sample ID: mb-54779	SampType: MBLK	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: PBS	Batch ID: 54779	RunNo: 71493								
Prep Date: 8/29/2020	Analysis Date: 8/30/2020	SeqNo: 2496794 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	510		500.0		103	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 24 of 24



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

Sample Log-In Check List

Client Name: Vertex Resource Group Ltd.

Work Order Number: 2008G08

RcptNo: 1

Received By: Juan Rojas 8/28/2020 8:00:00 AM

Completed By: Juan Rojas 8/28/2020 10:19:13 AM

Reviewed By: QM 8/28/20

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ 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: Cno 8/28/20

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: _____

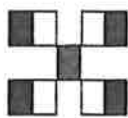
16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.6	Good				
2	4.9	Good				
3	1.3	Good				

Chain-of-Custody Record

Client: <u>Vertex</u>		Turn-Around Time: <u>5 Day</u>	
		☒ Standard ☐ Rush	
Mailing Address:		Project Name: <u>Shinnery Oaks SWD #003</u> <u>(Pasture)</u>	
Phone #:		Project #: <u>20E-00239</u>	
email or Fax#:		Project Manager: <u>Natalie Gordon</u>	
QA/QC Package:		Sampler: <u>MSP</u>	
☐ Standard ☐ Level 4 (Full Validation)		On Ice: ☒ Yes ☐ No	
Accreditation: ☐ AZ Compliance ☐ NELAC ☐ Other		# of Coolers: <u>3</u>	
☐ EDD (Type)		Cooler Temp (including on Ice) Remarks (°C)	
Date	Time	Matrix	Sample Name
8/6/20	11:20	Soil	BS20-68 1'
	11:05		BS20-69 1'
	11:10		BS20-70 1'
	11:15		BS20-71 1'
	11:20		BS20-72 1'
	11:25		BS20-73 1'
	11:40		BS20-76 2.5'
	4:45		BS20-85 4.5'
	4:50		BS20-86 4.5'
	4:55		BS20-87 4.5'
	10:00		BS20-88 4.5'
	10:05		BS20-89 4.5'
Date:	Time:	Relinquished by: <u>[Signature]</u>	Received by: <u>[Signature]</u>
Date:	Time:	Relinquished by: <u>[Signature]</u>	Received by: <u>[Signature]</u>



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

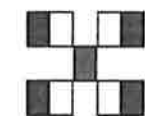
TPH: 8015D (GRO / DRO / MRO)	8081 Pesticides / 8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	(C) F, Br, NO ₃ , NO ₂ , PO ₄ , SO ₄	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
MTBE / TMB's (8021)								

Remarks: CC: Natalie Gordon

0.6-0=0.6
4.9-0=4.9
1.3-0=1.3

Matedor

Chain-of-Custody Record	Client:	Vertex	Turn-Around Time:	5 Days
	Mailing Address:		☐ Standard ☐ Rush	
			Project Name:	Shimney Oaks (Pasture)
			Project #:	Swd #003
				JOE-00339



**HALL ENVIRONMENTAL
ANALYSIS LABORATORY**

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

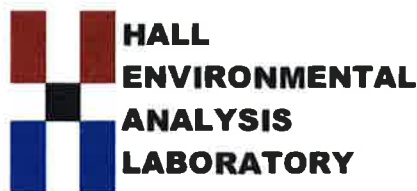
email or Fax#:	Project Manager:	
QA/QC Package:	Natalie Gordon	
☐ Standard	☐ Level 4 (Full Validation)	
Accreditation:	Sampler: MSP	
☐ NELAC	☐ Az Compliance	
☐ EDD (Type)	☐ Other	
	On Ice:	☒ Yes ☐ No
	# of Coolers:	3
	Cooler Temp (including CF):	See Dimensional (°C)

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.
3-26	10:15	Soil	WS20-37 0-3	402	ice	2005608
	10:20		WS20-38 0-4.5			-013
	10:25		WS20-39 0-4.5			-014
	10:30		WS20-40 0-4.5			-015
	10:40		WS20-41 0-3	✓	↓	-016
						-017
8-20	7:20	Soil	BS20-13 0-25	402	ice	-018
	7:25	↓	BS20-14 0-25	↓	↓	-019
	7:30	↓	BS20-15 0-25	↓	↓	-020
	7:35	↓	BS20-16 0-25	↓	↓	-021

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
			<i>Cummings</i>		<i>8/27/20</i>	<i>1000</i>
Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
			<i>Pat Cover</i>		<i>8/28/20</i>	<i>5:00</i>

Remarks:

$$\begin{array}{r} 0.6 - 0 = 0.6 \\ 4.9 - 0 = 4.9 \\ 13.0 - 0 = 13 \end{array}$$



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

September 09, 2020

Natalie Gordon

Vertex Resource Group Ltd.

3101 Boyd Drive

Carlsbad, NM 88220

TEL: (505) 506-0040

FAX:

RE: Shinnery Oaks SWD 003 Pad

OrderNo.: 2008G04

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 20 sample(s) on 8/28/2020 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,

A handwritten signature in black ink, appearing to read "Andy Freeman".

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-01 0.25

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 6:20:00 AM

Lab ID: 2008G04-001

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	9/1/2020 3:37:20 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	9/1/2020 3:37:20 PM
Surr: DNOP	81.3	30.4-154		%Rec	1	9/1/2020 3:37:20 PM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	120	60		mg/Kg	20	9/4/2020 3:35:14 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	8/30/2020 6:31:25 AM
Toluene	ND	0.050		mg/Kg	1	8/30/2020 6:31:25 AM
Ethylbenzene	ND	0.050		mg/Kg	1	8/30/2020 6:31:25 AM
Xylenes, Total	ND	0.10		mg/Kg	1	8/30/2020 6:31:25 AM
Surr: 1,2-Dichloroethane-d4	98.9	70-130		%Rec	1	8/30/2020 6:31:25 AM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	8/30/2020 6:31:25 AM
Surr: Dibromofluoromethane	111	70-130		%Rec	1	8/30/2020 6:31:25 AM
Surr: Toluene-d8	97.4	70-130		%Rec	1	8/30/2020 6:31:25 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/30/2020 6:31:25 AM
Surr: BFB	101	70-130		%Rec	1	8/30/2020 6:31:25 AM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level,
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative 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

Page 1 of 26

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-02 0.25

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 6:25:00 AM

Lab ID: 2008G04-002

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/1/2020 4:06:52 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/1/2020 4:06:52 PM
Surr: DNOP	70.4	30.4-154		%Rec	1	9/1/2020 4:06:52 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	3200	150		mg/Kg	50	9/8/2020 2:35:00 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	8/30/2020 7:56:58 AM
Toluene	ND	0.049		mg/Kg	1	8/30/2020 7:56:58 AM
Ethylbenzene	ND	0.049		mg/Kg	1	8/30/2020 7:56:58 AM
Xylenes, Total	ND	0.099		mg/Kg	1	8/30/2020 7:56:58 AM
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	8/30/2020 7:56:58 AM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	8/30/2020 7:56:58 AM
Surr: Dibromofluoromethane	113	70-130		%Rec	1	8/30/2020 7:56:58 AM
Surr: Toluene-d8	99.4	70-130		%Rec	1	8/30/2020 7:56:58 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/30/2020 7:56:58 AM
Surr: BFB	106	70-130		%Rec	1	8/30/2020 7:56:58 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative Limit
 S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
 E Value above quantitation range
 J Analyte detected below quantitation limits
 P Sample pH Not In Range
 RL Reporting Limit

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-03 0.25

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 6:30:00 AM

Lab ID: 2008G04-003

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/1/2020 4:16:40 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/1/2020 4:16:40 PM
Surr: DNOP	55.8	30.4-154		%Rec	1	9/1/2020 4:16:40 PM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	1700	60		mg/Kg	20	9/4/2020 4:49:41 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	8/30/2020 9:22:35 AM
Toluene	ND	0.050		mg/Kg	1	8/30/2020 9:22:35 AM
Ethylbenzene	ND	0.050		mg/Kg	1	8/30/2020 9:22:35 AM
Xylenes, Total	ND	0.099		mg/Kg	1	8/30/2020 9:22:35 AM
Surr: 1,2-Dichloroethane-d4	97.1	70-130		%Rec	1	8/30/2020 9:22:35 AM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	8/30/2020 9:22:35 AM
Surr: Dibromofluoromethane	113	70-130		%Rec	1	8/30/2020 9:22:35 AM
Surr: Toluene-d8	97.2	70-130		%Rec	1	8/30/2020 9:22:35 AM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/30/2020 9:22:35 AM
Surr: BFB	100	70-130		%Rec	1	8/30/2020 9:22:35 AM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 TL Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 3 of 26

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-04 0.25

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 6:35:00 AM

Lab ID: 2008G04-004

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	9/1/2020 4:26:29 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/1/2020 4:26:29 PM
Surr: DNOP	60.6	30.4-154		%Rec	1	9/1/2020 4:26:29 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	4300	150		mg/Kg	50	9/8/2020 2:47:20 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/30/2020 2:49:07 PM
Toluene	ND	0.050		mg/Kg	1	8/30/2020 2:49:07 PM
Ethylbenzene	ND	0.050		mg/Kg	1	8/30/2020 2:49:07 PM
Xylenes, Total	ND	0.099		mg/Kg	1	8/30/2020 2:49:07 PM
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	8/30/2020 2:49:07 PM
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	8/30/2020 2:49:07 PM
Surr: Dibromofluoromethane	113	70-130		%Rec	1	8/30/2020 2:49:07 PM
Surr: Toluene-d8	99.9	70-130		%Rec	1	8/30/2020 2:49:07 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/30/2020 2:49:07 PM
Surr: BFB	104	70-130		%Rec	1	8/30/2020 2:49:07 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative Limit
 S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
 E Value above quantitation range
 J Analyte detected below quantitation limits
 P Sample pH Not In Range
 RL Reporting Limit

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-05 0.25

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 6:40:00 AM

Lab ID: 2008G04-005

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/1/2020 4:36:16 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/1/2020 4:36:16 PM
Surr: DNOP	52.6	30.4-154		%Rec	1	9/1/2020 4:36:16 PM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	2000	60		mg/Kg	20	9/4/2020 5:14:31 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/30/2020 3:17:34 PM
Toluene	ND	0.050		mg/Kg	1	8/30/2020 3:17:34 PM
Ethylbenzene	ND	0.050		mg/Kg	1	8/30/2020 3:17:34 PM
Xylenes, Total	ND	0.099		mg/Kg	1	8/30/2020 3:17:34 PM
Surr: 1,2-Dichloroethane-d4	98.1	70-130		%Rec	1	8/30/2020 3:17:34 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	8/30/2020 3:17:34 PM
Surr: Dibromofluoromethane	107	70-130		%Rec	1	8/30/2020 3:17:34 PM
Surr: Toluene-d8	101	70-130		%Rec	1	8/30/2020 3:17:34 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/30/2020 3:17:34 PM
Surr: BFB	105	70-130		%Rec	1	8/30/2020 3:17:34 PM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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

Page 5 of 26

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-06 0.25

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 6:45:00 AM

Lab ID: 2008G04-006

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	9/1/2020 4:46:01 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/1/2020 4:46:01 PM
Surr: DNOP	45.7	30.4-154		%Rec	1	9/1/2020 4:46:01 PM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	1600	60		mg/Kg	20	9/4/2020 5:26:55 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/30/2020 3:46:05 PM
Toluene	ND	0.050		mg/Kg	1	8/30/2020 3:46:05 PM
Ethylbenzene	ND	0.050		mg/Kg	1	8/30/2020 3:46:05 PM
Xylenes, Total	ND	0.10		mg/Kg	1	8/30/2020 3:46:05 PM
Surr: 1,2-Dichloroethane-d4	96.7	70-130		%Rec	1	8/30/2020 3:46:05 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	8/30/2020 3:46:05 PM
Surr: Dibromofluoromethane	108	70-130		%Rec	1	8/30/2020 3:46:05 PM
Surr: Toluene-d8	97.0	70-130		%Rec	1	8/30/2020 3:46:05 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/30/2020 3:46:05 PM
Surr: BFB	102	70-130		%Rec	1	8/30/2020 3:46:05 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 6 of 26

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-07 0.25

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 6:50:00 AM

Lab ID: 2008G04-007

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	9/1/2020 4:55:43 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/1/2020 4:55:43 PM
Surr: DNOP	40.0	30.4-154		%Rec	1	9/1/2020 4:55:43 PM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	1100	60		mg/Kg	20	9/4/2020 5:39:20 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/30/2020 4:14:36 PM
Toluene	ND	0.050		mg/Kg	1	8/30/2020 4:14:36 PM
Ethylbenzene	ND	0.050		mg/Kg	1	8/30/2020 4:14:36 PM
Xylenes, Total	ND	0.10		mg/Kg	1	8/30/2020 4:14:36 PM
Surr: 1,2-Dichloroethane-d4	95.9	70-130		%Rec	1	8/30/2020 4:14:36 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	8/30/2020 4:14:36 PM
Surr: Dibromofluoromethane	106	70-130		%Rec	1	8/30/2020 4:14:36 PM
Surr: Toluene-d8	99.3	70-130		%Rec	1	8/30/2020 4:14:36 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/30/2020 4:14:36 PM
Surr: BFB	107	70-130		%Rec	1	8/30/2020 4:14:36 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative Limit
 S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
 E Value above quantitation range
 J Analyte detected below quantitation limits
 P Sample pH Not In Range
 RL Reporting Limit

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-08 0.25

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 6:55:00 AM

Lab ID: 2008G04-008

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/1/2020 5:05:24 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/1/2020 5:05:24 PM
Surr: DNOP	50.9	30.4-154		%Rec	1	9/1/2020 5:05:24 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	3500	150		mg/Kg	50	9/8/2020 2:59:40 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/30/2020 4:43:06 PM
Toluene	ND	0.050		mg/Kg	1	8/30/2020 4:43:06 PM
Ethylbenzene	ND	0.050		mg/Kg	1	8/30/2020 4:43:06 PM
Xylenes, Total	ND	0.099		mg/Kg	1	8/30/2020 4:43:06 PM
Surr: 1,2-Dichloroethane-d4	96.5	70-130		%Rec	1	8/30/2020 4:43:06 PM
Surr: 4-Bromofluorobenzene	99.7	70-130		%Rec	1	8/30/2020 4:43:06 PM
Surr: Dibromofluoromethane	111	70-130		%Rec	1	8/30/2020 4:43:06 PM
Surr: Toluene-d8	98.3	70-130		%Rec	1	8/30/2020 4:43:06 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/30/2020 4:43:06 PM
Surr: BFB	104	70-130		%Rec	1	8/30/2020 4:43:06 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative Limit
 S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
 E Value above quantitation range
 J Analyte detected below quantitation limits
 P Sample pH Not In Range
 RL Reporting Limit

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-09 0.25

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 7:00:00 AM

Lab ID: 2008G04-009

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	9/1/2020 5:15:08 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	9/1/2020 5:15:08 PM
Surr: DNOP	55.2	30.4-154		%Rec	1	9/1/2020 5:15:08 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	5200	300		mg/Kg	100	9/8/2020 3:12:01 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/30/2020 5:11:35 PM
Toluene	ND	0.050		mg/Kg	1	8/30/2020 5:11:35 PM
Ethylbenzene	ND	0.050		mg/Kg	1	8/30/2020 5:11:35 PM
Xylenes, Total	ND	0.099		mg/Kg	1	8/30/2020 5:11:35 PM
Surr: 1,2-Dichloroethane-d4	98.6	70-130		%Rec	1	8/30/2020 5:11:35 PM
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	8/30/2020 5:11:35 PM
Surr: Dibromofluoromethane	110	70-130		%Rec	1	8/30/2020 5:11:35 PM
Surr: Toluene-d8	98.1	70-130		%Rec	1	8/30/2020 5:11:35 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/30/2020 5:11:35 PM
Surr: BFB	103	70-130		%Rec	1	8/30/2020 5:11:35 PM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- F Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Page 9 of 26

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-10 0.25

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 7:05:00 AM

Lab ID: 2008G04-010

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/1/2020 5:24:57 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/1/2020 5:24:57 PM
Surr: DNOP	59.2	30.4-154		%Rec	1	9/1/2020 5:24:57 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	2700	150		mg/Kg	50	9/8/2020 3:24:21 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	8/30/2020 5:40:04 PM
Toluene	ND	0.048		mg/Kg	1	8/30/2020 5:40:04 PM
Ethylbenzene	ND	0.048		mg/Kg	1	8/30/2020 5:40:04 PM
Xylenes, Total	ND	0.097		mg/Kg	1	8/30/2020 5:40:04 PM
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	8/30/2020 5:40:04 PM
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	8/30/2020 5:40:04 PM
Surr: Dibromofluoromethane	110	70-130		%Rec	1	8/30/2020 5:40:04 PM
Surr: Toluene-d8	101	70-130		%Rec	1	8/30/2020 5:40:04 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/30/2020 5:40:04 PM
Surr: BFB	106	70-130		%Rec	1	8/30/2020 5:40:04 PM

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

Qualifiers:

- * Value exceeds Maximum Contaminant Level
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative 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

Page 10 of 26

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-11 0.25

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 7:10:00 AM

Lab ID: 2008G04-011

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/1/2020 5:34:47 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/1/2020 5:34:47 PM
Surr: DNOP	65.3	30.4-154		%Rec	1	9/1/2020 5:34:47 PM
EPA METHOD 300.0: ANIONS						Analyst: CJS
Chloride	2900	150		mg/Kg	50	9/8/2020 4:01:22 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/30/2020 6:08:32 PM
Toluene	ND	0.050		mg/Kg	1	8/30/2020 6:08:32 PM
Ethylbenzene	ND	0.050		mg/Kg	1	8/30/2020 6:08:32 PM
Xylenes, Total	ND	0.099		mg/Kg	1	8/30/2020 6:08:32 PM
Surr: 1,2-Dichloroethane-d4	98.5	70-130		%Rec	1	8/30/2020 6:08:32 PM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	8/30/2020 6:08:32 PM
Surr: Dibromofluoromethane	111	70-130		%Rec	1	8/30/2020 6:08:32 PM
Surr: Toluene-d8	96.8	70-130		%Rec	1	8/30/2020 6:08:32 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/30/2020 6:08:32 PM
Surr: BFB	102	70-130		%Rec	1	8/30/2020 6:08:32 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation of analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative Limit
	S	% Recovery outside of range due to dilution or matrix

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
F	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Page 11 of 26

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-12 0.25

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 7:15:00 AM

Lab ID: 2008G04-012

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	9/1/2020 5:44:41 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/1/2020 5:44:41 PM
Surr: DNOP	70.9	30.4-154		%Rec	1	9/1/2020 5:44:41 PM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	600	60		mg/Kg	20	9/4/2020 7:06:11 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/30/2020 6:37:01 PM
Toluene	ND	0.050		mg/Kg	1	8/30/2020 6:37:01 PM
Ethylbenzene	ND	0.050		mg/Kg	1	8/30/2020 6:37:01 PM
Xylenes, Total	ND	0.10		mg/Kg	1	8/30/2020 6:37:01 PM
Surr: 1,2-Dichloroethane-d4	99.5	70-130		%Rec	1	8/30/2020 6:37:01 PM
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	8/30/2020 6:37:01 PM
Surr: Dibromofluoromethane	109	70-130		%Rec	1	8/30/2020 6:37:01 PM
Surr: Toluene-d8	99.4	70-130		%Rec	1	8/30/2020 6:37:01 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/30/2020 6:37:01 PM
Surr: BFB	105	70-130		%Rec	1	8/30/2020 6:37:01 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level
	D	Sample Diluted Due to Matrix
	H	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative 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

Page 12 of 26

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-13 0.25

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 7:20:00 AM

Lab ID: 2008G04-013

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/1/2020 5:54:34 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/1/2020 5:54:34 PM
Surr: DNOP	50.8	30.4-154		%Rec	1	9/1/2020 5:54:34 PM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	1900	60		mg/Kg	20	9/4/2020 7:18:36 AM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/30/2020 7:05:29 PM
Toluene	ND	0.050		mg/Kg	1	8/30/2020 7:05:29 PM
Ethylbenzene	ND	0.050		mg/Kg	1	8/30/2020 7:05:29 PM
Xylenes, Total	ND	0.10		mg/Kg	1	8/30/2020 7:05:29 PM
Surr: 1,2-Dichloroethane-d4	96.7	70-130		%Rec	1	8/30/2020 7:05:29 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	8/30/2020 7:05:29 PM
Surr: Dibromofluoromethane	111	70-130		%Rec	1	8/30/2020 7:05:29 PM
Surr: Toluene-d8	99.6	70-130		%Rec	1	8/30/2020 7:05:29 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/30/2020 7:05:29 PM
Surr: BFB	103	70-130		%Rec	1	8/30/2020 7:05:29 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 13 of 26

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-14 0.25

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 7:25:00 AM

Lab ID: 2008G04-014

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	9/1/2020 6:04:28 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/1/2020 6:04:28 PM
Surr: DNOP	39.3	30.4-154		%Rec	1	9/1/2020 6:04:28 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	2200	60		mg/Kg	20	9/4/2020 12:04:01 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/30/2020 7:33:56 PM
Toluene	ND	0.050		mg/Kg	1	8/30/2020 7:33:56 PM
Ethylbenzene	ND	0.050		mg/Kg	1	8/30/2020 7:33:56 PM
Xylenes, Total	ND	0.10		mg/Kg	1	8/30/2020 7:33:56 PM
Surr: 1,2-Dichloroethane-d4	98.3	70-130		%Rec	1	8/30/2020 7:33:56 PM
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	8/30/2020 7:33:56 PM
Surr: Dibromofluoromethane	107	70-130		%Rec	1	8/30/2020 7:33:56 PM
Surr: Toluene-d8	97.2	70-130		%Rec	1	8/30/2020 7:33:56 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/30/2020 7:33:56 PM
Surr: BFB	107	70-130		%Rec	1	8/30/2020 7:33:56 PM

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

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

Page 14 of 26

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-15 0.25

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 7:30:00 AM

Lab ID: 2008G04-015

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/1/2020 6:14:23 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/1/2020 6:14:23 PM
Surr: DNOP	46.1	30.4-154		%Rec	1	9/1/2020 6:14:23 PM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	2900	150		mg/Kg	50	9/6/2020 5:34:25 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	8/30/2020 8:02:24 PM
Toluene	ND	0.049		mg/Kg	1	8/30/2020 8:02:24 PM
Ethylbenzene	ND	0.049		mg/Kg	1	8/30/2020 8:02:24 PM
Xylenes, Total	ND	0.097		mg/Kg	1	8/30/2020 8:02:24 PM
Surr: 1,2-Dichloroethane-d4	97.9	70-130		%Rec	1	8/30/2020 8:02:24 PM
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	8/30/2020 8:02:24 PM
Surr: Dibromofluoromethane	109	70-130		%Rec	1	8/30/2020 8:02:24 PM
Surr: Toluene-d8	96.2	70-130		%Rec	1	8/30/2020 8:02:24 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/30/2020 8:02:24 PM
Surr: BFB	105	70-130		%Rec	1	8/30/2020 8:02:24 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level,
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 15 of 26

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-16 0.25

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 7:35:00 AM

Lab ID: 2008G04-016

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	9/1/2020 6:24:18 PM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	9/1/2020 6:24:18 PM
Surr: DNOP	38.3	30.4-154		%Rec	1	9/1/2020 6:24:18 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	170	60		mg/Kg	20	9/4/2020 12:53:38 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	8/30/2020 8:30:50 PM
Toluene	ND	0.049		mg/Kg	1	8/30/2020 8:30:50 PM
Ethylbenzene	ND	0.049		mg/Kg	1	8/30/2020 8:30:50 PM
Xylenes, Total	ND	0.098		mg/Kg	1	8/30/2020 8:30:50 PM
Surr: 1,2-Dichloroethane-d4	95.2	70-130		%Rec	1	8/30/2020 8:30:50 PM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	8/30/2020 8:30:50 PM
Surr: Dibromofluoromethane	108	70-130		%Rec	1	8/30/2020 8:30:50 PM
Surr: Toluene-d8	101	70-130		%Rec	1	8/30/2020 8:30:50 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/30/2020 8:30:50 PM
Surr: BFB	105	70-130		%Rec	1	8/30/2020 8:30:50 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 16 of 26

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-90

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 10:10:00 AM

Lab ID: 2008G04-017

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/1/2020 6:34:12 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/1/2020 6:34:12 PM
Surr: DNOP	41.4	30.4-154		%Rec	1	9/1/2020 6:34:12 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	140	60		mg/Kg	20	9/4/2020 1:06:03 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/30/2020 8:59:17 PM
Toluene	ND	0.049		mg/Kg	1	8/30/2020 8:59:17 PM
Ethylbenzene	ND	0.049		mg/Kg	1	8/30/2020 8:59:17 PM
Xylenes, Total	ND	0.098		mg/Kg	1	8/30/2020 8:59:17 PM
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	8/30/2020 8:59:17 PM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	8/30/2020 8:59:17 PM
Surr: Dibromofluoromethane	110	70-130		%Rec	1	8/30/2020 8:59:17 PM
Surr: Toluene-d8	95.4	70-130		%Rec	1	8/30/2020 8:59:17 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/30/2020 8:59:17 PM
Surr: BFB	103	70-130		%Rec	1	8/30/2020 8:59:17 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quantitative 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

Page 17 of 26

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-91

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 10:30:00 AM

Lab ID: 2008G04-018

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/1/2020 6:44:10 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	9/1/2020 6:44:10 PM
Surr: DNOP	66.0	30.4-154		%Rec	1	9/1/2020 6:44:10 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	110	60		mg/Kg	20	9/4/2020 1:18:27 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.024		mg/Kg	1	8/30/2020 9:27:44 PM
Toluene	ND	0.048		mg/Kg	1	8/30/2020 9:27:44 PM
Ethylbenzene	ND	0.048		mg/Kg	1	8/30/2020 9:27:44 PM
Xylenes, Total	ND	0.096		mg/Kg	1	8/30/2020 9:27:44 PM
Surr: 1,2-Dichloroethane-d4	97.7	70-130		%Rec	1	8/30/2020 9:27:44 PM
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	8/30/2020 9:27:44 PM
Surr: Dibromofluoromethane	104	70-130		%Rec	1	8/30/2020 9:27:44 PM
Surr: Toluene-d8	97.1	70-130		%Rec	1	8/30/2020 9:27:44 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	8/30/2020 9:27:44 PM
Surr: BFB	105	70-130		%Rec	1	8/30/2020 9:27:44 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 18 of 26

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-92

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 10:35:00 AM

Lab ID: 2008G04-019

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	9/1/2020 6:54:10 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	9/1/2020 6:54:10 PM
Surr: DNOP	51.0	30.4-154		%Rec	1	9/1/2020 6:54:10 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	ND	60		mg/Kg	20	9/4/2020 1:55:41 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/30/2020 9:56:09 PM
Toluene	ND	0.049		mg/Kg	1	8/30/2020 9:56:09 PM
Ethylbenzene	ND	0.049		mg/Kg	1	8/30/2020 9:56:09 PM
Xylenes, Total	ND	0.099		mg/Kg	1	8/30/2020 9:56:09 PM
Surr: 1,2-Dichloroethane-d4	95.6	70-130		%Rec	1	8/30/2020 9:56:09 PM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	8/30/2020 9:56:09 PM
Surr: Dibromofluoromethane	104	70-130		%Rec	1	8/30/2020 9:56:09 PM
Surr: Toluene-d8	98.2	70-130		%Rec	1	8/30/2020 9:56:09 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	8/30/2020 9:56:09 PM
Surr: BFB	104	70-130		%Rec	1	8/30/2020 9:56:09 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 19 of 26

Analytical Report

Lab Order 2008G04

Date Reported: 9/9/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BS20-93

Project: Shinnery Oaks SWD 003 Pad

Collection Date: 8/26/2020 10:40:00 AM

Lab ID: 2008G04-020

Matrix: SOIL

Received Date: 8/28/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	9/1/2020 7:04:10 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/1/2020 7:04:10 PM
Surr: DNOP	55.0	30.4-154		%Rec	1	9/1/2020 7:04:10 PM
EPA METHOD 300.0: ANIONS						Analyst: MRA
Chloride	310	60		mg/Kg	20	9/4/2020 2:08:06 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: JMR
Benzene	ND	0.025		mg/Kg	1	8/30/2020 10:24:34 PM
Toluene	ND	0.050		mg/Kg	1	8/30/2020 10:24:34 PM
Ethylbenzene	ND	0.050		mg/Kg	1	8/30/2020 10:24:34 PM
Xylenes, Total	ND	0.10		mg/Kg	1	8/30/2020 10:24:34 PM
Surr: 1,2-Dichloroethane-d4	98.3	70-130		%Rec	1	8/30/2020 10:24:34 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	8/30/2020 10:24:34 PM
Surr: Dibromofluoromethane	111	70-130		%Rec	1	8/30/2020 10:24:34 PM
Surr: Toluene-d8	98.3	70-130		%Rec	1	8/30/2020 10:24:34 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: JMR
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	8/30/2020 10:24:34 PM
Surr: BFB	106	70-130		%Rec	1	8/30/2020 10:24:34 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 20 of 26

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G04

09-Sep-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 003 Pad

Sample ID: MB-54942		SampType: mblk		TestCode: EPA Method 300.0: Anions							
Client ID: PBS		Batch ID: 54942		RunNo: 71625							
Prep Date: 9/3/2020		Analysis Date: 9/4/2020		SeqNo: 2503636		Units: mg/Kg					
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		ND	1.5								

Sample ID: LCS-54942		SampType: lcs		TestCode: EPA Method 300.0: Anions						
Client ID: LCSS		Batch ID: 54942		RunNo: 71625						
Prep Date: 9/3/2020		Analysis Date: 9/4/2020		SeqNo: 2503637		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.5	90	110			

Sample ID: MB-54954	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 54954	RunNo: 71641								
Prep Date: 9/4/2020	Analysis Date: 9/4/2020	SeqNo: 2504278 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-54954		SampType: lcs		TestCode: EPA Method 300.0: Anions						
Client ID: LCSS		Batch ID: 54954		RunNo: 71641						
Prep Date: 9/4/2020		Analysis Date: 9/4/2020		SeqNo: 2504279		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.6	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 Quantitative 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

Page 21 of 26

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G04

09-Sep-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 003 Pad

Sample ID: 2008G04-001AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BS20-01 0.25	Batch ID: 54796	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499492 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	32	9.3	46.47	3.432	61.7	47.4	136			
Surr: DNOP	3.0		4.647		64.3	30.4	154			

Sample ID: 2008G04-001AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: BS20-01 0.25	Batch ID: 54796	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499493 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	30	9.0	45.21	3.432	59.8	47.4	136	5.14	43.4	
Surr: DNOP	3.0		4.521		67.2	30.4	154	0	0	

Sample ID: LCS-54795	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 54795	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499585 Units: %Rec								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.8		5.000		96.7	30.4	154			

Sample ID: LCS-54796	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 54796	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499586 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	39	10	50.00	0	77.6	70	130			
Surr: DNOP	4.4		5.000		88.0	30.4	154			

Sample ID: LCS-54804	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 54804	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499587 Units: %Rec								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	2.4		5.000		47.5	30.4	154			

Sample ID: MB-54795	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 54795	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499590 Units: %Rec								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	10		10.00		101	30.4	154			

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 Quantitative Limit | RL Reporting Limit |
| S % Recovery outside of range due to dilution or matrix | |

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G04

09-Sep-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 003 Pad

Sample ID: MB-54796	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 54796	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499591 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.6		10.00		86.3	30.4	154			

Sample ID: MB-54804	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 54804	RunNo: 71555								
Prep Date: 8/31/2020	Analysis Date: 9/1/2020	SeqNo: 2499592 Units: %Rec								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	5.1		10.00		51.1	30.4	154			

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 Quantitative Limit	RL Reporting Limit
S % Recovery outside of range due to dilution or matrix	

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G04

09-Sep-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 003 Pad

Sample ID: mb-54772	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBS	Batch ID: 54772	RunNo: 71470								
Prep Date: 8/28/2020	Analysis Date: 8/30/2020	SeqNo: 2495444 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	0.49		0.5000		98.8	70	130			
Surr: 4-Bromofluorobenzene	0.52		0.5000		103	70	130			
Surr: Dibromofluoromethane	0.54		0.5000		109	70	130			
Surr: Toluene-d8	0.50		0.5000		100	70	130			

Sample ID: lcs-54772	SampType: LCS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BatchQC	Batch ID: 54772	RunNo: 71470								
Prep Date: 8/28/2020	Analysis Date: 8/30/2020	SeqNo: 2495445 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.93	0.025	1.000	0	93.0	80	120			
Toluene	0.98	0.050	1.000	0	98.1	80	120			
Ethylbenzene	0.99	0.050	1.000	0	98.7	80	120			
Xylenes, Total	3.0	0.10	3.000	0	101	80	120			
Surr: 1,2-Dichloroethane-d4	0.50		0.5000		101	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.5000		101	70	130			
Surr: Dibromofluoromethane	0.56		0.5000		113	70	130			
Surr: Toluene-d8	0.49		0.5000		98.2	70	130			

Sample ID: 2008g04-001ams	SampType: MS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BS20-01 0.25	Batch ID: 54772	RunNo: 71470								
Prep Date: 8/28/2020	Analysis Date: 8/30/2020	SeqNo: 2495447 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	0.9881	0	111	71.1	115			
Toluene	1.2	0.049	0.9881	0	120	79.6	132			
Ethylbenzene	1.2	0.049	0.9881	0	118	83.8	134			
Xylenes, Total	3.6	0.099	2.964	0	123	82.4	132			
Surr: 1,2-Dichloroethane-d4	0.47		0.4941		94.6	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.4941		103	70	130			
Surr: Dibromofluoromethane	0.54		0.4941		110	70	130			
Surr: Toluene-d8	0.48		0.4941		96.8	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 Quantitative Limit	RL Reporting Limit
S % Recovery outside of range due to dilution or matrix	

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2008G04

09-Sep-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 003 Pad

Sample ID: 2008g04-001amsd		SampType: MSD4		TestCode: EPA Method 8260B: Volatiles Short List						
Client ID: BS20-01 0.25		Batch ID: 54772		RunNo: 71470						
Prep Date: 8/28/2020		Analysis Date: 8/30/2020		SeqNo: 2495448		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.2	0.025	0.9814	0	118	71.1	115			S
Toluene	1.2	0.049	0.9814	0	122	79.6	132			
Ethylbenzene	1.2	0.049	0.9814	0	120	83.8	134			
Xylenes, Total	3.8	0.098	2.944	0	131	82.4	132			
Surr: 1,2-Dichloroethane-d4	0.48		0.4907		97.4	70	130			
Surr: 4-Bromofluorobenzene	0.49		0.4907		99.9	70	130			
Surr: Dibromofluoromethane	0.55		0.4907		112	70	130			
Surr: Toluene-d8	0.50		0.4907		101	70	130			

Sample ID: lcs-54779		SampType: LCS4		TestCode: EPA Method 8260B: Volatiles Short List						
Client ID: BatchQC		Batch ID: 54779		RunNo: 71493						
Prep Date: 8/29/2020		Analysis Date: 8/30/2020		SeqNo: 2496739		Units: %Rec				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	0.47		0.5000		93.0	70	130			
Surr: 4-Bromofluorobenzene	0.54		0.5000		108	70	130			
Surr: Dibromofluoromethane	0.52		0.5000		105	70	130			
Surr: Toluene-d8	0.51		0.5000		102	70	130			

Sample ID: mb-54779		SampType: MBLK		TestCode: EPA Method 8260B: Volatiles Short List						
Client ID: PBS		Batch ID: 54779		RunNo: 71493						
Prep Date: 8/29/2020		Analysis Date: 8/30/2020		SeqNo: 2496740		Units: %Rec				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	0.49		0.5000		98.4	70	130			
Surr: 4-Bromofluorobenzene	0.50		0.5000		100	70	130			
Surr: Dibromofluoromethane	0.53		0.5000		106	70	130			
Surr: Toluene-d8	0.49		0.5000		97.2	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 Quantitative 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#: 2008G04

09-Sep-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oaks SWD 003 Pad

Sample ID: mb-54772	SampType: MBLK	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: PBS	Batch ID: 54772	RunNo: 71470								
Prep Date: 8/28/2020	Analysis Date: 8/30/2020	SeqNo: 2495481 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	520		500.0		103	70	130			

Sample ID: lcs-54772	SampType: LCS	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: LCSS	Batch ID: 54772	RunNo: 71470								
Prep Date: 8/28/2020	Analysis Date: 8/30/2020	SeqNo: 2495482 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	86.0	70	130			
Surr: BFB	520		500.0		104	70	130			

Sample ID: 2008g04-002ams	SampType: MS	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: BS20-02 0.25	Batch ID: 54772	RunNo: 71470								
Prep Date: 8/28/2020	Analysis Date: 8/30/2020	SeqNo: 2495485 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	25.00	0	104	49.2	122			
Surr: BFB	530		500.0		105	70	130			

Sample ID: 2008g04-002amsd	SampType: MSD	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: BS20-02 0.25	Batch ID: 54772	RunNo: 71470								
Prep Date: 8/28/2020	Analysis Date: 8/30/2020	SeqNo: 2495486 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	24.80	0	105	49.2	122	0.261	20	
Surr: BFB	510		496.0		103	70	130	0	0	

Sample ID: lcs-54779	SampType: LCS	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: LCSS	Batch ID: 54779	RunNo: 71493								
Prep Date: 8/29/2020	Analysis Date: 8/30/2020	SeqNo: 2496787 Units: %Rec								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	520		500.0		103	70	130			

Sample ID: mb-54779	SampType: MBLK	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: PBS	Batch ID: 54779	RunNo: 71493								
Prep Date: 8/29/2020	Analysis Date: 8/30/2020	SeqNo: 2496794 Units: %Rec								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	510		500.0		103	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 Quantitative Limit	RL Reporting Limit
S % Recovery outside of range due to dilution or matrix	



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

Sample Log-In Check List

Client Name: Vertex Resource Group Ltd.

Work Order Number: 2008G04

RcptNo: 1

Received By: Juan Rojas 8/28/2020 8:00:00 AM

Completed By: Juan Rojas 8/28/2020 9:24:15 AM

Reviewed By: *gm 8/28/20*

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ 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? Yes ☒ No ☐
(Note discrepancies on chain of custody)
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? Yes ☒ No ☐
(If no, notify customer for authorization.)

of preserved bottles checked for pH:

(<2 or >12 unless noted)

Adjusted? ☐

Checked by: *cm 8/28/20*

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: _____

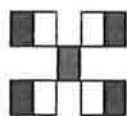
16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.6	Good				
2	4.9	Good				
3	1.3	Good				

Chain-of-Custody Record

Client: <u>Vertex</u>		Turn-Around Time: <u>6 Day</u>	
Mailing Address:		☒ Standard ☐ Rush Project Name: <u>Shinnery Oaks SWD#003 (PAD)</u>	
Phone #:		Project #: <u>20E-00239</u>	
email or Fax#:		Project Manager: <u>Natalie Gordon</u>	
QA/QC Package:		Sampler: <u>MJP</u>	
☐ Standard ☐ Level 4 (Full Validation) Accreditation: ☐ Az Compliance ☐ NELAC ☐ Other ☐ EDD (Type)		On Ice: ☒ Yes ☐ No # of Coolers: <u>3</u>	
Cooler Temp (including CF): <u>See Remarks (°C)</u>		HEAL No. <u>7008604</u>	
Date	Time	Matrix	Sample Name
8/26/20	6:20	Soil	BS20-01 0.25
	6:25		BS20-02 0.25
	6:30		BS20-03 0.25
	6:35		BS20-04 0.25
	6:40		BS20-05 0.25
	6:45		BS20-06 0.25
	6:50		BS20-07 0.25
	6:55		BS20-08 0.25
	7:00		BS20-09 0.25
	7:05		BS20-10 0.25
	7:10		BS20-11 0.25
	7:15		BS20-12 0.25
Date:	Time:	Relinquished by: <u>[Signature]</u>	Received by: <u>Alumina</u> Date: <u>8/26/20</u> Time: <u>1000</u>
Date:	Time:	Relinquished by: <u>Alumina</u>	Received by: <u>Alumina</u> Date: <u>8/26/20</u> Time: <u>8:00</u>


**HALL ENVIRONMENTAL
ANALYSIS LABORATORY**

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

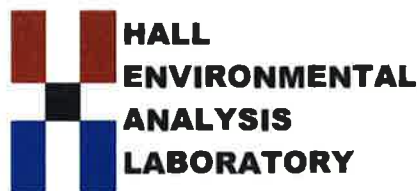
Analysis Request

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 ☐
 (C) F, Br, NO₃, NO₂, PO₄, SO₄ ☒
 8260 (VOA) ☐
 8270 (Semi-VOA) ☐
 Total Coliform (Present/Absent) ☐

Remarks: CC: Natalie Gordon

0.6-0=0.6
 4.9-0=4.9
 1.3-0=1.3

Motador



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

July 22, 2020

Natalie Gordon

Vertex Resource Group Ltd.

3101 Boyd Drive

Carlsbad, NM 88220

TEL: (505) 506-0040

FAX

RE: Shinnery Oak Federal SWD 001

OrderNo.: 2007731

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 13 sample(s) on 7/15/2020 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,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Analytical Report

Lab Order 2007731

Date Reported: 7/22/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: SS20-01 0-6"

Project: Shinnery Oak Federal SWD 001

Collection Date: 7/13/2020 11:13:00 AM

Lab ID: 2007731-001

Matrix: SOIL

Received Date: 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	7/18/2020 4:35:03 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/18/2020 4:35:03 AM
Surr: DNOP	60.3	55.1-146		%Rec	1	7/18/2020 4:35:03 AM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	66	60		mg/Kg	20	7/18/2020 7:04:50 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	7/18/2020 6:29:50 PM
Toluene	ND	0.047		mg/Kg	1	7/18/2020 6:29:50 PM
Ethylbenzene	ND	0.047		mg/Kg	1	7/18/2020 6:29:50 PM
Xylenes, Total	ND	0.095		mg/Kg	1	7/18/2020 6:29:50 PM
Surr: 1,2-Dichloroethane-d4	98.2	70-130		%Rec	1	7/18/2020 6:29:50 PM
Surr: 4-Bromofluorobenzene	91.4	70-130		%Rec	1	7/18/2020 6:29:50 PM
Surr: Dibromofluoromethane	98.9	70-130		%Rec	1	7/18/2020 6:29:50 PM
Surr: Toluene-d8	98.2	70-130		%Rec	1	7/18/2020 6:29:50 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	7/18/2020 6:29:50 PM
Surr: BFB	105	70-130		%Rec	1	7/18/2020 6:29:50 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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 pfi Not In Range
 RL Reporting Limit

Page 1 of 20

Analytical Report

Lab Order 2007731

Date Reported: 7/22/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: SS20-02 0-6"

Project: Shinnery Oak Federal SWD 001

Collection Date: 7/13/2020 11:21:00 AM

Lab ID: 2007731-002

Matrix: SOIL

Received Date: 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	7/18/2020 12:23:52 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/18/2020 12:23:52 AM
Surr: DNOP	39.2	55.1-146	S	%Rec	1	7/18/2020 12:23:52 AM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	250	60		mg/Kg	20	7/18/2020 7:41:53 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	7/17/2020 3:30:03 PM
Toluene	ND	0.049		mg/Kg	1	7/17/2020 3:30:03 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/17/2020 3:30:03 PM
Xylenes, Total	ND	0.098		mg/Kg	1	7/17/2020 3:30:03 PM
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	7/17/2020 3:30:03 PM
Surr: 4-Bromofluorobenzene	91.7	70-130		%Rec	1	7/17/2020 3:30:03 PM
Surr: Dibromofluoromethane	106	70-130		%Rec	1	7/17/2020 3:30:03 PM
Surr: Toluene-d8	104	70-130		%Rec	1	7/17/2020 3:30:03 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/17/2020 3:30:03 PM
Surr: BFB	94.8	70-130		%Rec	1	7/17/2020 3:30:03 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 2 of 20

Analytical Report

Lab Order 2007731

Date Reported: 7/22/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: SS20-03 0-6"

Project: Shinnery Oak Federal SWD 001

Collection Date: 7/13/2020 11:29:00 AM

Lab ID: 2007731-003

Matrix: SOIL

Received Date: 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	7/18/2020 12:54:17 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/18/2020 12:54:17 AM
Surr: DNOP	10.1	55.1-146	S	%Rec	1	7/18/2020 12:54:17 AM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	130	59		mg/Kg	20	7/18/2020 7:54:15 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	7/17/2020 4:56:07 PM
Toluene	ND	0.049		mg/Kg	1	7/17/2020 4:56:07 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/17/2020 4:56:07 PM
Xylenes, Total	ND	0.098		mg/Kg	1	7/17/2020 4:56:07 PM
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	7/17/2020 4:56:07 PM
Surr: 4-Bromofluorobenzene	95.5	70-130		%Rec	1	7/17/2020 4:56:07 PM
Surr: Dibromofluoromethane	110	70-130		%Rec	1	7/17/2020 4:56:07 PM
Surr: Toluene-d8	102	70-130		%Rec	1	7/17/2020 4:56:07 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/17/2020 4:56:07 PM
Surr: BFB	99.1	70-130		%Rec	1	7/17/2020 4:56:07 PM

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

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

Page 3 of 20

Analytical Report

Lab Order 2007731

Date Reported: 7/22/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: SS20-04 0-6"

Project: Shinnery Oak Federal SWD 001

Collection Date: 7/13/2020 11:40:00 AM

Lab ID: 2007731-004

Matrix: SOIL

Received Date: 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	7/18/2020 1:04:24 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	7/18/2020 1:04:24 AM
Surr: DNOP	19.1	55.1-146	S	%Rec	1	7/18/2020 1:04:24 AM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	ND	60		mg/Kg	20	7/18/2020 8:06:35 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	7/17/2020 6:22:17 PM
Toluene	ND	0.049		mg/Kg	1	7/17/2020 6:22:17 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/17/2020 6:22:17 PM
Xylenes, Total	ND	0.097		mg/Kg	1	7/17/2020 6:22:17 PM
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	7/17/2020 6:22:17 PM
Surr: 4-Bromofluorobenzene	93.3	70-130		%Rec	1	7/17/2020 6:22:17 PM
Surr: Dibromofluoromethane	111	70-130		%Rec	1	7/17/2020 6:22:17 PM
Surr: Toluene-d8	103	70-130		%Rec	1	7/17/2020 6:22:17 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/17/2020 6:22:17 PM
Surr: BFB	98.1	70-130		%Rec	1	7/17/2020 6:22:17 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 4 of 20

Hall Environmental Analysis Laboratory, Inc.**Analytical Report**

Lab Order 2007731

Date Reported: 7/22/2020

CLIENT: Vertex Resource Group Ltd.**Client Sample ID:** SS20-05 0-6"**Project:** Shinnery Oak Federal SWD 001**Collection Date:** 7/13/2020 11:51:00 AM**Lab ID:** 2007731-005**Matrix:** SOIL**Received Date:** 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	7/18/2020 1:14:38 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/18/2020 1:14:38 AM
Surr: DNOP	3.79	55.1-146	S	%Rec	1	7/18/2020 1:14:38 AM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	ND	60		mg/Kg	20	7/18/2020 8:18:56 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.023		mg/Kg	1	7/17/2020 6:50:56 PM
Toluene	ND	0.046		mg/Kg	1	7/17/2020 6:50:56 PM
Ethylbenzene	ND	0.046		mg/Kg	1	7/17/2020 6:50:56 PM
Xylenes, Total	ND	0.093		mg/Kg	1	7/17/2020 6:50:56 PM
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	7/17/2020 6:50:56 PM
Surr: 4-Bromofluorobenzene	95.8	70-130		%Rec	1	7/17/2020 6:50:56 PM
Surr: Dibromofluoromethane	112	70-130		%Rec	1	7/17/2020 6:50:56 PM
Surr: Toluene-d8	102	70-130		%Rec	1	7/17/2020 6:50:56 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	7/17/2020 6:50:56 PM
Surr: BFB	95.9	70-130		%Rec	1	7/17/2020 6:50:56 PM

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

Qualifiers:

+ Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 5 of 20

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2007731

Date Reported: 7/22/2020

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: SS20-06 0-6"

Project: Shinnery Oak Federal SWD 001

Collection Date: 7/13/2020 11:59:00 AM

Lab ID: 2007731-006

Matrix: SOIL

Received Date: 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	7/18/2020 1:24:52 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/18/2020 1:24:52 AM
Surr: DNOP	20.6	55.1-146	S	%Rec	1	7/18/2020 1:24:52 AM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	ND	60		mg/Kg	20	7/18/2020 8:31:15 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.023		mg/Kg	1	7/17/2020 7:19:33 PM
Toluene	ND	0.047		mg/Kg	1	7/17/2020 7:19:33 PM
Ethylbenzene	ND	0.047		mg/Kg	1	7/17/2020 7:19:33 PM
Xylenes, Total	ND	0.094		mg/Kg	1	7/17/2020 7:19:33 PM
Surr: 1,2-Dichloroethane-d4	106	70-130		%Rec	1	7/17/2020 7:19:33 PM
Surr: 4-Bromofluorobenzene	92.1	70-130		%Rec	1	7/17/2020 7:19:33 PM
Surr: Dibromofluoromethane	110	70-130		%Rec	1	7/17/2020 7:19:33 PM
Surr: Toluene-d8	103	70-130		%Rec	1	7/17/2020 7:19:33 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	7/17/2020 7:19:33 PM
Surr: BFB	96.3	70-130		%Rec	1	7/17/2020 7:19:33 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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, Inc.

Analytical Report

Lab Order 2007731

Date Reported: 7/22/2020

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: SS20-07 0-6'

Project: Shinnery Oak Federal SWD 001

Collection Date: 7/13/2020 12:12:00 PM

Lab ID: 2007731-007

Matrix: SOIL

Received Date: 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	7/18/2020 1:35:04 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/18/2020 1:35:04 AM
Surr: DNOP	6.99	55.1-146	S	%Rec	1	7/18/2020 1:35:04 AM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	140	60		mg/Kg	20	7/18/2020 8:43:37 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.023		mg/Kg	1	7/17/2020 7:48:10 PM
Toluene	ND	0.046		mg/Kg	1	7/17/2020 7:48:10 PM
Ethylbenzene	ND	0.046		mg/Kg	1	7/17/2020 7:48:10 PM
Xylenes, Total	ND	0.092		mg/Kg	1	7/17/2020 7:48:10 PM
Surr: 1,2-Dichloroethane-d4	100	70-130		%Rec	1	7/17/2020 7:48:10 PM
Surr: 4-Bromofluorobenzene	89.1	70-130		%Rec	1	7/17/2020 7:48:10 PM
Surr: Dibromofluoromethane	107	70-130		%Rec	1	7/17/2020 7:48:10 PM
Surr: Toluene-d8	103	70-130		%Rec	1	7/17/2020 7:48:10 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	7/17/2020 7:48:10 PM
Surr: BFB	93.1	70-130		%Rec	1	7/17/2020 7:48:10 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 7 of 20

Hall Environmental Analysis Laboratory, Inc.**Analytical Report**

Lab Order 2007731

Date Reported: 7/22/2020

CLIENT: Vertex Resource Group Ltd.**Client Sample ID:** SS20-08 0-6"**Project:** Shinnery Oak Federal SWD 001**Collection Date:** 7/13/2020 12:25:00 PM**Lab ID:** 2007731-008**Matrix:** SOIL**Received Date:** 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	7/18/2020 1:45:23 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/18/2020 1:45:23 AM
Surr: DNOP	6.42	55.1-146	S	%Rec	1	7/18/2020 1:45:23 AM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	ND	60		mg/Kg	20	7/18/2020 9:20:38 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	7/17/2020 8:16:47 PM
Toluene	ND	0.047		mg/Kg	1	7/17/2020 8:16:47 PM
Ethylbenzene	ND	0.047		mg/Kg	1	7/17/2020 8:16:47 PM
Xylenes, Total	ND	0.095		mg/Kg	1	7/17/2020 8:16:47 PM
Surr: 1,2-Dichloroethane-d4	107	70-130		%Rec	1	7/17/2020 8:16:47 PM
Surr: 4-Bromofluorobenzene	93.3	70-130		%Rec	1	7/17/2020 8:16:47 PM
Surr: Dibromofluoromethane	109	70-130		%Rec	1	7/17/2020 8:16:47 PM
Surr: Toluene-d8	106	70-130		%Rec	1	7/17/2020 8:16:47 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	7/17/2020 8:16:47 PM
Surr: BFB	99.5	70-130		%Rec	1	7/17/2020 8:16:47 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 8 of 20

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2007731

Date Reported: 7/22/2020

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: SS20-09 0-6"

Project: Shinnery Oak Federal SWD 001

Collection Date: 7/13/2020 12:31:00 PM

Lab ID: 2007731-009

Matrix: SOIL

Received Date: 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	7/18/2020 1:55:37 AM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	7/18/2020 1:55:37 AM
Surr: DNOP	17.1	55.1-146	S	%Rec	1	7/18/2020 1:55:37 AM
EPA METHOD 300.0: ANIONS						Analyst: CAS
Chloride	ND	60		mg/Kg	20	7/18/2020 9:33:00 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	7/17/2020 8:45:22 PM
Toluene	ND	0.049		mg/Kg	1	7/17/2020 8:45:22 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/17/2020 8:45:22 PM
Xylenes, Total	ND	0.097		mg/Kg	1	7/17/2020 8:45:22 PM
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	7/17/2020 8:45:22 PM
Surr: 4-Bromofluorobenzene	94.8	70-130		%Rec	1	7/17/2020 8:45:22 PM
Surr: Dibromofluoromethane	107	70-130		%Rec	1	7/17/2020 8:45:22 PM
Surr: Toluene-d8	105	70-130		%Rec	1	7/17/2020 8:45:22 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/17/2020 8:45:22 PM
Surr: BFB	98.2	70-130		%Rec	1	7/17/2020 8:45:22 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding time for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative Limit
 S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
 E Value above quantitation range
 J Analyte detected below quantitation limits
 P Sample pH Not In Range
 RL Reporting Limit

Analytical Report

Lab Order 2007731

Date Reported: 7/22/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: SS20-10 0-6"

Project: Shinnery Oak Federal SWD 001

Collection Date: 7/13/2020 12:45:00 PM

Lab ID: 2007731-010

Matrix: SOIL

Received Date: 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	7/18/2020 2:05:59 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/18/2020 2:05:59 AM
Surr: DNOP	22.1	55.1-146	S	%Rec	1	7/18/2020 2:05:59 AM
EPA METHOD 300.0: ANIONS						Analyst: JMT
Chloride	ND	60		mg/Kg	20	7/19/2020 8:31:31 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	7/17/2020 9:13:54 PM
Toluene	ND	0.049		mg/Kg	1	7/17/2020 9:13:54 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/17/2020 9:13:54 PM
Xylenes, Total	ND	0.099		mg/Kg	1	7/17/2020 9:13:54 PM
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	7/17/2020 9:13:54 PM
Surr: 4-Bromofluorobenzene	94.5	70-130		%Rec	1	7/17/2020 9:13:54 PM
Surr: Dibromofluoromethane	104	70-130		%Rec	1	7/17/2020 9:13:54 PM
Surr: Toluene-d8	105	70-130		%Rec	1	7/17/2020 9:13:54 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/17/2020 9:13:54 PM
Surr: BFB	97.2	70-130		%Rec	1	7/17/2020 9:13:54 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level,
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 10 of 20

Analytical Report

Lab Order 2007731

Date Reported: 7/22/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: SS20-11 0-6"

Project: Shinnery Oak Federal SWD 001

Collection Date: 7/13/2020 12:51:00 PM

Lab ID: 2007731-011

Matrix: SOIL

Received Date: 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	7/18/2020 2:16:18 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/18/2020 2:16:18 AM
Surr: DNOP	26.0	55.1-146	S	%Rec	1	7/18/2020 2:16:18 AM
EPA METHOD 300.0: ANIONS						Analyst: JMT
Chloride	ND	60		mg/Kg	20	7/19/2020 8:43:51 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	7/17/2020 9:42:26 PM
Toluene	ND	0.049		mg/Kg	1	7/17/2020 9:42:26 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/17/2020 9:42:26 PM
Xylenes, Total	ND	0.098		mg/Kg	1	7/17/2020 9:42:26 PM
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	7/17/2020 9:42:26 PM
Surr: 4-Bromofluorobenzene	92.5	70-130		%Rec	1	7/17/2020 9:42:26 PM
Surr: Dibromofluoromethane	104	70-130		%Rec	1	7/17/2020 9:42:26 PM
Surr: Toluene-d8	103	70-130		%Rec	1	7/17/2020 9:42:26 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/17/2020 9:42:26 PM
Surr: BFB	94.0	70-130		%Rec	1	7/17/2020 9:42:26 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 11 of 20

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 2007731

Date Reported: 7/22/2020

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: SS20-12 0-6"

Project: Shinnery Oak Federal SWD 001

Collection Date: 7/13/2020 12:55:00 PM

Lab ID: 2007731-012

Matrix: SOIL

Received Date: 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	7/18/2020 2:26:51 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	7/18/2020 2:26:51 AM
Surr: DNOP	29.8	55.1-146	S	%Rec	1	7/18/2020 2:26:51 AM
EPA METHOD 300.0: ANIONS						Analyst: JMT
Chloride	ND	60		mg/Kg	20	7/19/2020 9:20:55 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	7/17/2020 10:11:02 PM
Toluene	ND	0.049		mg/Kg	1	7/17/2020 10:11:02 PM
Ethylbenzene	ND	0.049		mg/Kg	1	7/17/2020 10:11:02 PM
Xylenes, Total	ND	0.098		mg/Kg	1	7/17/2020 10:11:02 PM
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	7/17/2020 10:11:02 PM
Surr: 4-Bromofluorobenzene	94.2	70-130		%Rec	1	7/17/2020 10:11:02 PM
Surr: Dibromofluoromethane	109	70-130		%Rec	1	7/17/2020 10:11:02 PM
Surr: Toluene-d8	103	70-130		%Rec	1	7/17/2020 10:11:02 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/17/2020 10:11:02 PM
Surr: BFB	96.0	70-130		%Rec	1	7/17/2020 10:11:02 PM

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

Qualifiers:	*	Value exceeds Maximum Contaminant Level.
	D	Sample Diluted Due to Matrix
	II	Holding times for preparation or analysis exceeded
	ND	Not Detected at the Reporting Limit
	PQL	Practical Quantitative 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

Page 12 of 20

Analytical Report

Lab Order 2007731

Date Reported: 7/22/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: SS20-13 0-6"

Project: Shinnery Oak Federal SWD 001

Collection Date: 7/13/2020 1:08:00 PM

Lab ID: 2007731-013

Matrix: SOIL

Received Date: 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	7/18/2020 2:37:24 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/18/2020 2:37:24 AM
Surr: DNOP	25.4	55.1-146	S	%Rec	1	7/18/2020 2:37:24 AM
EPA METHOD 300.0: ANIONS						Analyst: JMT
Chloride	ND	60		mg/Kg	20	7/19/2020 9:33:15 PM
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: DJF
Benzene	ND	0.023		mg/Kg	1	7/17/2020 10:39:34 PM
Toluene	ND	0.046		mg/Kg	1	7/17/2020 10:39:34 PM
Ethylbenzene	ND	0.046		mg/Kg	1	7/17/2020 10:39:34 PM
Xylenes, Total	ND	0.093		mg/Kg	1	7/17/2020 10:39:34 PM
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	7/17/2020 10:39:34 PM
Surr: 4-Bromofluorobenzene	93.9	70-130		%Rec	1	7/17/2020 10:39:34 PM
Surr: Dibromofluoromethane	105	70-130		%Rec	1	7/17/2020 10:39:34 PM
Surr: Toluene-d8	105	70-130		%Rec	1	7/17/2020 10:39:34 PM
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	7/17/2020 10:39:34 PM
Surr: BFB	97.2	70-130		%Rec	1	7/17/2020 10:39:34 PM

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative Limit
 S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
 E Value above quantitation range
 F Analyte detected below quantitation limits
 P Sample pH Not In Range
 RL Reporting Limit

Page 13 of 20

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2007731

22-Jul-20

Client: Vertex Resource Group Ltd.
Project: Shinnery Oak Federal SWD 001

Sample ID: MB-53803	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 53803	RunNo: 70443								
Prep Date: 7/18/2020	Analysis Date: 7/18/2020	SeqNo: 2449218 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-53803		SampType: lcs		TestCode: EPA Method 300.0: Anions						
Client ID: LCSS		Batch ID: 53803		RunNo: 70443						
Prep Date: 7/18/2020		Analysis Date: 7/18/2020		SeqNo: 2449219		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.1	90	110			

Sample ID: MB-53812	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 53812	RunNo: 70454								
Prep Date: 7/19/2020	Analysis Date: 7/19/2020	SeqNo: 2449940 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-53812		SampType: lcs		TestCode: EPA Method 300.0: Anions						
Client ID: LCSS		Batch ID: 53812		RunNo: 70454						
Prep Date: 7/19/2020		Analysis Date: 7/19/2020		SeqNo: 2449941		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.2	90	110			

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
II 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 Quantitative Limit	RL Reporting Limit
S % Recovery outside of range due to dilution or matrix	

Page 14 of 20

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2007731

22-Jul-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak Federal SWD 001

Sample ID: 2007731-002AMS	SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: SS20-02 0-6"	Batch ID: 53758	RunNo: 70416								
Prep Date: 7/16/2020	Analysis Date: 7/18/2020	SeqNo: 2448367 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	44	9.9	49.41	4.405	81.2	47.4	136			
Surr: DNOP	1.3		4.941		25.7	55.1	146			S

Sample ID: 2007731-002AMSD	SampType: MSD	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: SS20-02 0-6"	Batch ID: 53758	RunNo: 70416								
Prep Date: 7/16/2020	Analysis Date: 7/18/2020	SeqNo: 2448368 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	46	9.7	48.40	4.405	86.6	47.4	136	4.00	43.4	
Surr: DNOP	0.15		4.840		3.08	55.1	146	0	0	S

Sample ID: LCS-53758	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 53758	RunNo: 70416								
Prep Date: 7/16/2020	Analysis Date: 7/18/2020	SeqNo: 2448418 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	49	10	50.00	0	98.4	70	130			
Surr: DNOP	2.9		5.000		57.7	55.1	146			

Sample ID: MB-53758	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 53758	RunNo: 70416								
Prep Date: 7/16/2020	Analysis Date: 7/18/2020	SeqNo: 2448422 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	6.8		10.00		68.5	55.1	146			

Sample ID: LCS-53748	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 53748	RunNo: 70428								
Prep Date: 7/16/2020	Analysis Date: 7/17/2020	SeqNo: 2448823 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	49	10	50.00	0	97.1	70	130			
Surr: DNOP	4.7		5.000		93.1	55.1	146			

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
ff 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 Quantitative Limit	RL Reporting Limit
S % Recovery outside of range due to dilution or matrix	

Page 15 of 20

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2007731

22-Jul-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak Federal SWD 001

Sample ID: MB-53748	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 53748	RunNo: 70428								
Prep Date: 7/16/2020	Analysis Date: 7/17/2020	SeqNo: 2448824 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.4		10.00		94.5	55.1	146			

Sample ID: MB-53768	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 53768	RunNo: 70449								
Prep Date: 7/16/2020	Analysis Date: 7/18/2020	SeqNo: 2450409 Units: %Rec								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	8.6		10.00		86.2	55.1	146			

Sample ID: LCS-53768	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 53768	RunNo: 70449								
Prep Date: 7/16/2020	Analysis Date: 7/18/2020	SeqNo: 2450412 Units: %Rec								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.1		5.000		82.6	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 Quantitative 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

Page 16 of 20

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2007731

22-Jul-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak Federal SWD 001

Sample ID: mb-53742	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBS	Batch ID: 53742	RunNo: 70437								
Prep Date: 7/15/2020	Analysis Date: 7/17/2020	SeqNo: 2448594 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	0.51		0.5000		101	70	130			
Surr: 4-Bromofluorobenzene	0.47		0.5000		94.8	70	130			
Surr: Dibromofluoromethane	0.51		0.5000		102	70	130			
Surr: Toluene-d8	0.48		0.5000		96.8	70	130			

Sample ID: lcs-53742	SampType: LCS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BatchQC	Batch ID: 53742	RunNo: 70437								
Prep Date: 7/15/2020	Analysis Date: 7/17/2020	SeqNo: 2448595 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	108	80	120			
Toluene	1.0	0.050	1.000	0	104	80	120			
Ethylbenzene	1.0	0.050	1.000	0	103	80	120			
Xylenes, Total	3.1	0.10	3.000	0	103	80	120			
Surr: 1,2-Dichloroethane-d4	0.50		0.5000		99.3	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.5000		95.0	70	130			
Surr: Dibromofluoromethane	0.52		0.5000		105	70	130			
Surr: Toluene-d8	0.49		0.5000		97.1	70	130			

Sample ID: mb-53743	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBS	Batch ID: 53743	RunNo: 70438								
Prep Date: 7/15/2020	Analysis Date: 7/17/2020	SeqNo: 2448698 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	0.54		0.5000		109	70	130			
Surr: 4-Bromofluorobenzene	0.47		0.5000		93.7	70	130			
Surr: Dibromofluoromethane	0.55		0.5000		109	70	130			
Surr: Toluene-d8	0.52		0.5000		104	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 Quantitative 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

Page 17 of 20

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2007731

22-Jul-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak Federal SWD 001

Sample ID: lcs-53743	SampType: LCS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BatchQC	Batch ID: 53743	RunNo: 70438								
Prep Date: 7/15/2020	Analysis Date: 7/17/2020	SeqNo: 2448699	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	97.0	80	120			
Toluene	0.89	0.050	1.000	0	89.2	80	120			
Ethylbenzene	0.95	0.050	1.000	0	94.9	80	120			
Xylenes, Total	2.9	0.10	3.000	0	96.5	80	120			
Surr: 1,2-Dichloroethane-d4	0.52		0.5000		105	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.5000		95.5	70	130			
Surr: Dibromofluoromethane	0.52		0.5000		104	70	130			
Surr: Toluene-d8	0.50		0.5000		101	70	130			

Sample ID: 2007731-002ams	SampType: MS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: SS20-02 0-6"	Batch ID: 53743	RunNo: 70438								
Prep Date: 7/15/2020	Analysis Date: 7/17/2020	SeqNo: 2448701	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.024	0.9662	0	109	71.1	115			
Toluene	0.99	0.048	0.9662	0	102	79.6	132			
Ethylbenzene	1.0	0.048	0.9662	0	105	83.8	134			
Xylenes, Total	3.1	0.097	2.899	0	108	82.4	132			
Surr: 1,2-Dichloroethane-d4	0.52		0.4831		107	70	130			
Surr: 4-Bromofluorobenzene	0.45		0.4831		93.9	70	130			
Surr: Dibromofluoromethane	0.52		0.4831		107	70	130			
Surr: Toluene-d8	0.52		0.4831		107	70	130			

Sample ID: 2007731-002amsd	SampType: MSD4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: SS20-02 0-6"	Batch ID: 53743	RunNo: 70438								
Prep Date: 7/15/2020	Analysis Date: 7/17/2020	SeqNo: 2448702	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	0.9940	0	112	71.1	115	5.52	20	
Toluene	1.0	0.050	0.9940	0	103	79.6	132	3.40	20	
Ethylbenzene	1.0	0.050	0.9940	0	105	83.8	134	2.85	20	
Xylenes, Total	3.2	0.099	2.982	0	108	82.4	132	2.34	20	
Surr: 1,2-Dichloroethane-d4	0.53		0.4970		107	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.45		0.4970		90.2	70	130	0	0	
Surr: Dibromofluoromethane	0.55		0.4970		110	70	130	0	0	
Surr: Toluene-d8	0.51		0.4970		103	70	130	0	0	

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 Quantitative Limit	RL Reporting Limit
S % Recovery outside of range due to dilution or matrix	

Page 18 of 20

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2007731

22-Jul-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak Federal SWD 001

Sample ID: mb-53742	SampType: MBLK			TestCode: EPA Method 8015D Mod: Gasoline Range						
Client ID: PBS	Batch ID: 53742			RunNo: 70437						
Prep Date: 7/15/2020	Analysis Date: 7/17/2020			SeqNo: 2448615		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	550		500.0		110	70	130			

Sample ID: lcs-53742		SampType: LCS		TestCode: EPA Method 8015D Mod: Gasoline Range							
Client ID: LCSS		Batch ID: 53742		RunNo: 70437							
Prep Date: 7/15/2020		Analysis Date: 7/17/2020		SeqNo: 2448616		Units: mg/Kg					
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)		21	5.0	25.00	0	84.8	70	130			
Surr: BFB		540		500.0		107	70	130			

Sample ID: mb-53743		SampType: MBLK		TestCode: EPA Method 8015D Mod: Gasoline Range							
Client ID: PBS		Batch ID: 53743		RunNo: 70438							
Prep Date: 7/15/2020		Analysis Date: 7/17/2020		SeqNo: 2448759		Units: mg/Kg					
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)		ND	5.0								
Surr: BFB		480		500.0		95.8	70	130			

Sample ID: lcs-53743		SampType: LCS		TestCode: EPA Method 8015D Mod: Gasoline Range							
Client ID: LCSS		Batch ID: 53743		RunNo: 70438							
Prep Date: 7/15/2020		Analysis Date: 7/17/2020		SeqNo: 2448760		Units: mg/Kg					
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)		18	5.0	25.00	0	72.8	70	130			
Surr: BFB		460		500.0		92.0	70	130			

Sample ID: 2007731-003ams	SampType: MS		TestCode: EPA Method 8015D Mod: Gasoline Range							
Client ID: SS20-03 0-6"	Batch ID: 53743		RunNo: 70438							
Prep Date: 7/15/2020	Analysis Date: 7/17/2020		SeqNo: 2448763		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	18	4.9	24.73	0	74.3	70	130			
Surr: BFB	480		494.6		97.6	70	130			

Sample ID: 2007731-003amsd	SampType: MSD	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: SS20-03 0-6"	Batch ID: 53743	RunNo: 70438								
Prep Date: 7/15/2020	Analysis Date: 7/17/2020	SeqNo: 2448764 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
 II Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 19 of 20

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2007731

22-Jul-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oak Federal SWD 001

Sample ID: 2007731-003amsd		SampType: MSD		TestCode: EPA Method 8015D Mod: Gasoline Range						
Client ID: SS20-03 0-6"		Batch ID: 53743		RunNo: 70438						
Prep Date: 7/15/2020		Analysis Date: 7/17/2020		SeqNo: 2448764		Units: mg/Kg				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	18	4.8	23.88	0	76.6	70	130	0.476	20	
Surr: BFB	460		477.6		96.2	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	B	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 Quantitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Page 20 of 20



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

Sample Log-In Check List

Client Name: Vertex Resource Group Ltd.

Work Order Number: 2007731

RcptNo: 1

Received By: Juan Rojas

7/15/2020 9:30:00 AM

Completed By: Juan Rojas

7/15/2020 10:22:55 AM

Reviewed By:

gm 7/15/20

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ 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 7/15/20

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

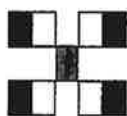
Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	5.1	Good				



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

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☐ Other☐ EDD (Type)

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.
7/13/80	11:13	Soil	SS20-01 0-6"	402 jar	ICE	2007731
	11:21		SS20-02 0-6"			001
	11:29		SS20-03 0-6"			002
	11:46		SS20-04 0-6"			003
	11:51		SS20-05 0-6"			004
	11:59		SS20-06 0-6"			005
	12:12		SS20-07 0-6"			006
	12:25		SS20-08 0-6"			007
	12:31		SS20-09 0-6"			008
	12:45		SS20-10 0-6"			009
	12:51		SS20-11 0-6"			010
7	12:55		SS20-12 0-6"			011
						210

Date:	Time:	Relinquished by:
-------	-------	------------------

Received by: Via:

Date	Time
------	------

Remarks:

Dates:	Time:
--------	-------

Relinquished by:

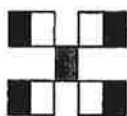
Received by 11/11/11 Via: 11/11/11

Date	Time
11-0	

Send to Natalie Gordon

B_i // Vertex

Page 2 of 2



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

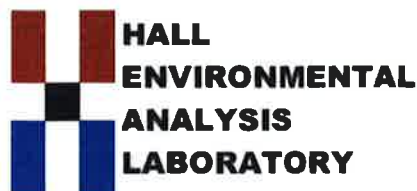
Tel. 505-345-3975 Fax 505-345-4107

Chain-of-Custody Record

[illegible]

Remarks:

Send to Natalie Gordon
Bill Ventres



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

July 21, 2020

Natalie Gordon

Vertex Resource Group Ltd.

3101 Boyd Drive

Carlsbad, NM 88220

TEL: (505) 506-0040

FAX:

RE: Shinnery Oak Federal SWD 001

OrderNo.: 2007733

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 5 sample(s) on 7/15/2020 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,

A handwritten signature in black ink, appearing to read 'Andy Freeman'.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Analytical Report

Lab Order 2007733

Date Reported: 7/21/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH20-01 1.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 7/8/2020

Lab ID: 2007733-001

Matrix: SOIL

Received Date: 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: JMT
Chloride	ND	60		mg/Kg	20	7/19/2020 9:45:36 PM	53812
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	7/18/2020 2:27:32 AM	53743
Surr: BFB	95.4	70-130		%Rec	1	7/18/2020 2:27:32 AM	53743
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	7/18/2020 2:47:53 AM	53758
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	7/18/2020 2:47:53 AM	53758
Surr: DNOP	30.9	55.1-146	S	%Rec	1	7/18/2020 2:47:53 AM	53758
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	7/18/2020 2:27:32 AM	53743
Toluene	ND	0.050		mg/Kg	1	7/18/2020 2:27:32 AM	53743
Ethylbenzene	ND	0.050		mg/Kg	1	7/18/2020 2:27:32 AM	53743
Xylenes, Total	ND	0.099		mg/Kg	1	7/18/2020 2:27:32 AM	53743
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	7/18/2020 2:27:32 AM	53743
Surr: 4-Bromofluorobenzene	94.5	70-130		%Rec	1	7/18/2020 2:27:32 AM	53743
Surr: Dibromofluoromethane	107	70-130		%Rec	1	7/18/2020 2:27:32 AM	53743
Surr: Toluene-d8	103	70-130		%Rec	1	7/18/2020 2:27:32 AM	53743

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 1 of 9

Analytical Report

Lab Order 2007733

Date Reported: 7/21/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH20-02 1.5'

Project: Shinnery Oak Federal SWD 001

Collection Date: 7/8/2020

Lab ID: 2007733-002

Matrix: SOIL

Received Date: 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: JMT
Chloride	100	59		mg/Kg	20	7/19/2020 10:22:38 PM	53812
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/18/2020 2:56:01 AM	53743
Surr: BFB	93.3	70-130		%Rec	1	7/18/2020 2:56:01 AM	53743
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	7/18/2020 2:58:24 AM	53758
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/18/2020 2:58:24 AM	53758
Surr: DNOP	33.5	55.1-146	S	%Rec	1	7/18/2020 2:58:24 AM	53758
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	7/18/2020 2:56:01 AM	53743
Toluene	ND	0.049		mg/Kg	1	7/18/2020 2:56:01 AM	53743
Ethylbenzene	ND	0.049		mg/Kg	1	7/18/2020 2:56:01 AM	53743
Xylenes, Total	ND	0.097		mg/Kg	1	7/18/2020 2:56:01 AM	53743
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	7/18/2020 2:56:01 AM	53743
Surr: 4-Bromofluorobenzene	90.5	70-130		%Rec	1	7/18/2020 2:56:01 AM	53743
Surr: Dibromofluoromethane	108	70-130		%Rec	1	7/18/2020 2:56:01 AM	53743
Surr: Toluene-d8	98.0	70-130		%Rec	1	7/18/2020 2:56:01 AM	53743

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 2 of 9

Analytical Report

Lab Order 2007733

Date Reported: 7/21/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH20-03 2'

Project: Shinnery Oak Federal SWD 001

Collection Date: 7/8/2020

Lab ID: 2007733-003

Matrix: SOIL

Received Date: 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: JMT
Chloride	71	60		mg/Kg	20	7/19/2020 10:34:58 PM	53812
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	7/18/2020 3:24:29 AM	53743
Surr: BFB	94.6	70-130		%Rec	1	7/18/2020 3:24:29 AM	53743
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	7/18/2020 3:08:50 AM	53758
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	7/18/2020 3:08:50 AM	53758
Surr: DNOP	33.7	55.1-146	S	%Rec	1	7/18/2020 3:08:50 AM	53758
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.023		mg/Kg	1	7/18/2020 3:24:29 AM	53743
Toluene	ND	0.046		mg/Kg	1	7/18/2020 3:24:29 AM	53743
Ethylbenzene	ND	0.046		mg/Kg	1	7/18/2020 3:24:29 AM	53743
Xylenes, Total	ND	0.093		mg/Kg	1	7/18/2020 3:24:29 AM	53743
Surr: 1,2-Dichloroethane-d4	106	70-130		%Rec	1	7/18/2020 3:24:29 AM	53743
Surr: 4-Bromofluorobenzene	93.2	70-130		%Rec	1	7/18/2020 3:24:29 AM	53743
Surr: Dibromofluoromethane	104	70-130		%Rec	1	7/18/2020 3:24:29 AM	53743
Surr: Toluene-d8	98.5	70-130		%Rec	1	7/18/2020 3:24:29 AM	53743

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

Qualifiers:

* Value exceeds Maximum Contaminant Level
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 3 of 9

Analytical Report

Lab Order 2007733

Date Reported: 7/21/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH20-04 4'

Project: Shinnery Oak Federal SWD 001

Collection Date: 7/8/2020

Lab ID: 2007733-004

Matrix: SOIL

Received Date: 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: JMT
Chloride	ND	60		mg/Kg	20	7/19/2020 10:47:18 PM	53812
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	7/18/2020 3:53:02 AM	53743
Surr: BFB	93.8	70-130		%Rec	1	7/18/2020 3:53:02 AM	53743
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	7/18/2020 3:19:17 AM	53758
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	7/18/2020 3:19:17 AM	53758
Surr: DNOP	38.0	55.1-146	S	%Rec	1	7/18/2020 3:19:17 AM	53758
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.024		mg/Kg	1	7/18/2020 3:53:02 AM	53743
Toluene	ND	0.048		mg/Kg	1	7/18/2020 3:53:02 AM	53743
Ethylbenzene	ND	0.048		mg/Kg	1	7/18/2020 3:53:02 AM	53743
Xylenes, Total	ND	0.097		mg/Kg	1	7/18/2020 3:53:02 AM	53743
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	7/18/2020 3:53:02 AM	53743
Surr: 4-Bromofluorobenzene	92.9	70-130		%Rec	1	7/18/2020 3:53:02 AM	53743
Surr: Dibromofluoromethane	106	70-130		%Rec	1	7/18/2020 3:53:02 AM	53743
Surr: Toluene-d8	101	70-130		%Rec	1	7/18/2020 3:53:02 AM	53743

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 4 of 9

Analytical Report

Lab Order 2007733

Date Reported: 7/21/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resource Group Ltd.

Client Sample ID: BH20-05 10'

Project: Shinnery Oak Federal SWD 001

Collection Date: 7/8/2020

Lab ID: 2007733-005

Matrix: SOIL

Received Date: 7/15/2020 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: JMT
Chloride	130	60		mg/Kg	20	7/19/2020 10:59:39 PM	53812
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: DJF
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	7/18/2020 4:21:36 AM	53743
Surr: BFB	92.3	70-130		%Rec	1	7/18/2020 4:21:36 AM	53743
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	7/18/2020 3:29:42 AM	53758
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	7/18/2020 3:29:42 AM	53758
Surr: DNOP	41.4	55.1-146	S	%Rec	1	7/18/2020 3:29:42 AM	53758
EPA METHOD 8260B: VOLATILES SHORT LIST							Analyst: DJF
Benzene	ND	0.025		mg/Kg	1	7/18/2020 4:21:36 AM	53743
Toluene	ND	0.049		mg/Kg	1	7/18/2020 4:21:36 AM	53743
Ethylbenzene	ND	0.049		mg/Kg	1	7/18/2020 4:21:36 AM	53743
Xylenes, Total	ND	0.099		mg/Kg	1	7/18/2020 4:21:36 AM	53743
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	7/18/2020 4:21:36 AM	53743
Surr: 4-Bromofluorobenzene	88.6	70-130		%Rec	1	7/18/2020 4:21:36 AM	53743
Surr: Dibromofluoromethane	106	70-130		%Rec	1	7/18/2020 4:21:36 AM	53743
Surr: Toluene-d8	102	70-130		%Rec	1	7/18/2020 4:21:36 AM	53743

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

Qualifiers:

* Value exceeds Maximum Contaminant Level.
 D Sample Diluted Due to Matrix
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 PQL Practical Quantitative 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

Page 5 of 9

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2007733

21-Jul-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak Federal SWD 001

Sample ID: MB-53812		SampType: mblik		TestCode: EPA Method 300.0: Anions						
Client ID: PBS		Batch ID: 53812		RunNo: 70454						
Prep Date: 7/19/2020		Analysis Date: 7/19/2020		SeqNo: 2449940			Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: LCS-53812		SampType: lcs		TestCode: EPA Method 300.0: Anions						
Client ID: LCSS		Batch ID: 53812		RunNo: 70454						
Prep Date: 7/19/2020		Analysis Date: 7/19/2020		SeqNo: 2449941			Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.2	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 Quantitative 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

Page 6 of 9

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2007733

21-Jul-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak Federal SWD 001

Sample ID: LCS-53751	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 53751	RunNo: 70416								
Prep Date: 7/16/2020	Analysis Date: 7/17/2020	SeqNo: 2448417 Units: %Rec								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	5.8		5.000		116	55.1	146			

Sample ID: LCS-53758	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 53758	RunNo: 70416								
Prep Date: 7/16/2020	Analysis Date: 7/18/2020	SeqNo: 2448418 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	49	10	50.00	0	98.4	70	130			
Surr: DNOP	2.9		5.000		57.7	55.1	146			

Sample ID: MB-53751	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 53751	RunNo: 70416								
Prep Date: 7/16/2020	Analysis Date: 7/17/2020	SeqNo: 2448421 Units: %Rec								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	12		10.00		117	55.1	146			

Sample ID: MB-53758	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 53758	RunNo: 70416								
Prep Date: 7/16/2020	Analysis Date: 7/18/2020	SeqNo: 2448422 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	6.8		10.00		68.5	55.1	146			

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 Quantitative Limit	RL Reporting Limit
S % Recovery outside of range due to dilution or matrix	

Page 7 of 9

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2007733

21-Jul-20

Client: Vertex Resource Group Ltd.

Project: Shinnery Oak Federal SWD 001

Sample ID: mb-53743	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBS	Batch ID: 53743	RunNo: 70438								
Prep Date: 7/15/2020	Analysis Date: 7/17/2020	SeqNo: 2448698 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	0.54		0.5000		109	70	130			
Surr: 4-Bromofluorobenzene	0.47		0.5000		93.7	70	130			
Surr: Dibromofluoromethane	0.55		0.5000		109	70	130			
Surr: Toluene-d8	0.52		0.5000		104	70	130			

Sample ID: lcs-53743	SampType: LCS4	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: BatchQC	Batch ID: 53743	RunNo: 70438								
Prep Date: 7/15/2020	Analysis Date: 7/17/2020	SeqNo: 2448699 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	97.0	80	120			
Toluene	0.89	0.050	1.000	0	89.2	80	120			
Ethylbenzene	0.95	0.050	1.000	0	94.9	80	120			
Xylenes, Total	2.9	0.10	3.000	0	96.5	80	120			
Surr: 1,2-Dichloroethane-d4	0.52		0.5000		105	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.5000		95.5	70	130			
Surr: Dibromofluoromethane	0.52		0.5000		104	70	130			
Surr: Toluene-d8	0.50		0.5000		101	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 Quantitative 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

Page 8 of 9

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2007733

21-Jul-20

Client: Vertex Resource Group Ltd.**Project:** Shinnery Oak Federal SWD 001

Sample ID: mb-53743	SampType: MBLK	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: PBS	Batch ID: 53743	RunNo: 70438								
Prep Date: 7/15/2020	Analysis Date: 7/17/2020	SeqNo: 2448759 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	480		500.0		95.8	70	130			

Sample ID: lcs-53743	SampType: LCS	TestCode: EPA Method 8015D Mod: Gasoline Range								
Client ID: LCSS	Batch ID: 53743	RunNo: 70438								
Prep Date: 7/15/2020	Analysis Date: 7/17/2020	SeqNo: 2448760 Units: mg/Kg								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	18	5.0	25.00	0	72.8	70	130			
Surr: BFB	460		500.0		92.0	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative 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

Page 9 of 9



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

Sample Log-In Check List

Client Name: Vertex Resource Group Ltd.

Work Order Number: 2007733

RcptNo: 1

Received By: **Scott Anderson**

7/15/2020 9:30:00 AM

Completed By: **Juan Rojas**

7/15/2020 10:25:40 AM

Reviewed By:

9/11/5/20

Chain of Custody

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

Log In

- | | | | |
|--|---|--|--|
| 3. Was an attempt made to cool the samples? | Yes ☒ | No ☐ | NA ☐ |
| 4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ 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)

Adjusted?

Checked by: _____

of preserved bottles checked for pH: _____
(<2 or >12 unless noted)
Adjusted? _____
Checked by: DAD 7/15/20

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	5.1	Good				

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

Chain-of-Custody Record									
Client: <u>Vertex</u>		Turn-Around Time: <u>5 Day Turn</u>							
Mailing Address: <u>on file</u>		☒ Standard ☐ Rush Project Name:							
Phone #: <u> </u>		Project #: <u> </u>							
email or Fax#: <u> </u>		Project Manager: <u>Natalie Goddard</u>							
QA/QC Package:		Sampler: <u>m3p</u>							
☐ Standard		On Ice: ☒ Yes ☐ No							
Accreditation: ☐ Az Compliance		# of Coolers: <u>1</u>							
☐ NELAC		Cooler Temp (including CF): <u>5.0 ± 0.1 = 5.1 (°C)</u>							
☐ EDD (Type) <u> </u>		Container Type and #		Preservative Type		HEAL No			
Date	Time	Matrix	Sample Name						
<u>7/18/20</u>		<u>Soil</u>	<u>BH20-01 1.5'</u>	<u>4 oz jar JCE</u>			<u>-001</u>	<u>2007733</u>	
			<u>BH20-02 1.5'</u>				<u>-007</u>		
			<u>BH20-03 2'</u>				<u>-003</u>		
			<u>BH20-04 4'</u>				<u>-004</u>		
			<u>BH20-05 10'</u>				<u>-005</u>		
Date:	Time:	Relinquished by:	Via:		Date	Time	Received by: <u>[Signature]</u>		
Date:	Time:	Relinquished by: <u>[Signature]</u>	Via:		Date	Time	Received by: <u>[Signature]</u>		

Send to Natalie Gordon

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.

Incident ID	NRM2019937520
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.*

- ☒ A scaled site and sampling diagram as described in 19.15.29.11 NMAC
- ☒ 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)
- ☒ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)
- ☒ 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: Johry Hurt Title: RES Specialist
Signature: [Signature] Date: 10/27/20
email: JHurt@matadorresources.com Telephone: 972-371-5200

OCD Only

Received by: Robert Hamlet Date: 3/29/2021

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: Robert Hamlet Date: 3/29/2021
Printed Name: Robert Hamlet Title: Environmental Specialist - Advanced

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 10871

CONDITIONS OF APPROVAL

Operator:		OGRID:	Action Number:	Action Type:
MATADOR PRODUCTION COMPANY One Lincoln Centre		228937	10871	C-141
5400 LBJ Freeway, Ste 1500 Dallas, TX75240				
OCD Reviewer	Condition			
rhamlet	We have received your closure report and final C-141 for Incident #NRM2019957626 SHINNERY OAK FEDERAL SWD #003, thank you. This closure is approved.			