General Information

NMOCD District:	District 2 - Artesia	Incident ID:	nJMW1231248032,nJMW1317034502, nAB1516753239
Landowner:	Bureau of Land Management	RP Reference:	2RP-1391, 2RP-1686, 2RP-3051
Client:	Devon Energy Production Company, LP	Site Location:	Todd 24 B Federal #002
Date:	July 4, 2023	Project #:	21E-02816-016
Client Contact:	Dale Woodall	Phone #:	405.318.4697
Vertex PM:	Kent Stallings	Phone #:	346.814.1413

Objective

The objective of the Environmental Site Remediation Work Plan is to identify areas of exceedance for constituents of concern delineated during spill assessment and site characterization activities, and propose appropriate remediation techniques to address the open release at Todd 24 B Federal #002 (hereafter referred to as "Todd 24"). This incident is composed of three separate incidents. The most recent occurred when a transfer pump failure resulted in the release of approximately 80 barrels (bbl) of produced water inside the unlined, earthen containment on the pad. Upon discovery, a hydrovac truck was dispatched to the site to recover free fluids. Approximately 75 bbl of oil were recovered and removed for disposal off-site. The second incident occurred when a transfer pump's discharge line became blocked with paraffin, causing 35 bbl of produced water to spill over. A vacuum truck recovered 30 bbl. The release was contained within the containment around tanks on the pad. The third incident occurred when a transfer pump malfunctioned causing 70 bbl of produced water to spill over with 70 bbl recovered by vacuum truck. The release was contained within the lined containment on-pad. No fluids were released into undisturbed areas or waterways. An aerial photograph of the site with characterization locations is presented on Figure 1 (Attachment 1).

Closure criteria has been selected as per New Mexico Administrative Code 19.15.29. On March 7, 2023, an exploratory borehole was drilled on the east side of the pad and registered with the New Mexico Office of the State Engineer. The borehole was drilled to 57.5 feet bgs approximately 130 feet from any of the original release areas. The borehole was dry immediately after drilling but water was measured at 56 feet bgs after 72 hours had passed. The current closure criteria for the site are determined to be associated with the following constituent concentration limits.

Table 1. Closure Criteria for Soils to Remediation & Reclamation Standards

	Constituent	Limit
0-4 feet bgs (19.15.29.13)	Chloride	600 mg/kg
	TPH (GRO+DRO+MRO)	100 mg/kg
DTGW 51-100 feet (19.15.29.12)	Chloride	10,000 mg/kg
	TPH (GRO+DRO+MRO)	2,500 mg/kg
	GRO+DRO	1,000 mg/kg
	BTEX	50 mg/kg
	Benzene	10 mg/kg

bgs – Below ground surface
DTGW – Depth to groundwater
TPH – Total petroleum hydrocarbons = gasoline range organics (GRO) + diesel range organics (DRO) + motor oil range organics (MRO)
BTEX - Benzene, toluene, ethylbenzene, and xylenes

Site Assessment/Characterization

Site characterization for each spill was treated as one delineation due to their occurrence in one single containment area and in an effort to address all releases. Site characterization was also used to identify potential historical remediation performed by another company via excavation to 1 foot and backfilling with uncontaminated earthen material.

Characterization was completed on February 17, 2023. A total of 12 sample points (boreholes) were established for field screening: six boreholes for vertical delineation were obtained at various depths inside the release area and six boreholes for horizontal delineation were obtained around the edge of the spill area. In total, 24 samples were submitted to Hall Environmental Analysis Laboratory in Albuquerque, New Mexico, for analysis. The characterization sampling locations are presented on Figure 1 (Attachment 1). Laboratory analyses were compared to the above noted closure criteria and the results from the characterization activity are presented in Table 2 (Attachment 2). The daily field reports and laboratory data reports are included in Attachments 3 and 4, respectively. Exceedances to reclamation criteria are identified in the table in bold with green background.

Field screening methods included using an electrical conductivity meter to estimate the level of chloride in the soil, a Dexsil PetroFlag analyzer to determine hydrocarbon concentrations, and a Photoionization Detector to measure volatile organic compounds. Laboratory analyses included Method 300.0 for chloride, Method 8021B for volatile organics, including BTEX, and EPA Method 8015 for TPH, including MRO, DRO and GRO. Data from the release characterization analysis were compared to the above noted closure criteria results to establish the appropriate level of remediation required.

Proposed Remedial Activities

Vertex Resource Services Inc. (Vertex) proposes that areas with identified contaminant concentrations above closure criteria be remediated through excavation with the use of a hand crew and a hydrovac truck to remove contaminated soil in close proximity to production equipment. The site will be backfilled with uncontaminated earthen material per paragraph 1 of subsection D of 19.15.29.13 NMAC. Remediation should include excavation of two areas, identified in the table below, to meet New Mexico Oil Conservation Division (NMOCD) Closure Criteria. The proposed excavation corresponds to BH22-01 and BH22-03 presented on Figure 1 (Attachment 1). A Vertex environmental technician will be on-site during final excavation activities to conduct additional field screening to confirm removal of contaminated soil to below the applicable closure criteria as shown in Table 1.

Sample Point	Excavation Depth	Remediation Method
BH22-01	3 feet	Equipment, Hand Crew
BH22-03	2 feet	Equipment, Hand Crew

Approximately 20 cubic yards of contaminated soils are projected to be removed during excavation for remediation and reclamation purposes. Laboratory results from the site assessment/characterization have been referenced to estimate the horizontal and vertical limits of the impacts, and the volume of soil to be removed. Remediated areas will be field screened utilizing a five-point composite sampling method, obtaining both base and wall samples, in correspondence with paragraph 1 of Subsection D of 19.15.29.12 NMAC, to confirm removal of contaminated soil below the applicable closure criteria. The confirmatory samples will be placed into laboratory-provided containers, preserved on ice and submitted to a National Environmental Laboratory Accreditation Program laboratory for chemical analysis. Laboratory analyses will include Method 300.0 for chlorides, Method 8021B for volatile organics, including benzene and BTEX, and EPA Method 8015 for TPH, including MRO, DRO and GRO. Contaminated soils will be stored on a 30-mil liner prior to disposal at an approved facility.

A Trimble global positioning system (GPS) unit, or equivalent, will be used to map the approximate center of each of the five-point composite sample.

Excavations will be backfilled with clean soil sourced locally, placed to match the site's existing grade and prevent ponding of water or erosion, and covered with a layer of topsoil or other suitable material to establish vegetation at the site per 19.15.29.13 NMAC.

Timeline for Completion

Remediation activities are projected to be completed in approximately 30 days following NMOCD approval of this workplan.

Should you have any questions or concerns, please do not hesitate to contact Kent Stallings at 346.814.1413 or KStallings@vertex.ca.

Stephanie McCarty

Stephanie McCarty, B.Sc.
ENVIRONMENTAL SPECIALIST, REPORTING

July 4, 2023
Date

kent stallings P.G.

Kent Stallings, P.G.
PROJECT MANAGER, REPORT REVIEW

July 09, 2023
Date

Attachments

Attachment 1. Aerial Photograph and Characterization Figure
Attachment 2. Field Screening and Laboratory Results Table
Attachment 3. Daily Field Reports with Photographs
Attachment 4. Laboratory Data Reports with Chain of Custody Forms
Attachment 5. Closure Criteria Research
Attachment 6. NMOCD C-141 Report

ATTACHMENT 1

Borehole (Prefixed by "BH22-") | Approximate Lease Boundary | Remaining Area of Impact - North (~52 sq.ft) | Remaining Area of Impact - South (~35 sq.ft.)

VERTEX

0 20 40 Feet

Map Center:
Lat/Long: 32.295480, -103.729650

NAD 1983 UTM Zone 13N
Date: Jul 04/23

N

Characterization Sampling Site Schematic
Todd 24 B Federal #002

FIGURE: 1

devon

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: Image from Google Earth Pro, 2017; georeferenced by Vertex. Feature from GPS. Vertex Professional Services Ltd., 2023.

VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects_US PROJECTS\Devon Energy Corporation\2021\21E-02816\016 - Todd 24 B Federal 2\Figure 1 Characterization Schematic Todd 24 B Federal 002(21E-02816)_Request#16094.mxd

ATTACHMENT 2

Client Name: Devon Energy Production Company, LP
Site Name: Todd 24 B Federal #002
NM OCD Tracking #: nAB1516753239, nJMW1231248032, nJMW1317034502
Project #: 21E-02816-16
Lab Reports: 2205800, 2205A95, and 2302857

Table 2. Initial Characterization Field Screen and Laboratory Results - Depth to Groundwater 51-100 feet bgs

Sample Description			Field Screening			Petroleum Hydrocarbons							Inorganic
						Volatile		Extractable					
Sample ID	Depth (ft)	Sample Date	Volatile Organic Compounds (PID)	Extractable Organic Compounds (PetroFlag)	Chloride Concentration	Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride Concentration
			(ppm)	(ppm)	(ppm)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
BH22-01	0	May 16, 2022	0	86	0	ND	ND	ND	ND	ND	ND	ND	60
	2	May 16, 2022	0	27	0	ND	ND	ND	19	100	19	**119**	ND
	4	February 17, 2023	0	7	223	ND	ND	ND	ND	ND	ND	ND	ND
BH22-02	0	May 16, 2022	0	413	0	ND	ND	ND	ND	ND	ND	ND	ND
	2	May 16, 2022	0	71	0	ND	ND	ND	ND	ND	ND	ND	ND
BH22-03	0	May 16, 2022	0	509	0	ND	ND	ND	17	290	17	**307**	ND
	2	February 17, 2023	0	13	245	ND	ND	ND	ND	ND	ND	ND	ND
	4	February 17, 2023	0	9	256	ND	ND	ND	ND	ND	ND	ND	ND
BH22-04	0	May 16, 2022	0	89	0	ND	ND	ND	ND	ND	ND	ND	ND
	2	May 16, 2022	0	27	0	ND	ND	ND	ND	ND	ND	ND	ND
BH22-05	0	May 16, 2022	0	58	0	ND	ND	ND	ND	ND	ND	ND	ND
	2	May 16, 2022	0	36	0	ND	ND	ND	ND	ND	ND	ND	ND
BH22-06	0	May 16, 2022	0	49	0	ND	ND	ND	ND	ND	ND	ND	ND
	2	May 16, 2022	0	29	0	ND	ND	ND	ND	ND	ND	ND	ND
BH22-07	0	May 20, 2022	0	190	0	ND	ND	ND	ND	ND	ND	ND	ND
	2	May 20, 2022	0	29	0	ND	ND	ND	ND	ND	ND	ND	ND
BH22-08	0	May 20, 2022	0	120	0	ND	ND	ND	ND	ND	ND	ND	ND
	2	May 20, 2022	0	32	0	ND	ND	ND	ND	ND	ND	ND	ND
BH22-09	0	May 20, 2022	0	27	0	ND	ND	ND	ND	ND	ND	ND	ND
	2	May 20, 2022	0	36	0	ND	ND	ND	ND	ND	ND	ND	ND
BH22-10	0	February 17, 2023	0	39	228	ND	ND	ND	ND	ND	ND	ND	ND
	2	February 17, 2023	0	11	236	ND	ND	ND	ND	ND	ND	ND	ND
BH22-11	0	February 17, 2023	0	17	431	ND	ND	ND	ND	ND	ND	ND	ND
BH22-12	0	February 17, 2023	0	15	277	ND	ND	ND	ND	ND	ND	ND	ND

"ND" Not Detected at the Reporting Limit
"-" indicates not analyzed/assessed
Bold and grey shaded indicates exceedance outside of NMOCD Remediation Closure Criteria
Bold and green shaded indicates exceedance outside of NMOCD Reclamation Closure Criteria

ATTACHMENT 3

Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	5/16/2022
Site Location Name:	Todd 24 B Federal 2	Report Run Date:	5/16/2022 10:50 PM
Client Contact Name:	Wes Matthews	API #:	
Client Contact Phone #:	(575) 748-0176		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	5/16/2022 9:00 AM
Departed Site	5/16/2022 3:00 PM

Field Notes

9:40 Completed consult with Monica, beginning delineation

11:43 Hit a rock about 6” bgs on BH22-03, moving 1’ to the SW

14:50 Ran all field screens for all 11 samples. See DSS report for results

Next Steps & Recommendations

1 Return later this week to finish delineation

Daily Site Visit Report

Site Photos

Viewing Direction: South	**Viewing Direction**: South
	
BH22-02	BH22-02 filled in
Viewing Direction: Southeast	**Viewing Direction**: Southeast
	
BH22-01	BH22-01 filled in

Daily Site Visit Report

Viewing Direction: East	**Viewing Direction**: Northeast
	
BH22-06 filled in	BH22-05
Viewing Direction: Northeast	**Viewing Direction**: Northeast
	
BH22-05 filled in	BH22-04

Daily Site Visit Report

Viewing Direction: Northeast

BH22-04 filled in

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Sally Carttar

Signature: 

Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	5/20/2022
Site Location Name:	Todd 24 B Federal 2	Report Run Date:	5/20/2022 6:15 PM
Client Contact Name:	Wes Matthews	API #:	
Client Contact Phone #:	(575) 748-0176		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	5/20/2022 7:45 AM
Departed Site	5/20/2022 11:45 AM

Field Notes

8:15 Put new sample points, BH22-07 and BH22-08, in collector

9:48 Running field screens

11:28 BH22-09 came back clean at both depths

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: Southwest	**Viewing Direction**: Southwest
	
BH22-07, stepped out 10’ from BH22-02	BH22-07 filled in
Viewing Direction: Northwest	**Viewing Direction**: Northwest
	
BH22-08	BH22-08 backfilled

Daily Site Visit Report

Viewing Direction: Southwest	**Viewing Direction**: Southwest
	
BH22-09	BH22-09 filled in

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Sally Carttar

Signature: 
Signature

Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	3/7/2023
Site Location Name:	Todd 24 B Federal 2	Report Run Date:	3/8/2023 1:48 AM
Client Contact Name:	Wes Matthews	API #:	
Client Contact Phone #:	(575) 748-0176		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	3/7/2023 12:50 PM
Departed Site	3/7/2023 2:00 PM

Field Notes

13:26 Arrived on site and filled out safety documents at 12:50.

13:30 Drilling began 12:55 and completed at 13:30.

13:50 Well reading at 13:40. Pipe height above ground is 3 ft 2 inches. Dry well reading at 60 ft and 9 inches. (57 ft and 7 inches depth of well).

13:55 Collected coordinates ((32.2953261, -103.7291990) of actual location drilled well. Well is approximately 36 ft SE of pump jack and 57 ft east of separators' fence at SE corner of pad.

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: Northeast

Well drilling rig and well site

Viewing Direction: North

Well actual location

Viewing Direction: North

Well location in relation to site references

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Stephanie McCartyM

Signature:

Daily Site Visit Report

Client:	Devon Energy Corporation	Inspection Date:	3/10/2023
Site Location Name:	Todd 24 B Federal 2	Report Run Date:	3/10/2023 9:02 PM
Client Contact Name:	Wes Matthews	API #:	
Client Contact Phone #:	(575) 748-0176		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	3/10/2023 12:45 PM
Departed Site	3/10/2023 2:05 PM

Field Notes

12:51 Arrived on site and completed a safety documents.
Documented location.

13:56 Well reading at 13:40 PM, 72 hours after drilling and initial measurement occurred, measured with Solinst model 122. Pipe height above ground is 3 foot. Well depth bottom reading at 60 ft and 6 inches with water detected at 59 ft. (Well is 57 ft and 6 inches total depth and 56 ft depth to meter observed ground water).
Coordinates of well location: (32.2953261, -103.7291990)
Well is approximately 36 ft SE of pump jack and 57 ft east of separators' fence at SE corner of pad.

13:59 Returned well pipe cap to top of pipe and cone over borehole and completed daily field report.

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: West	**Viewing Direction**: North
	
Site and information placard	Well location
Viewing Direction: West	**Viewing Direction**: North
	
Interface meter prepared reading	Interface meter (blinking) detecting water at measurement of 59 ft (with pipe)

Daily Site Visit Report

Viewing Direction: South

Interface meter measuring bottom of borehole at 60.5 (apparently 60 FT and 6 inches)

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Stephanie McCartyM

Signature:

ATTACHMENT 4

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

May 27, 2022

Monica Peppin

Devon Energy
6488 Seven Rivers Highway
Artesia, NM 88210
TEL: (505) 350-1336
FAX:

RE: Todd 24 B Federal 2 OrderNo.: 2205800

Dear Monica Peppin:

Hall Environmental Analysis Laboratory received 11 sample(s) on 5/18/2022 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 **2205800**
Date Reported: **5/27/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24 B Federal 2
Lab ID: 2205800-001 **Matrix:** SOIL

Client Sample ID: BH22-01 0'
Collection Date: 5/16/2022 10:25:00 AM
Received Date: 5/18/2022 8:27:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	5/23/2022 12:45:42 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	5/23/2022 12:45:42 PM
Surr: DNOP	128	51.1-141		%Rec	1	5/23/2022 12:45:42 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	5/19/2022 9:46:00 PM
Surr: BFB	86.5	37.7-212		%Rec	1	5/19/2022 9:46:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.025		mg/Kg	1	5/19/2022 9:46:00 PM
Toluene	ND	0.049		mg/Kg	1	5/19/2022 9:46:00 PM
Ethylbenzene	ND	0.049		mg/Kg	1	5/19/2022 9:46:00 PM
Xylenes, Total	ND	0.099		mg/Kg	1	5/19/2022 9:46:00 PM
Surr: 4-Bromofluorobenzene	86.9	70-130		%Rec	1	5/19/2022 9:46:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	60	59		mg/Kg	20	5/20/2022 12:17:26 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	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 range due to dilution or matrix interference		

Analytical Report
Lab Order **2205800**
Date Reported: **5/27/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24 B Federal 2
Lab ID: 2205800-002 **Matrix:** SOIL

Client Sample ID: BH22-01 2'
Collection Date: 5/16/2022 10:30:00 AM
Received Date: 5/18/2022 8:27:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	8.7		mg/Kg	1	5/23/2022 12:56:46 PM
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	5/23/2022 12:56:46 PM
Surr: DNOP	128	51.1-141		%Rec	1	5/23/2022 12:56:46 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	5/19/2022 10:45:00 PM
Surr: BFB	91.1	37.7-212		%Rec	1	5/19/2022 10:45:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.023		mg/Kg	1	5/19/2022 10:45:00 PM
Toluene	ND	0.047		mg/Kg	1	5/19/2022 10:45:00 PM
Ethylbenzene	ND	0.047		mg/Kg	1	5/19/2022 10:45:00 PM
Xylenes, Total	ND	0.093		mg/Kg	1	5/19/2022 10:45:00 PM
Surr: 4-Bromofluorobenzene	91.0	70-130		%Rec	1	5/19/2022 10:45:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	ND	60		mg/Kg	20	5/20/2022 12:29:51 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	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 range due to dilution or matrix interference

Analytical Report
Lab Order **2205800**
Date Reported: **5/27/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24 B Federal 2
Lab ID: 2205800-003 **Matrix:** SOIL

Client Sample ID: BH22-02 0'
Collection Date: 5/16/2022 10:10:00 AM
Received Date: 5/18/2022 8:27:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	19	8.8		mg/Kg	1	5/23/2022 1:07:46 PM
Motor Oil Range Organics (MRO)	100	44		mg/Kg	1	5/23/2022 1:07:46 PM
Surr: DNOP	127	51.1-141		%Rec	1	5/23/2022 1:07:46 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	5/19/2022 11:05:00 PM
Surr: BFB	89.7	37.7-212		%Rec	1	5/19/2022 11:05:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.025		mg/Kg	1	5/19/2022 11:05:00 PM
Toluene	ND	0.050		mg/Kg	1	5/19/2022 11:05:00 PM
Ethylbenzene	ND	0.050		mg/Kg	1	5/19/2022 11:05:00 PM
Xylenes, Total	ND	0.099		mg/Kg	1	5/19/2022 11:05:00 PM
Surr: 4-Bromofluorobenzene	88.0	70-130		%Rec	1	5/19/2022 11:05:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	ND	60		mg/Kg	20	5/20/2022 1:07:06 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	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 range due to dilution or matrix interference

Analytical Report
Lab Order **2205800**
Date Reported: **5/27/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24 B Federal 2
Lab ID: 2205800-004 **Matrix:** SOIL

Client Sample ID: BH22-02 2'
Collection Date: 5/16/2022 10:15:00 AM
Received Date: 5/18/2022 8:27:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	5/23/2022 1:29:28 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	5/23/2022 1:29:28 PM
Surr: DNOP	119	51.1-141		%Rec	1	5/23/2022 1:29:28 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	5/19/2022 11:24:00 PM
Surr: BFB	90.1	37.7-212		%Rec	1	5/19/2022 11:24:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	5/19/2022 11:24:00 PM
Toluene	ND	0.047		mg/Kg	1	5/19/2022 11:24:00 PM
Ethylbenzene	ND	0.047		mg/Kg	1	5/19/2022 11:24:00 PM
Xylenes, Total	ND	0.095		mg/Kg	1	5/19/2022 11:24:00 PM
Surr: 4-Bromofluorobenzene	90.8	70-130		%Rec	1	5/19/2022 11:24:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	ND	60		mg/Kg	20	5/20/2022 1:19:30 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	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 range due to dilution or matrix interference		

Analytical Report
Lab Order **2205800**
Date Reported: **5/27/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24 B Federal 2
Lab ID: 2205800-005 **Matrix:** SOIL

Client Sample ID: BH22-03 0'
Collection Date: 5/16/2022 11:30:00 AM
Received Date: 5/18/2022 8:27:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	17	10		mg/Kg	1	5/23/2022 1:40:27 PM
Motor Oil Range Organics (MRO)	290	50		mg/Kg	1	5/23/2022 1:40:27 PM
Surr: DNOP	121	51.1-141		%Rec	1	5/23/2022 1:40:27 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	5/19/2022 11:44:00 PM
Surr: BFB	89.5	37.7-212		%Rec	1	5/19/2022 11:44:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.025		mg/Kg	1	5/19/2022 11:44:00 PM
Toluene	ND	0.049		mg/Kg	1	5/19/2022 11:44:00 PM
Ethylbenzene	ND	0.049		mg/Kg	1	5/19/2022 11:44:00 PM
Xylenes, Total	ND	0.099		mg/Kg	1	5/19/2022 11:44:00 PM
Surr: 4-Bromofluorobenzene	88.1	70-130		%Rec	1	5/19/2022 11:44:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	ND	61		mg/Kg	20	5/20/2022 1:31:55 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	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 range due to dilution or matrix interference

Analytical Report
Lab Order **2205800**
Date Reported: **5/27/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24 B Federal 2
Lab ID: 2205800-006 **Matrix:** SOIL

Client Sample ID: BH22-04 0'
Collection Date: 5/16/2022 11:10:00 AM
Received Date: 5/18/2022 8:27:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	5/25/2022 10:08:54 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	5/25/2022 10:08:54 AM
Surr: DNOP	102	51.1-141		%Rec	1	5/25/2022 10:08:54 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	5/20/2022 12:04:00 AM
Surr: BFB	91.3	37.7-212		%Rec	1	5/20/2022 12:04:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	5/20/2022 12:04:00 AM
Toluene	ND	0.048		mg/Kg	1	5/20/2022 12:04:00 AM
Ethylbenzene	ND	0.048		mg/Kg	1	5/20/2022 12:04:00 AM
Xylenes, Total	ND	0.096		mg/Kg	1	5/20/2022 12:04:00 AM
Surr: 4-Bromofluorobenzene	91.2	70-130		%Rec	1	5/20/2022 12:04:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	ND	60		mg/Kg	20	5/20/2022 1:44:19 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	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 range due to dilution or matrix interference		

Analytical Report
Lab Order **2205800**
Date Reported: **5/27/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24 B Federal 2
Lab ID: 2205800-007 **Matrix:** SOIL

Client Sample ID: BH22-04 2'
Collection Date: 5/16/2022 11:15:00 AM
Received Date: 5/18/2022 8:27:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	5/23/2022 1:51:24 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	5/23/2022 1:51:24 PM
Surr: DNOP	108	51.1-141		%Rec	1	5/23/2022 1:51:24 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	5/20/2022 12:23:00 AM
Surr: BFB	90.3	37.7-212		%Rec	1	5/20/2022 12:23:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	5/20/2022 12:23:00 AM
Toluene	ND	0.048		mg/Kg	1	5/20/2022 12:23:00 AM
Ethylbenzene	ND	0.048		mg/Kg	1	5/20/2022 12:23:00 AM
Xylenes, Total	ND	0.096		mg/Kg	1	5/20/2022 12:23:00 AM
Surr: 4-Bromofluorobenzene	90.3	70-130		%Rec	1	5/20/2022 12:23:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	ND	60		mg/Kg	20	5/20/2022 1:56:43 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	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 range due to dilution or matrix interference

Analytical Report
Lab Order **2205800**
Date Reported: **5/27/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24 B Federal 2
Lab ID: 2205800-008 **Matrix:** SOIL

Client Sample ID: BH22-05 0'
Collection Date: 5/16/2022 11:00:00 AM
Received Date: 5/18/2022 8:27:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	5/23/2022 2:02:19 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	5/23/2022 2:02:19 PM
Surr: DNOP	109	51.1-141		%Rec	1	5/23/2022 2:02:19 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	5/20/2022 12:43:00 AM
Surr: BFB	88.1	37.7-212		%Rec	1	5/20/2022 12:43:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	5/20/2022 12:43:00 AM
Toluene	ND	0.048		mg/Kg	1	5/20/2022 12:43:00 AM
Ethylbenzene	ND	0.048		mg/Kg	1	5/20/2022 12:43:00 AM
Xylenes, Total	ND	0.096		mg/Kg	1	5/20/2022 12:43:00 AM
Surr: 4-Bromofluorobenzene	91.5	70-130		%Rec	1	5/20/2022 12:43:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	ND	60		mg/Kg	20	5/20/2022 2:09:08 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	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 range due to dilution or matrix interference		

Analytical Report
Lab Order **2205800**
Date Reported: **5/27/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24 B Federal 2
Lab ID: 2205800-009 **Matrix:** SOIL

Client Sample ID: BH22-05 2'
Collection Date: 5/16/2022 11:05:00 AM
Received Date: 5/18/2022 8:27:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	5/23/2022 2:13:15 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	5/23/2022 2:13:15 PM
Surr: DNOP	113	51.1-141		%Rec	1	5/23/2022 2:13:15 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	5/20/2022 1:03:00 AM
Surr: BFB	87.9	37.7-212		%Rec	1	5/20/2022 1:03:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	5/20/2022 1:03:00 AM
Toluene	ND	0.047		mg/Kg	1	5/20/2022 1:03:00 AM
Ethylbenzene	ND	0.047		mg/Kg	1	5/20/2022 1:03:00 AM
Xylenes, Total	ND	0.095		mg/Kg	1	5/20/2022 1:03:00 AM
Surr: 4-Bromofluorobenzene	90.3	70-130		%Rec	1	5/20/2022 1:03:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	ND	60		mg/Kg	20	5/20/2022 2:21:32 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	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 range due to dilution or matrix interference		

Analytical Report
Lab Order **2205800**
Date Reported: **5/27/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24 B Federal 2
Lab ID: 2205800-010 **Matrix:** SOIL

Client Sample ID: BH22-06 0'
Collection Date: 5/16/2022 10:40:00 AM
Received Date: 5/18/2022 8:27:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	5/23/2022 2:24:08 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	5/23/2022 2:24:08 PM
Surr: DNOP	99.6	51.1-141		%Rec	1	5/23/2022 2:24:08 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	5/20/2022 1:42:00 AM
Surr: BFB	88.7	37.7-212		%Rec	1	5/20/2022 1:42:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	5/20/2022 1:42:00 AM
Toluene	ND	0.048		mg/Kg	1	5/20/2022 1:42:00 AM
Ethylbenzene	ND	0.048		mg/Kg	1	5/20/2022 1:42:00 AM
Xylenes, Total	ND	0.096		mg/Kg	1	5/20/2022 1:42:00 AM
Surr: 4-Bromofluorobenzene	90.7	70-130		%Rec	1	5/20/2022 1:42:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	ND	60		mg/Kg	20	5/20/2022 2:33:57 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	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 range due to dilution or matrix interference		

Analytical Report
Lab Order **2205800**
Date Reported: **5/27/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24 B Federal 2
Lab ID: 2205800-011 **Matrix:** SOIL

Client Sample ID: BH22-06 2'
Collection Date: 5/16/2022 10:45:00 AM
Received Date: 5/18/2022 8:27:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	5/23/2022 2:35:01 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	5/23/2022 2:35:01 PM
Surr: DNOP	113	51.1-141		%Rec	1	5/23/2022 2:35:01 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	5/20/2022 2:02:00 AM
Surr: BFB	83.9	37.7-212		%Rec	1	5/20/2022 2:02:00 AM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	5/20/2022 2:02:00 AM
Toluene	ND	0.048		mg/Kg	1	5/20/2022 2:02:00 AM
Ethylbenzene	ND	0.048		mg/Kg	1	5/20/2022 2:02:00 AM
Xylenes, Total	ND	0.096		mg/Kg	1	5/20/2022 2:02:00 AM
Surr: 4-Bromofluorobenzene	85.5	70-130		%Rec	1	5/20/2022 2:02:00 AM
EPA METHOD 300.0: ANIONS						Analyst: **NAI**
Chloride	ND	60		mg/Kg	20	5/20/2022 2:46:22 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	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 range due to dilution or matrix interference		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2205800**

27-May-22

Client: Devon Energy

Project: Todd 24 B Federal 2

Sample ID:	**MB-67596**	SampType:	**mblk**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBS**	Batch ID:	**67596**	RunNo:	**88190**					
Prep Date:	**5/20/2022**	Analysis Date:	**5/20/2022**	SeqNo:	**3126542**	Units:	**mg/Kg**			

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

Sample ID:	**LCS-67596**	SampType:	**lcs**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**LCSS**	Batch ID:	**67596**	RunNo:	**88190**					
Prep Date:	**5/20/2022**	Analysis Date:	**5/20/2022**	SeqNo:	**3126543**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	90.7	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix interference
B	Analyte detected in the associated Method Blank
E	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#: **2205800**

27-May-22

Client: Devon Energy

Project: Todd 24 B Federal 2

Sample ID: **LCS-67548** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **67548** RunNo: **88170**
Prep Date: **5/19/2022** Analysis Date: **5/20/2022** SeqNo: **3126893** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	43	10	50.00	0	85.8	64.4	127			
Surr: DNOP	5.0		5.000		101	51.1	141			

Sample ID: **MB-67548** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **67548** RunNo: **88170**
Prep Date: **5/19/2022** Analysis Date: **5/20/2022** SeqNo: **3126897** 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	11		10.00		112	51.1	141			

Sample ID: **LCS-67607** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **67607** RunNo: **88200**
Prep Date: **5/20/2022** Analysis Date: **5/23/2022** SeqNo: **3127567** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	6.4		5.000		127	51.1	141			

Sample ID: **MB-67607** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **67607** RunNo: **88200**
Prep Date: **5/20/2022** Analysis Date: **5/23/2022** SeqNo: **3127570** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	13		10.00		132	51.1	141			

Sample ID: **LCS-67667** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **67667** RunNo: **88262**
Prep Date: **5/24/2022** Analysis Date: **5/25/2022** SeqNo: **3129962** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	6.2		5.000		124	51.1	141			

Sample ID: **LCS-67670** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **67670** RunNo: **88262**
Prep Date: **5/24/2022** Analysis Date: **5/25/2022** SeqNo: **3129963** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	57	10	50.00	0	115	64.4	127			
Surr: DNOP	6.5		5.000		129	51.1	141			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix interference
B	Analyte detected in the associated Method Blank
E	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#: **2205800**

27-May-22

Client: Devon Energy

Project: Todd 24 B Federal 2

Sample ID: **MB-67667**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **67667**	RunNo: **88262**
Prep Date: **5/24/2022**	Analysis Date: **5/25/2022**	SeqNo: **3129964** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.3		10.00		93.2	51.1	141			

Sample ID: **MB-67670**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **67670**	RunNo: **88262**
Prep Date: **5/24/2022**	Analysis Date: **5/25/2022**	SeqNo: **3129965** 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		96.8	51.1	141			

Sample ID: **MB-67666**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **67666**	RunNo: **88263**
Prep Date: **5/24/2022**	Analysis Date: **5/26/2022**	SeqNo: **3131422** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	10		10.00		101	51.1	141			

Sample ID: **LCS-67666**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **67666**	RunNo: **88263**
Prep Date: **5/24/2022**	Analysis Date: **5/26/2022**	SeqNo: **3131423** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	5.4		5.000		108	51.1	141			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix interference
B	Analyte detected in the associated Method Blank
E	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#: **2205800**

27-May-22

Client: Devon Energy

Project: Todd 24 B Federal 2

Sample ID: **lcs-67545**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **67545**	RunNo: **88144**
Prep Date: **5/18/2022**	Analysis Date: **5/19/2022**	SeqNo: **3124750** 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	100	72.3	137			
Surr: BFB	1900		1000		191	37.7	212			

Sample ID: **mb-67545**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **67545**	RunNo: **88144**
Prep Date: **5/18/2022**	Analysis Date: **5/19/2022**	SeqNo: **3124752** 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	910		1000		90.6	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 range due to dilution or matrix interference
B	Analyte detected in the associated Method Blank
E	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#: **2205800**

27-May-22

Client: Devon Energy

Project: Todd 24 B Federal 2

Sample ID: **lcs-67545**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **67545**	RunNo: **88144**
Prep Date: **5/18/2022**	Analysis Date: **5/19/2022**	SeqNo: **3124827** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.025	1.000	0	96.1	80	120			
Toluene	0.97	0.050	1.000	0	96.9	80	120			
Ethylbenzene	0.96	0.050	1.000	0	96.2	80	120			
Xylenes, Total	2.9	0.10	3.000	0	95.2	80	120			
Surr: 4-Bromofluorobenzene	0.89		1.000		89.4	70	130			

Sample ID: **mb-67545**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **67545**	RunNo: **88144**
Prep Date: **5/18/2022**	Analysis Date: **5/19/2022**	SeqNo: **3124828** 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	0.90		1.000		89.7	70	130			

Sample ID: **2205800-001ams**	SampType: **MS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BH22-01 0'**	Batch ID: **67545**	RunNo: **88144**
Prep Date: **5/18/2022**	Analysis Date: **5/19/2022**	SeqNo: **3124831** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.99	0.025	0.9843	0	101	68.8	120			
Toluene	1.0	0.049	0.9843	0	103	73.6	124			
Ethylbenzene	1.0	0.049	0.9843	0	102	72.7	129			
Xylenes, Total	3.0	0.098	2.953	0	102	75.7	126			
Surr: 4-Bromofluorobenzene	0.88		0.9843		89.1	70	130			

Sample ID: **2205800-001amsd**	SampType: **MSD**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BH22-01 0'**	Batch ID: **67545**	RunNo: **88144**
Prep Date: **5/18/2022**	Analysis Date: **5/19/2022**	SeqNo: **3124832** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.98	0.025	0.9833	0	99.5	68.8	120	1.44	20	
Toluene	1.0	0.049	0.9833	0	101	73.6	124	1.40	20	
Ethylbenzene	0.99	0.049	0.9833	0	101	72.7	129	1.31	20	
Xylenes, Total	3.0	0.098	2.950	0	100	75.7	126	1.57	20	
Surr: 4-Bromofluorobenzene	0.86		0.9833		87.6	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 range due to dilution or matrix interference
B	Analyte detected in the associated Method Blank
E	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: **Devon Energy** Work Order Number: **2205800** RcptNo: 1

Received By: **Joseph Alderette** **5/18/2022 8:27:00 AM**

Completed By: **Desiree Dominguez** **5/18/2022 9:28:26 AM**

Reviewed By: KPA 5.18.22

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: JM 5/18/22

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	5.5	Good				

Chain-of-Custody Record

Client: Devon

Mailing Address: On file

Phone #:

email or Fax#: permian@vertex.ca

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☑ Standard ☐ Rush 5 day

Project Name: Todd 24B Federal #2

Project #: 21E-02816-16

Project Manager: Monica Peppin

Sampler: Sally Carttar

On Ice: ☑ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 5.5-0=5.5 (°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. 2205800	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)
5/16	10:25	Soil	BH22-01 0'	1 glass jar 4oz	Ice	-001	✓	✓					✓			
	10:30		BH22-01 2'			-002										
	10:10		BH22-02 0'			-003										
	10:15		BH22-02 2'			-004										
	11:30		BH22-03 0'			-005										
	11:10		BH22-04 0'			-006										
	11:15		BH22-04 2'			-007										
	11:00		BH22-05 0'			-008										
	11:05		BH22-05 2'			-009										
	10:40		BH22-06 0'			-010										
	10:45		BH22-06 2'			-011										

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
5/16	1730	Sally Carttar	Cummings		5/17/22	700
5/17/22	1900			courier	~~5-17-22~~ 5-18-22	8:27

Remarks: No work order #
Invoice to be sent to Laura Calderwood and Dale Woodard

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

June 03, 2022

Monica Peppin

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

RE: Todd 24B Federal 2 OrderNo.: 2205A95

Dear Monica Peppin:

Hall Environmental Analysis Laboratory received 6 sample(s) on 5/25/2022 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 **2205A95**
Date Reported: **6/3/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-07 0'
Project: Todd 24B Federal 2
Collection Date: 5/20/2022 8:50:00 AM
Lab ID: 2205A95-001 **Matrix:** SOIL **Received Date:** 5/25/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	5/28/2022 12:09:51 AM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	5/28/2022 12:09:51 AM
Surr: DNOP	76.6	51.1-141		%Rec	1	5/28/2022 12:09:51 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	5/27/2022 5:44:25 PM
Surr: BFB	103	37.7-212		%Rec	1	5/27/2022 5:44:25 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.024		mg/Kg	1	5/27/2022 5:44:25 PM
Toluene	ND	0.048		mg/Kg	1	5/27/2022 5:44:25 PM
Ethylbenzene	ND	0.048		mg/Kg	1	5/27/2022 5:44:25 PM
Xylenes, Total	ND	0.096		mg/Kg	1	5/27/2022 5:44:25 PM
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	5/27/2022 5:44:25 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	6/1/2022 12:52:25 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	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 range due to dilution or matrix interference

Analytical Report
Lab Order **2205A95**
Date Reported: **6/3/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-07 2'
Project: Todd 24B Federal 2
Collection Date: 5/20/2022 9:00:00 AM
Lab ID: 2205A95-002 **Matrix:** SOIL
Received Date: 5/25/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	9.0		mg/Kg	1	5/28/2022 12:23:34 AM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	5/28/2022 12:23:34 AM
Surr: DNOP	108	51.1-141		%Rec	1	5/28/2022 12:23:34 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	5/27/2022 6:08:08 PM
Surr: BFB	99.6	37.7-212		%Rec	1	5/27/2022 6:08:08 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.024		mg/Kg	1	5/27/2022 6:08:08 PM
Toluene	ND	0.048		mg/Kg	1	5/27/2022 6:08:08 PM
Ethylbenzene	ND	0.048		mg/Kg	1	5/27/2022 6:08:08 PM
Xylenes, Total	ND	0.097		mg/Kg	1	5/27/2022 6:08:08 PM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	5/27/2022 6:08:08 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	59		mg/Kg	20	6/1/2022 1:04:50 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	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 range due to dilution or matrix interference		

Analytical Report
Lab Order **2205A95**
Date Reported: **6/3/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-08 0'
Project: Todd 24B Federal 2
Collection Date: 5/20/2022 9:10:00 AM
Lab ID: 2205A95-003 **Matrix:** SOIL
Received Date: 5/25/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	9.0		mg/Kg	1	5/28/2022 12:37:32 AM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	5/28/2022 12:37:32 AM
Surr: DNOP	98.2	51.1-141		%Rec	1	5/28/2022 12:37:32 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	5/27/2022 6:31:48 PM
Surr: BFB	98.4	37.7-212		%Rec	1	5/27/2022 6:31:48 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.024		mg/Kg	1	5/27/2022 6:31:48 PM
Toluene	ND	0.048		mg/Kg	1	5/27/2022 6:31:48 PM
Ethylbenzene	ND	0.048		mg/Kg	1	5/27/2022 6:31:48 PM
Xylenes, Total	ND	0.095		mg/Kg	1	5/27/2022 6:31:48 PM
Surr: 4-Bromofluorobenzene	98.9	70-130		%Rec	1	5/27/2022 6:31:48 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	6/1/2022 2:06:51 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	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 range due to dilution or matrix interference

Analytical Report
Lab Order **2205A95**
Date Reported: **6/3/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-08 2'
Project: Todd 24B Federal 2
Collection Date: 5/20/2022 9:20:00 AM
Lab ID: 2205A95-004 **Matrix:** SOIL
Received Date: 5/25/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **SB**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	5/28/2022 12:51:17 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	5/28/2022 12:51:17 AM
Surr: DNOP	99.8	51.1-141		%Rec	1	5/28/2022 12:51:17 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	5/27/2022 6:55:25 PM
Surr: BFB	100	37.7-212		%Rec	1	5/27/2022 6:55:25 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.024		mg/Kg	1	5/27/2022 6:55:25 PM
Toluene	ND	0.049		mg/Kg	1	5/27/2022 6:55:25 PM
Ethylbenzene	ND	0.049		mg/Kg	1	5/27/2022 6:55:25 PM
Xylenes, Total	ND	0.097		mg/Kg	1	5/27/2022 6:55:25 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	5/27/2022 6:55:25 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	6/1/2022 2:19:16 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	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 range due to dilution or matrix interference

Analytical Report
Lab Order **2205A95**
Date Reported: **6/3/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-09 0'
Project: Todd 24B Federal 2
Collection Date: 5/20/2022 10:50:00 AM
Lab ID: 2205A95-005 **Matrix:** SOIL
Received Date: 5/25/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **ED**
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	5/27/2022 7:02:55 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	5/27/2022 7:02:55 PM
Surr: DNOP	106	51.1-141		%Rec	1	5/27/2022 7:02:55 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	5/27/2022 7:49:00 PM
Surr: BFB	86.3	37.7-212		%Rec	1	5/27/2022 7:49:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	5/27/2022 7:49:00 PM
Toluene	ND	0.048		mg/Kg	1	5/27/2022 7:49:00 PM
Ethylbenzene	ND	0.048		mg/Kg	1	5/27/2022 7:49:00 PM
Xylenes, Total	ND	0.096		mg/Kg	1	5/27/2022 7:49:00 PM
Surr: 4-Bromofluorobenzene	87.6	70-130		%Rec	1	5/27/2022 7:49:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	6/1/2022 2:31:40 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	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 range due to dilution or matrix interference

Analytical Report
Lab Order **2205A95**
Date Reported: **6/3/2022**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Vertex Resources Services, Inc.
Client Sample ID: BH22-09 2'
Project: Todd 24B Federal 2
Collection Date: 5/20/2022 11:00:00 AM
Lab ID: 2205A95-006 **Matrix:** SOIL
Received Date: 5/25/2022 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **ED**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	5/27/2022 8:14:41 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	5/27/2022 8:14:41 PM
Surr: DNOP	105	51.1-141		%Rec	1	5/27/2022 8:14:41 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **BRM**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	5/27/2022 8:48:00 PM
Surr: BFB	87.1	37.7-212		%Rec	1	5/27/2022 8:48:00 PM
EPA METHOD 8021B: VOLATILES						Analyst: **BRM**
Benzene	ND	0.024		mg/Kg	1	5/27/2022 8:48:00 PM
Toluene	ND	0.048		mg/Kg	1	5/27/2022 8:48:00 PM
Ethylbenzene	ND	0.048		mg/Kg	1	5/27/2022 8:48:00 PM
Xylenes, Total	ND	0.097		mg/Kg	1	5/27/2022 8:48:00 PM
Surr: 4-Bromofluorobenzene	85.9	70-130		%Rec	1	5/27/2022 8:48:00 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	6/1/2022 2:44:04 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	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 range due to dilution or matrix interference

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2205A95**

03-Jun-22

Client: Vertex Resources Services, Inc.

Project: Todd 24B Federal 2

Sample ID: **MB-67796**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS**	Batch ID: **67796**	RunNo: **88375**
Prep Date: **5/31/2022**	Analysis Date: **5/31/2022**	SeqNo: **3135693** Units: **mg/Kg**

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

Sample ID: **LCS-67796**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS**	Batch ID: **67796**	RunNo: **88375**
Prep Date: **5/31/2022**	Analysis Date: **6/1/2022**	SeqNo: **3135694** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.8	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix interference
B	Analyte detected in the associated Method Blank
E	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#: **2205A95**

03-Jun-22

Client: Vertex Resources Services, Inc.

Project: Todd 24B Federal 2

Sample ID: **MB-67680**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **67680**	RunNo: **88246**
Prep Date: **5/25/2022**	Analysis Date: **5/26/2022**	SeqNo: **3132682** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.3		10.00		93.1	51.1	141			

Sample ID: **LCS-67680**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **67680**	RunNo: **88246**
Prep Date: **5/25/2022**	Analysis Date: **5/26/2022**	SeqNo: **3132685** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.7		5.000		93.1	51.1	141			

Sample ID: **MB-67736**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **67736**	RunNo: **88246**
Prep Date: **5/26/2022**	Analysis Date: **5/27/2022**	SeqNo: **3133612** 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	11		10.00		108	51.1	141			

Sample ID: **LCS-67736**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **67736**	RunNo: **88246**
Prep Date: **5/26/2022**	Analysis Date: **5/27/2022**	SeqNo: **3133613** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	10	50.00	0	102	64.4	127			
Surr: DNOP	4.7		5.000		93.7	51.1	141			

Sample ID: **2205A95-005AMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BH22-09 0'**	Batch ID: **67736**	RunNo: **88246**
Prep Date: **5/26/2022**	Analysis Date: **5/27/2022**	SeqNo: **3133615** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	53	9.4	46.77	8.478	95.1	36.1	154			
Surr: DNOP	4.5		4.677		95.5	51.1	141			

Sample ID: **2205A95-005AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BH22-09 0'**	Batch ID: **67736**	RunNo: **88246**
Prep Date: **5/26/2022**	Analysis Date: **5/27/2022**	SeqNo: **3133616** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	9.1	45.29	8.478	93.8	36.1	154	3.84	33.9	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix interference
B	Analyte detected in the associated Method Blank
E	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#: **2205A95**

03-Jun-22

Client: Vertex Resources Services, Inc.

Project: Todd 24B Federal 2

Sample ID: **2205A95-005AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BH22-09 0'**	Batch ID: **67736**	RunNo: **88246**
Prep Date: **5/26/2022**	Analysis Date: **5/27/2022**	SeqNo: **3133616** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.3		4.529		94.5	51.1	141	0	0	

Sample ID: **MB-67735**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **67735**	RunNo: **88333**
Prep Date: **5/26/2022**	Analysis Date: **5/27/2022**	SeqNo: **3134442** 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	9.9		10.00		98.7	51.1	141			

Sample ID: **LCS-67735**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **67735**	RunNo: **88333**
Prep Date: **5/26/2022**	Analysis Date: **5/27/2022**	SeqNo: **3134443** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	49	10	50.00	0	97.2	64.4	127			
Surr: DNOP	4.6		5.000		92.0	51.1	141			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix interference
B	Analyte detected in the associated Method Blank
E	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#: **2205A95**

03-Jun-22

Client: Vertex Resources Services, Inc.

Project: Todd 24B Federal 2

Sample ID: **mb-67725**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **67725**	RunNo: **88348**
Prep Date: **5/26/2022**	Analysis Date: **5/27/2022**	SeqNo: **3133375** 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		99.8	37.7	212			

Sample ID: **lcs-67725**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **67725**	RunNo: **88348**
Prep Date: **5/26/2022**	Analysis Date: **5/27/2022**	SeqNo: **3133376** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	30	5.0	25.00	0	119	72.3	137			
Surr: BFB	2100		1000		210	37.7	212			

Sample ID: **lcs-67728**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **67728**	RunNo: **88349**
Prep Date: **5/26/2022**	Analysis Date: **5/27/2022**	SeqNo: **3133510** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	96.0	72.3	137			
Surr: BFB	1800		1000		184	37.7	212			

Sample ID: **mb-67728**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **67728**	RunNo: **88349**
Prep Date: **5/26/2022**	Analysis Date: **5/27/2022**	SeqNo: **3133511** 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	880		1000		87.5	37.7	212			

Sample ID: **2205a95-005ams**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **BH22-09 0'**	Batch ID: **67728**	RunNo: **88349**
Prep Date: **5/26/2022**	Analysis Date: **5/27/2022**	SeqNo: **3133513** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	4.7	23.72	0	108	70	130			
Surr: BFB	1900		948.8		200	37.7	212			

Sample ID: **2205a95-005amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **BH22-09 0'**	Batch ID: **67728**	RunNo: **88349**
Prep Date: **5/26/2022**	Analysis Date: **5/27/2022**	SeqNo: **3133514** Units: **mg/Kg**

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix interference
B	Analyte detected in the associated Method Blank
E	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#: **2205A95**

03-Jun-22

Client: Vertex Resources Services, Inc.

Project: Todd 24B Federal 2

Sample ID: **2205a95-005amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **BH22-09 0'**	Batch ID: **67728**	RunNo: **88349**
Prep Date: **5/26/2022**	Analysis Date: **5/27/2022**	SeqNo: **3133514** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	4.7	23.70	0	105	70	130	2.42	20	
Surr: BFB	1800		947.9		192	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 range due to dilution or matrix interference
B	Analyte detected in the associated Method Blank
E	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#: **2205A95**

03-Jun-22

Client: Vertex Resources Services, Inc.

Project: Todd 24B Federal 2

Sample ID: **mb-67725** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **PBS** Batch ID: **67725** RunNo: **88348**

Prep Date: **5/26/2022** Analysis Date: **5/27/2022** SeqNo: **3133428** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.0		1.000		104	70	130			

Sample ID: **LCS-67725** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **LCSS** Batch ID: **67725** RunNo: **88348**

Prep Date: **5/26/2022** Analysis Date: **5/27/2022** SeqNo: **3133429** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.95	0.025	1.000	0	94.8	80	120			
Toluene	0.98	0.050	1.000	0	97.7	80	120			
Ethylbenzene	0.98	0.050	1.000	0	97.9	80	120			
Xylenes, Total	3.0	0.10	3.000	0	98.7	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		101	70	130			

Sample ID: **lcs-67728** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **LCSS** Batch ID: **67728** RunNo: **88349**

Prep Date: **5/26/2022** Analysis Date: **5/27/2022** SeqNo: **3133559** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.93	0.025	1.000	0	93.2	80	120			
Toluene	0.94	0.050	1.000	0	94.5	80	120			
Ethylbenzene	0.92	0.050	1.000	0	91.9	80	120			
Xylenes, Total	2.7	0.10	3.000	0	91.2	80	120			
Surr: 4-Bromofluorobenzene	0.87		1.000		87.2	70	130			

Sample ID: **mb-67728** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **PBS** Batch ID: **67728** RunNo: **88349**

Prep Date: **5/26/2022** Analysis Date: **5/27/2022** SeqNo: **3133560** 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	0.89		1.000		88.7	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix interference
B	Analyte detected in the associated Method Blank
E	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#: **2205A95**

03-Jun-22

Client: Vertex Resources Services, Inc.

Project: Todd 24B Federal 2

Sample ID: **2205a95-006ams**	SampType: **MS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BH22-09 2'**	Batch ID: **67728**	RunNo: **88349**
Prep Date: **5/26/2022**	Analysis Date: **5/27/2022**	SeqNo: **3133563** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.95	0.024	0.9653	0	98.7	68.8	120			
Toluene	0.97	0.048	0.9653	0	100	73.6	124			
Ethylbenzene	0.95	0.048	0.9653	0	98.8	72.7	129			
Xylenes, Total	2.8	0.097	2.896	0	97.3	75.7	126			
Surr: 4-Bromofluorobenzene	0.84		0.9653		87.1	70	130			

Sample ID: **2205a95-006amsd**	SampType: **MSD**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BH22-09 2'**	Batch ID: **67728**	RunNo: **88349**
Prep Date: **5/26/2022**	Analysis Date: **5/27/2022**	SeqNo: **3133564** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.94	0.024	0.9718	0	96.7	68.8	120	1.33	20	
Toluene	0.95	0.049	0.9718	0	98.2	73.6	124	1.14	20	
Ethylbenzene	0.93	0.049	0.9718	0	96.1	72.7	129	2.05	20	
Xylenes, Total	2.8	0.097	2.915	0	95.7	75.7	126	0.893	20	
Surr: 4-Bromofluorobenzene	0.83		0.9718		85.9	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 range due to dilution or matrix interference
B	Analyte detected in the associated Method Blank
E	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: 2205A95

RcptNo: 1

Received By: Juan Rojas 5/25/2022 7:15:00 AM

Completed By: Sean Livingston 5/25/2022 8:53:16 AM

Reviewed By: jn 5/25/22

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: 5-25-22

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	0.3	Good	Not Present			

Chain-of-Custody Record

Client: Vertex (Devon)

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: Todd 24B Federal #2

Project #: 21E-02816

Project Manager: Monica Peppin mpeppin@vertex.ca

Sampler: Sally Carthar

On Ice: ☑ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 0.3-0=0.3 (°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. 2205A95	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)
5/20	8:50	Soil	BH22-07 0'	1 4oz jar	Ice	001	✓	✓					✓			
	9:00		BH22-07 2'			002										
	9:10		BH22-08 0'			003										
	9:20		BH22-08 2'			004										
	10:50		BH22-09 0'			005										
	11:00		BH22-09 2'	(Heal)		006										

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
5/24	1:15	Sally Carthar			5/24/22	1030
5/24/22	1900				5/25/22	7:15

Remarks: Send invoice to Laura Calderwood and Dale Woodard

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

March 03, 2023

Kent Stallings

Devon Energy
6488 Seven Rivers Highway
Artesia, NM 88210
TEL: (505) 350-1336
FAX:

RE: Todd 24B Federal 2 OrderNo.: 2302857

Dear Kent Stallings:

Hall Environmental Analysis Laboratory received 7 sample(s) on 2/21/2023 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 **2302857**
Date Reported: **3/3/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24B Federal 2
Lab ID: 2302857-001 **Matrix:** SOIL

Client Sample ID: BH22-03 2ft
Collection Date: 2/17/2023 10:00:00 AM
Received Date: 2/21/2023 7:20:00 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	2/27/2023 7:13:23 PM
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	2/27/2023 7:13:23 PM
Surr: DNOP	98.0	69-147		%Rec	1	2/27/2023 7:13:23 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	2/25/2023 7:31:29 AM
Surr: BFB	95.5	37.7-212		%Rec	1	2/25/2023 7:31:29 AM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024		mg/Kg	1	2/25/2023 7:31:29 AM
Toluene	ND	0.047		mg/Kg	1	2/25/2023 7:31:29 AM
Ethylbenzene	ND	0.047		mg/Kg	1	2/25/2023 7:31:29 AM
Xylenes, Total	ND	0.095		mg/Kg	1	2/25/2023 7:31:29 AM
Surr: 4-Bromofluorobenzene	90.5	70-130		%Rec	1	2/25/2023 7:31:29 AM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	2/25/2023 6:26:48 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
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 **2302857**
Date Reported: **3/3/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24B Federal 2
Lab ID: 2302857-002 **Matrix:** SOIL

Client Sample ID: BH22-03 4ft
Collection Date: 2/17/2023 10:05:00 AM
Received Date: 2/21/2023 7:20:00 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	2/27/2023 7:45:05 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	2/27/2023 7:45:05 PM
Surr: DNOP	102	69-147		%Rec	1	2/27/2023 7:45:05 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	2/25/2023 10:14:58 AM
Surr: BFB	95.8	37.7-212		%Rec	1	2/25/2023 10:14:58 AM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024		mg/Kg	1	2/25/2023 10:14:58 AM
Toluene	ND	0.048		mg/Kg	1	2/25/2023 10:14:58 AM
Ethylbenzene	ND	0.048		mg/Kg	1	2/25/2023 10:14:58 AM
Xylenes, Total	ND	0.097		mg/Kg	1	2/25/2023 10:14:58 AM
Surr: 4-Bromofluorobenzene	90.4	70-130		%Rec	1	2/25/2023 10:14:58 AM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	2/25/2023 7:04:03 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
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 **2302857**
Date Reported: **3/3/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24B Federal 2
Lab ID: 2302857-003 **Matrix:** SOIL

Client Sample ID: BH22-01 4ft
Collection Date: 2/17/2023 10:10:00 AM
Received Date: 2/21/2023 7:20:00 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	2/27/2023 8:17:04 PM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	2/27/2023 8:17:04 PM
Surr: DNOP	104	69-147		%Rec	1	2/27/2023 8:17:04 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	2/25/2023 11:25:28 AM
Surr: BFB	97.3	37.7-212		%Rec	1	2/25/2023 11:25:28 AM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024		mg/Kg	1	2/25/2023 11:25:28 AM
Toluene	ND	0.048		mg/Kg	1	2/25/2023 11:25:28 AM
Ethylbenzene	ND	0.048		mg/Kg	1	2/25/2023 11:25:28 AM
Xylenes, Total	ND	0.097		mg/Kg	1	2/25/2023 11:25:28 AM
Surr: 4-Bromofluorobenzene	92.1	70-130		%Rec	1	2/25/2023 11:25:28 AM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	2/25/2023 7:41:16 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical 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 **2302857**
Date Reported: **3/3/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24B Federal 2
Lab ID: 2302857-004 **Matrix:** SOIL

Client Sample ID: BH22-10 0ft
Collection Date: 2/17/2023 10:15:00 AM
Received Date: 2/21/2023 7:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **DGH**
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	2/27/2023 8:27:48 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	2/27/2023 8:27:48 PM
Surr: DNOP	108	69-147		%Rec	1	2/27/2023 8:27:48 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	2/25/2023 12:36:21 PM
Surr: BFB	98.2	37.7-212		%Rec	1	2/25/2023 12:36:21 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.024		mg/Kg	1	2/25/2023 12:36:21 PM
Toluene	ND	0.049		mg/Kg	1	2/25/2023 12:36:21 PM
Ethylbenzene	ND	0.049		mg/Kg	1	2/25/2023 12:36:21 PM
Xylenes, Total	ND	0.098		mg/Kg	1	2/25/2023 12:36:21 PM
Surr: 4-Bromofluorobenzene	93.2	70-130		%Rec	1	2/25/2023 12:36:21 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	61		mg/Kg	20	2/25/2023 7:53:41 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
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 **2302857**
Date Reported: **3/3/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24B Federal 2
Lab ID: 2302857-005 **Matrix:** SOIL

Client Sample ID: BH22-10 2ft
Collection Date: 2/17/2023 10:20:00 AM
Received Date: 2/21/2023 7:20:00 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	2/27/2023 8:38:32 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	2/27/2023 8:38:32 PM
Surr: DNOP	106	69-147		%Rec	1	2/27/2023 8:38:32 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	2/25/2023 1:00:03 PM
Surr: BFB	99.5	37.7-212		%Rec	1	2/25/2023 1:00:03 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.025		mg/Kg	1	2/25/2023 1:00:03 PM
Toluene	ND	0.050		mg/Kg	1	2/25/2023 1:00:03 PM
Ethylbenzene	ND	0.050		mg/Kg	1	2/25/2023 1:00:03 PM
Xylenes, Total	ND	0.099		mg/Kg	1	2/25/2023 1:00:03 PM
Surr: 4-Bromofluorobenzene	93.0	70-130		%Rec	1	2/25/2023 1:00:03 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	2/25/2023 8:30:55 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical 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 **2302857**
Date Reported: **3/3/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24B Federal 2
Lab ID: 2302857-006 **Matrix:** SOIL

Client Sample ID: BH22-11 0ft
Collection Date: 2/17/2023 10:25:00 AM
Received Date: 2/21/2023 7:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **JME**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	3/2/2023 8:55:02 AM
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	3/2/2023 8:55:02 AM
Surr: DNOP	116	69-147		%Rec	1	3/2/2023 8:55:02 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	2/25/2023 1:23:47 PM
Surr: BFB	99.9	37.7-212		%Rec	1	2/25/2023 1:23:47 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.023		mg/Kg	1	2/25/2023 1:23:47 PM
Toluene	ND	0.046		mg/Kg	1	2/25/2023 1:23:47 PM
Ethylbenzene	ND	0.046		mg/Kg	1	2/25/2023 1:23:47 PM
Xylenes, Total	ND	0.092		mg/Kg	1	2/25/2023 1:23:47 PM
Surr: 4-Bromofluorobenzene	94.2	70-130		%Rec	1	2/25/2023 1:23:47 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	2/25/2023 8:43:20 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of 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 **2302857**
Date Reported: **3/3/2023**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Devon Energy
Project: Todd 24B Federal 2
Lab ID: 2302857-007 **Matrix:** SOIL

Client Sample ID: BH22-12 0ft
Collection Date: 2/17/2023 10:30:00 AM
Received Date: 2/21/2023 7:20:00 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	2/27/2023 9:00:02 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	2/27/2023 9:00:02 PM
Surr: DNOP	104	69-147		%Rec	1	2/27/2023 9:00:02 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **JJP**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	2/25/2023 1:47:34 PM
Surr: BFB	98.2	37.7-212		%Rec	1	2/25/2023 1:47:34 PM
EPA METHOD 8021B: VOLATILES						Analyst: **JJP**
Benzene	ND	0.023		mg/Kg	1	2/25/2023 1:47:34 PM
Toluene	ND	0.047		mg/Kg	1	2/25/2023 1:47:34 PM
Ethylbenzene	ND	0.047		mg/Kg	1	2/25/2023 1:47:34 PM
Xylenes, Total	ND	0.094		mg/Kg	1	2/25/2023 1:47:34 PM
Surr: 4-Bromofluorobenzene	91.9	70-130		%Rec	1	2/25/2023 1:47:34 PM
EPA METHOD 300.0: ANIONS						Analyst: **JMT**
Chloride	ND	60		mg/Kg	20	2/25/2023 8:55:45 AM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of 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#: **2302857**
03-Mar-23

Client: Devon Energy
Project: Todd 24B Federal 2

Sample ID: **MB-73383**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS**	Batch ID: **73383**	RunNo: **94885**
Prep Date: **2/25/2023**	Analysis Date: **2/25/2023**	SeqNo: **3429558** Units: **mg/Kg**

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

Sample ID: **LCS-73383**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS**	Batch ID: **73383**	RunNo: **94885**
Prep Date: **2/25/2023**	Analysis Date: **2/25/2023**	SeqNo: **3429559** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	96.6	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#: **2302857**

03-Mar-23

Client: Devon Energy

Project: Todd 24B Federal 2

Sample ID: **LCS-73309**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **73309**	RunNo: **94848**
Prep Date: **2/22/2023**	Analysis Date: **2/23/2023**	SeqNo: **3427958** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	40	10	50.00	0	79.7	61.9	130			
Surr: DNOP	3.7		5.000		73.3	69	147			

Sample ID: **MB-73309**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **73309**	RunNo: **94848**
Prep Date: **2/22/2023**	Analysis Date: **2/23/2023**	SeqNo: **3427961** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.3		10.00		83.1	69	147			

Sample ID: **LCS-73337**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **73337**	RunNo: **94894**
Prep Date: **2/23/2023**	Analysis Date: **2/27/2023**	SeqNo: **3430270** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	40	10	50.00	0	80.6	61.9	130			
Surr: DNOP	3.7		5.000		74.8	69	147			

Sample ID: **MB-73337**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **73337**	RunNo: **94894**
Prep Date: **2/23/2023**	Analysis Date: **2/27/2023**	SeqNo: **3430276** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.2		10.00		91.7	69	147			

Sample ID: **2302857-002AMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **BH22-03 4ft**	Batch ID: **73337**	RunNo: **94894**
Prep Date: **2/23/2023**	Analysis Date: **2/27/2023**	SeqNo: **3431125** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	42	9.6	47.89	0	86.8	54.2	135			
Surr: DNOP	4.4		4.789		92.7	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#: **2302857**

03-Mar-23

Client: Devon Energy

Project: Todd 24B Federal 2

Sample ID: **2302857-002AMSD** SampType: **MSD** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **BH22-03 4ft** Batch ID: **73337** RunNo: **94894**

Prep Date: **2/23/2023** Analysis Date: **2/27/2023** SeqNo: **3431126** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	38	9.0	45.17	0	83.4	54.2	135	9.80	29.2	
Surr: DNOP	4.0		4.517		87.8	69	147	0	0	

Sample ID: **MB-73474** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **PBS** Batch ID: **73474** RunNo: **94965**

Prep Date: **3/2/2023** Analysis Date: **3/2/2023** SeqNo: **3434009** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	8.4		10.00		84.0	69	147			

Sample ID: **LCS-73474** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **LCSS** Batch ID: **73474** RunNo: **94965**

Prep Date: **3/2/2023** Analysis Date: **3/2/2023** SeqNo: **3434010** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.5		5.000		90.1	69	147			

Sample ID: **MB-73456** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **PBS** Batch ID: **73456** RunNo: **94965**

Prep Date: **3/1/2023** Analysis Date: **3/2/2023** SeqNo: **3434451** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	11		10.00		113	69	147			

Sample ID: **LCS-73456** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **LCSS** Batch ID: **73456** RunNo: **94965**

Prep Date: **3/1/2023** Analysis Date: **3/2/2023** SeqNo: **3434452** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	5.0		5.000		100	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#: **2302857**

03-Mar-23

Client: Devon Energy

Project: Todd 24B Federal 2

Sample ID: **2302857-002ams**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **BH22-03 4ft**	Batch ID: **73320**	RunNo: **94858**
Prep Date: **2/22/2023**	Analysis Date: **2/25/2023**	SeqNo: **3429423** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	4.8	24.06	0	94.4	70	130			
Surr: BFB	1900		962.5		194	37.7	212			

Sample ID: **2302857-002amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **BH22-03 4ft**	Batch ID: **73320**	RunNo: **94858**
Prep Date: **2/22/2023**	Analysis Date: **2/25/2023**	SeqNo: **3429424** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	4.8	24.18	0	93.8	70	130	0.113	20	
Surr: BFB	1900		967.1		195	37.7	212	0	0	

Sample ID: **lcs-73299**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **73299**	RunNo: **94858**
Prep Date: **2/21/2023**	Analysis Date: **2/24/2023**	SeqNo: **3429444** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	95.1	72.3	137			
Surr: BFB	1900		1000		191	37.7	212			

Sample ID: **lcs-73320**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **73320**	RunNo: **94858**
Prep Date: **2/22/2023**	Analysis Date: **2/25/2023**	SeqNo: **3429445** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	91.2	72.3	137			
Surr: BFB	1900		1000		191	37.7	212			

Sample ID: **mb-73299**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **73299**	RunNo: **94858**
Prep Date: **2/21/2023**	Analysis Date: **2/24/2023**	SeqNo: **3429446** 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	980		1000		98.2	37.7	212			

Sample ID: **mb-73320**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **73320**	RunNo: **94858**
Prep Date: **2/22/2023**	Analysis Date: **2/25/2023**	SeqNo: **3429447** 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#: **2302857**
03-Mar-23

Client: Devon Energy
Project: Todd 24B Federal 2

Sample ID: **mb-73320**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **PBS**	Batch ID: **73320**	RunNo: **94858**							
Prep Date: **2/22/2023**	Analysis Date: **2/25/2023**	SeqNo: **3429447**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	970		1000		96.8	37.7	212			

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#: **2302857**

03-Mar-23

Client: Devon Energy

Project: Todd 24B Federal 2

Sample ID: **2302857-003ams**	SampType: **MS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BH22-01 4ft**	Batch ID: **73320**	RunNo: **94858**
Prep Date: **2/22/2023**	Analysis Date: **2/25/2023**	SeqNo: **3429471** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.86	0.024	0.9625	0	89.2	68.8	120			
Toluene	0.89	0.048	0.9625	0.01736	90.3	73.6	124			
Ethylbenzene	0.87	0.048	0.9625	0	90.8	72.7	129			
Xylenes, Total	2.6	0.096	2.887	0	91.7	75.7	126			
Surr: 4-Bromofluorobenzene	0.91		0.9625		94.7	70	130			

Sample ID: **2302857-003amsd**	SampType: **MSD**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **BH22-01 4ft**	Batch ID: **73320**	RunNo: **94858**
Prep Date: **2/22/2023**	Analysis Date: **2/25/2023**	SeqNo: **3429472** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.87	0.024	0.9653	0	89.7	68.8	120	0.815	20	
Toluene	0.89	0.048	0.9653	0.01736	90.6	73.6	124	0.538	20	
Ethylbenzene	0.88	0.048	0.9653	0	91.4	72.7	129	0.937	20	
Xylenes, Total	2.6	0.097	2.896	0	91.2	75.7	126	0.280	20	
Surr: 4-Bromofluorobenzene	0.91		0.9653		94.1	70	130	0	0	

Sample ID: **LCS-73299**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **73299**	RunNo: **94858**
Prep Date: **2/21/2023**	Analysis Date: **2/24/2023**	SeqNo: **3429488** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.92	0.025	1.000	0	91.5	80	120			
Toluene	0.94	0.050	1.000	0	93.7	80	120			
Ethylbenzene	0.93	0.050	1.000	0	92.9	80	120			
Xylenes, Total	2.8	0.10	3.000	0	93.2	80	120			
Surr: 4-Bromofluorobenzene	0.96		1.000		95.6	70	130			

Sample ID: **LCS-73320**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **73320**	RunNo: **94858**
Prep Date: **2/22/2023**	Analysis Date: **2/25/2023**	SeqNo: **3429489** 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	88.4	80	120			
Toluene	0.90	0.050	1.000	0	90.2	80	120			
Ethylbenzene	0.89	0.050	1.000	0	89.3	80	120			
Xylenes, Total	2.7	0.10	3.000	0	89.9	80	120			
Surr: 4-Bromofluorobenzene	0.95		1.000		94.6	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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2302857**

03-Mar-23

Client: Devon Energy

Project: Todd 24B Federal 2

Sample ID: **mb-73299**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **73299**	RunNo: **94858**
Prep Date: **2/21/2023**	Analysis Date: **2/24/2023**	SeqNo: **3429490** 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	0.94		1.000		93.5	70	130			

Sample ID: **mb-73320**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **73320**	RunNo: **94858**
Prep Date: **2/22/2023**	Analysis Date: **2/25/2023**	SeqNo: **3429491** 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	0.92		1.000		92.0	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical 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: Devon Energy | Work Order Number: 2302857 | RcptNo: 1

Received By: Tracy Casarrubias 2/21/2023 7:20:00 AM

Completed By: Tracy Casarrubias 2/21/2023 9:17:23 AM

Reviewed By: JR 2-21-23

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 2/21/23

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	5.2	Good	Yes	Yogi		
2	5.4	Good	Yes	Yogi		

Chain-of-Custody Record

Client: Devon Energy (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: Todd 24B Federal 2

Project #: 22E-02816-16

Project Manager: Kent Stallings

Sampler: Fernando Rodriguez

On Ice: ☒ Yes ☐ No

# of Coolers: 2

Cooler Temp(including CF): 5.3 -0.1 =5.2 (°C)
5.5 -0.1 =5.4 °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. 2302957	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)
2/1	10:00	Soil	BH22-03 2ft	4oz jar	Ice	001	✓	✓					✓			
	10:05		BH22-03 4ft			002	✓	✓					✓			
	10:10		BH22-01 4ft			003	✓	✓					✓			
	10:15		BH22-10 0ft			004	✓	✓					✓			
	10:20		BH22-10 2ft			005	✓	✓					✓			
	10:25		BH22-11 0ft			006	✓	✓					✓			
	10:30		BH22-12 0ft			007	✓	✓					✓			

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
2/1	18:00				2/20/23	900
2/20/23	1900			Courier	2/21/23	7:20

Remarks: cc: Kent Stalling & Fernando Rodriguez

Direct Bill to Devon

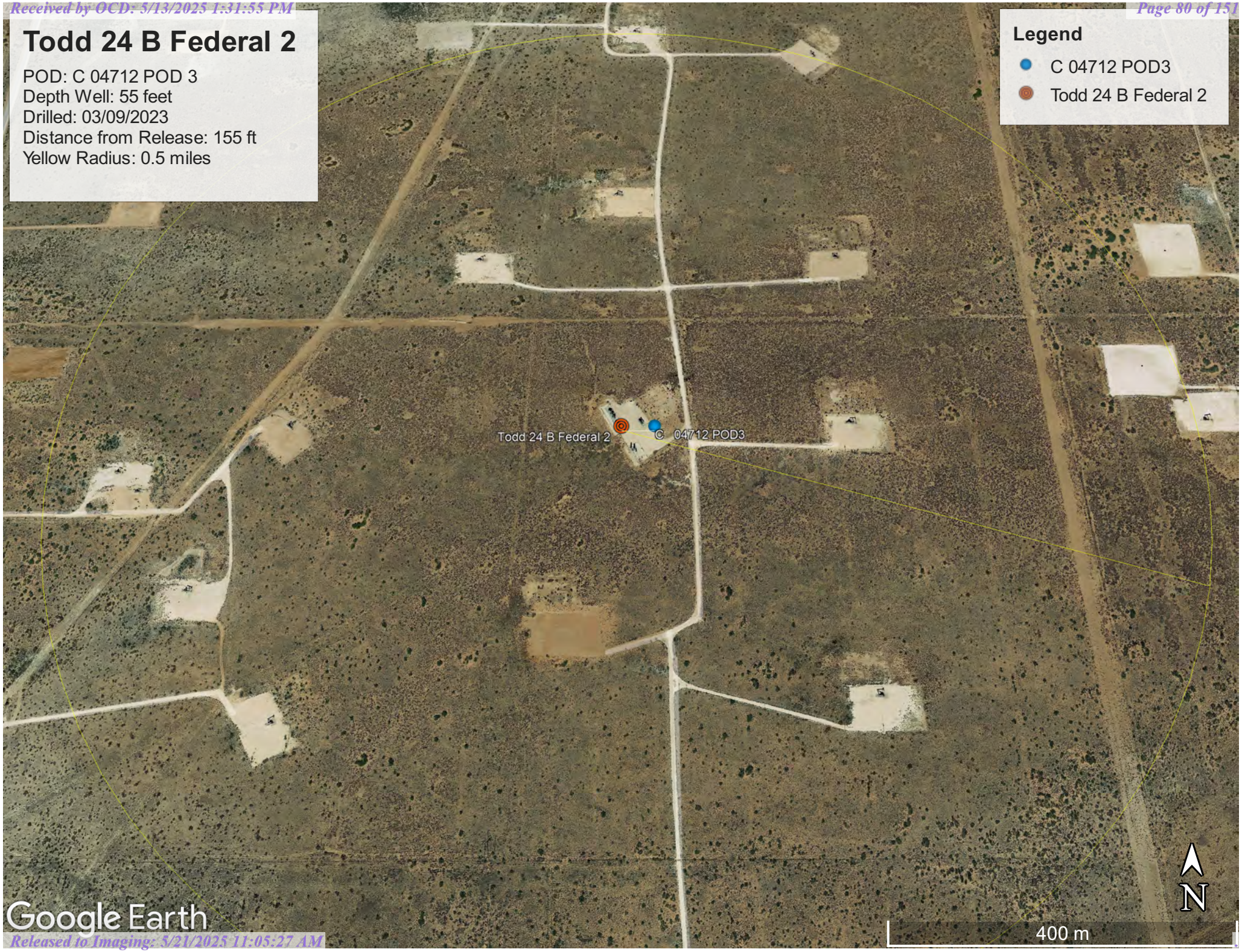
If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

ATTACHMENT 5

Closure Criteria Worksheet				
Site Name: Todd 24 B Federal #002				
Spill Coordinates:		X: 32.2952957	Y: -103.7293777	
Site Specific Conditions		Value	Unit	Reference
1	Depth to Groundwater	**56**	feet	1
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	15,259	feet	2
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	10,190	feet	3
4	Within 300 feet from an occupied residence, school, hospital, institution or church	28,100	feet	4
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**	8,421	feet	5
	ii) Within 1000 feet of any fresh water well or spring	8,421	feet	5
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)	6
7	Within 300 feet of a wetland	20,222	feet	7
8	Within the area overlying a subsurface mine	No	(Y/N)	8
9	Within an unstable area (Karst Map)	Low	Critical High Medium Low	9
10	Within a 100-year Floodplain	500	year	10
11	Soil Type	Loamy fine sand, sandy clay loam		11
12	Ecological Classification	Loamy sand		12
13	Geology	Eolian and piedmont deposits		13
NMAC 19.15.29.12 E (Table 1) Closure Criteria		51-100'	<50' 51-100' >100'	

Todd 24 B Federal 2

POD: C 04712 POD 3
Depth Well: 55 feet
Drilled: 03/09/2023
Distance from Release: 155 ft
Yellow Radius: 0.5 miles



OSE POD 0.5 mile

6/16/2023, 5:45:59 AM

GIS WATERS PODs

Active

OSE District Boundary

Water Right Regulations

Closure Area

New Mexico State Trust Lands

Subsurface Estate

SiteBoundaries

1:18,056

0 0.17 0.35 0.7 mi

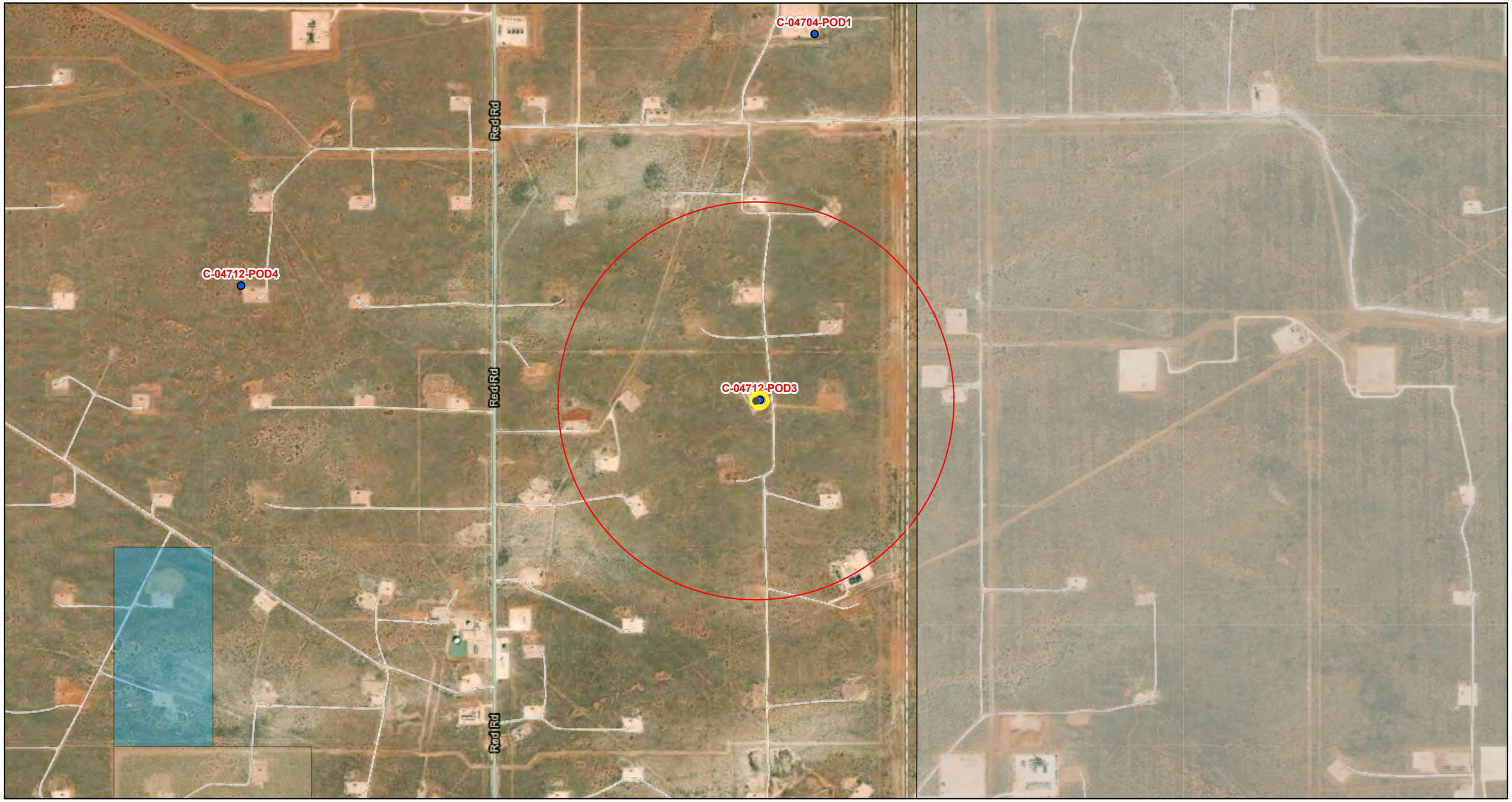
0 0.28 0.55 1.1 km

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.

OSE POD 0.5 mile



6/16/2023, 5:50:41 AM

GIS WATERS PODs
- Active
- OSE District Boundary

Water Right Regulations
- Closure Area

New Mexico State Trust Lands
- Subsurface Estate
- Both Estates
- SiteBoundaries

1:18,056

0 0.17 0.35 0.7 mi

0 0.3 0.6 1.2 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 Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Twn	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
C 04712 POD3		CUB	ED	4	1	2	24	23S	31E	619651	3573877	15	55		
C 04704 POD1		CUB	ED	3	2	2	13	23S	31E	619854	3575363	1502			
C 04712 POD4		CUB	ED	1	4	3	14	23S	31E	617535	3574316	2145	55		
C 02258		C	ED		3	2	26	23S	31E	618055	3571853*	2567	662		
C 02777		CUB	ED	4	4	4	10	23S	31E	616974	3575662	3204	890		
C 03749 POD1		CUB	ED		2	2	15	23S	31E	616974	3575662	3204	865	639	226
C 02348		C	ED	1	4	3	26	23S	31E	617648	3571068	3441	700	430	270
C 03851 POD1		CUB	LE	3	3	4	20	23S	32E	622880	3572660	3465	1392	713	679
C 04712 POD2		CUB	LE	4	4	4	17	23S	32E	623332	3574331	3724	55		
C 04712 POD1		CUB	LE	1	4	1	31	23S	32E	620917	3570289	3810	55		
C 03529 POD1		C	LE	2	4	3	29	23S	32E	622651	3571212	4024	550		
C 04709 POD1		CUB	ED	3	1	1	15	23S	31E	615509	3575262	4352			
C 04726 POD1		CUB	ED	1	1	4	01	23S	31E	619538	3578821	4945			

Average Depth to Water: **594 feet**
Minimum Depth: **430 feet**
Maximum Depth: **713 feet**

Record Count: 13

UTMNAD83 Radius Search (in meters):

Easting (X): 619635 **Northing (Y):** 3573877 **Radius:** 5000

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

New Mexico Office of the State Engineer

Active & Inactive Points of Diversion

(with Ownership Information)

(acre ft per annum) (R=POD has been replaced and no longer serves this file, C=the file is closed) (quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest) (NAD83 UTM in me

WR File Nbr	Sub basin	Use	Diversion	Owner	County	POD Number	Well Tag	Code	Grant	Source	q 64	q 16	q 4	Sec	Twn	Rng	X	Y
C 04712	CUB	MON	0	VERTEX RESOURCES	ED	C 04712 POD3	NA				4	1	2	24	23S	31E	619650	3573877
C 04704	CUB	MON	0	DEVON ENERGY	ED	C 04704 POD1	NA				3	2	2	13	23S	31E	619854	3575363
C 04712	CUB	MON	0	HARVARD PETROLEUM COMPANY LLC	ED	C 04712 POD4	NA				1	4	3	14	23S	31E	617535	3574316
C 02258	C	PRO	0	DEVON ENERGY CORP.(NEVADA)	ED	C 02258						3	2	26	23S	31E	618055	3571853*
C 02777	CUB	MON	0	US DEPT OF ENERGY WIPP	ED	C 02777					4	4	4	10	23S	31E	616973	3575662
C 03749	CUB	MON	0	US DEPARTMENT OF ENERGY	ED	C 03749 POD1				Shallow		2	2	15	23S	31E	616973	3575662
C 02602	C	SAN	0	POGO PRODUCING COMPANY	ED	C 02602						2	2	35	23S	31E	618471	3570650*
C 02348	C	STK	3	NGL WATER SOLUTIONS PERMIAN	ED	C 02348				Shallow	1	4	3	26	23S	31E	617647	3571068
C 03851	CUB	MON	0	US DEPARTMENT OF ENERGY	LE	C 03851 POD1				Artesian	3	3	4	20	23S	32E	622879	3572660
C 04712	CUB	MON	0	VERTEX RESOURCES	LE	C 04712 POD2	NA				4	4	4	17	23S	32E	623331	3574331
					LE	C 04712 POD1					1	4	1	31	23S	32E	620917	3570289
C 03529	C	STK	0	ANNETTE MCCLOY	LE	C 03529 POD1					2	4	3	29	23S	32E	622651	3571212
C 04703	CUB	MON	0	DEVON ENERGY PRODUCTION CO.	LE	C 04703 POD1	NA				1	4	4	08	26S	32E	623195	3576072
C 04724	CUB	MON	0	DEVON ENERGY	ED	C 04724 POD1	NA				4	3	3	10	23S	31E	615709	3575738
C 04709	CUB	MON	0	DEVON ENERGY	ED	C 04709 POD1	NA				3	1	1	15	23S	31E	615508	3575262
C 04746	CUB	MON	0	DEVON ENERGY RESOURCES	ED	C 04746 POD1	NA				3	4	3	36	23S	31E	619225	3569417
C 04726	CUB	MON	0	DEVON ENERGY	ED	C 04726 POD1	NA				1	1	4	01	23S	31E	619538	3578821

Record Count: 17

UTMNAD83 Radius Search (in meters):

Easting (X): 619635 **Northing (Y):** 3573877 **Radius:** 5000

Sorted by: Distance

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

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
NA	C 04712 POD3	4	1	2	24	23S	31E	619651	3573877

Driller License:	1833	**Driller Company:**	VISION RESOURCES, INC		
Driller Name:	JASON MALEY				
Drill Start Date:	03/09/2023	**Drill Finish Date:**	03/09/2023	**Plug Date:**	03/14/2023
Log File Date:	04/04/2023	**PCW Rcv Date:**		**Source:**	
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	
Casing Size:	6.00	**Depth Well:**	55 feet	**Depth Water:**	

New Mexico Office of the State Engineer
Water Right Summary

get image list

WR File Number: C 04712 **Subbasin:** CUB **Cross Reference:** -

Primary Purpose: MON MONITORING WELL

Primary Status: PMT PERMIT

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

Total Diversion: 0 **Cause/Case:** -

Owner: VERTEX RESOURCES

User: HARVARD PETROLEUM COMPANY LLC

Contact: JUSTIN WARREN

Documents on File

	Trn #	Doc	File/Act	Status 1	Status 2	Transaction Desc.	From/ To	Acres	Diversion	Consumptive
get images	743189	EXPL	2023-02-21	PMT	APR	C 04712 POD1-6	T	0	0	

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 04712 POD1	NA		1	4	1	31	23S	32E	620917	3570289	SDE
C 04712 POD2	NA		4	4	4	17	23S	32E	623332	3574331	TOMCAT17
C 04712 POD3	NA		4	1	2	24	23S	31E	619651	3573877	TODD24
C 04712 POD4	NA		1	4	3	14	23S	31E	617535	3574316	TODD14
C 04712 POD5	NA		4	4	3	09	23S	31E	614393	3575754	NPG9
C 04712 POD6	NA		3	3	4	08	23S	31E	613147	3575740	NPG8

New Mexico Office of the State Engineer

Transaction Summary

EXPL Permit To Explore

Transaction Number: 743189 **Transaction Desc:** C 04712 POD1-6 **File Date:** 12/14/2022

Primary Status: PMT Permit
Secondary Status: APR Approved
Person Assigned: *******
Applicant: VERTEX RESOURCES
User: HARVARD PETROLEUM COMPANY LLC
Contact: JUSTIN WARREN

Events

	Date	Type	Description	Comment	Processed By
get images	12/14/2022	APP	Application Received	*	*******
get images	02/07/2023	TEC	Technical Report	*PLG PLN OPS C	*******
	02/21/2023	FTN	Finalize non-published Trans.		*******
	03/09/2023	QAT	Quality Assurance Completed	DATA	*******
	03/14/2023	QAT	Quality Assurance Completed	IMAGE	*******
get images	04/04/2023	LOG	Well Log Received	*C-4712-POD1 DRY	*******
	04/04/2023	DRY	Dry well log received	C-4712 POD1 DRY	*******
get images	04/04/2023	LOG	Well Log Received	*C-4712-POD2 DRY	*******
	04/04/2023	DRY	Dry well log received	C-4712-POD2 DRY	*******
get images	04/04/2023	LOG	Well Log Received	*C-4712-POD3 DRY	*******
	04/04/2023	DRY	Dry well log received	C-4712-POD3 DRY	*******
get images	04/04/2023	LOG	Well Log Received	*C-4712-POD4 DRY	*******
	04/04/2023	DRY	Dry well log received	C-4712-POD4 DRY	*******
get images	04/04/2023	LOG	Well Log Received	*C-4712-POD5 DRY	*******
	04/04/2023	DRY	Dry well log received	C-4712-POD5 DRY	*******
get images	04/04/2023	LOG	Well Log Received	*C-4712-POD6 DRY	*******
	04/04/2023	DRY	Dry well log received	C-4712-POD6 DRY	*******

get images	04/04/2023	LGI	Well Log Image	*PLG RECORD C-	*******
get images	04/04/2023	LGI	Well Log Image	*PLG RECORD C-	*******
get images	04/04/2023	LGI	Well Log Image	*PLG RECORD C-	*******
get images	04/04/2023	LGI	Well Log Image	*PLG RECORD C-	*******
get images	04/04/2023	LGI	Well Log Image	*PLG RECORD C-	*******
get images	04/04/2023	LGI	Well Log Image	*PLG RECORD C-	*******
	05/24/2023	QAT	Quality Assurance Completed	DATA WR C-4712	*******
	05/24/2023	QAT	Quality Assurance Completed	DATA PLG RECORD	*******
	06/08/2023	QAT	Quality Assurance Completed	DATA LOG POD1	*******
	06/08/2023	QAT	Quality Assurance Completed	DATA LOG POD2	*******
	06/08/2023	QAT	Quality Assurance Completed	DATA LOG POD3	*******
	06/08/2023	QAT	Quality Assurance Completed	DATA LOG POD4	*******
	06/08/2023	QAT	Quality Assurance Completed	DATA LOG POD5	*******
	06/08/2023	QAT	Quality Assurance Completed	DATA LOG POD6	*******
	06/12/2023	QAT	Quality Assurance Completed	IMAGE	*******

Water Right Information

WR File Nbr	Acres	Diversion	Consumptive	Purpose of Use
C 04712	0	0		MON MONITORING WELL
**Point of Diversion				
C 04712 POD2		623332	3574331	
C 04712 POD1		620917	3570289	
C 04712 POD3		619651	3573877	
C 04712 POD6		613090	3576220	
C 04712 POD4		617535	3574316	
C 04712 POD5		614393	3575754	

Conditions

1A	Depth of the well shall not exceed the thickness of the valley fill.
4	No water shall be appropriated and beneficially used under this permit.
B	The well shall be drilled by a driller licensed in the State of New Mexico in accordance with 72-12-12 NMSA 1978. A licensed driller shall not be required

for the construction of a well driven without the use of a drill rig, provided that the casing shall not exceed two and three-eighths (2 3/8) inches outside diameter.

C The well driller must file the well record with the State Engineer and the applicant within 30 days after the well is drilled or driven. It is the well owner's responsibility to ensure that the well driller files the well record. The well driller may obtain the well record form from any District Office or the Office of the State Engineer website.

6 The well authorized by this permit shall be plugged completely using the following method per Rules and Regulations Governing Well Driller Licensing, Construction, Repair and Plugging of Wells; Subsection C of 19.27.4.30 NMAC unless an alternative plugging method is proposed by the well owner and approved by the State Engineer upon completion of the permitted use. All pumping appurtenance shall be removed from the well prior to plugging. To plug a well, the entire well shall be filled from the bottom upwards to ground surface using a tremie pipe. The bottom of the tremie shall remain submerged in the sealant throughout the entire sealing process; other placement methods may be acceptable

7 The Permittee shall utilize the highest and best technology available to ensure conservation of water to the maximum extent practical.

16 Construction of a water well by anyone without a valid New Mexico Well Driller License is illegal, and the landowner shall bear the cost of plugging the well by a licensed New Mexico well driller. This does not apply to driven wells, the casing of which does not exceed two and three-eighths inches outside diameter.

P The well shall be constructed, maintained, and operated to prevent inter-aquifer exchange of water and to prevent loss of hydraulic head between hydrogeologic zones.

Q The State Engineer retains jurisdiction over this permit.

R Pursuant to section 72-8-1 NMSA 1978, the permittee shall allow the State Engineer and OSE representatives entry upon private property for the performance of their respective duties, including access to the ditch or acequia to measure flow and also to the well for meter reading and water level measurement.

Action of the State Engineer

IT IS THE PERMITTEE'S RESPONSIBILITY TO OBTAIN ALL AUTHORIZATIONS AND PERMISSIONS TO DRILL ON PROPERTY OF OTHER OWNERSHIP BEFORE COMMENCING ACTIVITIES UNDER THIS PERMIT.

**** See Image For Any Additional Conditions of Approval ****

Approval Code: A - Approved

Action Date: 02/21/2023

Log Due Date: 02/21/2024

State Engineer: Mike A. Hamman, P.

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NO. (WELL NO.)	WELL TAG ID NO.	OSE FILE NO(S).
~~C-04712~~ POD3		C-4712

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Harvard Petroleum Company	

WELL OWNER MAILING ADDRESS	CITY	STATE	ZIP
P.O. Box 936	Roswell	NM	88202

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	17	43.1	N
	LONGITUDE	103	43	45.2	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND
* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS – PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
1833	Jason Maley	Vision Resources

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
3-9-2023	3-9-2023	55	55	Dry

COMPLETED WELL IS: ☐ ARTESIAN *add Centralizer info below ☑ DRY HOLE ☐ SHALLOW (UNCONFINED)

STATIC WATER LEVEL IN COMPLETED WELL (FT): Dry

DATE STATIC MEASURED: Dry

DRILLING FLUID: ☑ AIR ☐ MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ☑ ROTARY ☐ HAMMER ☐ CABLE TOOL ☐ OTHER – SPECIFY:

CHECK HERE IF PITLESS ADAPTER IS INSTALLED ☐

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	45	6"	2" PVC Sch 40	Thread	2"	Sch 40	—
45	55	6"	2" PVC Sch 40 (screen)	Thread	2"	Sch 40	.02

OSE DIV APR 4 2023 PM 1:23

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL *(if using Centralizers for Artesian wells- indicate the spacing below)	AMOUNT (cubic feet)	METHOD OF PLACEMENT
			None Pulled and Plugged		

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 09/22/2022)

FILE NO. C-4712-POD3	POD NO. 3	TRN NO. 743189	
LOCATION NMW 23.21.24.412		WELL TAG ID NO. —	PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
0	20	20	White Caliche	Y (N)	
20	45	25	Brown Fine Sand	Y (N)	
45	55	10	Red Sandy Caliche	Y (N)	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:

☐ PUMP ☐ AIR LIFT ☐ BAILER ☐ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm): Dry

5. TEST; RIG SUPERVISION

WELL TEST — TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION:

OSE DIT APR 4 2023 PM 1:23

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 30 DAYS AFTER COMPLETION OF WELL DRILLING:

JMaley Jason Maley — SIGNATURE OF DRILLER / PRINT SIGNEE NAME

3/24/23 — DATE

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 09/22/2022)

FILE NO. C-4712-POD3	POD NO. 3	TRN NO. 743189	
LOCATION Neon 23.31.24.412		WELL TAG ID NO. —	PAGE 2 OF 2

Mike A. Hamman, P.E.
State Engineer

Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 743189
File Nbr: C 04712
Well File Nbr: C 04712 POD3

Apr. 04, 2023

VERTEX RESOURCES
P.O. BOX 936
ROSWELL, NM 88202

Greetings:

The above numbered permit was issued in your name on 02/21/2023.

The Well Record was received in this office on 04/04/2023, stating that it had been completed on 03/09/2023, and was a dry well. The well is to be plugged according to 19.27.4.30 NMAC.

Please note that another well can be drilled under this permit if the well is completed and the well log filed on or before 02/21/2024.

If you have any questions, please feel free to contact us.

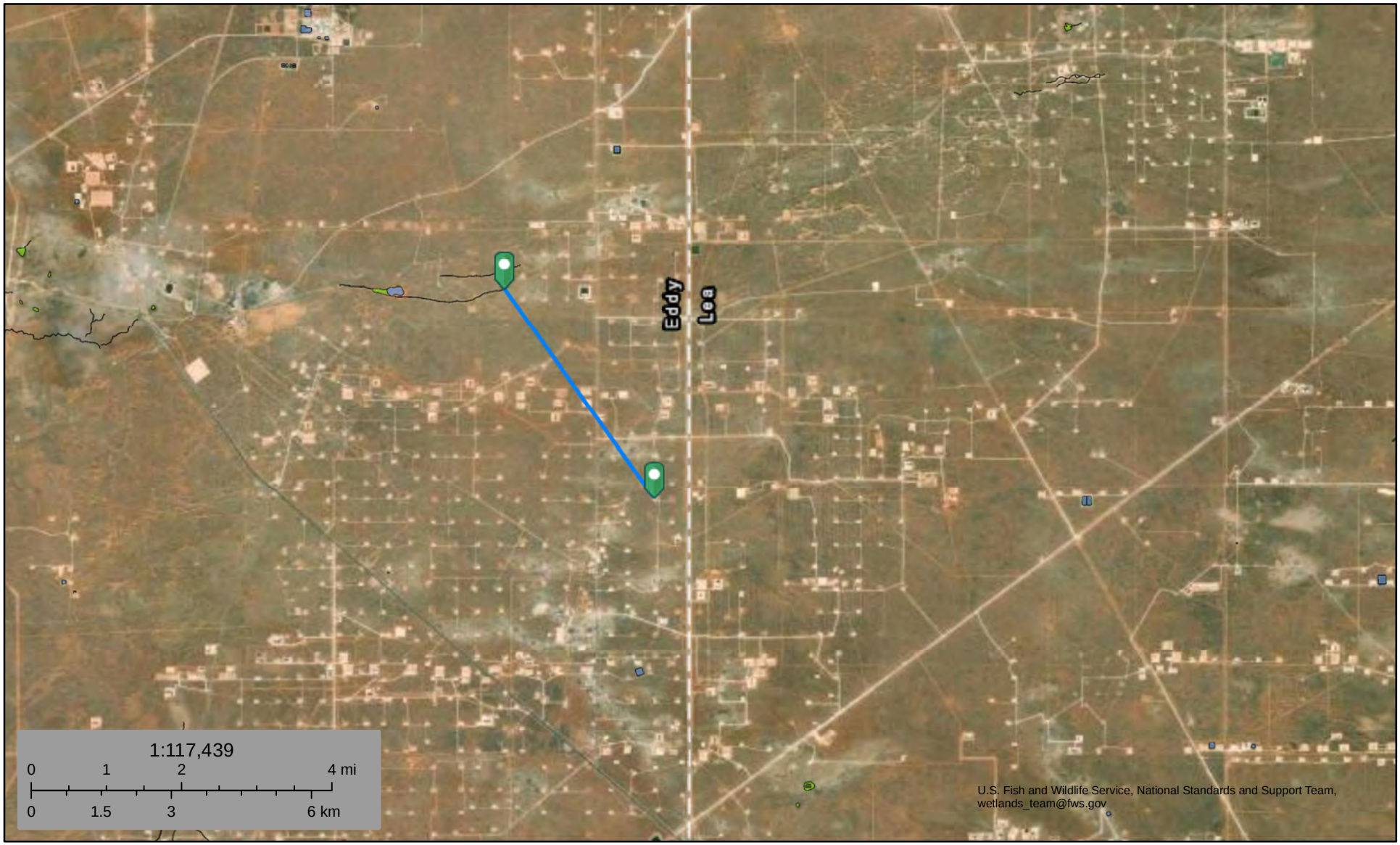
Sincerely,

Maret Thompson
(575)622-6521

drywell

U.S. Fish and Wildlife Service
National Wetlands Inventory

Todd 24B Fed2 Riverine 2.89 Miles



March 9, 2023

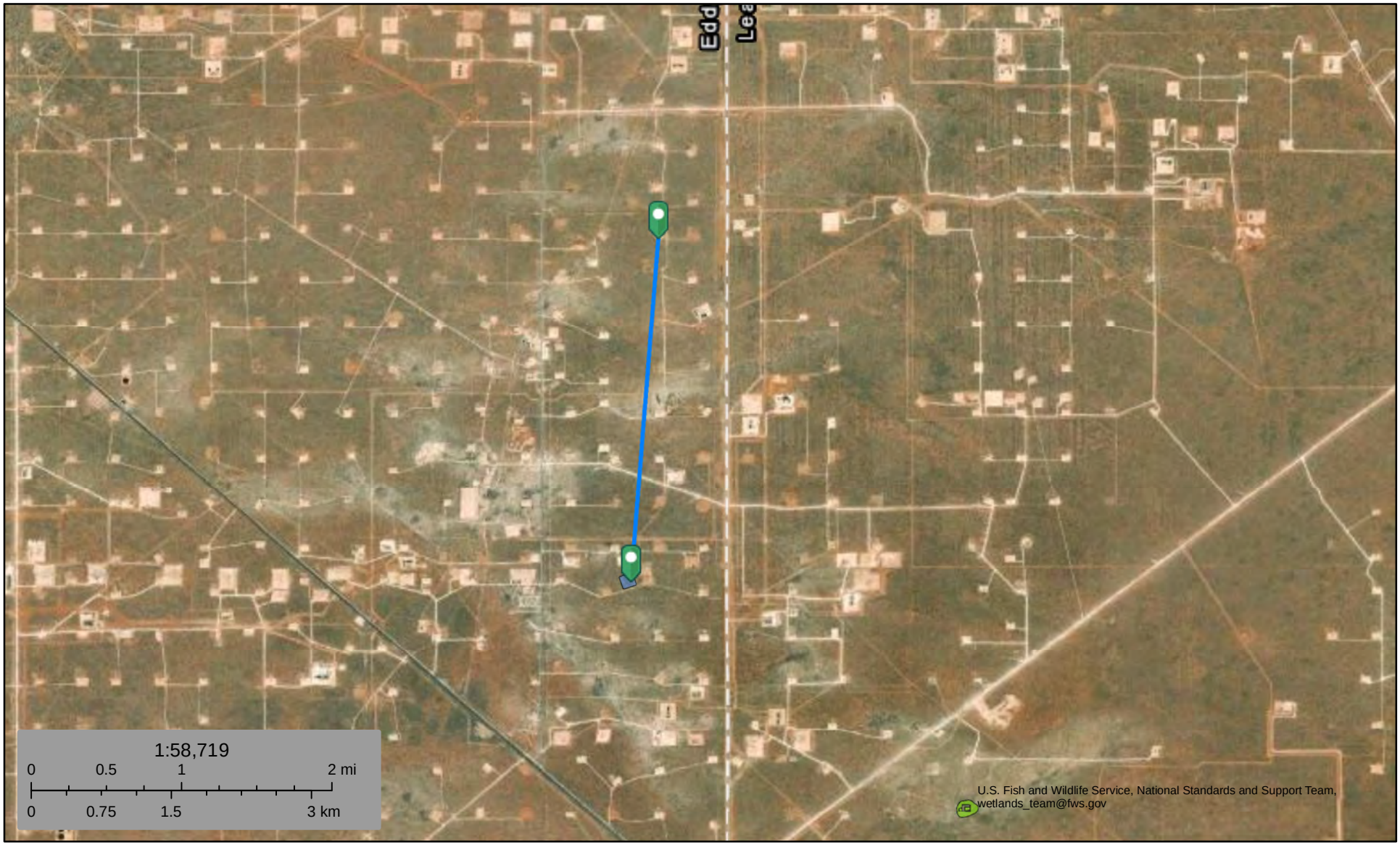
Wetlands

- 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.

U.S. Fish and Wildlife Service
National Wetlands Inventory

Todd 24B Fed2 Pond 1.93 Miles



March 9, 2023

Wetlands

- Estuarine and Marine Deepwater
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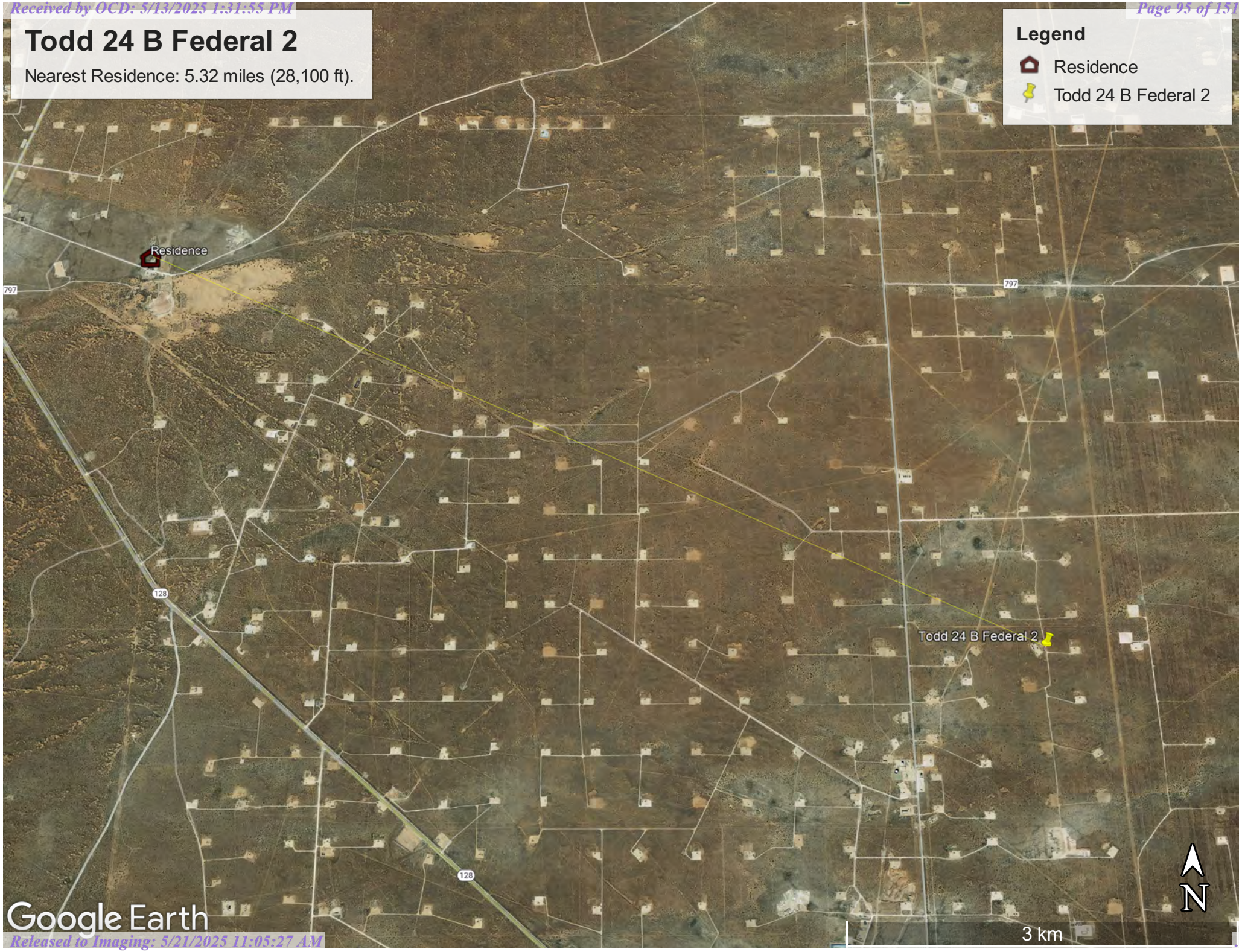
Todd 24 B Federal 2

Nearest Residence: 5.32 miles (28,100 ft).



OSE POD 0.5 mile

6/16/2023, 6:54:49 AM

GIS WATERS PODs
- Active
- OSE District Boundary

Water Right Regulations
- Closure Area

New Mexico State Trust Lands
- Subsurface Estate

- Both Estates
- SiteBoundaries

1:18,056

0 0.17 0.35 0.7 mi

0 0.3 0.6 1.2 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
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
	C 02258		3	2	26	23S	31E	618055	3571853*

Driller License:	421	**Driller Company:**	GLENN'S WATER WELL SERVICE		
Driller Name:	CORKY GLENN				
Drill Start Date:	09/18/1992	**Drill Finish Date:**	09/18/1992	**Plug Date:**	
Log File Date:	09/25/1992	**PCW Rcv Date:**		**Source:**	
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	
Casing Size:		**Depth Well:**	662 feet	**Depth Water:**	

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

New Mexico Office of the State Engineer
Water Right Summary

get image list

WR File Number: C 02258 **Subbasin:** C **Cross Reference:** -

Primary Purpose: PRO 72-12-1 PROSPECTING OR DEVELOPMENT OF NATURAL RESOURCE

Primary Status: PMT PERMIT

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

Total Diversion: 0 **Cause/Case:** -

Owner: DEVON ENERGY CORP.(NEVADA)

Contact: CHARLES W. HORSMAN

Documents on File

Trn #	Doc	File/Act	Status 1	Status 2	Transaction Desc.	From/ To	Acres	Diversion	Consumptive
get images 469242	72121	1992-05-27	EXP	EXP	C 02258	T		3	

Current Points of Diversion

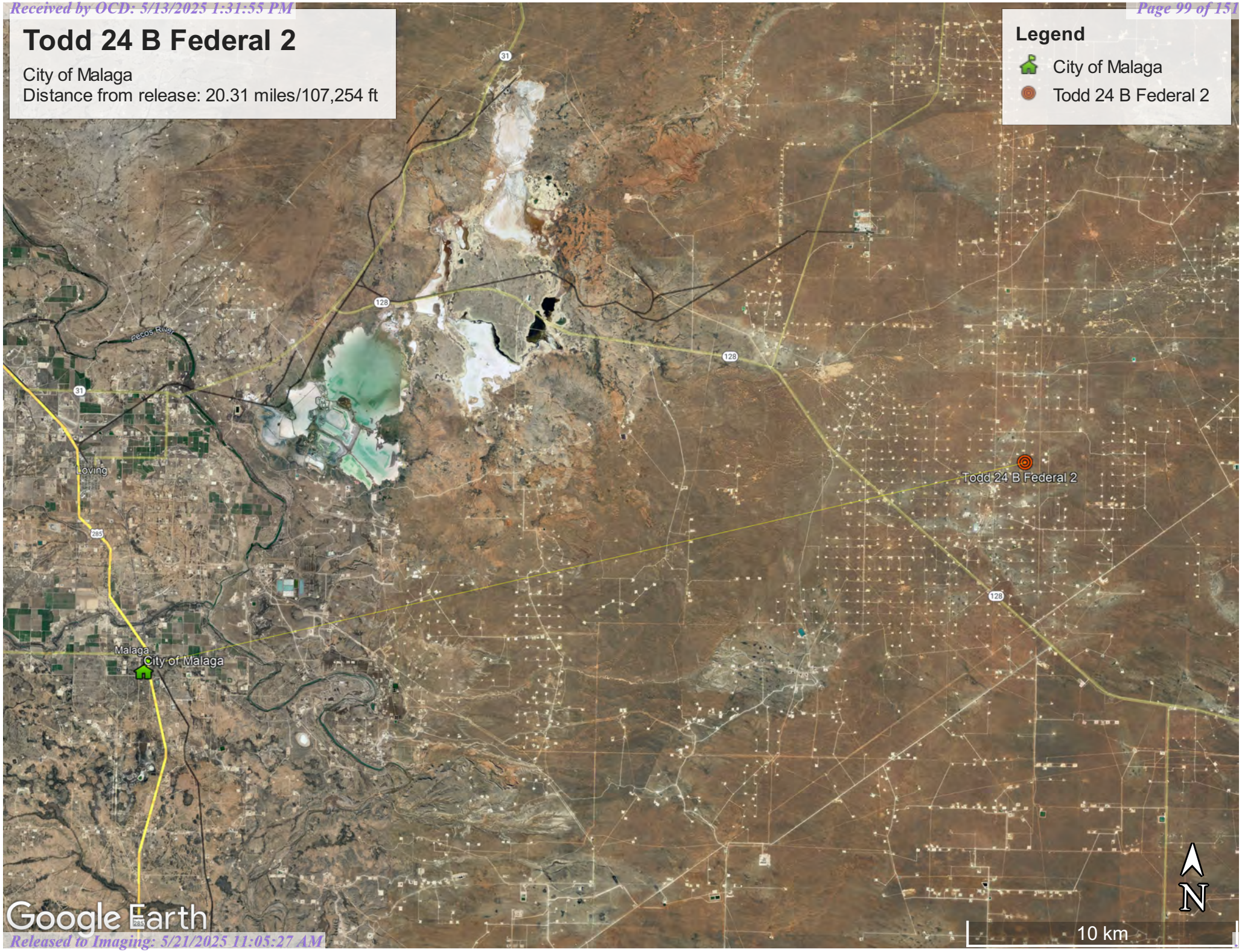
(NAD83 UTM in meters)

POD Number	Well Tag	Source	Q 64	Q16	Q4	Sec	Tws	Rng	X	Y	Other Location Desc
C 02258			3	2		26	23S	31E	618055	3571853*	

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

Todd 24 B Federal 2

City of Malaga
Distance from release: 20.31 miles/107,254 ft



U.S. Fish and Wildlife Service
National Wetlands Inventory

Todd 24B Fed2 Wetland 3.83 Miles

March 9, 2023

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
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- Other
- Riverine

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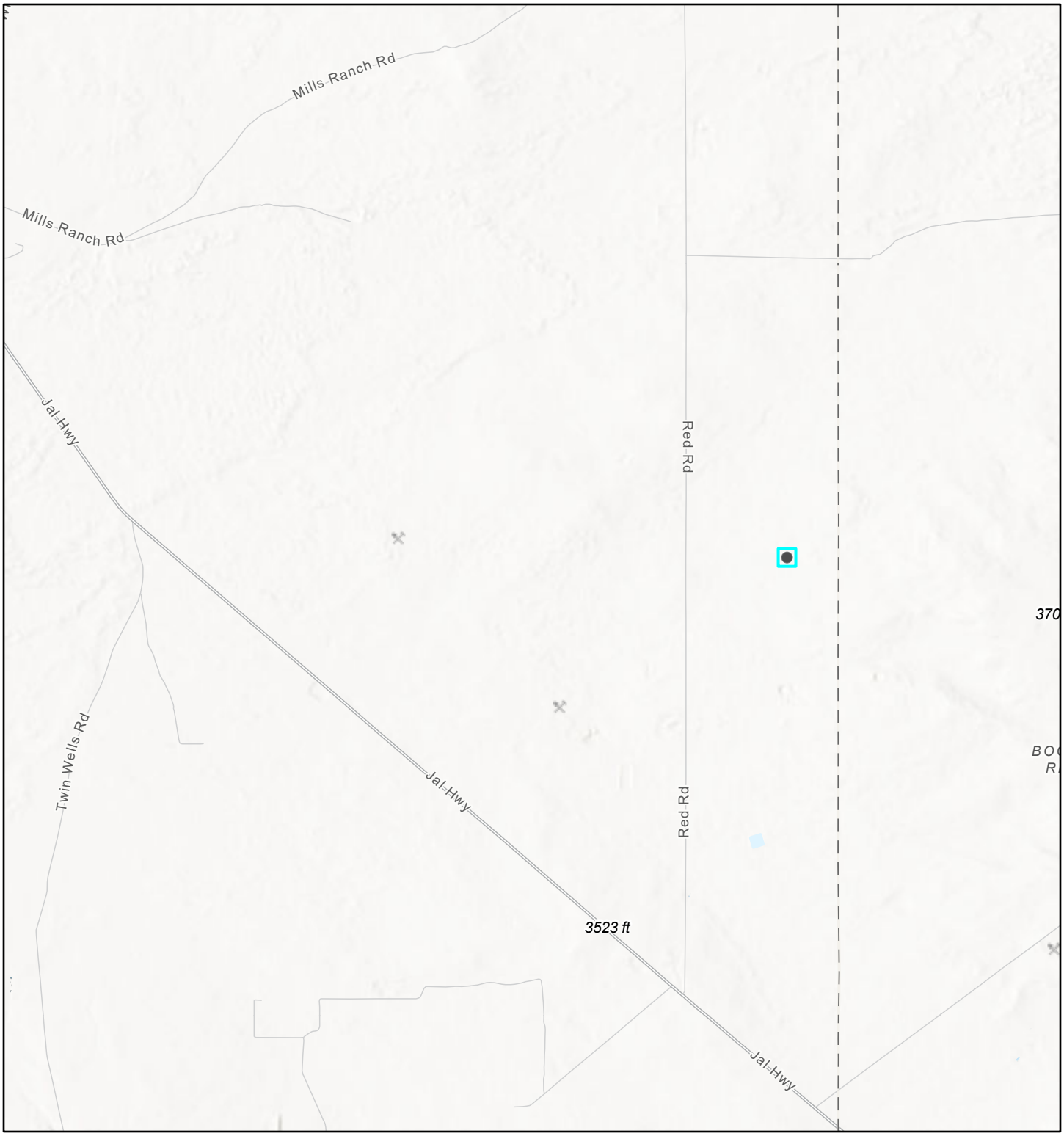
National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Todd 24 B Federal 2



4/27/2023, 4:47:16 PM

1:72,224

0 0.5 1 2 mi

0 0.75 1.5 3 km

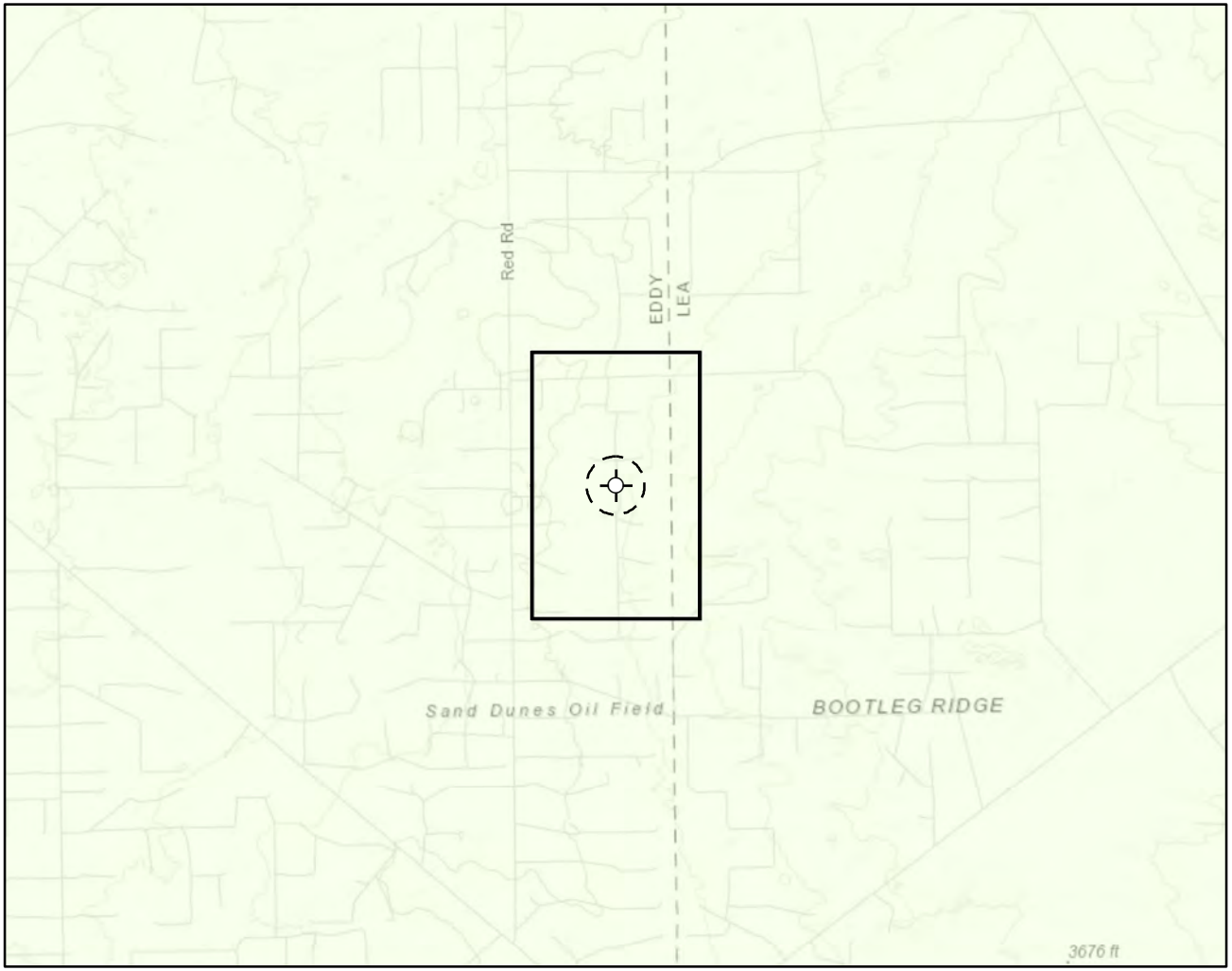
Registered Mines

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

Esri, NASA, NGA, USGS, FEMA, New Mexico State University, Texas Parks & Wildlife, CONANP, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

EMNRD MMD GIS Coordinator

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



Karst Potential

- Critical
- High
- Medium
- Low

- Site Location
- Site Buffer (1000 ft.)

Overview Map

0 0.25 0.5 1 mi

Detail Map

0 600 1,200 ft.

VERTEX

Map Center:
Lat/Long: 32.295230, -103.729000

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

N

Karst Potential Schematic
Todd 24 B Federal 2

FIGURE:
X

devon

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\Devon Energy Corporation\2021\21E-02816\016 - Todd 24 B Federal 2\Figure X Karst Potential Todd 24 B Federal 2.mxd

National Flood Hazard Layer FIRMette

FEMA

103°44'3"W 32°17'58"N

103°43'25"W 32°17'28"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 4/27/2023 at 6:31 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.

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United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Eddy Area, New Mexico

April 27, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:883 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 40 80 160 240

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 7, 2020—May 12, 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
BA	Berino loamy fine sand, 0 to 3 percent slopes	0.1	3.6%
BB	Berino complex, 0 to 3 percent slopes, eroded	1.7	96.4%
Totals for Area of Interest		**1.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Eddy Area, New Mexico

BA—Berino loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 1w42
Elevation: 2,000 to 5,700 feet
Mean annual precipitation: 6 to 14 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 180 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

Berino and similar soils: 99 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berino

Setting

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

Typical profile

H1 - 0 to 12 inches: loamy fine sand
H2 - 12 to 58 inches: sandy clay loam
H3 - 58 to 60 inches: clay 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 slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

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

Minor Components

Pajarito

Percent of map unit: 1 percent
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

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

Map Unit Setting

National map unit symbol: 1w43
Elevation: 2,000 to 5,700 feet
Mean annual precipitation: 5 to 15 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 180 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Berino

Setting

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

Typical profile

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

Properties and qualities

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

Available water supply, 0 to 60 inches: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Description of Pajarito

Setting

Landform: Dunes, plains, interdunes
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Mixed alluvium and/or eolian sands

Typical profile

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

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Minor Components

Pajarito

Percent of map unit: 4 percent
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Wink

Percent of map unit: 4 percent
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Cacique

Percent of map unit: 4 percent

Ecological site: R070BD004NM - Sandy
Hydric soil rating: No

Kermit

Percent of map unit: 3 percent
Ecological site: R070BD005NM - Deep Sand
Hydric soil rating: No

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USDA Natural Resources Conservation Service

Ecological site R070BD003NM
Loamy Sand

Accessed: 04/27/2023

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.

Associated sites

R070BD004NM	**Sandy** Sandy
R070BD005NM	**Deep Sand** Deep Sand

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

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

Low stabilized dunes may occur occasionally on this site. Elevations range from 2,800 to 5,000 feet.

Table 2. Representative physiographic features

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

Climatic features

The average annual precipitation ranges from 8 to 13 inches. Variations of 5 inches, more or less, are common. Over 80 percent of the precipitation falls from April through October. Most of the summer precipitation comes in the form of high intensity-short duration thunderstorms.
Temperatures are characterized by distinct seasonal changes and large annual and diurnal temperature changes.

The average annual temperature is 61 degrees with extremes of 25 degrees below zero in the winter to 112 degrees in the summer.
The average frost-free season is 207 to 220 days. The last killing frost being late March or early April and the first killing frost being in later October or early November.
Temperature and rainfall both favor warm season perennial plant growth. In years of abundant spring moisture, annual forbs and cool season grasses can make up an important component of this site. Strong winds blow from the southwest from January through June, which accelerates soil drying during a critical period for cool season plant growth.

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

Table 3. Representative climatic features

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

Influencing water features

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

Soil features

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

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

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

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

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

Characteristic soils are:
Maljamar
Berino
Parjarito
Palomas
Wink
Pyote

Table 4. Representative soil features

Surface texture	(1) Fine sand (2) Fine sandy loam (3) Loamy fine sand
Family particle size	(1) Sandy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate to moderately rapid

Soil depth	40–72 in
Surface fragment cover <=3"	0–10%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	5–7 in
Calcium carbonate equivalent (0-40in)	3–40%
Electrical conductivity (0-40in)	2–4 mmhos/cm
Sodium adsorption ratio (0-40in)	0–2
Soil reaction (1:1 water) (0-40in)	6.6–8.4
Subsurface fragment volume <=3" (Depth not specified)	4–12%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

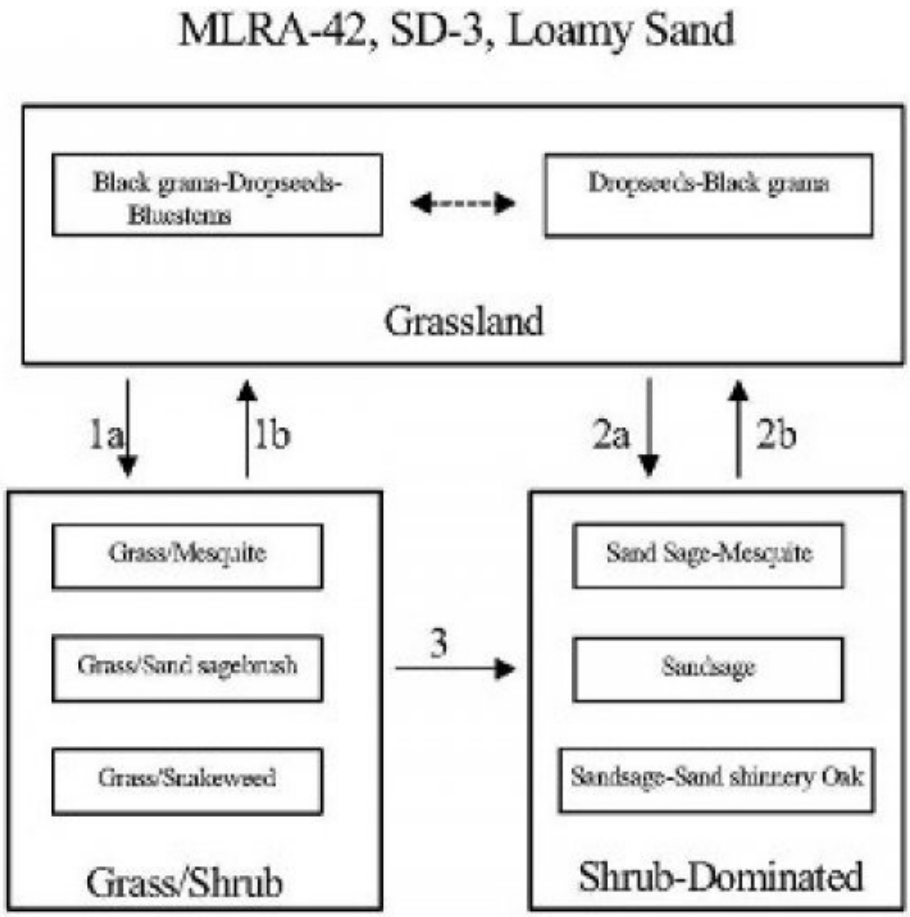
Overview

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

The historic plant community of Loamy Sand sites is dominated by black grama (*Bouteloua eriopoda*), dropseeds (*Sporobolus flexuosus*, *S. contractus*, *S. cryptandrus*), and bluestems (*Schizachyrium scoparium* and *Andropogon hallii*), with scattered shinnery oak (*Quercus havardii*) and sand sage (*Artemisia filifolia*). Perennial and annual forb abundance and distribution are dependent on precipitation. Litter and to a lesser extent, bare ground, are a significant proportion of ground cover while grasses compose the remainder. Decreases in black grama indicate a transition to either a grass/shrub or shrub-dominated state. The grass/shrub state is composed of grasses/honey mesquite (*Prosopis glandulosa*), grasses/broom snakeweed (*Gutierrezia sarothrae*), or grasses/sand sage. The shrub-dominated state occurs after a severe loss of grass cover and a prevalence of sand sage with secondary shinnery oak and mesquite. Heavy grazing intensity and/or drought are influential drivers in decreasing black grama and bluestems and subsequently increasing shrub cover, erosion, and bare patches. Historical fire suppression also encourages shrub pervasiveness and a competitive advantage over grass species (McPherson 1995). Brush and grazing management, however, may reverse grass/shrub and shrub-dominated states toward the grassland-dominated historic plant community.

State and transition model

Plant Communities and Transitional Pathways (diagram):



1a. Drought, over grazing, fire suppression.
1b. Brush control, prescribed grazing

2.a Severe loss of grass cover, fire suppression, erosion.
2b. Brush control, seeding, prescribed grazing.

3. Continued loss of grass cover, erosion.

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

Grassland: The historic plant community is a uniformly distributed grassland dominated by black grama, dropseeds, and bluestems. Sand sage and shinnery oak are evenly dispersed throughout the grassland due to the coarse soil

surface texture. Perennial and annual forbs are common but their abundance and distribution are reflective of precipitation. Bluestems initially, followed by black grama, decrease with drought and heavy grazing intensity. Historical fire frequency is unknown but likely occurred enough to remove small shrubs to the competitive advantage of grass species. Fire suppression, drought conditions, and excessive grazing drive most grass species out of competition with shrub species. Diagnosis: Grassland dominated by black grama, dropseeds, and bluestems. Shrubs, such as sand sage, shinnery oak, and mesquite are dispersed throughout the grassland. Forbs are present and populations fluctuate with precipitation variability.

Table 5. Annual production by plant type

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

Table 6. Ground cover

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

Figure 5. Plant community growth curve (percent production by month). NM2803, R042XC003NM-Loamy Sand-HCPC. SD-3 Loamy Sand - Warm season plant community .

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

State 2
Grass/Shrub

Community 2.1
Grass/Shrub

Grass/Shrub State: The grass/shrub state is dominated by communities of grasses/mesquite, grasses/snakeweed, or grasses/sand sage. Decreases in black grama and bluestem species lead to an increase in bare patches and mesquite which further competes with grass species. An increase of dropseeds and threeawns occurs. Grass distribution becomes more patchy with an absence or severe decrease in black grama and bluestems. Mesquite provides nitrogen and soil organic matter to co-dominant grasses (Ansley and Jacoby 1998, Ansley et al. 1998). Mesquite mortality when exposed to fire is low due to aggressive resprouting abilities. Herbicide application combined with subsequent prescribed fire may be more effective in mesquite reduction (Britton and Wright 1971). Diagnosis: This state is dominated by an increased abundance of communities including grass/mesquite, grass/snakeweed, or grass/sand sage. Dropseeds and threeawns have a patchy distribution. Transition to Grass/Shrub State (1a): The historic plant community begins to shift toward the grass/shrub state as drivers such as drought, fire suppression, interspecific competition, and excessive grazing contribute to alterations in soil properties and herbaceous cover. Cover loss and surface soil erosion are initial indicators of transition followed by a decrease in black grama with a subsequent increase of dropseeds, threeawns, mesquite, and snakeweed. Snakeweed has been documented to outcompete black grama especially under conditions of fire suppression and drought (McDaniel et al. 1984). Key indicators of approach to transition: • Loss of black grama cover • Surface soil erosion • Bare patch expansion • Increased dropseed/threeawn and mesquite, snakeweed, or sand sage abundances Transition to Historic Plant Community (1b): Brush and grazing management may restore the grassland component and reverse shrub or grass/shrub dominated states back toward the historic plant community.

State 3
Shrub Dominated

Community 3.1
Shrub Dominated

Shrub-Dominated State: The shrub-dominated state results from a severe loss of grass cover. This state's primary species is sand sage. Shinnery oak and mesquite also occur; however, grass cover is limited to intershrub distribution. Sand sage stabilizes light sandy soils from wind erosion, which enhances protected grass/forb cover (Davis and Bonham 1979). However, shinnery oak also responds to the sandy soils with dense stands due to an

aggressive rhizome system. Shinnery oak's extensive root system promotes competitive exclusion of grasses and forbs. Sand sage, shinnery oak, and mesquite can be controlled with herbicide (Herbel et al. 1979, Pettit 1986). Transition to Shrub-Dominated (2a): Severe loss of grass species with increased erosion and fire suppression will result in a transition to a shrub-dominated state with sand sage, Shin oak, and honey mesquite directly from the grassland-dominated state. Key indicators of approach to transition: • Severe loss of grass species cover • Surface soil erosion • Bare patch expansion • Increased sand sage, shinnery oak, and mesquite abundance Transition to Historic Plant Community (2b): Brush and grazing management may restore the grassland component and reverse shrub or grass/shrub dominated states back toward the historic plant community. In addition, seeding with native grass species will augment the transition to a grassland-dominated state. Transition to Shrub-Dominated (3): If the grass/shrub site continues to lose grass cover with soil erosion, the site will transition to a shrub-dominated state with sand sage, shinnery oak, and honey mesquite. Key indicators of approach to transition: • Continual loss of dropseeds/threeawns cover • Surface soil erosion • Bare patch expansion • Increased sand sage, shinnery oak, and mesquite/dropseed/threeawn and mesquite/snakeweed abundance

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Warm Season**			61–123	
	little bluestem	SCSC	*Schizachyrium scoparium*	61–123	–
2	**Warm Season**			37–61	
	sand bluestem	ANHA	*Andropogon hallii*	37–61	–
3	**Warm Season**			37–61	
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	37–61	–
	silver bluestem	BOSA	*Bothriochloa saccharoides*	37–61	–
4	**Warm Season**			123–184	
	black grama	BOER4	*Bouteloua eriopoda*	123–184	–
	bush muhly	MUPO2	*Muhlenbergia porteri*	123–184	–
5	**Warm Season**			123–184	
	thin paspalum	PASE5	*Paspalum setaceum*	123–184	–
	plains bristlegrass	SEVU2	*Setaria vulpiseta*	123–184	–
	fringed signalgrass	URCI	*Urochloa ciliatissima*	123–184	–
6	**Warm Season**			123–184	
	spike dropseed	SPCO4	*Sporobolus contractus*	123–184	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	123–184	–
	mesa dropseed	SPFL2	*Sporobolus flexuosus*	123–184	–
7	**Warm Season**			61–123	
	hooded windmill grass	CHCU2	*Chloris cucullata*	61–123	–
	Arizona cottontop	DICA8	*Digitaria californica*	61–123	–
9	**Other Perennial Grasses**			37–61	
	Grass, perennial	2GP	*Grass, perennial*	37–61	–
Shrub/Vine					
8	**Warm Season**			37–61	
	New Mexico feathergrass	HENE5	*Hesperostipa neomexicana*	37–61	–
	giant dropseed	SPGI	*Sporobolus giganteus*	37–61	–
10	**Shrub**			61–123	

	sand sagebrush	ARFI2	*Artemisia filifolia*	61–123	–
	Havard oak	QUHA3	*Quercus havardii*	61–123	–
11	**Shrub**			34–61	
	fourwing saltbush	ATCA2	*Atriplex canescens*	37–61	–
	featherplume	DAFO	*Dalea formosa*	37–61	–
12	**Shrub**			37–61	
	jointfir	EPHED	*Ephedra*	37–61	–
	littleleaf ratany	KRER	*Krameria erecta*	37–61	–
13	**Other Shrubs**			37–61	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	37–61	–
Forb					
14	**Forb**			61–123	
	leatherweed	CRPOP	*Croton pottsii var. pottsii*	61–123	–
	Indian blanket	GAPU	*Gaillardia pulchella*	61–123	–
	globemallow	SPHAE	*Sphaeralcea*	61–123	–
15	**Forb**			12–37	
	woolly groundsel	PACA15	*Packera cana*	12–37	–
16	**Forb**			61–123	
	touristplant	DIWI2	*Dimorphocarpa wislizeni*	61–123	–
	woolly plantain	PLPA2	*Plantago patagonica*	61–123	–
17	**Other Forbs**			37–61	
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	37–61	–

Animal community

This Ecological Site provides habitat which supports a resident animal community that is characterized by pronghorn antelope, desert cottontail, spotted ground squirrel, black-tailed prairie dog, yellow faced pocket gopher, Ord’s kangaroo rat, northern grasshopper mouse, southern plains woodrat, badger, roadrunner, meadowlark, burrowing owl, white necked raven, lesser prairie chicken, morning dove, scaled quail, Harris hawk, side blotched lizard, marbled whiptail, Texas horned lizard, western diamondback rattlesnake, dusty hognose snake and ornate box turtle.
Where mesquite has invaded, most resident birds and scissor-tailed flycatcher, morning dove and Swainson’s hawk, nest. Vesper and grasshopper sparrows utilize the site during migration.

Hydrological functions

The runoff curve numbers are determined by field investigations using hydraulic cover conditions and hydrologic soil groups.
Hydrologic Interpretations
Soil Series Hydrologic Group
Berino B
Kinco A
Maljamar B
Pajarito B
Palomas B
Wink B
Pyote A

Recreational uses

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

Wood products

This site has no potential for wood products.

Other products

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

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month
Similarity Index Ac/AUM
100 - 76 2.3 – 3.5
75 – 51 3.0 – 4.5
50 – 26 4.6 – 9.0
25 – 0 9.1 +

Inventory data references

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

Other references

Literature Cited:

Ansley, R. J.; Jacoby, P. W. 1998. Manipulation of fire intensity to achieve mesquite management goals in north Texas. In: Pruden, Teresa L.; Brennan, Leonard A., eds. Fire in ecosystem management: shifting the paradigm from suppression to prescription: Proceedings, Tall Timbers fire ecology conference; 1996 May 7-10; Boise, ID. No. 20. Tallahassee, FL: Tall Timbers Research Station: 195-204.

Ansley, R. J.; Jones, D. L.; Tunnell, T. R.; [and others]. 1998. Honey mesquite canopy responses to single winter fires: relation to herbaceous fuel, weather and fire temperature. International Journal of Wildland Fire 8(4):241-252.

Britton, Carlton M.; Wright, Henry A. 1971. Correlation of weather and fuel variables to mesquite damage by fire. Journal of Range Management 24:136-141.

Davis, Joseph H., III and Bonham, Charles D. 1979. Interference of sand sagebrush canopy with needleandthread. Journal of Range Management 32(5):384-386.

Herbel, C. H, Steger, R, Gould, W. L. 1974. Managing semidesert ranges of the Southwest Circular 456. Las Cruces, NM: New Mexico State University, Cooperative Extension Service. 48 p.

McDaniel, Kirk C.; Pieper, Rex D.; Loomis, Lyn E.; Osman, Abdelgader A. 1984. Taxonomy and ecology of perennial snakeweeds in New Mexico. Bulletin 711. Las Cruces, NM: New Mexico State University, Agricultural Experiment Station. 34 p.

McPherson, Guy R. 1995. The role of fire in the desert grasslands. In: McClaran, Mitchel P.; Van Devender, Thomas R., eds. The desert grassland. Tucson, AZ: The University of Arizona Press: 130-151.

Pettit, Russell D. 1986. Sand shinnery oak: control and management. Management Note 8. Lubbock, TX: Texas Tech University, College of Agricultural Sciences, Department of Range and Wildlife Management. 5 p.

Contributors

Don Sylvester
Quinn Hodgson

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):**

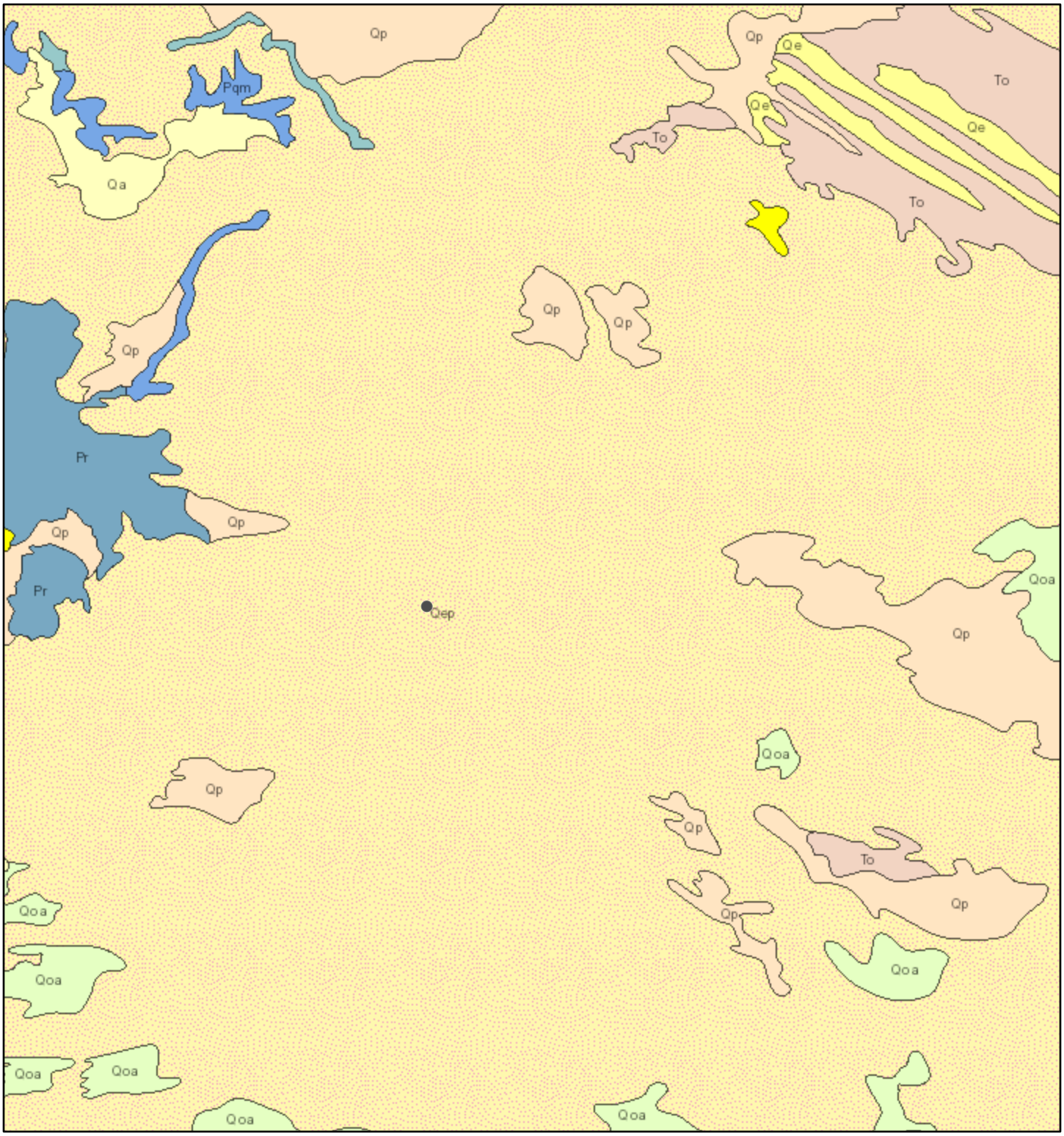
---

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:**

---

17. **Perennial plant reproductive capability:**

Todd 24 B Federal 2



3/9/2023, 3:46:31 PM

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0 10,000 20,000 40,000 ft

0 3,310 6,620 13,240 m

Lithologic Units

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

New Mexico Bureau of Geology and Mineral Resources, 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;

ArcGIS Web AppBuilder

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National

ATTACHMENT 6

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised October 10, 2003

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Release Notification and Corrective Action

nJM1231248032

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: Devon Energy Production LP 6137	Contact: Daniel Suniga
Address: P.O. Box 250 Artesia, N.M. 88211	Telephone No. (575)390-5850
Facility Name: Todd 24B # 2	Facility Type: Oil Well # 30-015-27691

Surface Owner	Mineral Owner	Lease No. NM0533177-A

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
B	24	23S	31E	660'	North	1980'	East	Eddy

NATURE OF RELEASE

Type of Release: Spill	Volume of Release: 70 bbls	Volume Recovered: 70 bbls
Source of Release: transfer pump malfunction	Date and Hour of Occurrence: 5/23/2012, 8:00 AM	Date and Hour of Discovery 5/23/2012, 8:00 AM
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Jim Amos, BLM-Eddy County	
By Whom? Daniel Suniga-Production Foreman	Date and Hour: 10/27/12, 3:55 PM	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

RECEIVED
NOV 01 2012
NMOCD ARTESIA

If a Watercourse was Impacted, Describe Fully.* N/A

Describe Cause of Problem and Remedial Action Taken.*
At the Todd 24B # 2 battery, a contract Lease Operator discovered produced water spilling over the tank due to a transfer pump malfunction that caused a 70 bbl. produced water spill with 70 bbls. recovered.

Describe Area Affected and Cleanup Action Taken.*
The affected location was the Todd 24B # 2 battery. The Lease Operator contacted a vacuum truck to haul the produced water and then contacted his foreman where he was advised to shut in the location. The transfer pump was repaired and put back into service.

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

Signature: Rebecca Raga	OIL CONSERVATION DIVISION
Printed Name: Rebecca Raga	Approved by District Supervisor: Signed By Mike Bratcher
Title: Field Tech	Approval Date: NOV 07 2012 Expiration Date:
E-mail Address: rebecca.raga@dvn.com	Conditions of Approval: Attached ☐
Date: 10/30/2012 Phone: (575) 746-5564	

* Attach Additional Sheets If Necessary

2RP-1391

Remediation per OCD Rules & Guidelines. **SUBMIT REMEDIATION PROPOSAL NOT LATER THAN:** Dec. 7th 2012

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised August 8, 2011

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

Release Notification and Corrective Action

nJMW1317034502 Energy

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company **DEVON ENERGY** 6137	Contact **DAN SUNIGA**
Address **PO BOX 250** **ARTESIA NM 88211**	Telephone No. **575-746-5555**
Facility Name **TODD 24 FED 2 BATTERY**	Facility Type **OIL WELL**

Surface Owner	Mineral Owner	API No. **3001527691**

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
B	**24**	**23S**	**31E**	**660'**	**North**	**1980"**	**East**	**Eddy**

Latitude: 32.2952956145063 **Longitude:** -103.7294101096522

NATURE OF RELEASE

Type of Release **Produced Water**	Volume of Release **35bbls**	Volume Recovered **30bbls**
Source of Release **Spill**	Date and Hour of Occurrence **June 12, 2013**	Date and Hour of Discovery **June 12, 2013**
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? **Mike Bratcher/OCD, Jennifer Van Curen/BLM**	
By Whom? **Wesley Ryan**	Date and Hour: **June 13, 2013 8:15am/8:30am**	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

RECEIVED
JUN 17 2013
NMOCD ARTESIA

If a Watercourse was Impacted, Describe Fully.*

N/A

Describe Cause of Problem and Remedial Action Taken.*

At the Todd 24 Fed 2 Battery, a transfer pumps discharge line plugged off from a slug of paraffin causing a produced water tank to run over resulting in a spill of 35 bbls of produced water.

Describe Area Affected and Cleanup Action Taken.*

The lease operator arrived to discover the produced water tank running over. The operator discovered that a slug of paraffin had built up in a 90 on the discharge side of the pump. The pump was unable to transfer the produced water off location and the tank filled up and ran over. The spill was estimated to be 35bbls of produced water within the containment around the tanks. A vacuum truck was dispatched and the driver recovered 30bbls. The operator then notified the Asst. Foreman and made arrangements to have the line cleaned, replace the pump and remove the contaminated soil around the tank. Also, the spill was contained within the unlined containment on the caliche pad.

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

Signature: Veronica Teel

Printed Name: **Veronica Teel**

Title: **Field Admin Support**

E-mail Address: **Veronica.Teel@dvn.com**

Date: **June 14, 2013** Phone: **575-748-9933**

OIL CONSERVATION DIVISION

Approved by Environmental Specialist: Signed By Mike Bratcher

Approval Date: JUN 19 2013 Expiration Date:

Conditions of Approval:

Remediation per OCD Rule & Guidelines. **SUBMIT REMEDIATION PROPOSAL NO LATER THAN:** July 19, 2013

Attached ☐

2RP-1686

* Attach Additional Sheets If Necessary

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised August 8, 2011

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

Release Notification and Corrective Action

nAB1516753239

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company Devon Energy Production 6137	**Contact Randy Gladden**
Address 6488 Seven Rivers Hwy Artesia, NM 88220	**Telephone No.** 575.513.9463
Facility Name Todd 24-B Battery 2	**Facility Type OIL**

Surface Owner BLM	**Mineral Owner BLM**	**API No. 30-015-27691**

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
B	24	23S	31E	660	North	1980	East	EDDY

Latitude: 32.29523 **Longitude:** -103.72888

NATURE OF RELEASE

Type of Release Spill Produced Water	**Volume of Release 80 BBL**	**Volume Recovered 75 BBL**
Source of Release A water transfer pump went down causing water tank to overflow.	**Date and Hour of Occurrence 2.23.15 4:00 am**	**Date and Hour of Discovery 2.23.15 11:10 am**
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	**If YES, To Whom?** Jeff Robertson BLM Mike Bratcher OCD	NM OIL CONSERVATION ARTESIA DISTRICT JUN 15 2015
By Whom? Randy Gladden	**Date and Hour 2.23.15 @ 11:20 am**	
Was a Watercourse Reached? ☐ Yes ☒ No	**If YES, Volume Impacting the Watercourse**	RECEIVED

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*
Result of transfer pump not operating properly approximately 80 barrels of produced water spilled inside containment. Lobo trucking recovered 75 BBLS and the transfer pump was repaired and returned to normal operations.

Describe Area Affected and Cleanup Action Taken.*
Unlined Containment 15x80 all inside containment. Environmental service will be called on.

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

Signature: Jeanette Barron	OIL CONSERVATION DIVISION
Printed Name: **Jeanette Barron**	Approved by Environmental Specialist:
Title: **Field Admin Support**	Approval Date: 6/16/15 Expiration Date: NA
E-mail Address: **Jeanette.barron@dvn.com**	Conditions of Approval: Attached ☐
Date: 2.26.15 Phone: **575.748.1813**	**Remediation per O.C.D. Rules & Guidelines SUBMIT REMEDIATION PROPOSAL NO LATER THAN: 7/17/15**

* Attach Additional Sheets If Necessary

2RP-3051

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	nJMW1231248032, nJMW1317034502, nAB1516753239
District RP	2RP-1391, 2RP-1686, 2RP-3051
Facility ID	30-015-27691
Application ID	

Release Notification

Responsible Party

Responsible Party **Harvard Petroleum Company, LLC**	OGRID **10155**
Contact Name **Jeff Harvard**	Contact Telephone **575-208-7135**
Contact email **jharvard@hpcnm.com**	Incident # **nJMW1231248032,nJMW1317034502, nAB1516753239**
Contact mailing address **P.O. Box 936 Roswell, NM 88202**	

Location of Release Source

Latitude **32.2952957** Longitude **103.7293777**
(NAD 83 in decimal degrees to 5 decimal places)

Site Name **Todd 24 B Federal #002**	Site Type **Oil**
Date Release Discovered **May 23, 2012, June 12, 2013, February 23, 2021**	API# **30-015-27691**

Unit Letter	Section	Township	Range	County
B	**24**	**23S**	**31E**	**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) **70, 35, 80**	Volume Recovered (bbls) **70, 30, 75**
	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)

State of New Mexico
Oil Conservation Division

Incident ID	nJMW1231248032,nJMW1317034502, nAB1516753239
District RP	2RP-1391, 2RP-1686, 2RP-3051
Facility ID	30-015-27691
Application ID	

2RP-1391, C-141 rec'd 11/01/2012 for release on 05/23/2012 of 70 bbls PW. Recovered none. Source: "transfer pump malfunction" Cause: "At the Todd 24B # 2 battery, a contact Lease Operator discovered produced water spilling over the tank due to a transfer pump malfunction that caused a 70 bbl. Produced water spill with 70 bbls. Recovered." Affected Area: "The affected location was the Todd 24B # 2 battery. The Lease Operator contacted a vacuum truck to haul the produced water and then contacted his foreman where he was advised to shut in the location. The transfer pump was repaired and put back into service."

2RP-1686, rec'd C-141 6/17/13 for release on 6/12/13 of 35 bbls PW, recovered 30bbls PW. Source: "Spill" Cause: "At the Todd 24 Fed 2 Battery, a transfer pumps discharge line plugged off from a slug of paraffin causing a produced water tank to run over resulting in a spill of 35 bbls of produced water." Affected Area: "The lease operator arrived to discover the produced water tank running over. The operator discovered that a slug of paraffin had built up in a 90 on the discharge side of the pump. The pump was unable to transfer the rpoduced water off location and the tank filled up and ran over. The spill was estimated to be 35bbls of produced water within the containment around the tanks. A vacuum truck was dispatched and the driver recovered 30bbls. The operator then notified the Asst. Foreman and made arrangements to have the line cleaned, replace the pump and remove the contaminated soil around the tank. Also, the spill was contained within the unlined containment on the caliche pad."

2RP-3051 C-141 received 6/15/2015 for release on 2/23/2015. Cause listed as, "Result of transfer pump not operating properly approximately 80 barrels of produced water spilled inside containment. Lobo trucking recovered 75 bbls and the transfer pump was repaired and returned to normal operations." The area affected listed as, "Unlined containment 15x80 all inside containment. Environmental service will be called on."

Was this a major release as defined by 19.15.29.7(A) NMAC?	If YES, for what reason(s) does the responsible party consider this a major release?
☒ Yes ☐ No	**All three releases exceeded 25 bbl in volume.**

If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?

Yes. See original initial C-141s.

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.

Form C-141
Page 3

State of New Mexico
Oil Conservation Division

Incident ID	nJMW1231248032,nJMW1317034502, nAB1516753239
District RP	2RP-1391, 2RP-1686, 2RP-3051
Facility ID	30-015-27691
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: Jeff Harvard Title: President and Manager

Signature: _____ Date: _____

email: jharvard@hpcnm.com Telephone: 575-208-7135

OCD Only

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	nJMW1231248032,nJMW1317034502, nAB1516753239
District RP	2RP-1391, 2RP-1686, 2RP-3051
Facility ID	30-015-27691
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?	**56** (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.

Form C-141
Page 5

State of New Mexico
Oil Conservation Division

Incident ID	nJMW1231248032,nJMW1317034502, nAB1516753239
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Printed Name: Jeff Harvard Title: President and Manager

Signature: Date:

email: jharvard@hpcnm.com Telephone: 575-208-7135

OCD Only

Received by: Date:

State of New Mexico
Oil Conservation Division

Incident ID	nJMW1231248032,nJMW1317034502, nAB1516753239
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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: Jeff Harvard Title: President and Manager

Signature: _____ Date: _____

email: jharvard@hpcnm.com Telephone: 575-208-7135

OCD Only

Received by: _____ Date: _____

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

Signature: _____ Date: _____

Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

Online Phone Directory
https://www.emnrd.nm.gov/ocd/contact-us

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

QUESTIONS

Action 460377

QUESTIONS

Operator: HARVARD PETROLEUM COMPANY, LLC P.O. Box 936 Roswell, NM 88202	OGRID: 10155
	Action Number: 460377
	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

QUESTIONS

Prerequisites	
Incident ID (n#)	**nJMW1231248032**
Incident Name	**NJMW1231248032 TODD 24 B FEDERAL #002 @ 30-015-27691**
Incident Type	**Produced Water Release**
Incident Status	**Remediation Plan Approved**
Incident Well	**[30-015-27691] TODD 24 B FEDERAL #002**

Location of Release Source	
Please answer all the questions in this group.	
Site Name	TODD 24 B FEDERAL #002
Date Release Discovered	05/23/2012
Surface Owner	Federal

Incident Details	
Please answer all the questions in this group.	
Incident Type	Produced Water Release
Did this release result in a fire or is the result of a fire	No
Did this release result in any injuries	No
Has this release reached or does it have a reasonable probability of reaching a watercourse	No
Has this release endangered or does it have a reasonable probability of endangering public health	No
Has this release substantially damaged or will it substantially damage property or the environment	No
Is this release of a volume that is or may with reasonable probability be detrimental to fresh water	No

Nature and Volume of Release	
Material(s) released, please answer all that apply below. Any calculations or specific justifications for the volumes provided should be attached to the follow-up C-141 submission.	
Crude Oil Released (bbls) Details	*Not answered.*
Produced Water Released (bbls) Details	Cause: Equipment Failure | Pump | Produced Water | Released: 70 BBL | Recovered: 70 BBL | Lost: 0 BBL.
Is the concentration of chloride in the produced water >10,000 mg/l	No
Condensate Released (bbls) Details	*Not answered.*
Natural Gas Vented (Mcf) Details	*Not answered.*
Natural Gas Flared (Mcf) Details	*Not answered.*
Other Released Details	*Not answered.*
Are there additional details for the questions above (i.e. any answer containing Other, Specify, Unknown, and/or Fire, or any negative lost amounts)	*Not answered.*

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QUESTIONS (continued)

Operator: HARVARD PETROLEUM COMPANY, LLC P.O. Box 936 Roswell, NM 88202	OGRID: 10155
	Action Number: 460377
	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

QUESTIONS

Nature and Volume of Release (continued)	
Is this a gas only submission (i.e. only significant Mcf values reported)	**No, according to supplied volumes this does not appear to be a "gas only" report.**
Was this a major release as defined by Subsection A of 19.15.29.7 NMAC	**Yes**
Reasons why this would be considered a submission for a notification of a major release	**From paragraph A. "Major release" determine using:** **(1) an unauthorized release of a volume, excluding gases, of 25 barrels or more.**

With the implementation of the 19.15.27 NMAC (05/25/2021), venting and/or flaring of natural gas (i.e. gas only) are to be submitted on the C-129 form.

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	True
The impacted area has been secured to protect human health and the environment	True
Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices	True
All free liquids and recoverable materials have been removed and managed appropriately	True
If all the actions described above have not been undertaken, explain why	*Not answered.*

Per Paragraph (4) of Subsection B of 19.15.29.8 NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please prepare and attach a narrative of actions to date in the follow-up C-141 submission. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see Subparagraph (a) of Paragraph (5) of Subsection A of 19.15.29.11 NMAC), please prepare and attach all information needed for closure evaluation in the follow-up C-141 submission.

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.

I hereby agree and sign off to the above statement	Name: Roni Kidd Title: Business Manager Email: rkidd@buckhornproduction.com Date: 05/08/2025

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QUESTIONS (continued)

Operator: HARVARD PETROLEUM COMPANY, LLC P.O. Box 936 Roswell, NM 88202	OGRID: 10155
	Action Number: 460377
	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

QUESTIONS

Site Characterization	
Please answer all the questions in this group (only required when seeking remediation plan approval and beyond). 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 in feet below ground surface (ft bgs)	Between 51 and 75 (ft.)
What method was used to determine the depth to ground water	NM OSE iWaters Database Search
Did this release impact groundwater or surface water	No
What is the minimum distance, between the closest lateral extents of the release and the following surface areas:	
A continuously flowing watercourse or any other significant watercourse	Between 1 and 5 (mi.)
Any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)	Between 1 and 5 (mi.)
An occupied permanent residence, school, hospital, institution, or church	Between 1 and 5 (mi.)
A spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes	Between 1 and 5 (mi.)
Any other fresh water well or spring	Between 1 and 5 (mi.)
Incorporated municipal boundaries or a defined municipal fresh water well field	Greater than 5 (mi.)
A wetland	Between 1 and 5 (mi.)
A subsurface mine	Greater than 5 (mi.)
An (non-karst) unstable area	Greater than 5 (mi.)
Categorize the risk of this well / site being in a karst geology	Low
A 100-year floodplain	Greater than 5 (mi.)
Did the release impact areas not on an exploration, development, production, or storage site	No

Remediation Plan	
Please answer all the questions that apply or are indicated. This information must be provided to the appropriate district office no later than 90 days after the release discovery date.	
Requesting a remediation plan approval with this submission	Yes
Attach a comprehensive report demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined, pursuant to 19.15.29.11 NMAC and 19.15.29.13 NMAC.	
Have the lateral and vertical extents of contamination been fully delineated	Yes
Was this release entirely contained within a lined containment area	No
Soil Contamination Sampling: (Provide the highest observable value for each, in milligrams per kilograms.)	
Chloride (EPA 300.0 or SM4500 Cl B)	60
TPH (GRO+DRO+MRO) (EPA SW-846 Method 8015M)	307
GRO+DRO (EPA SW-846 Method 8015M)	19
BTEX (EPA SW-846 Method 8021B or 8260B)	0
Benzene (EPA SW-846 Method 8021B or 8260B)	0
Per Subsection B of 19.15.29.11 NMAC unless the site characterization report includes completed efforts at remediation, the report must include a proposed remediation plan in accordance with 19.15.29.12 NMAC, which includes the anticipated timelines for beginning and completing the remediation.	
On what estimated date will the remediation commence	05/09/2025
On what date will (or did) the final sampling or liner inspection occur	07/14/2025
On what date will (or was) the remediation complete(d)	07/14/2025
What is the estimated surface area (in square feet) that will be reclaimed	0
What is the estimated volume (in cubic yards) that will be reclaimed	0
What is the estimated surface area (in square feet) that will be remediated	87
What is the estimated volume (in cubic yards) that will be remediated	20
These estimated dates and measurements are recognized to be the best guess or calculation at the time of submission and may (be) change(d) over time as more remediation efforts are completed.	
The OCD recognizes that proposed remediation measures may have to be minimally adjusted in accordance with the physical realities encountered during remediation. If the responsible party has any need to significantly deviate from the remediation plan proposed, then it should consult with the division to determine if another remediation plan submission is required.	

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QUESTIONS (continued)

Operator: HARVARD PETROLEUM COMPANY, LLC P.O. Box 936 Roswell, NM 88202	OGRID: 10155
	Action Number: 460377
	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

QUESTIONS

Remediation Plan (continued)	
Please answer all the questions that apply or are indicated. This information must be provided to the appropriate district office no later than 90 days after the release discovery date.	
This remediation will (or is expected to) utilize the following processes to remediate / reduce contaminants:	
(Select all answers below that apply.)	
(Ex Situ) Excavation and **off-site** disposal (i.e. dig and haul, hydrovac, etc.)	Yes
Which OCD approved facility will be used for **off-site** disposal	OWL LANDFILL JAL [fJEG1635837366]
OR which OCD approved well (API) will be used for **off-site** disposal	*Not answered.*
OR is the **off-site** disposal site, to be used, out-of-state	*Not answered.*
OR is the **off-site** disposal site, to be used, an NMED facility	*Not answered.*
(Ex Situ) Excavation and **on-site** remediation (i.e. On-Site Land Farms)	*Not answered.*
(In Situ) Soil Vapor Extraction	*Not answered.*
(In Situ) Chemical processing (i.e. Soil Shredding, Potassium Permanganate, etc.)	*Not answered.*
(In Situ) Biological processing (i.e. Microbes / Fertilizer, etc.)	*Not answered.*
(In Situ) Physical processing (i.e. Soil Washing, Gypsum, Disking, etc.)	*Not answered.*
Ground Water Abatement pursuant to 19.15.30 NMAC	*Not answered.*
OTHER (Non-listed remedial process)	*Not answered.*
Per Subsection B of 19.15.29.11 NMAC unless the site characterization report includes completed efforts at remediation, the report must include a proposed remediation plan in accordance with 19.15.29.12 NMAC, which includes the anticipated timelines for beginning and completing the remediation.	
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.	
I hereby agree and sign off to the above statement	Name: Roni Kidd Title: Business Manager Email: rkidd@buckhornproduction.com Date: 05/08/2025
The OCD recognizes that proposed remediation measures may have to be minimally adjusted in accordance with the physical realities encountered during remediation. If the responsible party has any need to significantly deviate from the remediation plan proposed, then it should consult with the division to determine if another remediation plan submission is required.	

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QUESTIONS (continued)

Operator: HARVARD PETROLEUM COMPANY, LLC P.O. Box 936 Roswell, NM 88202	OGRID: 10155
	Action Number: 460377
	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

QUESTIONS

Deferral Requests Only	
Only answer the questions in this group if seeking a deferral upon approval this submission. Each of the following items must be confirmed as part of any request for deferral of remediation.	
Requesting a deferral of the remediation closure due date with the approval of this submission	No

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QUESTIONS (continued)

Operator:	OGRID:
HARVARD PETROLEUM COMPANY, LLC P.O. Box 936 Roswell, NM 88202	10155
	Action Number: 460377
	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

QUESTIONS

Sampling Event Information	
Last sampling notification (C-141N) recorded	*{Unavailable.}*

Remediation Closure Request	
Only answer the questions in this group if seeking remediation closure for this release because all remediation steps have been completed.	
Requesting a remediation closure approval with this submission	No

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

CONDITIONS

Operator:	OGRID:
HARVARD PETROLEUM COMPANY, LLC P.O. Box 936 Roswell, NM 88202	10155
	Action Number: 460377
	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

CONDITIONS

Created By	Condition	Condition Date
scwells	Remediation plan approved with the following conditions:	5/21/2025
scwells	1) Referring to Google Earth historical imagery, between 3/2012 and 2/2014, something occurred to cause vegetation to die to the north of the tank battery. Collect delineation samples at the following locations: 32.295831, -103.730106 and 32.295709, -103.730192. For each, samples must be discrete and collected at surface, 1', 2', 3' and 4'. These samples must be submitted to a laboratory for testing for all Table I constituents. Should exceedances be found these will be required to be remediated pursuant to 19.15.29.12 NMAC.	5/21/2025
scwells	2) As these releases go back 13 years, two boreholes are required to be drilled within the tank battery and discrete samples collected at surface, 1', 2', etc. down to 10' depth. These samples must be submitted to a laboratory for testing for all Table I constituents. One of the boreholes must be drilled at 32.295651, -103.729932 as it appears this portion of the tank battery had staining in Google Earth imagery and this corner appears to have the lowest elevation. The second borehole should be drilled somewhere in the middle to southern portion of the tank battery. Should exceedances be found, remediation is required to the maximum extent practicable.	5/21/2025
scwells	Submit a remediation closure report or deferral request by 8/19/25.	5/21/2025