April 18, 2023 Vertex Project #: 23E-00893

Spill Closure Report: Black River SWD #1
Section 31, Township 23 South, Range 28 East
County: Eddy
Incident Report: nAPP2303627366

Prepared For: **San Mateo Midstream**
1500, 5400 LBJ Freeway
Dallas, Texas 75240

New Mexico Oil Conservation Division - District 2 - Artesia
811 South 1st Street
Artesia, New Mexico 88210

San Mateo Midstream (San Mateo) retained Vertex Resource Services Inc. (Vertex) to conduct a Spill Assessment for a release of produced water caused by a tank overflow at Black River SWD #1, Incident nAPP2303627366 (hereafter referred to as "Black River"). This letter provides a description of the Spill Assessment and includes a request for Incident Closure. The spill area is located at N 32.26616, W -104.12471.

Background

The site is located approximately 0.97 miles southwest of Loving, New Mexico (Google Inc., 2023). The legal location for the site is Section 31, Township 23 South and Range 28 East in Eddy County, New Mexico. The spill area is located on private property. An aerial photograph and site schematic are included on Figure 1 (Attachment 1).

The Geological Map of New Mexico (New Mexico Bureau of Geology and Mineral Resources, 2023) indicates the site's surface geology is comprised primarily of Qa - Alluvium (Holocene to upper Pleistocene). The Natural Resources Conservation Service *Web Soil Survey* characterizes the predominant soil texture on the site is Reagan loam and Reeves-Gypsum land complex. It tends to be well drained with low to high runoff and low to moderate available moisture levels in the soil profile (United States Department of Agriculture, Natural Resources Conservation Service, 2023).

The surrounding landscape is associated with ridges, hills, plains, fan remnants and alluvial fans at elevations of 1,100 to 5,000 feet above sea level. The climate is semi-arid, with annual precipitation ranging between 7 to 25 inches. Historically, the plant community has grassland aspect, dominated by grasses with shrubs and half-shrubs sparse and evenly distributed. Black grama and tobosa is dominant with a mixture of creosotebush, mesquite, and tarbush. Overgrazing and extended drought can reduce grass cover (United States Department of Agriculture, Natural Resources Conservation Service, 2023).

There is no surface water located at Black River. The nearest significant watercourse, as defined in Subsection P of 19.15.17.7 Mexico Administrative Code (NMAC; New Mexico Oil Conservation Division, 2018), is the Black River located

approximately 2.59 miles southeast of the site (United States Fish and Wildlife Service, 2023). There are no continuous flowing watercourses or significant watercourses, lakebeds, sinkholes, playa lakes, or other critical water or community features as outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC.

Incident Description

The spill occurred on February 4, 2023, due to a tank overflow. The spill was reported on February 4, 2023, and involved the release of approximately 22 barrels (bbl.) of produced water on the pad site. Approximately 20 bbl. of free fluid was removed during initial spill clean-up. Characterization samples are included in Table 2 (Attachment 2). The New Mexico Oil Conservation Division (NMOCD) C-141 Report: nAPP2303627366 is included in Attachment 3. The daily field reports and site photographs are included in Attachment 4.

Closure Criteria Determination

The depth to groundwater was determined using information from the United States Geological Survey National Water Information Mapping System and Office of the State Engineer's Water Rights Database. A 0.5-mile search radius was used to determine groundwater depth. The closest recorded depth to groundwater was determined to be 100 feet below ground surface (bgs) and 0.20 miles from the site (New Mexico Office of the State Engineer, New Mexico Water Rights Reporting System, 2023). Documentation used in Closure Criteria Determination research is included in Attachment 5.

Closure Criteria Worksheet			
Site Name: Black River SWD #1			
Spill Coordinates:		**X: 32.26616**	**Y: -104.12471**
Site Specific Conditions		**Value**	**Unit**
1	Depth to Groundwater	**100**	feet
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	13,670	feet
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	29,394	feet
4	Within 300 feet from an occupied residence, school, hospital, institution or church	5,107	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**	725	feet
	ii) Within 1000 feet of any fresh water well or spring	**725**	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	2,475	feet
8	Within the area overlying a subsurface mine	No	(Y/N)
9	Within an unstable area (Karst Map)	Medium	Critical High Medium Low
10	Within a 100-year Floodplain	Undetermined	year
11	Soil Type	Reagan loam and Reeves-Gypsum land complex	
12	Ecological Classification	Loamy	
13	Geology	Qa	
	NMAC 19.15.29.12 E (Table 1) Closure Criteria	<50'	<50' 51-100' >100'

The closure criteria determined for the site are associated with the following constituent concentration limits as presented in Table 1.

Table 1. Closure Criteria for Soils Impacted by a Release		
Minimum depth below any point within the horizontal boundary of the release to groundwater less than 10,000 mg/l TDS	**Constituent**	**Limit**
< 50 feet	Chloride	600 mg/kg
	TPH (GRO+DRO+MRO)	100 mg/kg
	BTEX	50 mg/kg
	Benzene	10 mg/kg

TDS - Total dissolved solids, TPH - Total petroleum hydrocarbons = gasoline range organics (GRO) + diesel range organics (DRO) + motor oil range organics (MRO), BTEX - Benzene, toluene, ethylbenzene, and xylenes

Remedial Actions Taken

An initial site inspection of the spill area was completed on February 15, 2023, which identified the area of the spill specified in the initial C-141 Report. An aerial view and site schematic is included on Figure 1 (Attachment 1). Initial characterization and laboratory analysis results are included in Table 2 (Attachment 2). The daily field reports associated with the site inspection are included in Attachment 4.

Remediation efforts began on March 6, 2023, and were completed on March 8, 2023. Vertex personnel supervised the excavation of impacted soils. Field screening was completed on multiple sample points and consisted of analysis using Dexsil Petroflag using EPA SW-846 Method 9074 (extractable hydrocarbons) and titration (chlorides). Field screening results were used to identify areas requiring further remediation from those areas showing concentrations below determined closure criteria levels. Soils were removed to a depth of 1.5 feet bgs. Impacted soil was transported by a licensed waste hauler and disposed of at an approved waste management facility. An aerial view and excavation schematic are presented on Figure 2 (Attachment 1).

Notification that confirmatory samples were being collected was provided to the NMOCD on March 6, 2023, and is included in Attachment 6. Confirmatory composite samples were collected from the base and walls of the excavation in 200 square foot increments. A total of 12 samples were collected for laboratory analysis following NMOCD soil sampling procedures. Samples were submitted to Hall Environmental Analysis Laboratory under chain-of-custody protocols and analyzed for BTEX (EPA Method 8021B), total petroleum hydrocarbons (GRO, DRO, MRO – EPA Method 8015D) and total chlorides (EPA Method 300.0). Laboratory results are presented in Table 3 (Attachment 2) and the laboratory data reports are included in Attachment 7. All confirmatory samples collected and analyzed were below closure criteria for the site.

Closure Request

The spill area was fully delineated, remediated, and backfilled with local soils. The Confirmatory Sample Notification email is included in Attachment 6. Confirmatory samples were analyzed by the laboratory and found to be below allowable concentrations as per the NMAC Closure Criteria for Soils Impacted by a Release locations “under 50 feet to groundwater”. Based on these findings, San Mateo Midstream requests that this spill be closed.

Should you have any questions or concerns, please do not hesitate to contact the undersigned at 575.361.9880 or mpeppin@vertex.ca.

Monica Peppin, A.S.
PROJECT MANAGER, REPORTING

April 20, 2023
Date

Attachments

Attachment 1. Figures
Attachment 2. Tables
Attachment 3. NMOCD C-141 Report
Attachment 4. Daily Field Reports with Photographs
Attachment 5. Closure Criteria for Soils Impacted by a Release Research Determination Documentation
Attachment 6. Confirmatory Sample Notification to the NMOCD
Attachment 7. Laboratory Data Reports and Chain of Custody Forms

References

Google Inc. (2023). *Google Earth Pro* (Version 7.3.4) [Software]. Retrieved from http://www.google.com/earth

New Mexico Bureau of Geology and Mineral Resources. (2023). *Interactive Geologic Map.* Retrieved from http://geoinfo.nmt.edu.

New Mexico Mining and Minerals Division. (2023). *Coal Mine Resources in New Mexico*. Retrieved from http://www.emnrd.state.nm.us/MMD/gismapminedata.html

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

New Mexico Office of the State Engineer, New Mexico Water Rights Reporting System. (2023). *Water Column/Average Depth to Water Report.* Retrieved from http://nmwrrs.ose.state.nm.us/nmwrrs/waterColumn.html

United States Department of Agriculture, Natural Resources Conservation Service. (2023). *Web Soil Survey.* Retrieved from https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

United States Department of Homeland Security, FEMA Flood Map Service Center. (2020).

United States Department of the Interior, Bureau of Land Management. (2018). *New Mexico Cave/Karsts.* Retrieved from https://www.blm.gov/programs/recreation/recreation-programs/caves/new-mexico.

United States Fish and Wildlife Service. (2023). *National Wetlands Inventory Surface Waters and Wetland*. Retrieved from https://www.fws.gov/ wetlands/data/Mapper.html.

Limitations

This report has been prepared for the sole benefit of San Mateo Midstream. 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 San Mateo Midstream. 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

Borehole 4' Excavation (~1,622 sq.ft.)

VERTEX

0 10 20 40 Feet

Map Center:
Lat/Long: 32.266033, -104.125175

NAD 1983 UTM Zone 13N
Date: Mar 02/23

N

Characterization Schematic
Black River SWD #1

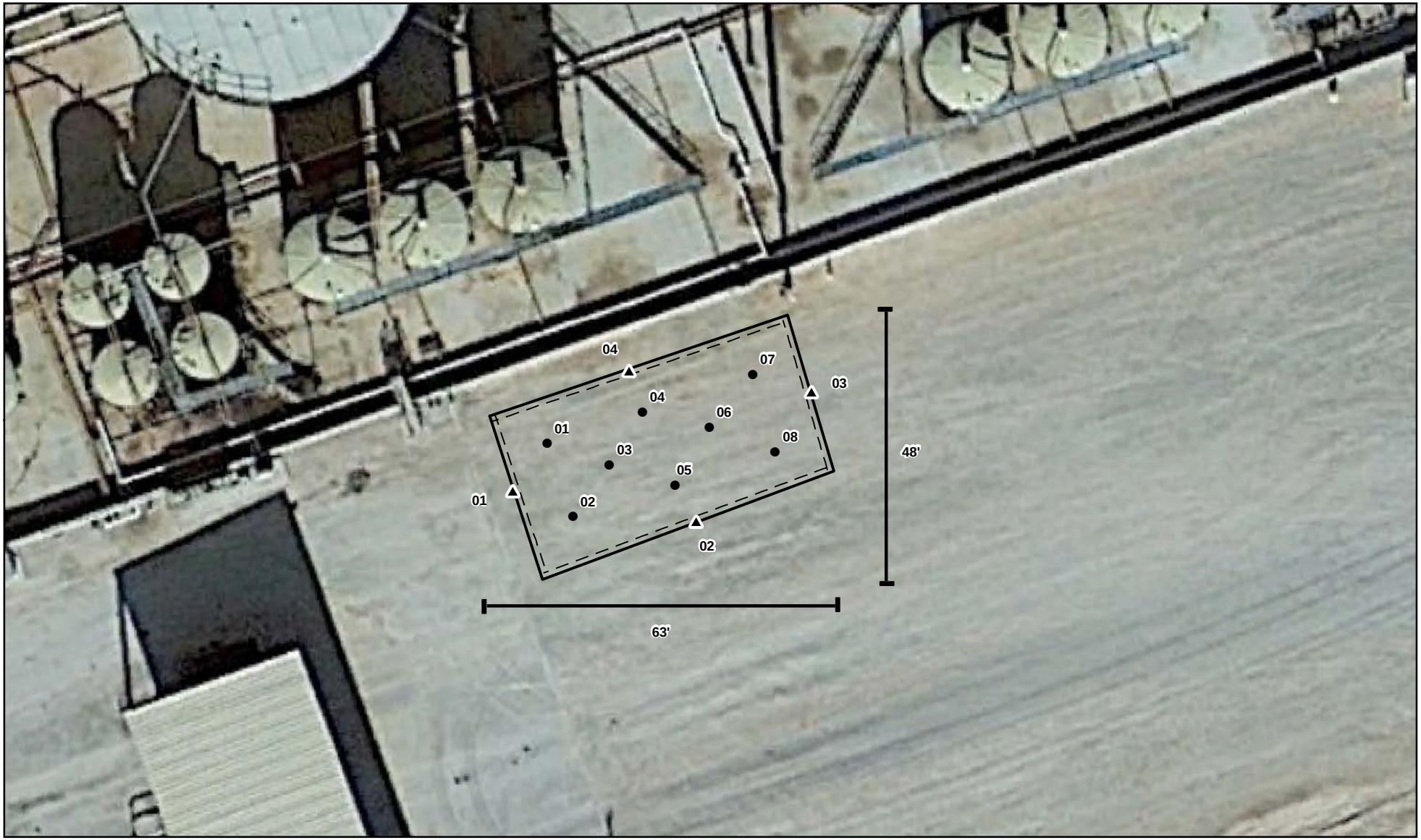
FIGURE:
1

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

Note: Background imagery from Google Earth (2023). Features from GPS. Vertex Professional Services Ltd., 2023.

VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects_US PROJECTS\Matador Resources\22E-04178\Figure 1 Characterization Schematic (Black River).mxd



● Base Sample (Prefixed by "BS23-") ▲ Wall Sample (Prefixed by "WS23-") 1.5' Excavation Boundary (~1,692 sq.ft.)

VERTEX

0 5 10 20 Feet

Map Center:
Lat/Long: 32.266045, -104.125144

NAD 1983 UTM Zone 13N
Date: Mar 13/23

N

Confirmatory Schematic
Black River SWD #1

FIGURE:
2

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

Note: Background imagery collected from Google Erath 2019. Data surveyed by Vertex Professional Services Ltd., 2023

VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects_US PROJECT S\Matador Resources\23E-00893\Figure 2 Confirmatory Schematic (Black River SWD #1).mxd

ATTACHMENT 2

Table 2. Initial Characterization Sample Laboratory Results - Depth to Groundwater <50 feet bgs
San Mateo Midstream
Black River SWD #1
NMOCD Tracking #: nAPP2303627366
Project #: 23E-00893
Lab Report: 2302785

Sample Description			Petroleum Hydrocarbons										Inorganic
Sample ID	Depth (ft)	Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride Concentration
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Criteria	NMOCD - NMAC <50 ft 19.15.29 (2018)		10	-	-	-	50	-	-	-	-	100	600
	NMOCD - NMAC 51-100 ft 19.15.29 (2018)		10	-	-	-	50	-	-	-	1000	2500	10000
	NMOCD - NMAC >100 ft 19.15.29 (2018)		10	-	-	-	50	-	-	-	1000	2500	20000
2023 Boreholes													
BH23-01	0	February 15, 2023	ND	ND	ND	ND	ND	ND	75	52	75	127	170
	2	February 15, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	140
	4	February 15, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	130
BH23-02	0	February 15, 2023	ND	ND	ND	ND	ND	ND	18	ND	18	18	1800
	2	February 15, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	110
	4	February 15, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH23-03	0	February 15, 2023	ND	ND	ND	ND	ND	ND	140	140	140	280	5200
	2	February 15, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	220
	4	February 15, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	270
BH23-04	0	February 15, 2023	ND	ND	ND	0.41	0.41	8.0	340	280	348	628	980
	2	February 15, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	120
	4	February 15, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH23-05	0	February 15, 2023	ND	ND	ND	ND	ND	ND	11	ND	11	11	3800
	2	February 15, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	160
	4	February 15, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	390
BH23-06	0	February 15, 2023	ND	ND	ND	ND	ND	ND	42	69	42	111	1900
	2	February 15, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4	February 15, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NMAC - New Mexico Administrative Code (Title 19, Chapter 15, Part 29; 2022)
ND - Not Detected at the Reporting Limit
- Denotes no standard/not analyzed
Bold and grey shaded indicates exceedance outside of NMOCD Closure Criteria (on-pad)
Bold and green shaded indicates exceedance outside of NMOCD Reclamation Criteria (off-pad)

Table 3. Confirmatory Laboratory Results - Depth to Groundwater <50 feet bgs
San Mateo Midstream
Black River SWD #1
NMOCD Tracking #: nAPP2303627366
Project #: 23E-00893
Lab Report: 2303584

Sample Description			Petroleum Hydrocarbons										Inorganic
Sample ID	Depth (ft)	Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride Concentration
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Criteria	NMOCD - NMAC <50 ft 19.15.29 (2018)		10	-	-	-	50	-	-	-	-	100	600
	NMOCD - NMAC 51-100 ft 19.15.29 (2018)		10	-	-	-	50	-	-	-	1000	2500	10000
	NMOCD - NMAC >100 ft 19.15.29 (2018)		10	-	-	-	50	-	-	-	1000	2500	20000
2023 Excavation													
WS23-01	0-1.5	March 8, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	130
WS23-02	0-1.5	March 8, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	170
WS23-03	0-1.5	March 8, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	280
WS23-04	0-1.5	March 8, 2023	ND	ND	ND	ND	ND	ND	12	ND	12	12	210
BS23-01	1.5	March 8, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	78
BS23-02	1.5	March 8, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	69
BS23-03	1.5	March 8, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	78
BS23-04	1.5	March 8, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	77
BS23-05	1.5	March 8, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	190
BS23-06	1.5	March 8, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	180
BS23-07	1.5	March 8, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	190
BS23-08	1.5	March 8, 2023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	190

NMAC - New Mexico Administrative Code (Title 19, Chapter 15, Part 29; 2022)
ND - Not Detected at the Reporting Limit
- Denotes no standard/not analyzed
Bold and grey shaded indicates exceedance outside of NMOCD Closure Criteria (on-pad)
Bold and green shaded indicates exceedance outside of NMOCD Reclamation Criteria (off-pad)

ATTACHMENT 3

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	nAPP2303627366
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party San Mateo Midstream	OGRID 329461
Contact Name Arsenio Jones	Contact Telephone 575-361-4333
Contact email arsenio.jones@matadorresources.com	Incident # *(assigned by OCD)* nAPP2303627366
Contact mailing address 5400 LBJ Freeway, Suite 1500 Dallas, Texas 75240	

Location of Release Source

Latitude 32.26616 Longitude -104.12471
(NAD 83 in decimal degrees to 5 decimal places)

Site Name Black River SWD #1	Site Type SWD
Date Release Discovered 2/4/2023	API# *(if applicable)*

Unit Letter	Section	Township	Range	County
B	31	23S	28E	Eddy

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

Nature and Volume of Release

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

☐ Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
☒ Produced Water	Volume Released (bbls) 22	Volume Recovered (bbls) 20
	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)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

Tank Overflow

Form C-141
Page 2

State of New Mexico
Oil Conservation Division

Incident ID	nAPP2303627366
District RP	
Facility ID	
Application ID	

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

Initial Response

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

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

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

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

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

Printed Name: Arsenio Jones Title: Supervisor - Regulatory

Signature: Clint Talley Date: 4/26/2023

email: arsenio.jones@matadorresources.com Telephone: 575-361-4333

OCD Only

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	nAPP2303627366
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?	100 (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.

State of New Mexico
Oil Conservation Division

Incident ID	nAPP2303627366
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: Arsenio Jones Title: Supervisor - Regulatory

Signature: Clint Talley Date: 4/26/2023

email: arsenio.jones@matadorresources.com Telephone: 575-361-4333

OCD Only

Received by: Jocelyn Harimon Date: 04/26/2023

State of New Mexico
Oil Conservation Division

Incident ID	nAPP2306327366
District RP	
Facility ID	
Application ID	

Remediation Plan

Remediation Plan Checklist: ***Each of the following items must be included in the plan.***

- ☐ Detailed description of proposed remediation technique
- ☐ Scaled sitemap with GPS coordinates showing delineation points
- ☐ Estimated volume of material to be remediated
- ☐ Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- ☐ Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

Deferral Requests Only: ***Each of the following items must be confirmed as part of any request for deferral of remediation.***

☐ Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.

☐ Extents of contamination must be fully delineated.

☐ Contamination does not cause an imminent risk to human health, the environment, or groundwater.

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: Arsenio Jones Title: Supervisor - Regulatory

Signature: Clint Talley Date: 4/26/2023

email: arsenio.jones@matadorresources.com Telephone: 575-361-4333

OCD Only

Received by: _____ Date: _____

☐ Approved ☐ Approved with Attached Conditions of Approval ☐ Denied ☐ Deferral Approved

Signature: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	nAPP2303627366
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: Arsenio Jones Title: Supervisor - Regulatory

Signature: Clint Talley Date: 4/26/2023

email: arsenio.jones@matadorresources.com Telephone: 575-361-4333

OCD Only

Received by: Jocelyn Harimon Date: 04/26/2023

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: 08/24/2023

Printed Name: Jocelyn Harimon Title: Environmental Professional

ATTACHMENT 4

Daily Site Visit Report

Client:	Matador Resources	Inspection Date:	2/15/2023
Site Location Name:	Black River SWD #1	Report Run Date:	2/15/2023 9:51 PM
Client Contact Name:	Arsenio Jones	API #:	
Client Contact Phone #:	(575)361-4333		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	2/15/2023 9:00 AM
Departed Site	2/15/2023 1:15 PM

Field Notes

9:14 Arrived on site and filled out safety paperwork.

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: South	**Viewing Direction**: North
	
Sampling area.	Hand auger site.
Viewing Direction: East	**Viewing Direction**: North
	
Digging borehole.	Spill site boundary.

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Hunter Klein

Signature: 

Daily Site Visit Report

Client:	Matador Resources	Inspection Date:	3/8/2023
Site Location Name:	Black River SWD #1	Report Run Date:	3/8/2023 8:41 PM
Client Contact Name:	Arsenio Jones	API #:	
Client Contact Phone #:	(575)361-4333		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	3/8/2023 9:00 AM
Departed Site	3/8/2023 12:02 PM

Field Notes

9:10 Arrived on site and filled out safety paperwork.

11:57 Started collecting confirmation samples.

11:58 Screened and jarred all field samples.

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: East	**Viewing Direction**: North
	
Site excavation.	Trench digging.
Viewing Direction: West	**Viewing Direction**: North
	
Excavation trench.	Dirty spoils pile on tarp.

Daily Site Visit Report

Viewing Direction: North

Western portion of excavation.

Viewing Direction: East

Excavation at 1.5 feet

Viewing Direction: West

Entire excavation.

Daily Site Visit Report

Site Photos

Viewing Direction: East	**Viewing Direction**: North
	
Site excavation.	Dirty tailings pile on tarp.
Viewing Direction: East	**Viewing Direction**: West
	
Northern expansion of excavation.	Northern expansion of excavation.

Daily Site Visit Report

Viewing Direction: Southwest	**Viewing Direction**: North
	
Finished western side of excavation.	Eastern portion of excavation.
Viewing Direction: Northeast	**Viewing Direction**: East
	
Final excavation.	Final excavation.

Daily Site Visit Report

Site Photos

Viewing Direction: East	**Viewing Direction**: North
	
Excavation with samples.	Excavation site.
Viewing Direction: South	**Viewing Direction**: Southwest
	
Excavation area.	Excavation area.

Daily Site Visit Report

Viewing Direction: Northwest	**Viewing Direction**: West
	
Excavation area.	Excavation area.

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Hunter Klein

Signature:

ATTACHMENT 5

Black River SWD #1

2/6/2023, 3:00:23 PM

Override 1

GIS WATERS PODs

Active

Pending

OSE District Boundary

SiteBoundaries

1:2,257

0 0.02 0.04 0.08 mi

0 0.04 0.07 0.14 km

Maxar, Microsoft, Esri, HERE, iPC, U.S. Department of Energy Office of Legacy Management, Esri, HERE, Garmin, iPC

Web Generated Map
Map is generated by web users.

Black River SWD #1

2/6/2023, 2:42:48 PM

GIS WATERS PODs

- Active
- Pending
- OSE District Boundary

New Mexico State Trust Lands

- Both Estates

Conveyances

- Canal
- Ditch
- SiteBoundaries

1:9,028

0 0.07 0.15 0.3 mi

0 0.13 0.25 0.5 km

Esri, HERE, iPC, U.S. Department of Energy Office of Legacy Management, Esri, HERE, Garmin, iPC, Maxar

Web Generated Map
Map is generated by web users.

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
22157	C 04281 POD1	2	4	1	31	23S	28E	582193	3570055

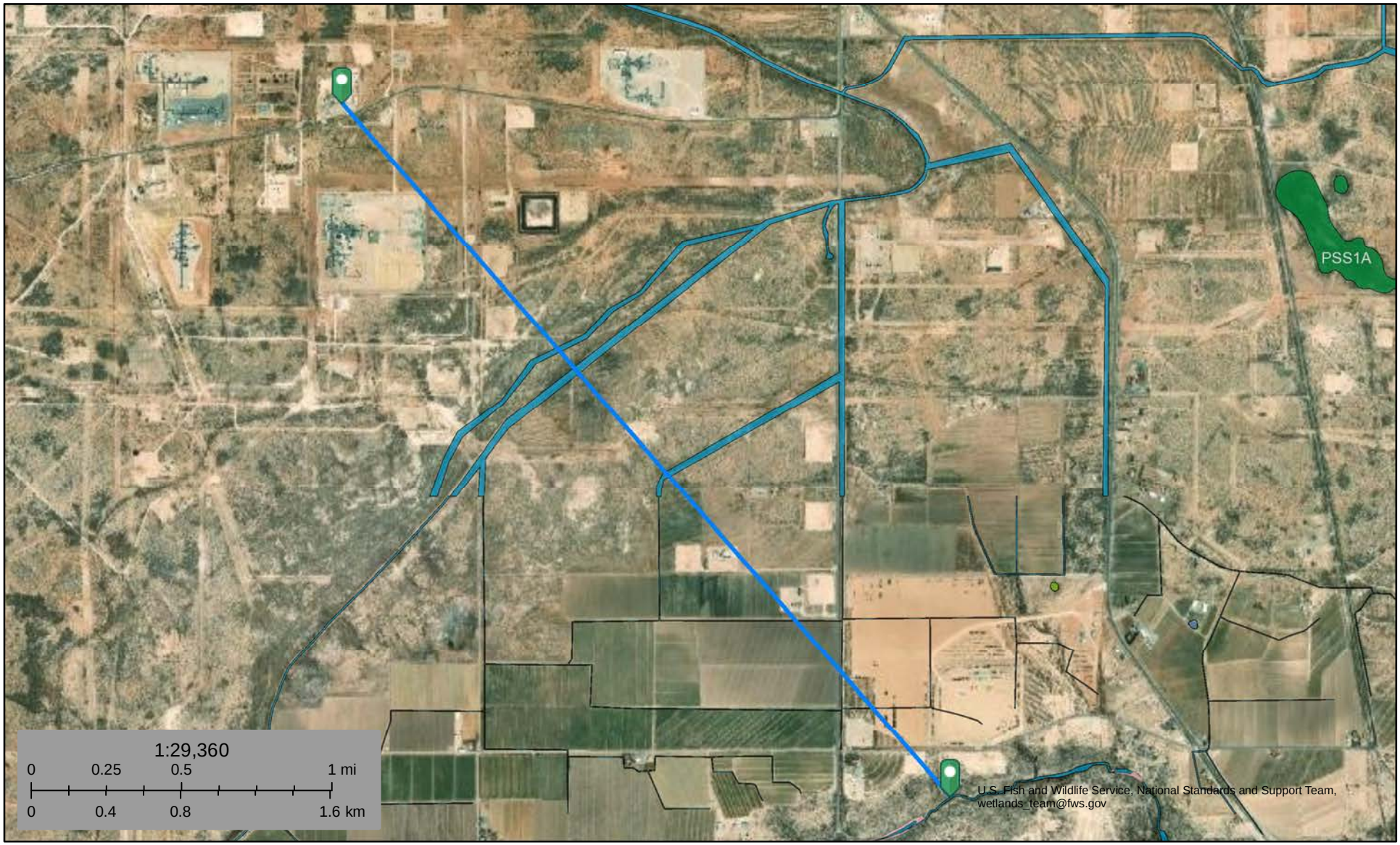
Driller License:	1778	**Driller Company:**	THIRD GENERATION DRILLING		
Driller Name:	TRAVIS MANN				
Drill Start Date:	10/10/2018	**Drill Finish Date:**	10/16/2018	**Plug Date:**	
Log File Date:	11/05/2018	**PCW Rcv Date:**		**Source:**	Shallow
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	30 GPM
Casing Size:	5.00	**Depth Well:**	200 feet	**Depth Water:**	100 feet

Water Bearing Stratifications:	Top	Bottom	Description
	160	180	Sandstone/Gravel/Conglomerate

Casing Perforations:	Top	Bottom
	40	180

U.S. Fish and Wildlife Service
National Wetlands Inventory

Black River SWD #1



February 6, 2023

Wetlands

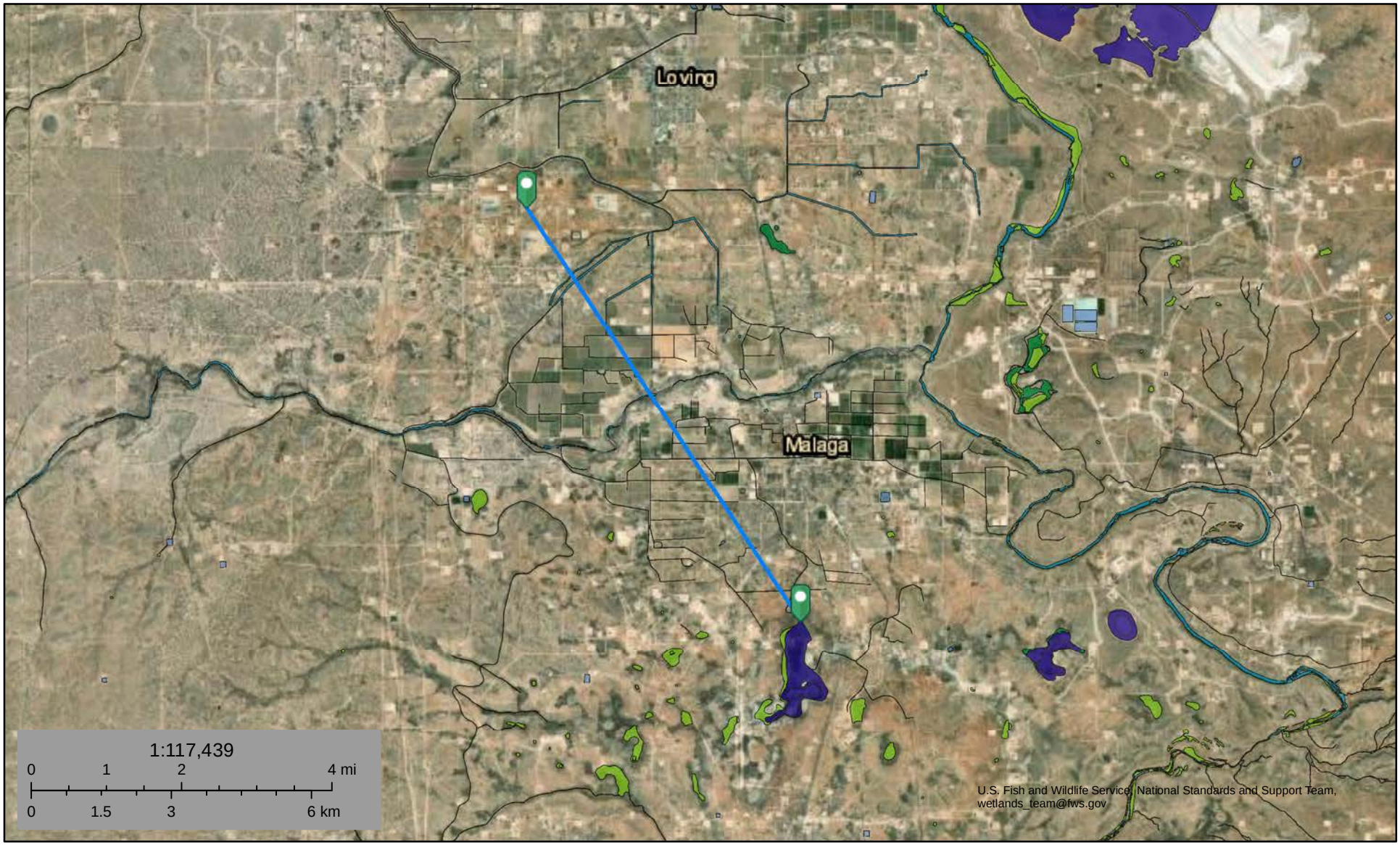
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

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

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

U.S. Fish and Wildlife Service
National Wetlands Inventory

Black River SWD #1



February 6, 2023

Wetlands

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Black River SWD #1

Nearest Residence: 0.97 miles (5,107 feet)

Black River SWD #1

2/6/2023, 2:50:15 PM

Override 1

GIS WATERS PODs

Active

Pending

OSE District Boundary

New Mexico State Trust Lands

Both Estates

SiteBoundaries

1:4,514

0 0.04 0.09 0.17 mi

0 0.05 0.1 0.2 km

Esri, HERE, iPC, U.S. Department of Energy Office of Legacy Management, Esri, HERE, Garmin, iPC, Maxar

Web Generated Map

Map is generated by web users.

New Mexico Office of the State Engineer
Water Right Summary

WR File Number: C 03108 **Subbasin:** CUB **Cross Reference:** -

Primary Purpose: STK 72-12-1 LIVESTOCK WATERING

Primary Status: DCL DECLARATION

Total Acres: 0 **Subfile:** - **Header:** -

Total Diversion: 6 **Cause/Case:** -

Owner: LOVING RANCH WATTS LAND AND CATTLE

Contact: MARVIN WATTS

Documents on File

Trn #	Doc	File/Act	Status 1	Status 2	Transaction Desc.	From/ To	Acres	Diversion	Consumptive
311858	DCL	2004-08-16	DCL	PRC	C 03108	T	0	6	

Current Points of Diversion

(NAD83 UTM in meters)

POD Number	Well Tag	Source	Q 64	Q16	Q4	Sec	Tws	Rng	X	Y	Other Location Desc
C 03108			1	3	2	31	23S	28E	582348	3570063*	

***An (*) after northing value indicates UTM location was derived from PLSS - see Help**

Priority Summary

Priority	Status	Acres	Diversion	Pod Number
12/31/1928	DCL	0	6	C 03108

Place of Use

Q 256	Q 64	Q16	Q4	Sec	Tws	Rng	Acres	Diversion	CU	Use	Priority	Status	Other Location Desc
							0	6		STK		DCL	NO PLACE OF USE GIVEN

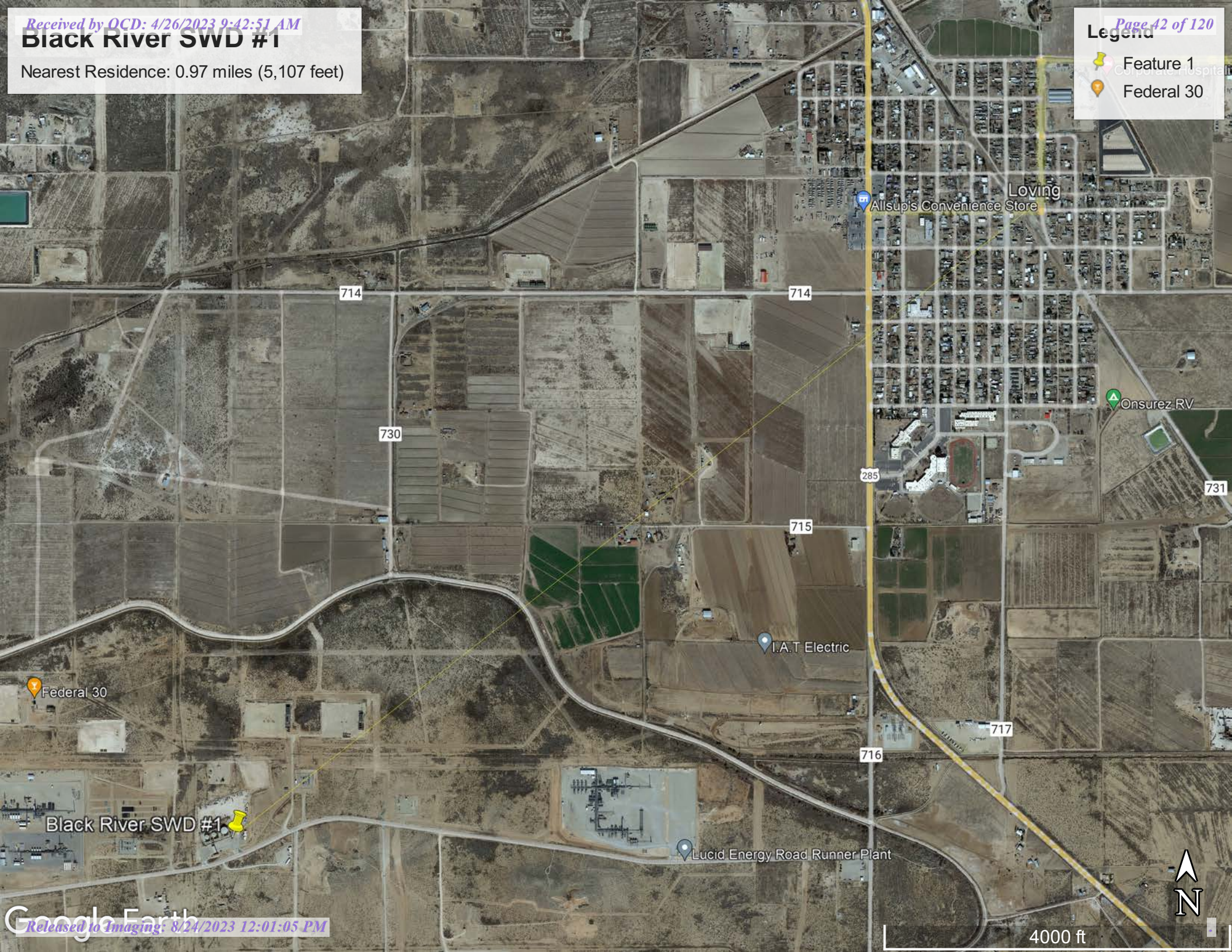
Source

Acres	Diversion	CU	Use	Priority	Source	Description
0	6		STK	12/31/1927	GW	SHALLOW

2/6/23 2:55 PM WATER RIGHT SUMMARY

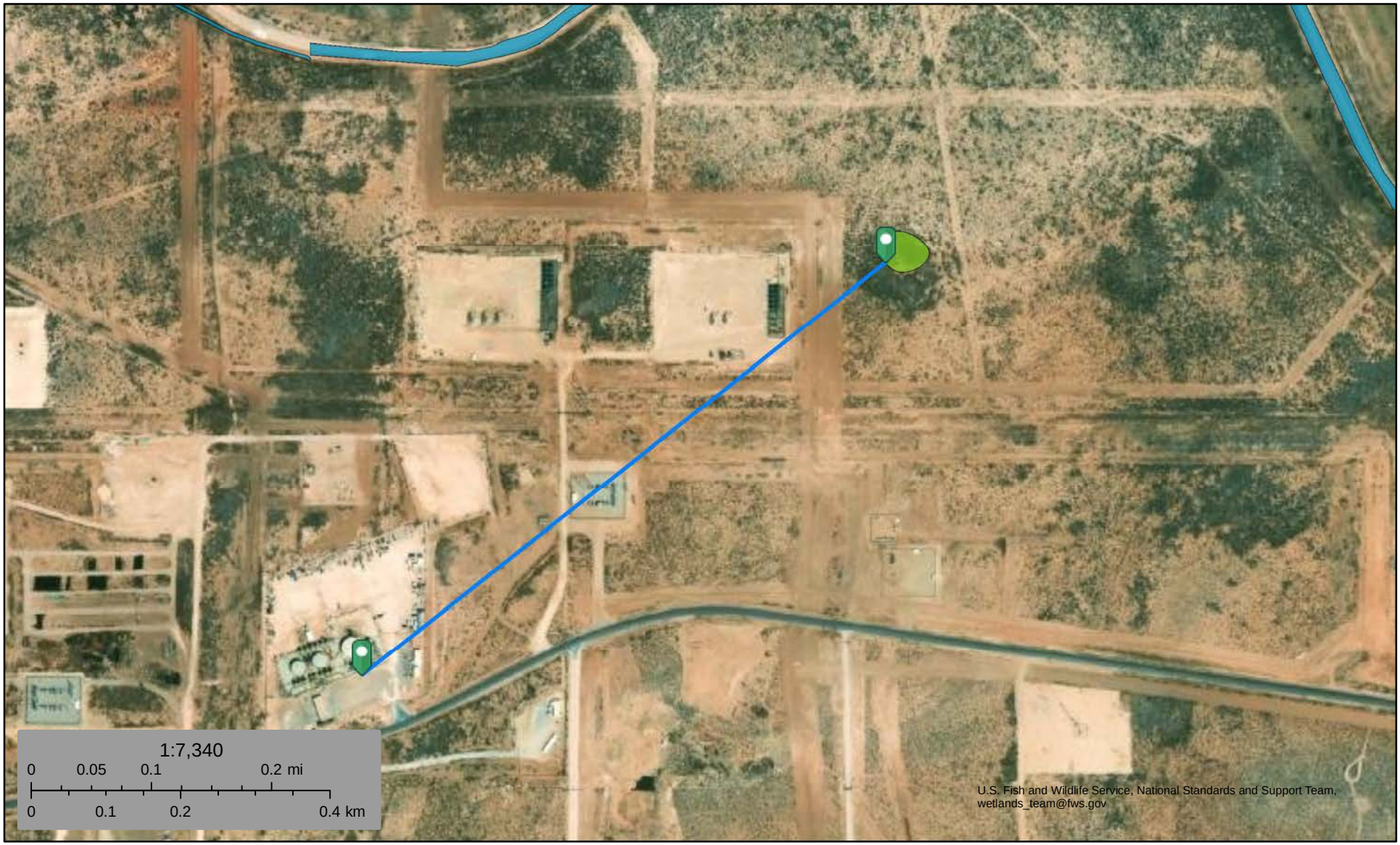
Black River SWD #1

Nearest Residence: 0.97 miles (5,107 feet)



U.S. Fish and Wildlife Service
National Wetlands Inventory

Black River SWD #1



February 6, 2023

Wetlands

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

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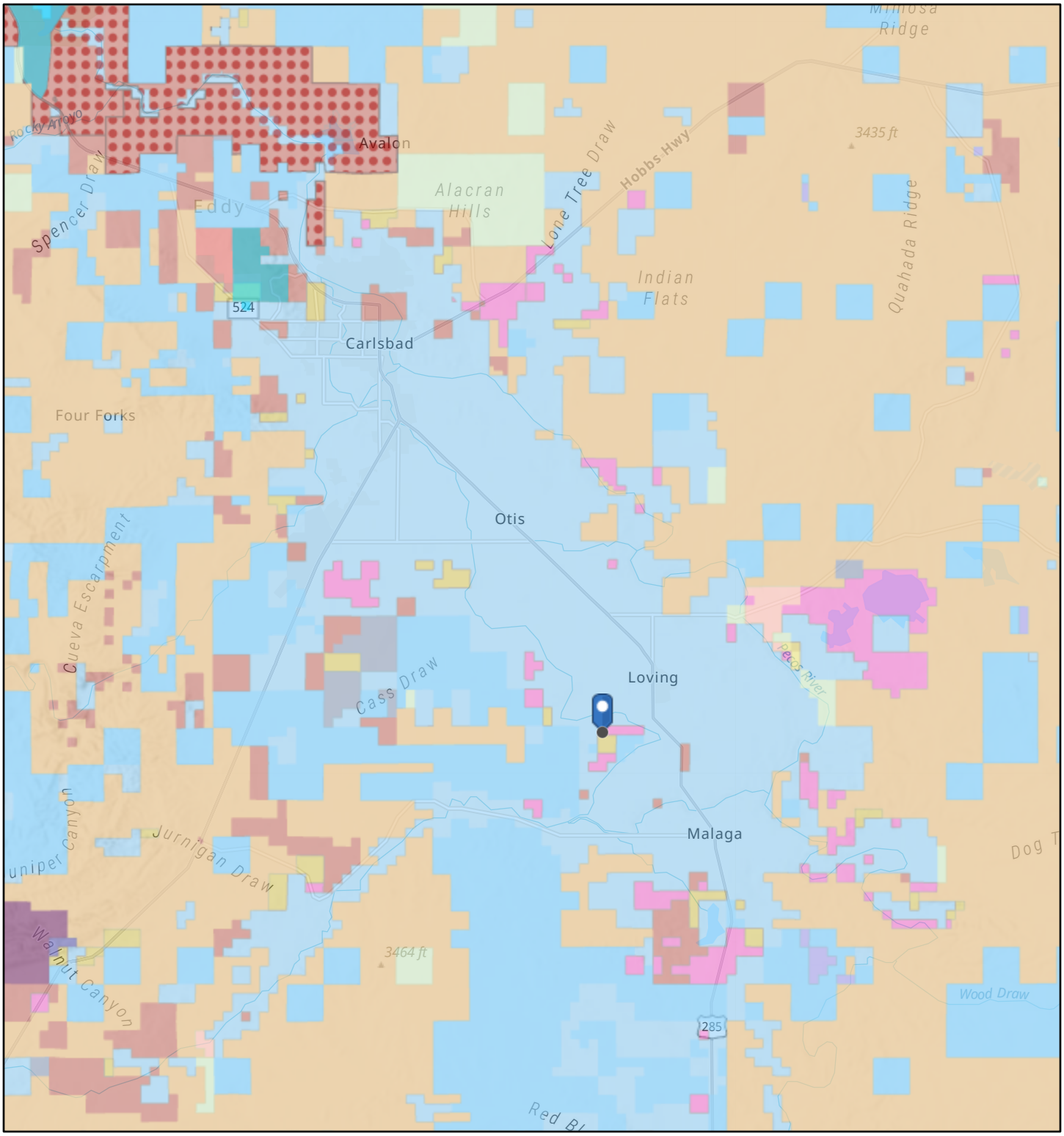
Black River SWD #1



2/6/2023, 2:38:15 PM

1:288,895

0 2 4 8 mi

0 3.25 6.5 13 km

Mineral Ownership

- A-All minerals are owned by U.S.
- N-No minerals are owned by the U.S.
- O-Only oil and gas are owned by the U.S.
- T-Other minerals are owned by the U.S.

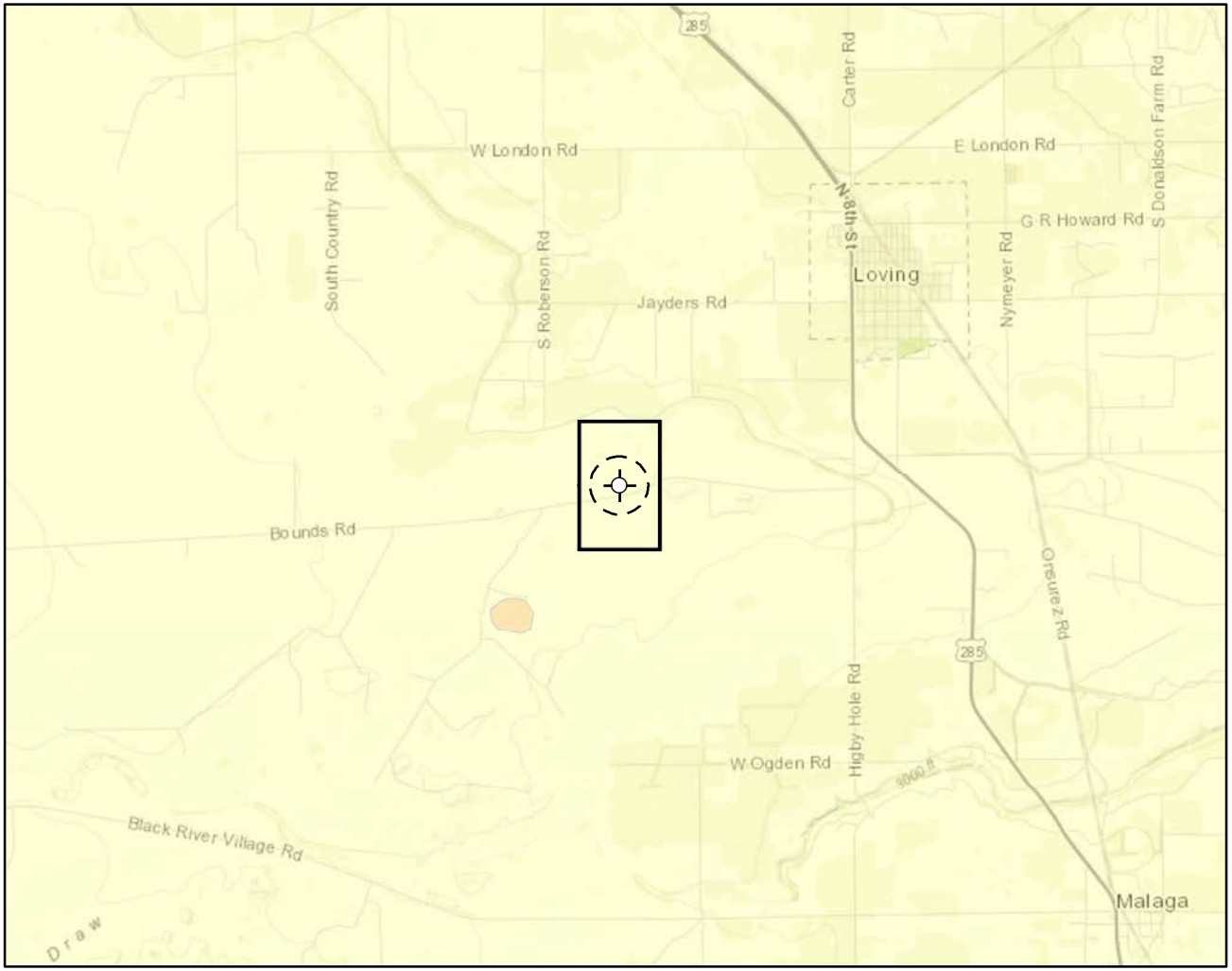
Land Ownership

- BLM
- BOR
- DOD
- NPS
- P
- S

U.S. BLM, Esri, NASA, NGA, USGS, NM Coal Mine Reclamation Program, NM EMNRD, New Mexico State University, Texas Parks & Wildlife, CONANP, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA

EMNRD MMD GIS Coordinator

Mining Minerals and Natural Resources Department (http://nm-emnrd.maps.arcgis.com/apps/webappbuilder/index.html?id=7ebfa3c432db42978d66c99a9cc8311a)



Karst Potential

- Critical
- High
- Medium
- Low

- Site Location
- Site Buffer (1,000 ft.)

Overview Map

0 0.25 0.5 1 mi

Detail Map

0 150 300 600 ft.

VERTEX

Map Center:
Lat/Long: 32.266160, -104.127410

NAD 1983 UTM Zone 13N
Date: Apr 06/23

N

Karst Potential Schematic
Black River SWD #1

FIGURE:
X

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

Note: Inset Map, ESRI 2023; Overview Map: ESRI World Topographic. Karst potential data sourced from Rosswell Field Office, Bureau of Land Management, 2020 or United States Department of the Interior, Bureau of Land Management. (2018). Karst Potential.

VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects_US PROJECTS\Matador Resources\23E-00893\Figure X - Karst Potential Schematic (Black River SWD #1).mxd

National Flood Hazard Layer FIRMette

FEMA

104°7'48"W 32°16'13"N

104°7'10"W 32°15'43"N

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

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

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

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

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

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

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

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

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

N

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/6/2023 at 4:29 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

Soil Map—Eddy Area, New Mexico

Map Scale: 1:1,280 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 18, Sep 8, 2022

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
RA	Reagan loam, 0 to 3 percent slopes	0.3	3.8%
RG	Reeves-Gypsum land complex, 0 to 3 percent slopes	7.2	96.2%
Totals for Area of Interest		**7.5**	**100.0%**

Eddy Area, New Mexico

RA—Reagan loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 1w5c
Elevation: 1,100 to 4,400 feet
Mean annual precipitation: 7 to 14 inches
Mean annual air temperature: 60 to 70 degrees F
Frost-free period: 200 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Reagan

Setting

Landform: Fan remnants, alluvial fans
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Alluvium and/or eolian deposits

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 60 inches: loam

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 moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B

Ecological site: R070BC007NM - Loamy
Hydric soil rating: No

Minor Components

Atoka
Percent of map unit: 1 percent
Ecological site: R070BC007NM - Loamy
Hydric soil rating: No

Upton
Percent of map unit: 1 percent
Ecological site: R070BC025NM - Shallow
Hydric soil rating: No

Data Source Information

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 18, Sep 8, 2022

Eddy Area, New Mexico

RG—Reeves-Gypsum land complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 1w5f
Elevation: 1,250 to 5,000 feet
Mean annual precipitation: 10 to 25 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 190 to 235 days
Farmland classification: Not prime farmland

Map Unit Composition

Reeves and similar soils: 55 percent
Gypsum land: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Reeves

Setting

Landform: Ridges, plains, hills
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, head slope, nose slope, crest
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Residuum weathered from gypsum

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 32 inches: clay loam
H3 - 32 to 60 inches: gypsiferous material

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Gypsum, maximum content: 80 percent
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: R070BC007NM - Loamy
Hydric soil rating: No

Description of Gypsum Land

Setting

Landform: Ridges, plains, hills
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Side slope, head slope, nose slope, crest
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Residuum weathered from gypsum

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Minor Components

Largo

Percent of map unit: 5 percent
Ecological site: R070BC007NM - Loamy
Hydric soil rating: No

Reagan

Percent of map unit: 5 percent
Ecological site: R070BC007NM - Loamy
Hydric soil rating: No

Cottonwood

Percent of map unit: 5 percent
Ecological site: R070BC033NM - Salty Bottomland
Hydric soil rating: No

Data Source Information

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 18, Sep 8, 2022

USDA Natural Resources Conservation Service

Ecological site R070BC007NM
Loamy

Accessed: 02/06/2023

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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on uplands landforms, mainly on hill slopes, ridges, plains, terraces and some fan remnants. Slopes range from 1 to 5 percent and average about 3 percent. Average annual precipitation is about 8 to 14 inches. Elevations range from 2,842 to 5,000 feet.

Table 2. Representative physiographic features

Landforms	(1) Plain (2) Terrace (3) Fan piedmont
Flooding frequency	None
Ponding frequency	None
Elevation	2,842–5,000 ft
Slope	0–5%
Aspect	E, S, W

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 is in late March or early April, and the first killing frost is in late 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 in January through June rapidly drying out the soil during a critical time 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 by wetland or streams.

Soil features

The soils of this site are deep to moderately deep. The moderately deep soils have either a petrocalcic, petrogypsic or gypsum horizon between 30 and 40 inches.

Surface textures are loam, silt loam, very fine sandy loam, or clay loam. Substratum textures are loam, silty clay loam, clay loam, or silt loams. Subsoil textures are silt loam , clay loam silty clay loam, gravelly loam, gravelly clay loam or very gravelly loam. Permeability is moderate to slow and the available water holding capacity is high to moderate. The Atoka, Reeves, Russler, Milner soils may have highr amounts of CaC03, ranging as high as 40 percent in the subsoil. Rock fragments range fro 5 to 50 percent in the subsoil. Reeves, Rusler, Milner, Holloman soils will have 40 to 80 percent gypsum in the underlying material.

Maximum and minimum values listed below represent the characteristic soils for this site.

Characteristic Soils:

Atoka (petrocalcic)
Bigetty
Reagan
Reakor
Reeves (gypsum)
Russler (gypsum)
Largo
Russler (gypsum)
Largo
Berino
Tinney
Midessa
Ratliff
Holloman (gypsum)
Milner (gypsum)

Table 4. Representative soil features

Surface texture	(1) Loam (2) Very fine sandy loam (3) Silt loam
Family particle size	(1) Loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate to slow
Soil depth	30–72 in

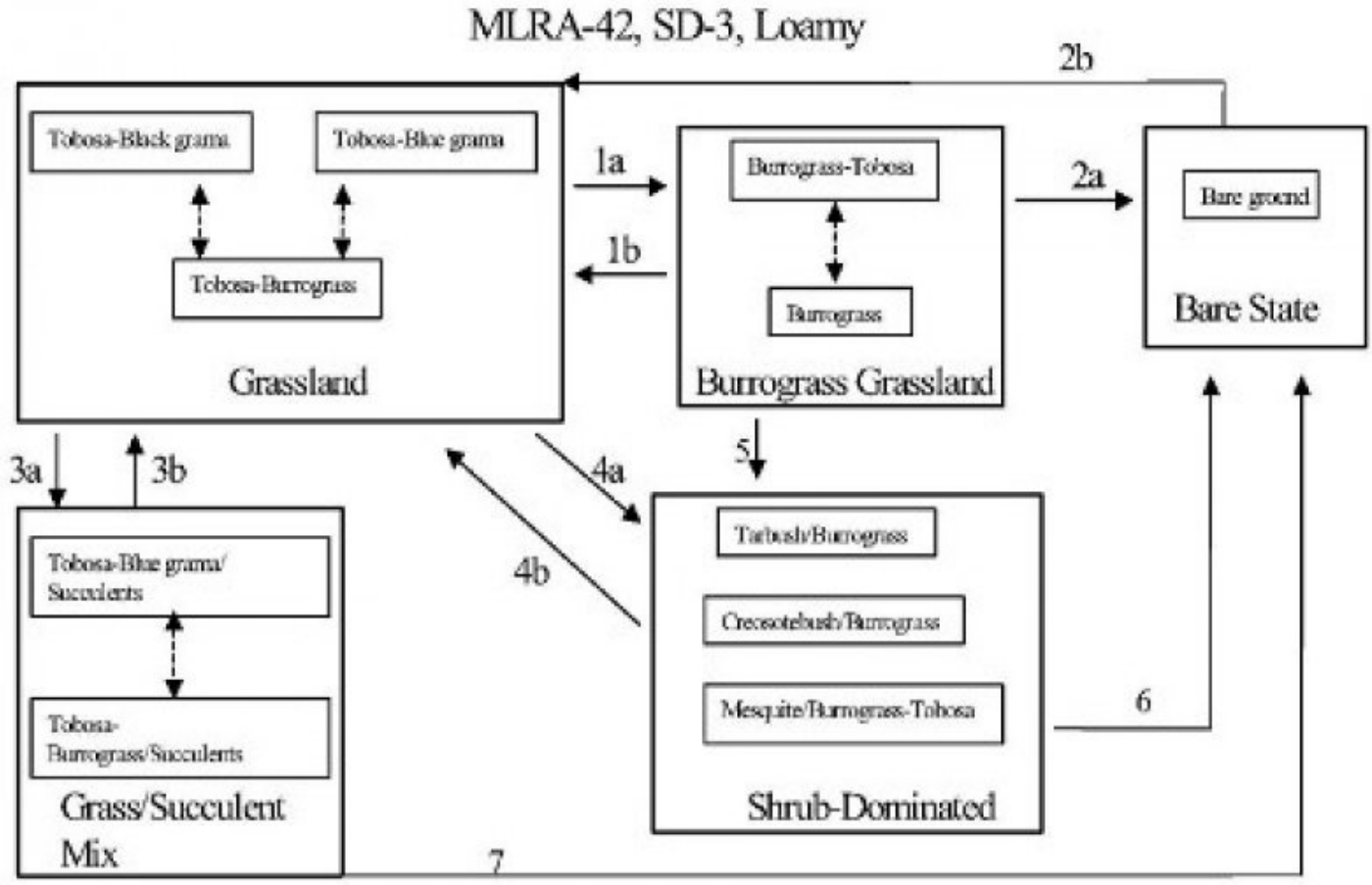
Surface fragment cover <=3"	0–5%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	5–12 in
Calcium carbonate equivalent (0-40in)	0–10%
Electrical conductivity (0-40in)	0–8 mmhos/cm
Sodium adsorption ratio (0-40in)	0–6
Soil reaction (1:1 water) (0-40in)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

Overview: The Loamy site is associated with the Gyp Upland ecological site with which it intergrades. There is a pronounced increase in alkali sacaton along this interface. The loamy site is also associated with the Gravelly and Shallow ecological sites from which it receives run-on water. The Draw site often dissects Loamy sites and is distinguished from the Loamy site by increased production or greater densities of woody species. The historic plant community has a grassland aspect, dominated by grasses with shrubs and half-shrubs sparse and evenly distributed. Tobosa, black grama and blue grama are the dominant species. Retrogression within this state is characterized by a decrease in black and blue grama and an increase in burrograss. Continuous overgrazing and drought can initiate a transition to a Burrograss- Grassland state. Continued reduction in grass cover and resulting infiltration problems may eventually effect a change to a Bare State, with very little or no remaining grass cover. Alternatively, creosotebush, tarbush or mesquite may expand or invade. Transitions back to a Grassland State from a Bare or Shrub-Dominated state are costly and may not be economically feasible. Decreased fire frequency may play a part in the transition to the Grass/Succulent Mix state with increased amounts of cholla and prickly pear.

State and transition model

Plant Communities and Transitional Pathways (diagram)



1a. Soil drying, overgrazing, drought, soil surface sealing. 1b. Restore natural overland flow, increase infiltration, prescribed grazing.

2a. Severe reduction in cover, soil surface sealing, decreased infiltration, erosion. 2b. Restore hydrology, break up physical crust, range seeding, prescribed grazing.

3a. Lack of fire, overgrazing, hail storms or other physical disturbance, drought. 3b. Prescribed fire, brush control, prescribed grazing.

4a. Seed dispersal of shrubs, persistent loss of grass cover, competition by shrubs, lack of fire. 4b. Brush control, range seeding -dependent on amount of grass (seed bank) remaining.

5. Loss of grass cover, seed dispersal of shrubs, competition by shrubs.

6. & 7. Brush control with continued loss of grass cover, soil sealing, erosion.

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

State Containing Historic Climax Plant Community Grassland: The historic plant community has a grassland aspect, dominated by grasses with shrubs and half-shrubs sparse and evenly distributed. Black grama, blue grama, and tobosa are the dominant grass species. There are a variety of perennial forbs and their production varies widely by season and year. Globemallow, verbena, groundsels, croton and filaree are forbs commonly found on this site. Fourwing saltbush and winterfat are two of the more palatable shrubs. The Loamy ecological site encompasses a

wide variety of soils, with surface textures ranging from sandy loams to clay loams. Soil depths range from shallow to very deep and can include sub surface features such as calcic, petrocalcic, and gypsic horizons. These variations cause differences in plant community composition and dynamics. Black grama is found at highest densities on coarser textured sandy loams, with blue grama preferring finer textured loam and silt loam, and tobosa favoring lower landscape positions and loam to clay loam surface textures. Burrograss may often be the dominant grass species on silty soils, perhaps in part due to the seedlings ability to auger into and establish on physically crusted soils. Gypsum influenced soils typically have greater amounts of tobosa, burrograss, and ephedra. There is greater representation of sideoats and vine mesquite within the tobosa-blue grama community. Retrogression under continuous heavy grazing results in a decrease of black grama, blue grama, sideoats grama, plains bristlegrass, bush muhly, cane bluestem, vine mesquite, winterfat, and fourwing saltbush. Species such as burrograss, threeawns, sand dropseed, sand muhly, and broom snakeweed increase under continuous heavy grazing or prolonged periods of drought. Under continued retrogression burrograss can completely dominate the site. Creosotebush, tarbush, and mesquite, can also dominate. Cholla and prickly pear can increase on areas that are disturbed or overgrazed. Diagnosis: Tobosa, black grama, and blue grama are the dominant species. Grass cover is uniformly distributed with few large bare areas. Shrubs are sparse and evenly distributed. Slopes range from level to gently sloping and usually display limited evidence of active rills and gully formation if plant cover remains intact. Litter movement associated with overland flow is limited to smaller size class litter and short distances. Other shrubs include: yucca, mesquite, tarbush, cholla and creosote bush. Other forbs include: desert holly, scorpionweed, bladderpod, flax, nama, fleabane, Indianwheat, Indian blanket flower, groundcherry, deerstongue, and rayless goldenrod.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	585	833	1080
Forb	39	55	72
Shrub/Vine	26	37	48
Total	**650**	**925**	**1200**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	15-30%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	25-30%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	40-50%

Figure 5. Plant community growth curve (percent production by month). NM2807, R042XC007NM Loamy HCPC. R042XC007NM Loamy HCPC Warm Season Plant Community..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	10	10	25	30	15	5	0	0

State 2

Burrograss-Grassland

Community 2.1
Burrograss-Grassland

Burrograss-Grassland: Changes in hydrology resulting in decreased available soil moisture, reduces grass cover and increases bare ground. Burrograss is the dominant grass. Tobosa cover is variable and can range from sizeable areas to small patches occupying only depressions or the lowest and wettest positions within the site. Threeawns, ear muhly, sand muhly, and fluffgrass occur at increased densities compared to the grassland state. Shrub densities may increase especially mesquite, creosotebush or tarbush. Retrogression within this state is characterized by a further decrease in grass cover and increased bare ground. Further deterioration of this site can result in the transition to a bare state or becoming shrub dominated. Diagnosis: Burrograss is the dominant species. Grass cover is no longer uniformly distributed, instead tending to be patchy with large areas of bare ground present. Physical crusts are present in bare areas reducing infiltration and suppressing seedling establishment by any grass species other than burrograss. Transition to Burrograss-Grassland (1a): Transitions from grassland to a burrograss-grassland state may occur due to changes in hydrology. Gullies, roads or obstructions that alter natural water flow patterns may cause this transition. Changes in surface hydrology may also occur due to overgrazing or drought. The reduction in grass cover promotes increased soil physical crusts and reduces infiltration. 5 Key indicators of approach to transition: ? Diversion of overland flow resulting in decreased soil moisture. ? Increase in amount of burrograss cover ? Reduction in grass cover and increase in size and frequency of bare patches. ? Formation of physical crusts—indicating reduced infiltration. ? Evidence of litter movement—indicating loss or redistribution of organic matter. Transition back to Grassland (1b) The natural hydrology of the site must be returned. Culverts, turnouts, or rerouting roads may help re-establish natural overland flow, if roads or trails have altered the hydrology. Erosion control structures or shaping and filling gullies may help regain natural flow patterns and establish vegetation if the flow has been channeled. Breaking up physical crusts by soil disturbance may promote infiltration and seedling emergence. Allow natural revegetation to take place. Prescribed grazing will help ensure proper forage utilization and reduce grass loss due to grazing.

State 3
Bare State

Community 3.1
Bare State

Bare State: Extremely low ground cover, soil degradation and erosion characterize this state. Very little vegetation remains. Burrograss is the dominant grass and cover is extremely patchy. Physical soil crusts are extensive. Erosion and resource depletion increase as site degrades. Diagnosis: Very little cover remains. Erosion is evident by soil sealing, water flow patterns, pedestals or terracettes. Rills and gullies may be present and active. Transition to Bare State (2a): Extended drought, continuous heavy grazing, or other disturbance that severely depletes grass cover can effect this transition. As grass cover decreases, sheet flow and erosion increase, and physical soil crusts form, thereby further reducing infiltration. Key indicators of approach to transition: ? Continued reduction in grass cover. ? Increased soil surface sealing. ? Increased erosion. ? Reduced aggregate stability in bare areas. Transition back to Grassland (2b) Restore the hydrology, see (1a). With the extent of grass loss range seeding may be necessary. Utilizing livestock or mechanical means to break up the physical crusts may increase infiltration and aid seedling establishment. Prescribed grazing will help ensure adequate deferment period following seeding, and proper forage utilization once the grass stand is well established. The degree to which this site is capable of recovery depends on the restoration of hydrology, extent of degradation to soil resources, and adequate rainfall necessary to establish grasses.

State 4
Grass/Succulent Mix

Community 4.1
Grass/Succulent Mix

Grass / Succulent Mix: Increased representations of succulents characterize this site. Increased densities of cholla or pricklypear is recognized as a management concern, but their impact on grass production is unclear. Light to

medium cholla or prickly pear infestation doesn't seem to greatly reduce grass production, however it limits access to palatable grasses and interferes with livestock movement and handling. Tobosa and blue grama are the dominant species on this site. Retrogression within this site is characterized by a decrease in blue grama and an increase in succulents, tobosa and burrograss. Diagnosis: Cholla or prickly pear is found at increased densities. Grass cover is variable ranging from uniformly distributed to patchy with frequent areas of bare ground present. Tobosa or blue grama is the dominant grass species. Transition to Grass/Succulent Mix (3a): If fire was historically a part of desert grassland ecosystem and played a role in suppressing seedlings of shrubs and succulents, then fire suppression may favor the increase of succulents.1 Heavy grazing by livestock or other physical disturbances may help disseminate seed and increase the establishment of succulents. Areas historically overgrazed by sheep are sometimes associated with higher densities of Succulents. Intense hailstorms can spread pricklypear by breaking off joints causing new plants to take root.3 During severe drought perennial grass cover can decline significantly, leaving resources available for use by more drought tolerant succulents. Cholla and pricklypear are both adapted to and favored by drought due to the ability of their shallow, wide spreading root systems to absorb and store water.4 Key indicators of approach to transition: ? Decrease or change in distribution of grass cover. ? Increase in amount of succulent seedlings. ? Increased cover of succulents. Transition back to Grassland (3b) Fire is an effective means of controlling cholla and prickly pear if adequate grass cover remains to carry fire.2 Cholla greater than two feet tall or pricklypear with a large amount of pads (>15-20) are harder to kill. Chemical control is effective in controlling prickly pear and cholla; apply when growth starts in May. Hand grubbing is also effective if cholla or pricklypear is severed 2-4 inches below ground and care is taken not to let broken joints or pads take root. Stacking and burning piles and grubbing during winter or drought help keeps broken joints and pads from rooting. Prescribed grazing will help ensure proper forage utilization and sustain grass cover.

State 5
Shrub Dominated

Community 5.1
Shrub Dominated

Shrub Dominated: Increased shrub cover characterizes this state. Mesquite, creosotebush, and/or tarbush are the dominant shrub species. Burrograss or tobosa is the dominant grass species. Grass cover is decreased, typically patchy with large bare areas present; however, sometimes grass cover can remain relatively high for extended periods when associated with light to moderate infestations of mesquite. Variations in soil characteristics play a part in determining which shrub species increase. Mesquite is well adapted to a wide range of soil types, but increases more often on deep soils low in carbonates, that have a sandy surface overlying finer textured soils. Tarbush prefers finer textured, calcareous soils, usually in lower positions that receive some extra water. Creosotebush is less tolerant of fine textured soils, preferring sandy, calcareous soils that have some gravel. Creosotebush also does well on soils that are shallow over caliche. Retrogression within this state is characterized by a decrease in tobosa, and an increase in burrograss. As the site continues to degrade shrub cover continues to increase and grass cover is severely reduced. Diagnosis: Mesquite, Creosotebush, and/or tarbush are the dominant shrubs. Blue grama and black grama cover is low or absent. Burrograss or tobosa are the dominant grasses. Typically grass cover is patchy with large interconnected bare areas present. Physical soil crusts are present, especially on silt loam surface soils. Transition to Shrub Dominated (4a): Wildlife and livestock consume and disperse mesquite seeds. Flood events may wash creosote or tarbush seeds off adjacent gravelly sites onto the loamy site and supply adequate moisture for germination. Persistent loss of grass cover due to overgrazing or drought can cause large bare patches, providing competition free areas for shrub seedling establishment. As shrub cover increases, competition for soil resources, especially water, becomes a major factor in further reducing grass cover. Reduction of fire, due to either fire suppression policy or loss of adequate fine fuels may increase the probability of shrub encroachment. Increased soil surface physical crusts and associated decreased infiltration, may prevent the establishment of grass seedlings. Transition to Shrub Dominated (5): The dispersal of creosotebush, tarbush or mesquite seed, combined with loss of grass cover and resource competition by shrubs may cause this transition. Key indicators of approach to transition: ? Decreased grass and litter cover. ? Increased bare patch size. ? Increased physical soil crusts. ? Increased amount of mesquite, creosotebush, or tarbush seedlings. ? Increased shrub cover. Transition back to Grassland (4b) Brush control will be necessary to remove shrubs and eliminate competition for resources necessary for grass establishment or reproduction. Seeding may be necessary on those sites where desired grass species are absent or very limited. Pitting and seeding may increase the chances of successful grass establishment. Prescribed grazing will help ensure adequate time is elapsed before grazing seeded area is allowed and proper forage utilization following seeding establishment. Transition to Bare State (6): If grass cover on the shrub-dominated state is

severely limited and shrubs are removed a bare state may result. This transition will depend on amount of grasses or seed remaining, whether site is seeded, or if seeding is successful. Transition to Bare State (7): Removal of succulents and continued overgrazing or drought may cause loss of remaining grasses and erosion. Soil surface physical crusting may also be an important factor in inhibiting grass seedling establishment

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**			278–324	
	tobosagrass	PLMU3	*Pleuraphis mutica*	278–324	–
2	**Warm Season**			9–46	
	burrograss	SCBR2	*Scleropogon brevifolius*	9–46	–
3	**Warm Season**			231–278	
	black grama	BOER4	*Bouteloua eriopoda*	231–278	–
	blue grama	BOGR2	*Bouteloua gracilis*	231–278	–
4	**Warm Season**			28–46	
	sideoats grama	BOCU	*Bouteloua curtipendula*	28–46	–
5	**Warm Season**			46–93	
	bush muhly	MUPO2	*Muhlenbergia porteri*	46–93	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	46–93	–
6	**Warm Season**			9–28	
	Arizona cottontop	DICA8	*Digitaria californica*	9–28	–
7	**Warm Season**			46–93	
	threeawn	ARIST	*Aristida*	46–93	–
	muhly	MUHLE	*Muhlenbergia*	46–93	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	46–93	–
8	**Warm Season**			28–46	
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	28–46	–
Shrub/Vine					
9	**Shrub**			9–28	
	fourwing saltbush	ATCA2	*Atriplex canescens*	9–28	–
	jointfir	EPHED	*Ephedra*	9–28	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	9–28	–
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	5–24	–
	Arizona cottontop	DICA8	*Digitaria californica*	5–24	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	5–24	–
10	**Shrub**			9–28	
	javelina bush	COER5	*Condalia ericoides*	9–28	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	9–28	–
	Grass, annual	2GA	*Grass, annual*	5–15	–
11	**Shrubs**			9–28	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	9–28	–
Forb					

12	**Forb**			9–46	
	threadleaf ragwort	SEFLF	*Senecio flaccidus var. flaccidus*	9–46	–
	globemallow	SPHAE	*Sphaeralcea*	9–46	–
	verbena	VEPO4	*Verbena polystachya*	9–46	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	5–15	–
	pricklypear	OPUNT	*Opuntia*	5–15	–
13	**Forb**			9–28	
	croton	CROTO	*Croton*	9–28	–
	woolly groundsel	PACA15	*Packera cana*	9–28	–
14	**Forb**			9–28	
	Goodding's tansyaster	MAPIG2	*Machaeranthera pinnatifida ssp. gooddingii var. gooddingii*	9–28	–
	woolly paperflower	PSTA	*Psilostrophe tagetina*	9–28	–
15	**Forb**			9–28	
	redstem stork's bill	ERCI6	*Erodium cicutarium*	9–28	–
	Texas stork's bill	ERTE13	*Erodium texanum*	9–28	–
16	**Forb**			9–28	
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	9–28	–

Animal community

This site provides habitats which support a resident animal community that is characterized by pronghorn antelope, black-tailed jackrabbit, black tailed prairie dog, yellow-faced pocket gopher, banner-tailed kangaroo rat, hispid cotton rat, swift fox, burrowing owl, horned lark, mockingbird, meadowlark, mourning dove, scaled quail, Great Plains toad, plains spadefoot toad, prairie rattlesnake and western coachwhip shake.

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
Atoka C
Bigetty B
Ratliff B
Reyab B
Holloman B
Largo B
Holloman B
Bigetty B
Berino B
Reagan B
Reakor B
Reeves B
Russler C

Recreational uses

This site offers limited potential for hiking, horseback riding, nature observation and photography. Game bird, antelope and predator hunting are also limited.

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, during all seasons of the year. Under retrogression, such plants as black grama, blue grama, sideoats grama, bush muhly, plains bristlegrass, Arizona cottontop, fourwing saltbush and winterfat decrease and there is an increase in burrograss, threeawns, sand dropseed, muhlys, broom snakeweed and javilinabush. Under continued retrogression, burrograss can completely dominate the site. Creosotebush, mesquite, and tarbush can also dominate. Grazing management alone will not improve the site in the above situation. This site is well suited 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 3.0 – 4.2
75 – 51 4.1 – 5.5
50 – 26 5.3 – 7.0
25 – 0 7.1 +

Inventory data references

Other 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 Chavez County.

Other references

Literature References:

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2. Bunting, S.C., H.A. Wright, and L.F. Neuenschwander. 1980. Long-term effects of fire on cactus in the Southern Mixed Prairie of Texas. J. Range. Manage. 33: 85-88.

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pear cactus. p. 359-361. In: J.A. Smith and V.W. Hays (eds.) Proc. XIV Int. Grassland Congr. Westview Press, Boulder, Colo.

4. Vallentine, J.F. 1989. Range Developments and Improvements. 3rd Edition. Academic Press. San Diego, California.

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Contributors

David Trujillo
Don Sylvester

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

1. **Number and extent of rills:**

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 decadence):**

---

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:**

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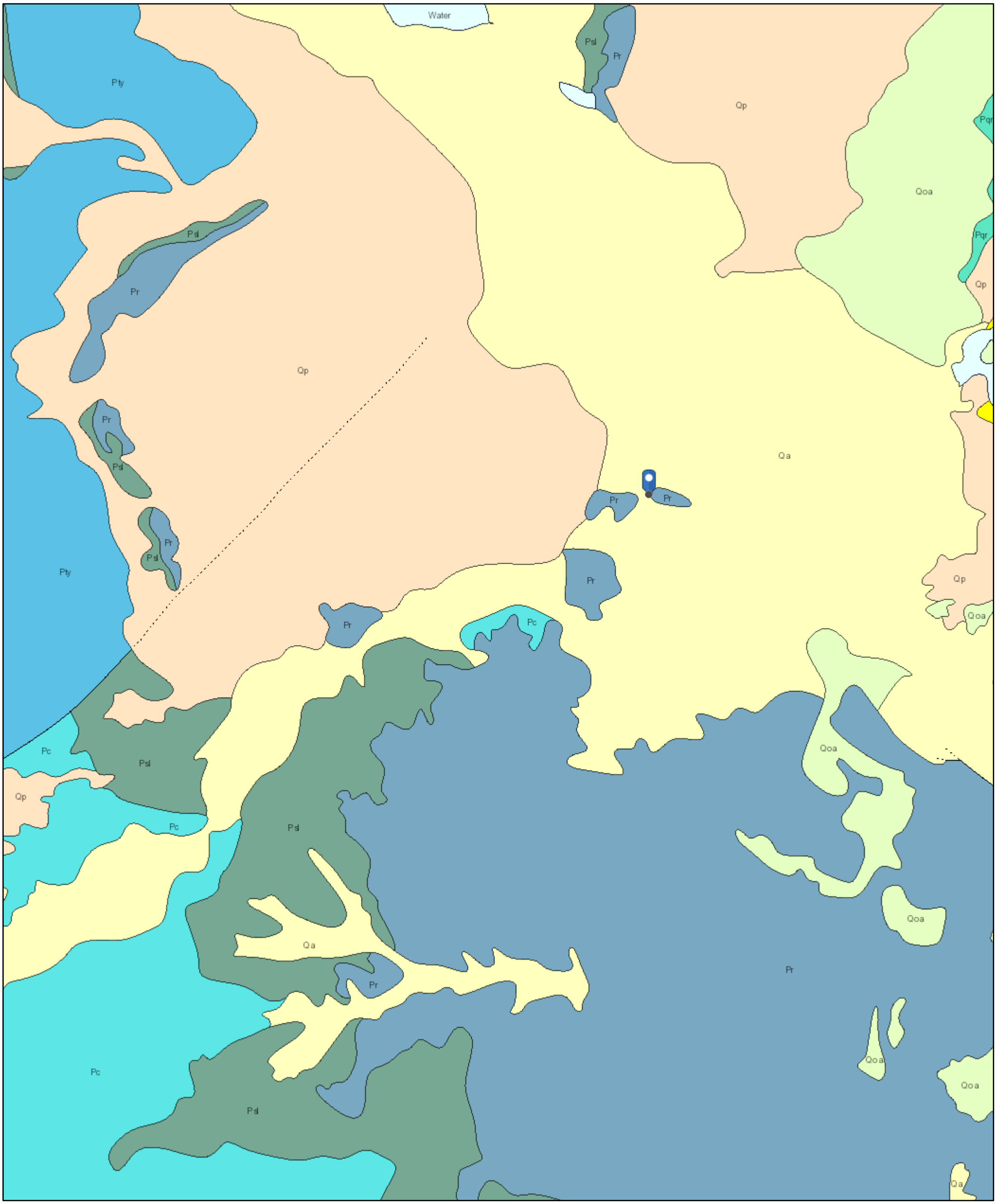
17. **Perennial plant reproductive capability:**

Black River SWD #1



2/6/2023, 3:39:16 PM

Lithologic Units

- Playa——Alluvium and evaporite deposits (Holocene)
- Water——Perenial standing water
- Qa——Alluvium (Holocene to upper Pleistocene)

1:144,448

0 1.25 2.5 5 mi

0 2.25 4.5 9 km

Esri, NASA, NGA, USGS, USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census

ArcGIS Web AppBuilder

ATTACHMENT 6

Gmail Dhugal Hanton <vertexresourcegroupusa@gmail.com>

Black River SWD #1 Confirmation Sampling nAPP2303627366

2 messages

Dhugal Hanton <vertexresourcegroupusa@gmail.com> Mon, Mar 6, 2023 at 8:30 AM
To: "Enviro, OCD, EMNRD" <OCD.Enviro@emnrd.nm.gov>
Cc: clinton.talley@matadorresources.com, Arsenio Jones <arsenio.jones@matadorresources.com>, mpeppin@vertex.ca

All,

Please accept this email as 48-hr notification that Vertex Resource Services has scheduled confirmatory sampling to be conducted at Black River SWD #1 for the following release:

nAPP2303627366 DOR: February 4, 2023

This work will be completed on behalf of San Mateo Midstream.

On Wednesday, March 8th through Friday March 10th, 2023, at approximately 9:00 a.m., Hunter Klein of Vertex will be onsite to conduct confirmation sampling for the above release.

He can be reached at 575-263-3124. If you need directions to the site, please do not hesitate to contact him. If you have any questions or concerns regarding this notification, please give me a call at 575-361-9880.

Thank you,
Monica

Monica Peppin, A.S.
Project Manager

Vertex Resource Services Inc.
3101 Boyd Drive,
Carlsbad, NM 88220

P 575.725.5001 Ext. 711
C 575.361.9880
F

www.vertex.ca

Enviro, OCD, EMNRD <OCD.Enviro@emnrd.nm.gov> Tue, Mar 7, 2023 at 9:46 AM
To: Dhugal Hanton <vertexresourcegroupusa@gmail.com>
Cc: "Bratcher, Michael, EMNRD" <mike.bratcher@emnrd.nm.gov>, "Hamlet, Robert, EMNRD" <Robert.Hamlet@emnrd.nm.gov>

Monica,

Please be aware that notification requirements are **two business days**, per rule. You may proceed on your schedule. This, and all correspondence, should be included in the closure report to insure inclusion in the project file.

JH

Jocelyn Harimon ● Environmental Specialist

Environmental Bureau

EMNRD - Oil Conservation Division

1220 South St. Francis Drive | Santa Fe, NM 87505

(505)469-2821 | Jocelyn.Harimon@emnrd.nm.gov

http:// **www.emnrd.nm.gov**

From: Dhugal Hanton <vertexresourcegroupusa@gmail.com>
Sent: Monday, March 6, 2023 8:31 AM
To: Enviro, OCD, EMNRD <OCD.Enviro@emnrd.nm.gov>
Cc: clinton.talley@matadorresources.com; Arsenio Jones <arsenio.jones@matadorresources.com>; mpeppin@vertex.ca
Subject: [EXTERNAL] Black River SWD #1 Confirmation Sampling nAPP2303627366

[Quoted text hidden]

ATTACHMENT 7

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

February 28, 2023

Monica Peppin

Vertex Resources Services, Inc.
3101 Boyd Drive
Carlsbad, NM 88220
TEL: (505) 506-0040
FAX:

RE: Black River SWD OrderNo.: 2302785

Dear Monica Peppin:

Hall Environmental Analysis Laboratory received 18 sample(s) on 2/17/2023 for the analyses presented in the following report.

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

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

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

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH23-01 0'
Project: Black River SWD
Collection Date: 2/15/2023 9:00:00 AM
Lab ID: 2302785-001 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	75	9.0		mg/Kg	1	2/20/2023 1:47:05 PM
Motor Oil Range Organics (MRO)	52	45		mg/Kg	1	2/20/2023 1:47:05 PM
Surr: DNOP	91.7	69-147		%Rec	1	2/20/2023 1:47:05 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	2/20/2023 2:17:50 PM
Surr: BFB	102	37.7-212		%Rec	1	2/20/2023 2:17:50 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024		mg/Kg	1	2/20/2023 2:17:50 PM
Toluene	ND	0.049		mg/Kg	1	2/20/2023 2:17:50 PM
Ethylbenzene	ND	0.049		mg/Kg	1	2/20/2023 2:17:50 PM
Xylenes, Total	ND	0.098		mg/Kg	1	2/20/2023 2:17:50 PM
Surr: 4-Bromofluorobenzene	95.3	70-130		%Rec	1	2/20/2023 2:17:50 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	170	60		mg/Kg	20	2/18/2023 9:00:02 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	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BH23-01 2'
Project: Black River SWD **Collection Date:** 2/15/2023 9:05:00 AM
Lab ID: 2302785-002 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	2/20/2023 2:08:15 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	2/20/2023 2:08:15 PM
Surr: DNOP	95.1	69-147		%Rec	1	2/20/2023 2:08:15 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	2/20/2023 2:41:38 PM
Surr: BFB	105	37.7-212		%Rec	1	2/20/2023 2:41:38 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024		mg/Kg	1	2/20/2023 2:41:38 PM
Toluene	ND	0.048		mg/Kg	1	2/20/2023 2:41:38 PM
Ethylbenzene	ND	0.048		mg/Kg	1	2/20/2023 2:41:38 PM
Xylenes, Total	ND	0.096		mg/Kg	1	2/20/2023 2:41:38 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	2/20/2023 2:41:38 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	140	60		mg/Kg	20	2/18/2023 10:02:04 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BH23-01 4'
Project: Black River SWD **Collection Date:** 2/15/2023 9:10:00 AM
Lab ID: 2302785-003 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	2/20/2023 2:18:51 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	2/20/2023 2:18:51 PM
Surr: DNOP	124	69-147		%Rec	1	2/20/2023 2:18:51 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	2/20/2023 3:05:13 PM
Surr: BFB	103	37.7-212		%Rec	1	2/20/2023 3:05:13 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024		mg/Kg	1	2/20/2023 3:05:13 PM
Toluene	ND	0.048		mg/Kg	1	2/20/2023 3:05:13 PM
Ethylbenzene	ND	0.048		mg/Kg	1	2/20/2023 3:05:13 PM
Xylenes, Total	ND	0.097		mg/Kg	1	2/20/2023 3:05:13 PM
Surr: 4-Bromofluorobenzene	98.6	70-130		%Rec	1	2/20/2023 3:05:13 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	130	60		mg/Kg	20	2/18/2023 10:14:29 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH23-02 0'
Project: Black River SWD
Collection Date: 2/15/2023 9:15:00 AM
Lab ID: 2302785-004 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	18	8.4		mg/Kg	1	2/20/2023 2:29:27 PM
Motor Oil Range Organics (MRO)	ND	42		mg/Kg	1	2/20/2023 2:29:27 PM
Surr: DNOP	118	69-147		%Rec	1	2/20/2023 2:29:27 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	2/20/2023 3:28:49 PM
Surr: BFB	103	37.7-212		%Rec	1	2/20/2023 3:28:49 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.023		mg/Kg	1	2/20/2023 3:28:49 PM
Toluene	ND	0.047		mg/Kg	1	2/20/2023 3:28:49 PM
Ethylbenzene	ND	0.047		mg/Kg	1	2/20/2023 3:28:49 PM
Xylenes, Total	ND	0.093		mg/Kg	1	2/20/2023 3:28:49 PM
Surr: 4-Bromofluorobenzene	97.2	70-130		%Rec	1	2/20/2023 3:28:49 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	1800	60		mg/Kg	20	2/18/2023 10:26:54 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	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH23-02 2'
Project: Black River SWD
Collection Date: 2/15/2023 9:20:00 AM
Lab ID: 2302785-005 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	2/20/2023 2:40:06 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	2/20/2023 2:40:06 PM
Surr: DNOP	123	69-147		%Rec	1	2/20/2023 2:40:06 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	2/20/2023 3:52:24 PM
Surr: BFB	104	37.7-212		%Rec	1	2/20/2023 3:52:24 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024		mg/Kg	1	2/20/2023 3:52:24 PM
Toluene	ND	0.048		mg/Kg	1	2/20/2023 3:52:24 PM
Ethylbenzene	ND	0.048		mg/Kg	1	2/20/2023 3:52:24 PM
Xylenes, Total	ND	0.096		mg/Kg	1	2/20/2023 3:52:24 PM
Surr: 4-Bromofluorobenzene	98.9	70-130		%Rec	1	2/20/2023 3:52:24 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	110	60		mg/Kg	20	2/18/2023 10:39:19 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH23-02 4'
Project: Black River SWD
Collection Date: 2/15/2023 9:25:00 AM
Lab ID: 2302785-006 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	8.8		mg/Kg	1	2/20/2023 3:26:55 PM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	2/20/2023 3:26:55 PM
Surr: DNOP	104	69-147		%Rec	1	2/20/2023 3:26:55 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	2/20/2023 4:15:57 PM
Surr: BFB	101	37.7-212		%Rec	1	2/20/2023 4:15:57 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.025		mg/Kg	1	2/20/2023 4:15:57 PM
Toluene	ND	0.050		mg/Kg	1	2/20/2023 4:15:57 PM
Ethylbenzene	ND	0.050		mg/Kg	1	2/20/2023 4:15:57 PM
Xylenes, Total	ND	0.10		mg/Kg	1	2/20/2023 4:15:57 PM
Surr: 4-Bromofluorobenzene	97.4	70-130		%Rec	1	2/20/2023 4:15:57 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	ND	60		mg/Kg	20	2/18/2023 10:51:45 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH23-03 0'
Project: Black River SWD
Collection Date: 2/15/2023 9:30:00 AM
Lab ID: 2302785-007 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	140	9.2		mg/Kg	1	2/20/2023 3:37:37 PM
Motor Oil Range Organics (MRO)	140	46		mg/Kg	1	2/20/2023 3:37:37 PM
Surr: DNOP	127	69-147		%Rec	1	2/20/2023 3:37:37 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	2/20/2023 4:39:32 PM
Surr: BFB	103	37.7-212		%Rec	1	2/20/2023 4:39:32 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024		mg/Kg	1	2/20/2023 4:39:32 PM
Toluene	ND	0.049		mg/Kg	1	2/20/2023 4:39:32 PM
Ethylbenzene	ND	0.049		mg/Kg	1	2/20/2023 4:39:32 PM
Xylenes, Total	ND	0.097		mg/Kg	1	2/20/2023 4:39:32 PM
Surr: 4-Bromofluorobenzene	97.0	70-130		%Rec	1	2/20/2023 4:39:32 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	5200	150		mg/Kg	50	2/19/2023 11:16:02 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BH23-03 2'
Project: Black River SWD **Collection Date:** 2/15/2023 9:35:00 AM
Lab ID: 2302785-008 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	2/20/2023 3:48:20 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	2/20/2023 3:48:20 PM
Surr: DNOP	90.9	69-147		%Rec	1	2/20/2023 3:48:20 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	2/20/2023 5:26:28 PM
Surr: BFB	106	37.7-212		%Rec	1	2/20/2023 5:26:28 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024		mg/Kg	1	2/20/2023 5:26:28 PM
Toluene	ND	0.048		mg/Kg	1	2/20/2023 5:26:28 PM
Ethylbenzene	ND	0.048		mg/Kg	1	2/20/2023 5:26:28 PM
Xylenes, Total	ND	0.097		mg/Kg	1	2/20/2023 5:26:28 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	2/20/2023 5:26:28 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	220	60		mg/Kg	20	2/18/2023 11:16:35 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BH23-03 4'
Project: Black River SWD **Collection Date:** 2/15/2023 9:40:00 AM
Lab ID: 2302785-009 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	2/20/2023 3:59:04 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	2/20/2023 3:59:04 PM
Surr: DNOP	95.5	69-147		%Rec	1	2/20/2023 3:59:04 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	2/20/2023 5:50:14 PM
Surr: BFB	103	37.7-212		%Rec	1	2/20/2023 5:50:14 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024		mg/Kg	1	2/20/2023 5:50:14 PM
Toluene	ND	0.048		mg/Kg	1	2/20/2023 5:50:14 PM
Ethylbenzene	ND	0.048		mg/Kg	1	2/20/2023 5:50:14 PM
Xylenes, Total	ND	0.096		mg/Kg	1	2/20/2023 5:50:14 PM
Surr: 4-Bromofluorobenzene	98.4	70-130		%Rec	1	2/20/2023 5:50:14 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	270	60		mg/Kg	20	2/18/2023 11:29:00 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH23-04 0'
Project: Black River SWD
Collection Date: 2/15/2023 9:45:00 AM
Lab ID: 2302785-010 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	340	9.0		mg/Kg	1	2/20/2023 4:09:48 PM
Motor Oil Range Organics (MRO)	280	45		mg/Kg	1	2/20/2023 4:09:48 PM
Surr: DNOP	107	69-147		%Rec	1	2/20/2023 4:09:48 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	8.0	4.7		mg/Kg	1	2/20/2023 6:14:06 PM
Surr: BFB	149	37.7-212		%Rec	1	2/20/2023 6:14:06 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.023		mg/Kg	1	2/20/2023 6:14:06 PM
Toluene	ND	0.047		mg/Kg	1	2/20/2023 6:14:06 PM
Ethylbenzene	ND	0.047		mg/Kg	1	2/20/2023 6:14:06 PM
Xylenes, Total	0.41	0.094		mg/Kg	1	2/20/2023 6:14:06 PM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	2/20/2023 6:14:06 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	980	59		mg/Kg	20	2/18/2023 12:06:14 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH23-04 2'
Project: Black River SWD
Collection Date: 2/15/2023 9:50:00 AM
Lab ID: 2302785-011 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	2/20/2023 4:31:32 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	2/20/2023 4:31:32 PM
Surr: DNOP	120	69-147		%Rec	1	2/20/2023 4:31:32 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	2/20/2023 6:38:07 PM
Surr: BFB	106	37.7-212		%Rec	1	2/20/2023 6:38:07 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024		mg/Kg	1	2/20/2023 6:38:07 PM
Toluene	ND	0.048		mg/Kg	1	2/20/2023 6:38:07 PM
Ethylbenzene	ND	0.048		mg/Kg	1	2/20/2023 6:38:07 PM
Xylenes, Total	ND	0.095		mg/Kg	1	2/20/2023 6:38:07 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	2/20/2023 6:38:07 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	120	60		mg/Kg	20	2/18/2023 12:18:39 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc. **Client Sample ID:** BH23-04 4'
Project: Black River SWD **Collection Date:** 2/15/2023 9:55:00 AM
Lab ID: 2302785-012 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	2/20/2023 4:42:17 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	2/20/2023 4:42:17 PM
Surr: DNOP	130	69-147		%Rec	1	2/20/2023 4:42:17 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	2/20/2023 7:02:05 PM
Surr: BFB	106	37.7-212		%Rec	1	2/20/2023 7:02:05 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.025		mg/Kg	1	2/20/2023 7:02:05 PM
Toluene	ND	0.050		mg/Kg	1	2/20/2023 7:02:05 PM
Ethylbenzene	ND	0.050		mg/Kg	1	2/20/2023 7:02:05 PM
Xylenes, Total	ND	0.099		mg/Kg	1	2/20/2023 7:02:05 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	2/20/2023 7:02:05 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	ND	60		mg/Kg	20	2/18/2023 12:31:04 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH23-05 0'
Project: Black River SWD
Collection Date: 2/15/2023 10:00:00 AM
Lab ID: 2302785-013 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	11	9.7		mg/Kg	1	2/20/2023 4:53:03 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	2/20/2023 4:53:03 PM
Surr: DNOP	93.6	69-147		%Rec	1	2/20/2023 4:53:03 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	2/20/2023 7:26:01 PM
Surr: BFB	107	37.7-212		%Rec	1	2/20/2023 7:26:01 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024		mg/Kg	1	2/20/2023 7:26:01 PM
Toluene	ND	0.049		mg/Kg	1	2/20/2023 7:26:01 PM
Ethylbenzene	ND	0.049		mg/Kg	1	2/20/2023 7:26:01 PM
Xylenes, Total	ND	0.097		mg/Kg	1	2/20/2023 7:26:01 PM
Surr: 4-Bromofluorobenzene	99.2	70-130		%Rec	1	2/20/2023 7:26:01 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	3800	150		mg/Kg	50	2/19/2023 11:28:27 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH23-05 2'
Project: Black River SWD
Collection Date: 2/15/2023 10:05:00 AM
Lab ID: 2302785-014 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	2/20/2023 5:03:49 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	2/20/2023 5:03:49 PM
Surr: DNOP	99.7	69-147		%Rec	1	2/20/2023 5:03:49 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	2/20/2023 7:49:53 PM
Surr: BFB	108	37.7-212		%Rec	1	2/20/2023 7:49:53 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024		mg/Kg	1	2/20/2023 7:49:53 PM
Toluene	ND	0.048		mg/Kg	1	2/20/2023 7:49:53 PM
Ethylbenzene	ND	0.048		mg/Kg	1	2/20/2023 7:49:53 PM
Xylenes, Total	ND	0.097		mg/Kg	1	2/20/2023 7:49:53 PM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	2/20/2023 7:49:53 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	160	60		mg/Kg	20	2/18/2023 12:55:54 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH23-05 4'
Project: Black River SWD
Collection Date: 2/15/2023 10:10:00 AM
Lab ID: 2302785-015 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	2/20/2023 5:14:44 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	2/20/2023 5:14:44 PM
Surr: DNOP	99.2	69-147		%Rec	1	2/20/2023 5:14:44 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	2/20/2023 8:13:46 PM
Surr: BFB	108	37.7-212		%Rec	1	2/20/2023 8:13:46 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.023		mg/Kg	1	2/20/2023 8:13:46 PM
Toluene	ND	0.046		mg/Kg	1	2/20/2023 8:13:46 PM
Ethylbenzene	ND	0.046		mg/Kg	1	2/20/2023 8:13:46 PM
Xylenes, Total	ND	0.092		mg/Kg	1	2/20/2023 8:13:46 PM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	2/20/2023 8:13:46 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	390	60		mg/Kg	20	2/18/2023 1:08:19 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH23-06 0'
Project: Black River SWD
Collection Date: 2/15/2023 10:15:00 AM
Lab ID: 2302785-016 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	42	8.8		mg/Kg	1	2/20/2023 5:25:24 PM
Motor Oil Range Organics (MRO)	69	44		mg/Kg	1	2/20/2023 5:25:24 PM
Surr: DNOP	106	69-147		%Rec	1	2/20/2023 5:25:24 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	2/20/2023 8:37:32 PM
Surr: BFB	102	37.7-212		%Rec	1	2/20/2023 8:37:32 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024		mg/Kg	1	2/20/2023 8:37:32 PM
Toluene	ND	0.049		mg/Kg	1	2/20/2023 8:37:32 PM
Ethylbenzene	ND	0.049		mg/Kg	1	2/20/2023 8:37:32 PM
Xylenes, Total	ND	0.097		mg/Kg	1	2/20/2023 8:37:32 PM
Surr: 4-Bromofluorobenzene	96.8	70-130		%Rec	1	2/20/2023 8:37:32 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	1900	60		mg/Kg	20	2/18/2023 1:20:43 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 Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH23-06 2'
Project: Black River SWD
Collection Date: 2/15/2023 10:20:00 AM
Lab ID: 2302785-017 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	2/20/2023 5:36:17 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	2/20/2023 5:36:17 PM
Surr: DNOP	112	69-147		%Rec	1	2/20/2023 5:36:17 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	2/20/2023 9:01:21 PM
Surr: BFB	106	37.7-212		%Rec	1	2/20/2023 9:01:21 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.025		mg/Kg	1	2/20/2023 9:01:21 PM
Toluene	ND	0.050		mg/Kg	1	2/20/2023 9:01:21 PM
Ethylbenzene	ND	0.050		mg/Kg	1	2/20/2023 9:01:21 PM
Xylenes, Total	ND	0.099		mg/Kg	1	2/20/2023 9:01:21 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	2/20/2023 9:01:21 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	ND	61		mg/Kg	20	2/18/2023 1:33:08 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	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

Analytical Report
Lab Order **2302785**
Date Reported: **2/28/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH23-06 4'
Project: Black River SWD
Collection Date: 2/15/2023 10:25:00 AM
Lab ID: 2302785-018 **Matrix:** SOIL **Received Date:** 2/17/2023 8:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	2/21/2023 2:07:01 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	2/21/2023 2:07:01 PM
Surr: DNOP	95.5	69-147		%Rec	1	2/21/2023 2:07:01 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	2/20/2023 1:10:00 PM
Surr: BFB	109	37.7-212		%Rec	1	2/20/2023 1:10:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.025		mg/Kg	1	2/20/2023 1:10:00 PM
Toluene	ND	0.049		mg/Kg	1	2/20/2023 1:10:00 PM
Ethylbenzene	ND	0.049		mg/Kg	1	2/20/2023 1:10:00 PM
Xylenes, Total	ND	0.098		mg/Kg	1	2/20/2023 1:10:00 PM
Surr: 4-Bromofluorobenzene	95.3	70-130		%Rec	1	2/20/2023 1:10:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	ND	61		mg/Kg	20	2/21/2023 1:36:37 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	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2302785**

28-Feb-23

Client: Vertex Resources Services, Inc.

Project: Black River SWD

Sample ID: **MB-73252**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS**	Batch ID: **73252**	RunNo: **94705**
Prep Date: **2/18/2023**	Analysis Date: **2/18/2023**	SeqNo: **3423662** Units: **mg/Kg**

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

Sample ID: **LCS-73252**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS**	Batch ID: **73252**	RunNo: **94705**
Prep Date: **2/18/2023**	Analysis Date: **2/18/2023**	SeqNo: **3423663** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	15	1.5	15.00	0	96.8	90	110			

Sample ID: **MB-73277**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS**	Batch ID: **73277**	RunNo: **94770**
Prep Date: **2/21/2023**	Analysis Date: **2/21/2023**	SeqNo: **3425718** Units: **mg/Kg**

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

Sample ID: **LCS-73277**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS**	Batch ID: **73277**	RunNo: **94770**
Prep Date: **2/21/2023**	Analysis Date: **2/21/2023**	SeqNo: **3425719** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.9	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2302785**

28-Feb-23

Client: Vertex Resources Services, Inc.

Project: Black River SWD

Sample ID: **LCS-73243**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **73243**	RunNo: **94749**
Prep Date: **2/17/2023**	Analysis Date: **2/20/2023**	SeqNo: **3424939** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	64	10	50.00	0	128	61.9	130			
Surr: DNOP	6.2		5.000		124	69	147			

Sample ID: **MB-73243**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **73243**	RunNo: **94749**
Prep Date: **2/17/2023**	Analysis Date: **2/20/2023**	SeqNo: **3424941** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	10		10.00		100	69	147			

Sample ID: **LCS-73273**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **73273**	RunNo: **94787**
Prep Date: **2/20/2023**	Analysis Date: **2/21/2023**	SeqNo: **3426200** 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	83.5	61.9	130			
Surr: DNOP	4.7		5.000		93.4	69	147			

Sample ID: **MB-73273**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **73273**	RunNo: **94787**
Prep Date: **2/20/2023**	Analysis Date: **2/21/2023**	SeqNo: **3426201** 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	9.0		10.00		90.4	69	147			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2302785**

28-Feb-23

Client: Vertex Resources Services, Inc.

Project: Black River SWD

Sample ID: **lcs-73238**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **73238**	RunNo: **94713**
Prep Date: **2/17/2023**	Analysis Date: **2/20/2023**	SeqNo: **3423969** 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	82.1	72.3	137			
Surr: BFB	1800		1000		183	37.7	212			

Sample ID: **mb-73238**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **73238**	RunNo: **94713**
Prep Date: **2/17/2023**	Analysis Date: **2/20/2023**	SeqNo: **3423996** 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	1000		1000		101	37.7	212			

Sample ID: **2302785-018ams**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **BH23-06 4'**	Batch ID: **73242**	RunNo: **94744**
Prep Date: **2/17/2023**	Analysis Date: **2/20/2023**	SeqNo: **3424662** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	20	4.9	24.51	0	81.8	70	130			
Surr: BFB	2000		980.4		207	37.7	212			

Sample ID: **2302785-018amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **BH23-06 4'**	Batch ID: **73242**	RunNo: **94744**
Prep Date: **2/17/2023**	Analysis Date: **2/20/2023**	SeqNo: **3424663** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	4.9	24.46	0	84.7	70	130	3.36	20	
Surr: BFB	2200		978.5		221	37.7	212	0	0	S

Sample ID: **mb-73242**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **73242**	RunNo: **94744**
Prep Date: **2/17/2023**	Analysis Date: **2/20/2023**	SeqNo: **3424665** 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	1000		1000		100	37.7	212			

Sample ID: **lcs-73242**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **73242**	RunNo: **94744**
Prep Date: **2/17/2023**	Analysis Date: **2/20/2023**	SeqNo: **3424689** Units: **mg/Kg**

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2302785**

28-Feb-23

Client: Vertex Resources Services, Inc.

Project: Black River SWD

Sample ID: **lcs-73242**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **73242**	RunNo: **94744**
Prep Date: **2/17/2023**	Analysis Date: **2/20/2023**	SeqNo: **3424689** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	98.0	72.3	137			
Surr: BFB	2300		1000		226	37.7	212			S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2302785**

28-Feb-23

Client: Vertex Resources Services, Inc.

Project: Black River SWD

Sample ID: **LCS-73238**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **73238**	RunNo: **94713**
Prep Date: **2/17/2023**	Analysis Date: **2/20/2023**	SeqNo: **3423971** 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	88.2	80	120			
Toluene	0.91	0.050	1.000	0	91.4	80	120			
Ethylbenzene	0.91	0.050	1.000	0	91.3	80	120			
Xylenes, Total	2.7	0.10	3.000	0	91.2	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		101	70	130			

Sample ID: **mb-73238**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **73238**	RunNo: **94713**
Prep Date: **2/17/2023**	Analysis Date: **2/20/2023**	SeqNo: **3423999** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.98		1.000		98.4	70	130			

Sample ID: **mb-73242**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **73242**	RunNo: **94744**
Prep Date: **2/17/2023**	Analysis Date: **2/20/2023**	SeqNo: **3424666** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.96		1.000		96.4	70	130			

Sample ID: **lcs-73242**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **73242**	RunNo: **94744**
Prep Date: **2/17/2023**	Analysis Date: **2/20/2023**	SeqNo: **3424690** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.94	0.025	1.000	0	93.7	80	120			
Toluene	0.94	0.050	1.000	0	93.9	80	120			
Ethylbenzene	0.93	0.050	1.000	0	93.4	80	120			
Xylenes, Total	2.8	0.10	3.000	0	93.2	80	120			
Surr: 4-Bromofluorobenzene	0.99		1.000		98.6	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: Vertex Resources Services, Inc.

Work Order Number: 2302785

RcptNo: 1

Received By: Tracy Casarrubias 2/17/2023 8:25:00 AM

Completed By: Tracy Casarrubias 2/17/2023 9:20:56 AM

Reviewed By: JN 2/17/23

Chain of Custody

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

Log In

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

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

Adjusted? _____

Checked by: JN 2-17-23

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	1.2	Good	Yes	Morty		

Chain-of-Custody Record

Client: Vertex

Mailing Address: On File

Phone #:

email or Fax#:

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☒ Rush 5 Day

Project Name: Black River SWD

Project #: 23E-00893

Project Manager: Monica Peppin

Sampler: Hunter Klein

On Ice: ☒ Yes ☐ No mom

# of Coolers: 1

Cooler Temp(including CF): 1.1 +0.1 = 1.2 (°C)

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

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2302785	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
2/15/23	9:00	Soil	BH23-01 0'	4oz	Ice	001	X	X					X			
	9:05		BH23-01 2'			002	X	X					X			
	9:10		BH23-01 4'			003	X	X					X			
	9:15		BH23-02 0'			004	X	X					X			
	9:20		BH23-02 2'			005	X	X					X			
	9:25		BH23-02 4'			006	X	X					X			
	9:30		BH23-03 0'			007	X	X					X			
	9:35		BH23-03 2'			008	X	X					X			
	9:40		BH23-03 4'			009	X	X					X			
	9:45		BH23-04 0'			010	X	X					X			
	9:50		BH23-04 2'			011	X	X					X			
↓	9:55	↓	BH23-04 4'	↓	↓	012	X	X					X			

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
2/15/23	16:00	Hunter Klein				
2/16/23	9:20				2/16/23	920
Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
2/16/23	1900			Courier	2/17/23	8:25

Remarks:
CC Monica Peppin

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

Chain-of-Custody Record

Client: Vertex

Mailing Address: On File

Phone #:

email or Fax#:

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance

☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:

☒ Standard ☐ Rush 5 Day

Project Name: Black River SWD

Project #: 23E-00893

Project Manager: Monica Peppin

Sampler: Hunter Klein

On Ice: ☒ Yes ☐ No marty

# of Coolers: 1

Cooler Temp(Including CF): 1.1 +0.1 = 1.2 (°C)

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2302785	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	(Cl, F, Br, NO_3, NO_2, PO_4, SO_4)	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
2/15/23	10:00	Soil	BH23-05 0'	4oz	Ice	013	X	X					X			
	10:05		BH23-05 2'			014	X	X					X			
	10:10		BH23-05 4'			015	X	X					X			
	10:15		BH23-06 0'			016	X	X					X			
	10:20		BH23-06 2'			017	X	X					X			
	10:25		BH23-06 4'			018	X	X					X			

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
2/15/23	16:00	Hunter Klein				
2/16/23	1900				2/16/23	920
					2/17/23	8:25

Remarks: CC Monica Peppin

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

March 17, 2023

Monica Peppin

Vertex Resources Services, Inc.
3101 Boyd Drive
Carlsbad, NM 88220
TEL: (505) 506-0040
FAX:

RE: Black River SDW OrderNo.: 2303584

Dear Monica Peppin:

Hall Environmental Analysis Laboratory received 12 sample(s) on 3/10/2023 for the analyses presented in the following report.

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

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

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

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2303584**
Date Reported: **3/17/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BS23-01 1.5'
Project: Black River SDW
Collection Date: 3/8/2023 9:00:00 AM
Lab ID: 2303584-001 **Matrix:** SOIL **Received Date:** 3/10/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **PRD**
Diesel Range Organics (DRO)	ND	8.8		mg/Kg	1	3/14/2023 8:33:55 PM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	3/14/2023 8:33:55 PM
Surr: DNOP	93.0	69-147		%Rec	1	3/14/2023 8:33:55 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	3/14/2023 7:59:34 PM
Surr: BFB	106	37.7-212		%Rec	1	3/14/2023 7:59:34 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024		mg/Kg	1	3/14/2023 7:59:34 PM
Toluene	ND	0.048		mg/Kg	1	3/14/2023 7:59:34 PM
Ethylbenzene	ND	0.048		mg/Kg	1	3/14/2023 7:59:34 PM
Xylenes, Total	ND	0.097		mg/Kg	1	3/14/2023 7:59:34 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	3/14/2023 7:59:34 PM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	78	60		mg/Kg	20	3/14/2023 9:05:10 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

Analytical Report
Lab Order **2303584**
Date Reported: **3/17/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BS23-02 1.5'
Project: Black River SDW
Collection Date: 3/8/2023 9:05:00 AM
Lab ID: 2303584-002 **Matrix:** SOIL
Received Date: 3/10/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **JME**
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	3/15/2023 1:18:37 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	3/15/2023 1:18:37 PM
Surr: DNOP	81.2	69-147		%Rec	1	3/15/2023 1:18:37 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	3/14/2023 8:23:13 PM
Surr: BFB	106	37.7-212		%Rec	1	3/14/2023 8:23:13 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.023		mg/Kg	1	3/14/2023 8:23:13 PM
Toluene	ND	0.046		mg/Kg	1	3/14/2023 8:23:13 PM
Ethylbenzene	ND	0.046		mg/Kg	1	3/14/2023 8:23:13 PM
Xylenes, Total	ND	0.091		mg/Kg	1	3/14/2023 8:23:13 PM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	3/14/2023 8:23:13 PM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	69	60		mg/Kg	20	3/14/2023 9:17:32 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

Analytical Report
Lab Order **2303584**
Date Reported: **3/17/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BS23-03 1.5'
Project: Black River SDW
Collection Date: 3/8/2023 9:10:00 AM
Lab ID: 2303584-003 **Matrix:** SOIL **Received Date:** 3/10/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **PRD**
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	3/14/2023 9:22:40 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	3/14/2023 9:22:40 PM
Surr: DNOP	69.3	69-147		%Rec	1	3/14/2023 9:22:40 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	3/14/2023 8:46:47 PM
Surr: BFB	106	37.7-212		%Rec	1	3/14/2023 8:46:47 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.025		mg/Kg	1	3/14/2023 8:46:47 PM
Toluene	ND	0.049		mg/Kg	1	3/14/2023 8:46:47 PM
Ethylbenzene	ND	0.049		mg/Kg	1	3/14/2023 8:46:47 PM
Xylenes, Total	ND	0.099		mg/Kg	1	3/14/2023 8:46:47 PM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	3/14/2023 8:46:47 PM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	78	60		mg/Kg	20	3/14/2023 9:29:52 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	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303584**
Date Reported: **3/17/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BS23-04 1.5'
Project: Black River SDW
Collection Date: 3/8/2023 9:15:00 AM
Lab ID: 2303584-004 **Matrix:** SOIL **Received Date:** 3/10/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **JME**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	3/15/2023 1:42:08 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	3/15/2023 1:42:08 PM
Surr: DNOP	75.0	69-147		%Rec	1	3/15/2023 1:42:08 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	3/14/2023 9:10:22 PM
Surr: BFB	103	37.7-212		%Rec	1	3/14/2023 9:10:22 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024		mg/Kg	1	3/14/2023 9:10:22 PM
Toluene	ND	0.049		mg/Kg	1	3/14/2023 9:10:22 PM
Ethylbenzene	ND	0.049		mg/Kg	1	3/14/2023 9:10:22 PM
Xylenes, Total	ND	0.098		mg/Kg	1	3/14/2023 9:10:22 PM
Surr: 4-Bromofluorobenzene	98.6	70-130		%Rec	1	3/14/2023 9:10:22 PM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	77	60		mg/Kg	20	3/14/2023 9:42:13 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

Analytical Report
Lab Order **2303584**
Date Reported: **3/17/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BS23-05 1.5'
Project: Black River SDW
Collection Date: 3/8/2023 9:20:00 AM
Lab ID: 2303584-005 **Matrix:** SOIL **Received Date:** 3/10/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	3/14/2023 12:47:37 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	3/14/2023 12:47:37 PM
Surr: DNOP	88.4	69-147		%Rec	1	3/14/2023 12:47:37 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	3/16/2023 9:31:00 PM
Surr: BFB	93.1	37.7-212		%Rec	1	3/16/2023 9:31:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.025		mg/Kg	1	3/16/2023 9:31:00 PM
Toluene	ND	0.049		mg/Kg	1	3/16/2023 9:31:00 PM
Ethylbenzene	ND	0.049		mg/Kg	1	3/16/2023 9:31:00 PM
Xylenes, Total	ND	0.099		mg/Kg	1	3/16/2023 9:31:00 PM
Surr: 4-Bromofluorobenzene	91.9	70-130		%Rec	1	3/16/2023 9:31:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	190	60		mg/Kg	20	3/14/2023 9:54:33 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

Analytical Report
Lab Order **2303584**
Date Reported: **3/17/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BS23-06 1.5'
Project: Black River SDW
Collection Date: 3/8/2023 9:25:00 AM
Lab ID: 2303584-006 **Matrix:** SOIL **Received Date:** 3/10/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	3/14/2023 1:30:03 PM
Motor Oil Range Organics (MRO)	ND	51		mg/Kg	1	3/14/2023 1:30:03 PM
Surr: DNOP	83.0	69-147		%Rec	1	3/14/2023 1:30:03 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	3/16/2023 10:36:00 PM
Surr: BFB	90.2	37.7-212		%Rec	1	3/16/2023 10:36:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.024		mg/Kg	1	3/16/2023 10:36:00 PM
Toluene	ND	0.048		mg/Kg	1	3/16/2023 10:36:00 PM
Ethylbenzene	ND	0.048		mg/Kg	1	3/16/2023 10:36:00 PM
Xylenes, Total	ND	0.096		mg/Kg	1	3/16/2023 10:36:00 PM
Surr: 4-Bromofluorobenzene	92.3	70-130		%Rec	1	3/16/2023 10:36:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	180	60		mg/Kg	20	3/14/2023 10:06:55 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2303584**
Date Reported: **3/17/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BS23-07 1.5'
Project: Black River SDW
Collection Date: 3/8/2023 9:30:00 AM
Lab ID: 2303584-007 **Matrix:** SOIL **Received Date:** 3/10/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	3/14/2023 1:40:42 PM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	3/14/2023 1:40:42 PM
Surr: DNOP	85.5	69-147		%Rec	1	3/14/2023 1:40:42 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	3/16/2023 11:41:00 PM
Surr: BFB	89.6	37.7-212		%Rec	1	3/16/2023 11:41:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.024		mg/Kg	1	3/16/2023 11:41:00 PM
Toluene	ND	0.049		mg/Kg	1	3/16/2023 11:41:00 PM
Ethylbenzene	ND	0.049		mg/Kg	1	3/16/2023 11:41:00 PM
Xylenes, Total	ND	0.098		mg/Kg	1	3/16/2023 11:41:00 PM
Surr: 4-Bromofluorobenzene	92.4	70-130		%Rec	1	3/16/2023 11:41:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	190	60		mg/Kg	20	3/14/2023 11:08:37 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	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303584**
Date Reported: **3/17/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BS23-08 1.5'
Project: Black River SDW
Collection Date: 3/8/2023 9:35:00 AM
Lab ID: 2303584-008 **Matrix:** SOIL **Received Date:** 3/10/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	3/14/2023 1:51:20 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	3/14/2023 1:51:20 PM
Surr: DNOP	83.4	69-147		%Rec	1	3/14/2023 1:51:20 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	3/17/2023 12:03:00 AM
Surr: BFB	93.8	37.7-212		%Rec	1	3/17/2023 12:03:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.023		mg/Kg	1	3/17/2023 12:03:00 AM
Toluene	ND	0.046		mg/Kg	1	3/17/2023 12:03:00 AM
Ethylbenzene	ND	0.046		mg/Kg	1	3/17/2023 12:03:00 AM
Xylenes, Total	ND	0.091		mg/Kg	1	3/17/2023 12:03:00 AM
Surr: 4-Bromofluorobenzene	93.2	70-130		%Rec	1	3/17/2023 12:03:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	190	60		mg/Kg	20	3/14/2023 11:20:58 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

Analytical Report
Lab Order **2303584**
Date Reported: **3/17/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: WS23-01 0-1.5'
Project: Black River SDW
Collection Date: 3/8/2023 9:40:00 AM
Lab ID: 2303584-009 **Matrix:** SOIL **Received Date:** 3/10/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	3/14/2023 2:01:59 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	3/14/2023 2:01:59 PM
Surr: DNOP	73.0	69-147		%Rec	1	3/14/2023 2:01:59 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	3/17/2023 12:25:00 AM
Surr: BFB	92.5	37.7-212		%Rec	1	3/17/2023 12:25:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.024		mg/Kg	1	3/17/2023 12:25:00 AM
Toluene	ND	0.048		mg/Kg	1	3/17/2023 12:25:00 AM
Ethylbenzene	ND	0.048		mg/Kg	1	3/17/2023 12:25:00 AM
Xylenes, Total	ND	0.096		mg/Kg	1	3/17/2023 12:25:00 AM
Surr: 4-Bromofluorobenzene	91.4	70-130		%Rec	1	3/17/2023 12:25:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	130	60		mg/Kg	20	3/14/2023 11:33:19 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303584**
Date Reported: **3/17/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: WS23-02 0-1.5'
Project: Black River SDW
Collection Date: 3/8/2023 9:45:00 AM
Lab ID: 2303584-010 **Matrix:** SOIL
Received Date: 3/10/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	3/14/2023 2:12:38 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	3/14/2023 2:12:38 PM
Surr: DNOP	97.7	69-147		%Rec	1	3/14/2023 2:12:38 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	3/17/2023 12:46:00 AM
Surr: BFB	91.3	37.7-212		%Rec	1	3/17/2023 12:46:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.024		mg/Kg	1	3/17/2023 12:46:00 AM
Toluene	ND	0.048		mg/Kg	1	3/17/2023 12:46:00 AM
Ethylbenzene	ND	0.048		mg/Kg	1	3/17/2023 12:46:00 AM
Xylenes, Total	ND	0.097		mg/Kg	1	3/17/2023 12:46:00 AM
Surr: 4-Bromofluorobenzene	90.8	70-130		%Rec	1	3/17/2023 12:46:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	170	60		mg/Kg	20	3/14/2023 11:45:40 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Analytical Report
Lab Order **2303584**
Date Reported: **3/17/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: WS23-03 0-1.5'
Project: Black River SDW
Collection Date: 3/8/2023 9:50:00 AM
Lab ID: 2303584-011 **Matrix:** SOIL
Received Date: 3/10/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	3/14/2023 2:23:19 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	3/14/2023 2:23:19 PM
Surr: DNOP	112	69-147		%Rec	1	3/14/2023 2:23:19 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	3/17/2023 1:08:00 AM
Surr: BFB	92.2	37.7-212		%Rec	1	3/17/2023 1:08:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.025		mg/Kg	1	3/17/2023 1:08:00 AM
Toluene	ND	0.050		mg/Kg	1	3/17/2023 1:08:00 AM
Ethylbenzene	ND	0.050		mg/Kg	1	3/17/2023 1:08:00 AM
Xylenes, Total	ND	0.099		mg/Kg	1	3/17/2023 1:08:00 AM
Surr: 4-Bromofluorobenzene	92.0	70-130		%Rec	1	3/17/2023 1:08:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	280	60		mg/Kg	20	3/14/2023 11:57:59 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **2303584**
Date Reported: **3/17/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: WS23-04 0-1.5'
Project: Black River SDW
Collection Date: 3/8/2023 9:55:00 AM
Lab ID: 2303584-012 **Matrix:** SOIL
Received Date: 3/10/2023 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	12	9.8		mg/Kg	1	3/14/2023 2:33:59 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	3/14/2023 2:33:59 PM
Surr: DNOP	100	69-147		%Rec	1	3/14/2023 2:33:59 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **CCM**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	3/17/2023 1:29:00 AM
Surr: BFB	89.4	37.7-212		%Rec	1	3/17/2023 1:29:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **CCM**
Benzene	ND	0.023		mg/Kg	1	3/17/2023 1:29:00 AM
Toluene	ND	0.047		mg/Kg	1	3/17/2023 1:29:00 AM
Ethylbenzene	ND	0.047		mg/Kg	1	3/17/2023 1:29:00 AM
Xylenes, Total	ND	0.094		mg/Kg	1	3/17/2023 1:29:00 AM
Surr: 4-Bromofluorobenzene	92.0	70-130		%Rec	1	3/17/2023 1:29:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **SNS**
Chloride	210	60		mg/Kg	20	3/15/2023 12:21:40 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2303584**

17-Mar-23

Client: Vertex Resources Services, Inc.

Project: Black River SDW

Sample ID: **MB-73698**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS**	Batch ID: **73698**	RunNo: **95280**
Prep Date: **3/14/2023**	Analysis Date: **3/14/2023**	SeqNo: **3446161** Units: **mg/Kg**

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

Sample ID: **LCS-73698**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS**	Batch ID: **73698**	RunNo: **95280**
Prep Date: **3/14/2023**	Analysis Date: **3/14/2023**	SeqNo: **3446162** 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-73724**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS**	Batch ID: **73724**	RunNo: **95316**
Prep Date: **3/15/2023**	Analysis Date: **3/15/2023**	SeqNo: **3447493** Units: **mg/Kg**

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

Sample ID: **LCS-73724**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS**	Batch ID: **73724**	RunNo: **95316**
Prep Date: **3/15/2023**	Analysis Date: **3/15/2023**	SeqNo: **3447494** 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
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2303584**

17-Mar-23

Client: Vertex Resources Services, Inc.

Project: Black River SDW

Sample ID: **MB-73676**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **73676**	RunNo: **95253**
Prep Date: **3/13/2023**	Analysis Date: **3/14/2023**	SeqNo: **3445056** 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	12		10.00		121	69	147			

Sample ID: **LCS-73676**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **73676**	RunNo: **95253**
Prep Date: **3/13/2023**	Analysis Date: **3/14/2023**	SeqNo: **3445072** 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	61.9	130			
Surr: DNOP	5.0		5.000		99.1	69	147			

Sample ID: **2303584-005AMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BS23-05 1.5'**	Batch ID: **73681**	RunNo: **95271**
Prep Date: **3/13/2023**	Analysis Date: **3/14/2023**	SeqNo: **3445664** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	49	9.9	49.50	0	98.6	54.2	135			
Surr: DNOP	4.6		4.950		93.7	69	147			

Sample ID: **2303584-005AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BS23-05 1.5'**	Batch ID: **73681**	RunNo: **95271**
Prep Date: **3/13/2023**	Analysis Date: **3/14/2023**	SeqNo: **3445665** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	44	9.9	49.50	0	88.3	54.2	135	11.0	29.2	
Surr: DNOP	4.2		4.950		84.3	69	147	0	0	

Sample ID: **LCS-73681**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **73681**	RunNo: **95271**
Prep Date: **3/13/2023**	Analysis Date: **3/14/2023**	SeqNo: **3445679** 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	95.9	61.9	130			
Surr: DNOP	4.9		5.000		98.7	69	147			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2303584**
17-Mar-23

Client: Vertex Resources Services, Inc.
Project: Black River SDW

Sample ID: **MB-73681**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **73681**	RunNo: **95271**
Prep Date: **3/13/2023**	Analysis Date: **3/14/2023**	SeqNo: **3445680** 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	9.7		10.00		97.3	69	147			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2303584**

17-Mar-23

Client: Vertex Resources Services, Inc.

Project: Black River SDW

Sample ID: **lcs-73671**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **73671**	RunNo: **95254**
Prep Date: **3/13/2023**	Analysis Date: **3/14/2023**	SeqNo: **3445081** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	101	70	130			
Surr: BFB	2100		1000		208	37.7	212			

Sample ID: **mb-73671**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **73671**	RunNo: **95254**
Prep Date: **3/13/2023**	Analysis Date: **3/14/2023**	SeqNo: **3445082** 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	1100		1000		110	37.7	212			

Sample ID: **2.5ug gro lcs**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **GS95308**	RunNo: **95308**
Prep Date:	Analysis Date: **3/16/2023**	SeqNo: **3447294** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	2200		1000		217	37.7	212			S

Sample ID: **mb**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **GS95308**	RunNo: **95308**
Prep Date:	Analysis Date: **3/16/2023**	SeqNo: **3447295** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	1100		1000		106	37.7	212			

Sample ID: **lcs-73674**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **73674**	RunNo: **95308**
Prep Date: **3/13/2023**	Analysis Date: **3/16/2023**	SeqNo: **3448234** 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	73.2	70	130			
Surr: BFB	1900		1000		188	37.7	212			

Sample ID: **mb-73674**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **73674**	RunNo: **95308**
Prep Date: **3/13/2023**	Analysis Date: **3/16/2023**	SeqNo: **3448507** 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	900		1000		90.0	37.7	212			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2303584**

17-Mar-23

Client: Vertex Resources Services, Inc.

Project: Black River SDW

Sample ID: **2303584-005ams**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **BS23-05 1.5'**	Batch ID: **73674**	RunNo: **95308**
Prep Date: **3/13/2023**	Analysis Date: **3/16/2023**	SeqNo: **3448509** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	4.9	24.70	0	84.4	70	130			
Surr: BFB	1900		988.1		191	37.7	212			

Sample ID: **2303584-005amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **BS23-05 1.5'**	Batch ID: **73674**	RunNo: **95308**
Prep Date: **3/13/2023**	Analysis Date: **3/16/2023**	SeqNo: **3448510** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	18	4.9	24.70	0	72.0	70	130	15.8	20	
Surr: BFB	1800		988.1		186	37.7	212	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2303584**
17-Mar-23

Client: Vertex Resources Services, Inc.
Project: Black River SDW

Sample ID: **LCS-73671**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **73671**	RunNo: **95254**
Prep Date: **3/13/2023**	Analysis Date: **3/14/2023**	SeqNo: **3445087** 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	94.0	80	120			
Toluene	0.94	0.050	1.000	0	94.4	80	120			
Ethylbenzene	0.94	0.050	1.000	0	93.7	80	120			
Xylenes, Total	2.8	0.10	3.000	0	94.4	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		104	70	130			

Sample ID: **mb-73671**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **73671**	RunNo: **95254**
Prep Date: **3/13/2023**	Analysis Date: **3/14/2023**	SeqNo: **3445088** 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	1.1		1.000		105	70	130			

Sample ID: **100ng btex lcs**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **BS95308**	RunNo: **95308**
Prep Date:	Analysis Date: **3/16/2023**	SeqNo: **3447298** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	1.1		1.000		106	70	130			

Sample ID: **mb**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **BS95308**	RunNo: **95308**
Prep Date:	Analysis Date: **3/16/2023**	SeqNo: **3447299** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	1.1		1.000		106	70	130			

Sample ID: **lcs-73674**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **73674**	RunNo: **95308**
Prep Date: **3/13/2023**	Analysis Date: **3/16/2023**	SeqNo: **3448410** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.84	0.025	1.000	0	84.4	80	120			
Toluene	0.84	0.050	1.000	0	83.5	80	120			
Ethylbenzene	0.82	0.050	1.000	0	81.9	80	120			
Xylenes, Total	2.4	0.10	3.000	0	81.4	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2303584**
17-Mar-23

Client: Vertex Resources Services, Inc.
Project: Black River SDW

Sample ID: **lcs-73674**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **73674**	RunNo: **95308**
Prep Date: **3/13/2023**	Analysis Date: **3/16/2023**	SeqNo: **3448410** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.95		1.000		94.7	70	130			

Sample ID: **mb-73674**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **73674**	RunNo: **95308**
Prep Date: **3/13/2023**	Analysis Date: **3/16/2023**	SeqNo: **3448534** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.93		1.000		92.6	70	130			

Sample ID: **2303584-006ams**	SampType: **MS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BS23-06 1.5'**	Batch ID: **73674**	RunNo: **95308**
Prep Date: **3/13/2023**	Analysis Date: **3/16/2023**	SeqNo: **3448537** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.82	0.024	0.9643	0	85.4	68.8	120			
Toluene	0.83	0.048	0.9643	0	86.0	73.6	124			
Ethylbenzene	0.81	0.048	0.9643	0	84.2	72.7	129			
Xylenes, Total	2.4	0.096	2.893	0	83.8	75.7	126			
Surr: 4-Bromofluorobenzene	0.90		0.9643		93.6	70	130			

Sample ID: **2303584-006amsd**	SampType: **MSD**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BS23-06 1.5'**	Batch ID: **73674**	RunNo: **95308**
Prep Date: **3/13/2023**	Analysis Date: **3/16/2023**	SeqNo: **3448538** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.83	0.024	0.9634	0	85.9	68.8	120	0.511	20	
Toluene	0.84	0.048	0.9634	0	86.8	73.6	124	0.795	20	
Ethylbenzene	0.82	0.048	0.9634	0	85.3	72.7	129	1.10	20	
Xylenes, Total	2.4	0.096	2.890	0	84.3	75.7	126	0.510	20	
Surr: 4-Bromofluorobenzene	0.91		0.9634		94.2	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: Vertex Resources Services, Inc.

Work Order Number: 2303584

RcptNo: 1

Received By: Tracy Casarrubias 3/10/2023 7:30:00 AM

Completed By: Tracy Casarrubias 3/10/2023 7:49:41 AM

Reviewed By: LRH 3.10.23

Chain of Custody

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

Log In

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

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

Adjusted? _____

Checked by: JR 3/10/23

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	5.0	Good	Yes	Yogi		

Chain-of-Custody Record

Client: Vertex (Matador)

Mailing Address: On File

Phone #:

email or Fax#:

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☒ Rush 5 Days

Project Name: Black River SWD

Project #: 23E-00893

Project Manager: Monica Peppin

Sampler: Hunter Klein

On Ice: ☒ Yes ☐ No 4 of 4

# of Coolers: 1

Cooler Temp(Including CF): 5.0-0=5.0 (°C)

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

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2303584	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
3/8/23	9:00	Soil	BS23-01 1.5'	4oz	Ice	001	X	X					X			
	9:05		BS23-02 1.5'			002	X	X					X			
	9:10		BS23-03 1.5'			003	X	X					X			
	9:15		BS23-04 1.5'			004	X	X					X			
	9:20		BS23-05 1.5'			005	X	X					X			
	9:25		BS23-06 1.5'			006	X	X					X			
	9:30		BS23-07 1.5'			007	X	X					X			
	9:35		BS23-08 1.5'			008	X	X					X			
	9:40		WS23-010-1.5'			009	X	X					X			
	9:45		WS23-020-1.5'			010	X	X					X			
	9:50		WS23-030-1.5'			011	X	X					X			
	9:55		WS23-040-1.5'			012	X	X					X			

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
3/8/23	2:00 pm	Hunter Klein				
3/9/23	1900			courier	3/10/23	7:30

Remarks: cc Monica Peppin

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.

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 210911

CONDITIONS

Operator: MATADOR PRODUCTION COMPANY One Lincoln Centre Dallas, TX 75240	OGRID: 228937
	Action Number: 210911
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
jharimon	None	8/24/2023