****** LIQUID SPILLS - VOLUME CALCULATIONS ******

Location of spill: Stark 5 Fed Com #701H **Date of Spill:** 3/15/2025

If the leak/spill is associated with production equipment, i.e. - wellhead, stuffing box,
flowline, tank battery, production vessel, transfer pump, or storage tank place an "X" here: [X]

Input Data:

	OIL:	WATER:
If spill volumes from measurement, i.e. metering, tank volumes, etc.are known enter the volumes here:	0.0000 BBL	0.0000 BBL

If "known" spill volumes are given, input data for the following "Area Calculations" is optional. The above will override the calculated volumes.

Total Area Calculations

Total Surface Area	width		length		wet soil depth	oil (%)
Rectangle Area #1	89 ft	X	720 ft	X	0.75 in	0%
Rectangle Area #2	0 ft	X	0 ft	X	0.00 in	0%
Rectangle Area #3	0 ft	X	0 ft	X	0.00 in	0%
Rectangle Area #4	0 ft	X	0 ft	X	0.00 in	0%
Rectangle Area #5	0 ft	X	0 ft	X	0.00 in	0%
Rectangle Area #6	0 ft	X	0 ft	X	0.00 in	0%
Rectangle Area #7	0 ft	X	0 ft	X	0.00 in	0%
Rectangle Area #8	0 ft	X	0 ft	X	0.00 in	0%

Standing Liquid Calculations

Standing Liquid Area	width		length		liquid depth	oil (%)
Rectangle Area #1	0 ft	X	0 ft	X	0 in	0%
Rectangle Area #2	0 ft	X	0 ft	X	0 in	0%
Rectangle Area #3	0 ft	X	0 ft	X	0 in	0%
Rectangle Area #4	0 ft	X	0 ft	X	0 in	0%
Rectangle Area #5	0 ft	X	0 ft	X	0 in	0%
Rectangle Area #6	0 ft	X	0 ft	X	0 in	0%
Rectangle Area #7	0 ft	X	0 ft	X	0 in	0%
Rectangle Area #8	0 ft	X	0 ft	X	0 in	0%

okay

production system leak - DAILY PRODUCTION DATA REQUIRED

Average Daily Production: Oil BBL Water 0 BBL

Did leak occur before the separator?: [ ] YES [X] N/A *(place an "X")*

Amount of Free Liquid Recovered: 0 BBL okay

Percentage of Oil in Free Liquid Recovered: 0% (percentage)

Liquid holding factor *: 0.14 gal per gal

Use the following when the spill wets the grains of the soil.
* sand = .08 gallon liquid per gallon volume of soil.
* gravelly (caliche) loam = .14 gallon liquid per gallon volume of soil.
* sandy clay loam soil = .14 gallon liquid per gallon volume of soil.
* clay loam = .16 gallon liquid per gallon volume of soil.

Use the following when the liquid completely fills the pore space of the soil:
Occures when the spill soaked soil is contained by barriers, natural (or not).
* gravelly (caliche) loam = .25 gallon liquid per gallon volume of soil.
* sandy loam = .5 gallon liquid per gallon volume of soil.

Saturated Soil Volume Calculations:

		H2O	OIL
Total Solid/Liquid Volume:	64,080 sq. ft.	4,005 cu. ft.	cu. ft.

Free Liquid Volume Calculations:

		H2O	OIL
Total Free Liquid Volume:	sq. ft.	.000 cu. ft.	.000 cu. ft.

Estimated Volumes Spilled

	H2O	OIL
Liquid in Soil:	99.9 BBL	0.0 BBL
Free Liquid:	0.0 BBL	0.0 BBL
Totals:	99.858 BBL	0.000 BBL
Total Liquid Spill Liquid:	99.858 BBL	0.000 BBL

Estimated Production Volumes Lost

	H2O	OIL
Estimated Production Spilled:	0.000000 BBL	0.000000 BBL

Estimated Surface Damage

Surface Area: 64,080 sq. ft.

Surface Area: 1.4711 acre

Recovered Volumes

Estimated oil recovered: 0.0 BBL check - okay

Estimated water recovered: 0.0 BBL check - okay

Estimated Weights, and Volumes

Saturated Soil =	448,560 lbs	4,005 cu.ft.	148 cu.yds.
Total Liquid =	100 BBL	4,194.04 gallon	34,894 lbs

General Information

NMOCD District:	District 2 – Artesia	Incident ID:	TBD
Landowner:	Federal	Location:	32.077578, -103.896381
Client:	EOG Resources, Inc.	Site Location:	Stark 5 Federal Com #701H
Date:	May 24, 2025	Project #:	25A-01241

Objective

The objective of the environmental remediation plan is to identify exceedances found during the site characterization activities and propose an appropriate technique to address the open release for Stark 5 Federal Com #701H (30-015-48307). On March 17, 2025, EOG Resources, Inc. reported an incident caused by high winds damaging the liner inside the Banjo aboveground storage tank (AST) on the gas well pad. The release was initially reported as 4 barrels (bbls) of produced water with 0 bbl of material recovered. However, further site investigation revealed that the original release estimate was under-reported from the field. The official calculated release estimate is 100 bbls of produced water. Areas of environmental concern identified and delineated include the pad to the southeast corner around the AST. An aerial photograph of the site with characterization locations and approximate area of release impact is presented on Figure 1 (Attachment 1). Closure criteria have been selected as per New Mexico Administrative Code (NMAC) 19.15.29. All applicable research as it pertains to closure criteria selection is presented in Attachment 5. The closure criteria for the site are presented below (Table 1).

Table 1. Closure Criteria for Soils Impacted by a Release DTGW <50 feet bgs

Minimum depth below any point within the horizontal boundary of the release to groundwater less than 10,000 mg/l TDS	Constituent	Limit
< 50 feet	Chloride	600 mg/kg
	TPH (GRO+DRO+MRO)	100 mg/kg
	BTEX	50 mg/kg
	Benzene	10 mg/kg

TDS – total dissolved solids
TPH – total petroleum hydrocarbons, GRO – gas range organics, DRO – diesel range organics, MRO – motor oil range organics
BTEX – benzene, toluene, ethylbenzene and xylenes
DTGW – depth to groundwater

Site Assessment/Characterization

Site characterization started on March 24, 2025, and was completed on April 1, 2025. A total of 16 pertinent sample points (seven boreholes and nine testpits) were established. Samples were obtained at various depths for horizontal and vertical delineation. Samples at the deepest vertical distance below criteria were submitted to the laboratory for analysis. In total, 21 samples were submitted to Cardinal Laboratories in Hobbs, New Mexico, for laboratory analysis. The sample locations are presented on Figure 1 (Attachment 1). Samples at the greatest lateral limits below the AST will be completed following the deconstruction of the AST from the pad. Laboratory analysis results have been compared to the above noted closure criteria and the results from the characterization activity are presented in Table 2 (Attachment 2). The following sample points: TP25-07 through TP-10 and TP25-14 have been omitted from the table due to impertinence. Daily field reports with photographs are included in Attachment 3 and laboratory data reports are included in Attachment 4. Exceedances to criteria are identified in the table in bold font with a gray background.

Proposed Remedial Activities

Areas identified with contaminant concentrations above closure criteria will be remediated through excavation. Laboratory results from the site assessment/characterization have been referenced to estimate both the vertical and horizontal limits of the impacts and the volume of soil to be removed. Field screening will be utilized to confirm removal of contaminated soil until the excavation is below the applicable closure criteria. Contaminated soil will be disposed at an approved facility. Confirmatory samples will be collected during excavation activities and will be sent to an approved laboratory to confirm closure criteria guidelines are met. The excavation will be backfilled with clean soil sourced locally.

Exceedances to closure criteria were identified at multiple sample points on the southeast corner of the pad. Heavy equipment will be utilized to complete the excavation. Deconstruction of the AST from the pad will be completed and the release area will be excavated to depths of 2.5 to 4.5 feet below ground surface. The estimated volume to be excavated is 7,611 cubic yards. Excavation is planned to be completed within 90 days of approval of this remediation plan.

Sample Point	Excavation Depth	Remediation Method
BH25-02	2.5’	Backhoe
TP25-02	2.5’	Backhoe
TP25-03	4.5’	Backhoe
TP25-04	2.5’	Backhoe

Variance Request

EOG and Vertex would like to request a variance for confirmation sampling due to the square footage of the proposed excavation area. This variance will consist of five-point composite samples for every 400 square feet for the base of the excavation. The walls of the excavation will utilize five-point composite samples that are representative of no more than 200 square feet.

Should you have any questions or concerns, please do not hesitate to contact Chance Dixon at 575.988.1472 or cdixon@vertexresource.com.

Stephanie McCarty 5/24/2025

Stephanie McCarty, B.Sc. Date
ENVIRONMENTAL SPECIALIST, REPORTING

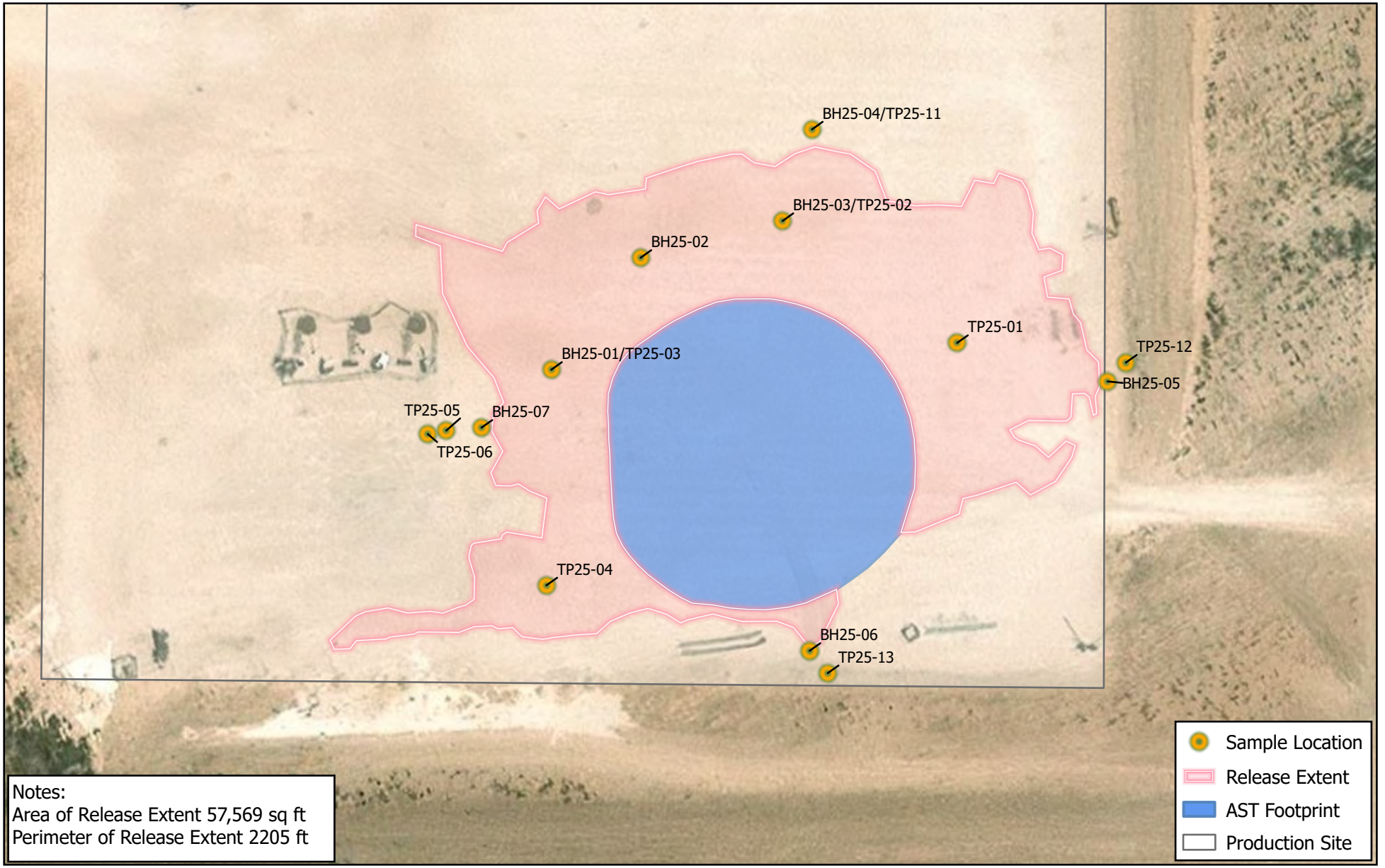
Chance Dixon 5/24/2025

Chance Dixon, B.Sc. Date
PROJECT MANAGER, REPORT REVIEW

Attachments

Attachment 1. Characterization Sampling Site Schematic
Attachment 2. Field Screening and Laboratory Results Table
Attachment 3. Daily Field Report with Photographs
Attachment 4. Laboratory Data Reports with Chain of Custody Forms
Attachment 5. Closure Criteria Research

ATTACHMENT 1



VERTEX

0 40 80 ft

NAD 1983 StatePlane New Mexico East FIPS 3001 Feet

Map Center:
Lat/Long: 32.077578°N, 103.896381°W

Date: Apr 08/25

N

Characterization Sampling Site Schematic
Stark 5 Federal Com #701H

FIGURE:
1

EOG Resources

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: Georeferenced image from Esri, 2025. Site features from GPS, Vertex, 2025.

VERSATILITY. EXPERTISE.

ATTACHMENT 2

Client Name: EOG Resources Inc.
Site Name: Stark 5 Fed Com #701
NMOCD Tracking #: To be determined
Project #: 25A-01241
Lab Reports: H251830, H251915 and H251968

Table 2. Initial Characterization Sample Field Screen and Laboratory Results

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)
			Depth to Groundwater <50										
BH25-01	0	March 24, 2025	—	**258**	**13,340**	-	-	-	-	-	-	-	-
	1.5	March 24, 2025	—	44	**1,638**	-	-	-	-	-	-	-	-
BH25-02	0	March 24, 2025	—	43	**7,195**	ND	ND	ND	ND	ND	ND	ND	**8,160**
	2	March 24, 2025	—	54	**908**	ND	ND	ND	ND	ND	ND	ND	**784**
	3	March 24, 2025	—	30	310	ND	ND	ND	ND	ND	ND	ND	160
BH25-03	0	March 24, 2025	—	45	**5,068**	-	-	-	-	-	-	-	-
	1.5	March 24, 2025	—	46	**4,220**	-	-	-	-	-	-	-	-
BH25-04	0	March 24, 2025	—	32	528	ND	ND	ND	ND	ND	ND	ND	560
	1	March 24, 2025	—	40	575	ND	ND	ND	ND	ND	ND	ND	496
BH25-05	0	March 24, 2025	—	**474**	550	-	-	-	-	-	-	-	-
	1	March 24, 2025	—	**117**	438	-	-	-	-	-	-	-	-
BH25-06	0	March 24, 2025	—	**247**	395	-	-	-	-	-	-	-	-
	1	March 24, 2025	—	**161**	238	-	-	-	-	-	-	-	-
BH25-07	0	March 24, 2025	—	—	**3,875**	-	-	-	-	-	-	-	-
	1	March 24, 2025	—	—	**2,745**	-	-	-	-	-	-	-	-
TP25-01	0	March 28, 2025	—	—	**39,295**	-	-	-	-	-	-	-	-
	2	March 28, 2025	—	18	235	ND	ND	ND	ND	ND	ND	ND	96
TP25-02	0	March 28, 2025	—	—	**50,000**	-	-	-	-	-	-	-	-
	2	March 28, 2025	—	—	**3,775**	ND	ND	ND	ND	ND	ND	ND	**3,600**
	3	March 28, 2025	—	—	**770**	ND	ND	ND	ND	ND	ND	ND	544
	4	March 28, 2025	—	44	538	ND	ND	ND	ND	ND	ND	ND	416
TP25-03	0	March 28, 2025	—	—	**41,985**	-	-	-	-	-	-	-	-
	2	March 28, 2025	—	—	**5,195**	ND	ND	ND	56.5	ND	56.5	56.5	**2,600**
	4	March 28, 2025	—	—	**703**	ND	ND	ND	ND	ND	ND	ND	**624**
	6	March 28, 2025	—	24	155	ND	ND	ND	ND	ND	ND	ND	48
TP25-04	0	March 28, 2025	—	—	**8,610**	-	-	-	-	-	-	-	-
	2	March 28, 2025	—	—	**830**	ND	ND	ND	ND	ND	ND	ND	**640**
	3	March 28, 2025	—	61	520	ND	ND	ND	ND	ND	ND	ND	320
	4	March 28, 2025	—	43	583	-	-	-	-	-	-	-	-
TP25-05	0	April 1, 2025	—	**125**	**1,218**	-	-	-	-	-	-	-	-
	2	April 1, 2025	—	79	**1,123**	-	-	-	-	-	-	-	-
TP25-06	0	April 1, 2025	—	**160**	570	ND	ND	ND	36.5	ND	36.5	36.5	480
	2	April 1, 2025	—	**177**	595	ND	ND	ND	39.5	11.5	51	51	592
TP25-11	2	April 1, 2025	—	33	370	ND	ND	ND	ND	ND	ND	ND	160
TP25-12	0	April 1, 2025	—	30	240	ND	ND	ND	ND	ND	ND	ND	192
	2	April 1, 2025	—	82	323	ND	ND	ND	12.9	ND	12.9	12.9	240
TP25-13	0	April 1, 2025	—	64	255	ND	ND	ND	ND	ND	ND	ND	96
	2	April 1, 2025	—	51	298	ND	ND	ND	ND	ND	ND	ND	80

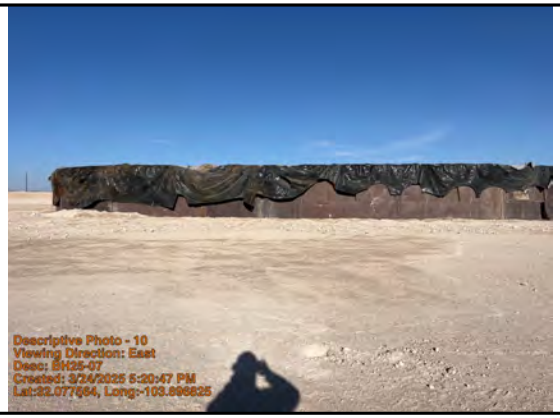
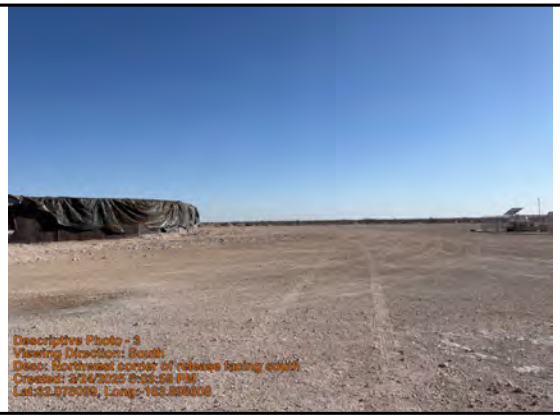
"ND" Not Detected at the Reporting Limit
"-" indicates not analyzed/assessed
Bold and grey shaded indicates exceedance outside of NMOCD Closure Criteria (on-pad)

VERTEX

ATTACHMENT 3

Daily Site Visit Report

Site Photos

Viewing Direction: Southwest	**Viewing Direction**: East
	
Placard	BH25-07
Viewing Direction: Southeast	**Viewing Direction**: South
	
Northwest corner of release facing southeast	Northwest corner of release facing south

Daily Site Visit Report

Viewing Direction: South	**Viewing Direction**: East
	
BH25-01	BH25-02
Viewing Direction: Southeast	**Viewing Direction**: South
	
BH25-03	BH25-04

Daily Site Visit Report

Viewing Direction: West	**Viewing Direction**: Northeast
	
BH25-05	BH25-06

Daily Site Visit Report

Site Photos

Viewing Direction: West

Placard

Viewing Direction: South

Swept planned dig location with magnetic locator.

Viewing Direction: West

TP25-01. Samples collected at 0’ and 2’ bgs.

Viewing Direction: West

TP25-02. Samples collected at 0’ 2’ 3’ and 4’ bgs.

Daily Site Visit Report

Viewing Direction: West	**Viewing Direction**: Southeast
	
TP25-02. Samples collected at 0’ 2’ and 3’ 4’ bgs.	TP25-03. Samples collected at 0’ and 2’ 4’ and 6’ bgs.
Viewing Direction: Southeast	**Viewing Direction**: East
	
TP25-03. Samples collected at 0’ and 2’ 4’ and 6’ bgs.	TP25-04. Samples collected at 0’ 2’ and 3’ 4’ bgs.

Daily Site Visit Report

Viewing Direction: East

TP25-04. Samples collected at 0’ 2’ and 3’ 4’ bgs.

Viewing Direction: Northeast

Overview of work area

Viewing Direction: Southeast

Overview of work area

Viewing Direction: West

Overview of work area

ATTACHMENT 4

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

April 02, 2025

CHANCE DIXON

VERTEX RESOURCE

3101 BOYD DRIVE

CARLSBAD, NM 88220

RE: STARK 5 FED COM #701H

Enclosed are the results of analyses for samples received by the laboratory on 03/27/25 13:20.

Cardinal Laboratories is accredited through Texas NELAP under certificate number TX-C24-00112. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	03/27/2025	Sampling Date:	03/24/2025
Reported:	04/02/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	25A - 01241	Sample Received By:	Alyssa Parras
Project Location:	EOG		

Sample ID: BH25 - 02 0.0' (H251830-01)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/31/2025	ND	1.80	89.9	2.00	0.147	
Toluene*	<0.050	0.050	03/31/2025	ND	1.87	93.3	2.00	0.802	
Ethylbenzene*	<0.050	0.050	03/31/2025	ND	1.88	93.8	2.00	1.12	
Total Xylenes*	<0.150	0.150	03/31/2025	ND	5.81	96.9	6.00	0.864	
Total BTEX	<0.300	0.300	03/31/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *102 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**8160**	16.0	03/29/2025	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/28/2025	ND	208	104	200	0.540	
DRO >C10-C28*	<10.0	10.0	03/28/2025	ND	203	101	200	0.665	
EXT DRO >C28-C36	<10.0	10.0	03/28/2025	ND					

Surrogate: 1-Chlorooctane *86.3 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *85.2 %* *40.6-153*

Cardinal Laboratories *=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	03/27/2025	Sampling Date:	03/24/2025
Reported:	04/02/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	25A - 01241	Sample Received By:	Alyssa Parras
Project Location:	EOG		

Sample ID: BH25 - 02 2.0' (H251830-02)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/31/2025	ND	1.80	89.9	2.00	0.147	
Toluene*	<0.050	0.050	03/31/2025	ND	1.87	93.3	2.00	0.802	
Ethylbenzene*	<0.050	0.050	03/31/2025	ND	1.88	93.8	2.00	1.12	
Total Xylenes*	<0.150	0.150	03/31/2025	ND	5.81	96.9	6.00	0.864	
Total BTEX	<0.300	0.300	03/31/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *102 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**784**	16.0	03/29/2025	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/28/2025	ND	208	104	200	0.540	
DRO >C10-C28*	<10.0	10.0	03/28/2025	ND	203	101	200	0.665	
EXT DRO >C28-C36	<10.0	10.0	03/28/2025	ND					

Surrogate: 1-Chlorooctane *80.0 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *75.4 %* *40.6-153*

Cardinal Laboratories *=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	03/27/2025	Sampling Date:	03/24/2025
Reported:	04/02/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	25A - 01241	Sample Received By:	Alyssa Parras
Project Location:	EOG		

Sample ID: BH25 - 02 3.0' (H251830-03)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/31/2025	ND	1.80	89.9	2.00	0.147	
Toluene*	<0.050	0.050	03/31/2025	ND	1.87	93.3	2.00	0.802	
Ethylbenzene*	<0.050	0.050	03/31/2025	ND	1.88	93.8	2.00	1.12	
Total Xylenes*	<0.150	0.150	03/31/2025	ND	5.81	96.9	6.00	0.864	
Total BTEX	<0.300	0.300	03/31/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *104 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**160**	16.0	03/29/2025	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/28/2025	ND	208	104	200	0.540	
DRO >C10-C28*	<10.0	10.0	03/28/2025	ND	203	101	200	0.665	
EXT DRO >C28-C36	<10.0	10.0	03/28/2025	ND					

Surrogate: 1-Chlorooctane *80.7 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *73.5 %* *40.6-153*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	03/27/2025	Sampling Date:	03/24/2025
Reported:	04/02/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	25A - 01241	Sample Received By:	Alyssa Parras
Project Location:	EOG		

Sample ID: BH25 - 04 0.0' (H251830-04)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/31/2025	ND	1.80	89.9	2.00	0.147	
Toluene*	<0.050	0.050	03/31/2025	ND	1.87	93.3	2.00	0.802	
Ethylbenzene*	<0.050	0.050	03/31/2025	ND	1.88	93.8	2.00	1.12	
Total Xylenes*	<0.150	0.150	03/31/2025	ND	5.81	96.9	6.00	0.864	
Total BTEX	<0.300	0.300	03/31/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *103 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**560**	16.0	03/29/2025	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/28/2025	ND	208	104	200	0.540	
DRO >C10-C28*	<10.0	10.0	03/28/2025	ND	203	101	200	0.665	
EXT DRO >C28-C36	<10.0	10.0	03/28/2025	ND					

Surrogate: 1-Chlorooctane *80.6 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *75.0 %* *40.6-153*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	03/27/2025	Sampling Date:	03/24/2025
Reported:	04/02/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	25A - 01241	Sample Received By:	Alyssa Parras
Project Location:	EOG		

Sample ID: BH25 - 04 1.0' (H251830-05)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/31/2025	ND	1.80	89.9	2.00	0.147	
Toluene*	<0.050	0.050	03/31/2025	ND	1.87	93.3	2.00	0.802	
Ethylbenzene*	<0.050	0.050	03/31/2025	ND	1.88	93.8	2.00	1.12	
Total Xylenes*	<0.150	0.150	03/31/2025	ND	5.81	96.9	6.00	0.864	
Total BTEX	<0.300	0.300	03/31/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *104 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**496**	16.0	03/29/2025	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	03/28/2025	ND	208	104	200	0.540	
DRO >C10-C28*	<10.0	10.0	03/28/2025	ND	203	101	200	0.665	
EXT DRO >C28-C36	<10.0	10.0	03/28/2025	ND					

Surrogate: 1-Chlorooctane *82.5 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *75.3 %* *40.6-153*

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Notes and Definitions

QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

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CARDINAL Laboratories

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name: Vertex Resource Services (Direct Bill to EOG Resources Inc)	BILL TO
Project Manager: Chance Dixon	P.O. #:
Address: 3101 Boyd Drive	Company: EOG Resources
City: Carlsbad State: NM Zip: 88220	Attn: Chase Settle
Phone #: 575.725.5001 Fax #:	Address:
Project #: 25A-01241 Project Owner:	City:
Project Name: Stark 5 Fed Com #701H	State: Zip:
Project Location:	Phone #:
Sampler Name: A. Ludvik	Fax #:

ANALYSIS REQUEST

FOR LAB USE ONLY Lab I.D. (H25182)	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	BTEX (8021)	TPH:8015D(GRO / DRO / MRO)	Chloride
1	BH25-02 0.0'	G	1			X					X		03.24.25	10:50	X	X	X
2	BH25-02 2.0'	G	1			X					X		03.24.25	11:00	X	X	X
3	BH25-02 3.0'	G	1			X					X		03.24.25	11:10	X	X	X
4	BH25-04 0.0'	G	1			X					X		03.24.25	15:45	X	X	X
5	BH25-04 1.0'	G	1			X					X		03.24.25	15:55	X	X	X

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Relinquished By:	Date: 3.07.25 Time: 1320	Received By:	Verbal Result: ☐ Yes ☐ No Add'l Phone #:
			Please Email Results: Chance Dixon (cdixon@vertexresource.com), Andrew Ludvik (aludvik@vertexresource.com), permian@vertexresource.com
Relinquished By:	Date: Time:	Received By:	REMARKS: Direct Bill to EOG Resources Inc.

Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Observed Temp. °C 13C Corrected Temp. °C 16C	Sample Condition Cool: ☑ Yes ☐ No Intact: ☑ Yes ☐ No	CHECKED BY: (Initials) AD	Turnaround Time: Standard ☑ Bacteria (only) Sample Condition Rush: ☐ Cool Intact Observed Temp. °C Thermometer ID #113 #140 Correction Factor -0.5°C +0.3C ☐ Yes ☐ Yes ☐ No ☐ No Corrected Temp. °C

FORM-006 R 3.2 10/07/21

Received by OCD: 6/4/2025 9:26:57 AM

Released to Imaging: 7/15/2025 11:46:43 AM

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

April 07, 2025

CHANCE DIXON

VERTEX RESOURCE

3101 BOYD DRIVE

CARLSBAD, NM 88220

RE: STARK 5 FED COM #701H

Enclosed are the results of analyses for samples received by the laboratory on 04/01/25 13:30.

Cardinal Laboratories is accredited through Texas NELAP under certificate number TX-C24-00112. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	04/01/2025	Sampling Date:	03/28/2025
Reported:	04/07/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	24A - 01241	Sample Received By:	Tamara Oldaker
Project Location:	EOG		

Sample ID: TP25 - 01 2.0' (H251915-01)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/02/2025	ND	1.97	98.4	2.00	4.78	
Toluene*	<0.050	0.050	04/02/2025	ND	2.03	102	2.00	3.34	
Ethylbenzene*	<0.050	0.050	04/02/2025	ND	2.30	115	2.00	2.60	
Total Xylenes*	<0.150	0.150	04/02/2025	ND	7.04	117	6.00	2.48	
Total BTEX	<0.300	0.300	04/02/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *118 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**96.0**	16.0	04/02/2025	ND	480	120	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/01/2025	ND	207	104	200	0.508	
DRO >C10-C28*	<10.0	10.0	04/01/2025	ND	201	100	200	1.89	
EXT DRO >C28-C36	<10.0	10.0	04/01/2025	ND					

Surrogate: 1-Chlorooctane *95.1 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *88.6 %* *40.6-153*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	04/01/2025	Sampling Date:	03/28/2025
Reported:	04/07/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	24A - 01241	Sample Received By:	Tamara Oldaker
Project Location:	EOG		

Sample ID: TP25 - 02 2.0' (H251915-02)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/02/2025	ND	1.97	98.4	2.00	4.78	
Toluene*	<0.050	0.050	04/02/2025	ND	2.03	102	2.00	3.34	
Ethylbenzene*	<0.050	0.050	04/02/2025	ND	2.30	115	2.00	2.60	
Total Xylenes*	<0.150	0.150	04/02/2025	ND	7.04	117	6.00	2.48	
Total BTEX	<0.300	0.300	04/02/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *117 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: KV

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**3600**	16.0	04/02/2025	ND	416	104	400	3.77	QM-07

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/01/2025	ND	207	104	200	0.508	
DRO >C10-C28*	<10.0	10.0	04/01/2025	ND	201	100	200	1.89	
EXT DRO >C28-C36	<10.0	10.0	04/01/2025	ND					

Surrogate: 1-Chlorooctane *94.6 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *90.2 %* *40.6-153*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	04/01/2025	Sampling Date:	03/28/2025
Reported:	04/07/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	24A - 01241	Sample Received By:	Tamara Oldaker
Project Location:	EOG		

Sample ID: TP25 - 02 3.0' (H251915-03)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/02/2025	ND	1.97	98.4	2.00	4.78	
Toluene*	<0.050	0.050	04/02/2025	ND	2.03	102	2.00	3.34	
Ethylbenzene*	<0.050	0.050	04/02/2025	ND	2.30	115	2.00	2.60	
Total Xylenes*	<0.150	0.150	04/02/2025	ND	7.04	117	6.00	2.48	
Total BTEX	<0.300	0.300	04/02/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *121 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: KV

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**544**	16.0	04/02/2025	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/01/2025	ND	207	104	200	0.508	
DRO >C10-C28*	<10.0	10.0	04/01/2025	ND	201	100	200	1.89	
EXT DRO >C28-C36	<10.0	10.0	04/01/2025	ND					

Surrogate: 1-Chlorooctane *95.2 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *90.4 %* *40.6-153*

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Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

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Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	04/01/2025	Sampling Date:	03/28/2025
Reported:	04/07/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	24A - 01241	Sample Received By:	Tamara Oldaker
Project Location:	EOG		

Sample ID: TP25 - 02 4.0' (H251915-04)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/02/2025	ND	1.97	98.4	2.00	4.78	
Toluene*	<0.050	0.050	04/02/2025	ND	2.03	102	2.00	3.34	
Ethylbenzene*	<0.050	0.050	04/02/2025	ND	2.30	115	2.00	2.60	
Total Xylenes*	<0.150	0.150	04/02/2025	ND	7.04	117	6.00	2.48	
Total BTEX	<0.300	0.300	04/02/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *126 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: KV

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**416**	16.0	04/02/2025	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/01/2025	ND	207	104	200	0.508	
DRO >C10-C28*	<10.0	10.0	04/01/2025	ND	201	100	200	1.89	
EXT DRO >C28-C36	<10.0	10.0	04/01/2025	ND					

Surrogate: 1-Chlorooctane *91.2 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *87.2 %* *40.6-153*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	04/01/2025	Sampling Date:	03/28/2025
Reported:	04/07/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	24A - 01241	Sample Received By:	Tamara Oldaker
Project Location:	EOG		

Sample ID: TP25 - 03 2.0' (H251915-05)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/02/2025	ND	1.97	98.4	2.00	4.78	
Toluene*	<0.050	0.050	04/02/2025	ND	2.03	102	2.00	3.34	
Ethylbenzene*	<0.050	0.050	04/02/2025	ND	2.30	115	2.00	2.60	
Total Xylenes*	<0.150	0.150	04/02/2025	ND	7.04	117	6.00	2.48	
Total BTEX	<0.300	0.300	04/02/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *109 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: KV

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2600**	16.0	04/02/2025	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/02/2025	ND	214	107	200	2.57	
DRO >C10-C28*	**56.5**	10.0	04/02/2025	ND	204	102	200	0.742	
EXT DRO >C28-C36	<10.0	10.0	04/02/2025	ND					

Surrogate: 1-Chlorooctane *91.3 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *92.0 %* *40.6-153*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	04/01/2025	Sampling Date:	03/28/2025
Reported:	04/07/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	24A - 01241	Sample Received By:	Tamara Oldaker
Project Location:	EOG		

Sample ID: TP25 - 03 4.0' (H251915-06)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/02/2025	ND	1.97	98.4	2.00	4.78	
Toluene*	<0.050	0.050	04/02/2025	ND	2.03	102	2.00	3.34	
Ethylbenzene*	<0.050	0.050	04/02/2025	ND	2.30	115	2.00	2.60	
Total Xylenes*	<0.150	0.150	04/02/2025	ND	7.04	117	6.00	2.48	
Total BTEX	<0.300	0.300	04/02/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *122 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: KV

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**624**	16.0	04/02/2025	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/02/2025	ND	214	107	200	2.57	
DRO >C10-C28*	<10.0	10.0	04/02/2025	ND	204	102	200	0.742	
EXT DRO >C28-C36	<10.0	10.0	04/02/2025	ND					

Surrogate: 1-Chlorooctane *97.6 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *93.9 %* *40.6-153*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	04/01/2025	Sampling Date:	03/28/2025
Reported:	04/07/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	24A - 01241	Sample Received By:	Tamara Oldaker
Project Location:	EOG		

Sample ID: TP25 - 03 6.0' (H251915-07)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/02/2025	ND	1.97	98.4	2.00	4.78	
Toluene*	<0.050	0.050	04/02/2025	ND	2.03	102	2.00	3.34	
Ethylbenzene*	<0.050	0.050	04/02/2025	ND	2.30	115	2.00	2.60	
Total Xylenes*	<0.150	0.150	04/02/2025	ND	7.04	117	6.00	2.48	
Total BTEX	<0.300	0.300	04/02/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *121 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: KV

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**48.0**	16.0	04/02/2025	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/02/2025	ND	214	107	200	2.57	
DRO >C10-C28*	<10.0	10.0	04/02/2025	ND	204	102	200	0.742	
EXT DRO >C28-C36	<10.0	10.0	04/02/2025	ND					

Surrogate: 1-Chlorooctane *104 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *98.7 %* *40.6-153*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	04/01/2025	Sampling Date:	03/28/2025
Reported:	04/07/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	24A - 01241	Sample Received By:	Tamara Oldaker
Project Location:	EOG		

Sample ID: TP25 - 04 2.0' (H251915-08)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/02/2025	ND	1.97	98.4	2.00	4.78	
Toluene*	<0.050	0.050	04/02/2025	ND	2.03	102	2.00	3.34	
Ethylbenzene*	<0.050	0.050	04/02/2025	ND	2.30	115	2.00	2.60	
Total Xylenes*	<0.150	0.150	04/02/2025	ND	7.04	117	6.00	2.48	
Total BTEX	<0.300	0.300	04/02/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *116 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: KV

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**640**	16.0	04/02/2025	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/02/2025	ND	214	107	200	2.57	
DRO >C10-C28*	<10.0	10.0	04/02/2025	ND	204	102	200	0.742	
EXT DRO >C28-C36	<10.0	10.0	04/02/2025	ND					

Surrogate: 1-Chlorooctane *96.5 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *91.3 %* *40.6-153*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	04/01/2025	Sampling Date:	03/28/2025
Reported:	04/07/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	24A - 01241	Sample Received By:	Tamara Oldaker
Project Location:	EOG		

Sample ID: TP25 - 04 3.0' (H251915-09)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/02/2025	ND	1.97	98.4	2.00	4.78	
Toluene*	<0.050	0.050	04/02/2025	ND	2.03	102	2.00	3.34	
Ethylbenzene*	<0.050	0.050	04/02/2025	ND	2.30	115	2.00	2.60	
Total Xylenes*	<0.150	0.150	04/02/2025	ND	7.04	117	6.00	2.48	
Total BTEX	<0.300	0.300	04/02/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *122 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: KV

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**320**	16.0	04/02/2025	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/02/2025	ND	214	107	200	2.57	
DRO >C10-C28*	<10.0	10.0	04/02/2025	ND	204	102	200	0.742	
EXT DRO >C28-C36	<10.0	10.0	04/02/2025	ND					

Surrogate: 1-Chlorooctane *98.0 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *93.0 %* *40.6-153*

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Celey D. Keene, Lab Director/Quality Manager

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Notes and Definitions

QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name: Vertex Resource Services (Direct Bill to EOG Resources Inc)	BILL TO
Project Manager: Chance Dixon	P.O. #:
Address: 3101 Boyd Drive	Company: EOG Resources
City: Carlsbad State: NM Zip: 88220	Attn: Chase Settle
Phone #: 575.725.5001 Fax #:	Address:
Project #: 25A-01241 Project Owner:	City:
Project Name: Stark 5 Fed Com #701H	State: Zip:
Project Location:	Phone #:
Sampler Name: A. Ludvik	Fax #:

FOR LAB USE ONLY

Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	ANALYSIS REQUEST: BTEX (8021)	TPH:8015D(GRO / DRO / MRO)	Chloride
H25915																	
1	TP25-01 2.0'	G	1			X					X		03.28.25	10:15	X	X	X
2	TP25-02 2.0'	G	1			X					X		03.28.25	10:25	X	X	X
3	TP25-02 3.0'	G	1			X					X		03.28.25	10:45	X	X	X
4	TP25-02 4.0'	G	1			X					X		03.28.25	10:55	X	X	X
5	TP25-03 2.0'	G	1			X					X		03.28.25	11:15	X	X	X
6	TP25-03 4.0'	G	1			X					X		03.28.25	11:45	X	X	X
7	TP25-03 6.0'	G	1			X					X		03.28.25	13:00	X	X	X
8	TP25-04 2.0'	G	1			X					X		03.28.25	13:15	X	X	X
9	TP25-04 3.0'	G	1			X					X		03.28.25	13:25	X	X	X

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Relinquished By:	Date: 4-1-25 Time: 1330	Received By:	Verbal Result: ☐ Yes ☐ No Add'l Phone #:
Relinquished By:	Date: Time:	Received By:	Please Email Results: Chance Dixon (cdixon@vertexresource.com), Andrew Ludvik (aludvik@vertexresource.com), permian@vertexresource.com REMARKS: Direct Bill to EOG Resources Inc.

Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Observed Temp. °C 0.8 Corrected Temp. °C 1.1	Sample Condition Cool Intact ☑ Yes ☑ Yes ☐ No ☐ No	CHECKED BY: (Initials)	Turnaround Time: Standard ☑ Bacteria (only) Sample Condition Rush: ☐ Cool Intact Observed Temp. °C Thermometer ID #113 #140 Correction Factor -0.5°C +0.3c T= 4/1/25 ☐ Yes ☐ Yes ☐ No ☐ No Corrected Temp. °C

FORM-006 R 3.2 10/07/21

Received by OCD: 6/4/2025 9:26:57 AM

Released to Imaging: 7/15/2025 11:46:43 AM

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

April 09, 2025

CHANCE DIXON

VERTEX RESOURCE

3101 BOYD DRIVE

CARLSBAD, NM 88220

RE: STARK 5 FED COM #701H

Enclosed are the results of analyses for samples received by the laboratory on 04/03/25 13:15.

Cardinal Laboratories is accredited through Texas NELAP under certificate number TX-C24-00112. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	04/03/2025	Sampling Date:	04/01/2025
Reported:	04/09/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	25A - 01241	Sample Received By:	Tamara Oldaker
Project Location:	EOG		

Sample ID: TP25 - 06 0.0' (H251968-01)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/06/2025	ND	1.97	98.6	2.00	4.53	
Toluene*	<0.050	0.050	04/06/2025	ND	1.93	96.4	2.00	6.47	
Ethylbenzene*	<0.050	0.050	04/06/2025	ND	2.03	101	2.00	5.53	
Total Xylenes*	<0.150	0.150	04/06/2025	ND	6.27	104	6.00	3.69	
Total BTEX	<0.300	0.300	04/06/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *97.2 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: CT

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**480**	16.0	04/04/2025	ND	432	108	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/04/2025	ND	196	98.2	200	0.0255	
DRO >C10-C28*	**36.5**	10.0	04/04/2025	ND	206	103	200	1.37	
EXT DRO >C28-C36	<10.0	10.0	04/04/2025	ND					

Surrogate: 1-Chlorooctane *81.6 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *79.6 %* *40.6-153*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	04/03/2025	Sampling Date:	04/01/2025
Reported:	04/09/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	25A - 01241	Sample Received By:	Tamara Oldaker
Project Location:	EOG		

Sample ID: TP25 - 06 2.0' (H251968-02)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/06/2025	ND	1.97	98.6	2.00	4.53	
Toluene*	<0.050	0.050	04/06/2025	ND	1.93	96.4	2.00	6.47	
Ethylbenzene*	<0.050	0.050	04/06/2025	ND	2.03	101	2.00	5.53	
Total Xylenes*	<0.150	0.150	04/06/2025	ND	6.27	104	6.00	3.69	
Total BTEX	<0.300	0.300	04/06/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *102 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**592**	16.0	04/04/2025	ND	480	120	400	6.90	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/04/2025	ND	196	98.2	200	0.0255	
DRO >C10-C28*	**39.0**	10.0	04/04/2025	ND	206	103	200	1.37	
EXT DRO >C28-C36	**11.5**	10.0	04/04/2025	ND					

Surrogate: 1-Chlorooctane *82.8 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *79.5 %* *40.6-153*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	04/03/2025	Sampling Date:	04/01/2025
Reported:	04/09/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	25A - 01241	Sample Received By:	Tamara Oldaker
Project Location:	EOG		

Sample ID: TP25 - 11 2.0' (H251968-03)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/06/2025	ND	1.97	98.6	2.00	4.53	
Toluene*	<0.050	0.050	04/06/2025	ND	1.93	96.4	2.00	6.47	
Ethylbenzene*	<0.050	0.050	04/06/2025	ND	2.03	101	2.00	5.53	
Total Xylenes*	<0.150	0.150	04/06/2025	ND	6.27	104	6.00	3.69	
Total BTEX	<0.300	0.300	04/06/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *111 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**160**	16.0	04/04/2025	ND	480	120	400	6.90	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/04/2025	ND	196	98.2	200	0.0255	
DRO >C10-C28*	<10.0	10.0	04/04/2025	ND	206	103	200	1.37	
EXT DRO >C28-C36	<10.0	10.0	04/04/2025	ND					

Surrogate: 1-Chlorooctane *84.8 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *81.3 %* *40.6-153*

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Celey D. Keene, Lab Director/Quality Manager

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Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	04/03/2025	Sampling Date:	04/01/2025
Reported:	04/09/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	25A - 01241	Sample Received By:	Tamara Oldaker
Project Location:	EOG		

Sample ID: TP25 - 12 0.0' (H251968-04)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/06/2025	ND	1.97	98.6	2.00	4.53	
Toluene*	<0.050	0.050	04/06/2025	ND	1.93	96.4	2.00	6.47	
Ethylbenzene*	<0.050	0.050	04/06/2025	ND	2.03	101	2.00	5.53	
Total Xylenes*	<0.150	0.150	04/06/2025	ND	6.27	104	6.00	3.69	
Total BTEX	<0.300	0.300	04/06/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *107 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**192**	16.0	04/04/2025	ND	480	120	400	6.90	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/04/2025	ND	196	98.2	200	0.0255	
DRO >C10-C28*	<10.0	10.0	04/04/2025	ND	206	103	200	1.37	
EXT DRO >C28-C36	<10.0	10.0	04/04/2025	ND					

Surrogate: 1-Chlorooctane *86.2 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *82.4 %* *40.6-153*

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Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	04/03/2025	Sampling Date:	04/01/2025
Reported:	04/09/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	25A - 01241	Sample Received By:	Tamara Oldaker
Project Location:	EOG		

Sample ID: TP25 - 12 2.0' (H251968-05)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/06/2025	ND	1.97	98.6	2.00	4.53	
Toluene*	<0.050	0.050	04/06/2025	ND	1.93	96.4	2.00	6.47	
Ethylbenzene*	<0.050	0.050	04/06/2025	ND	2.03	101	2.00	5.53	
Total Xylenes*	<0.150	0.150	04/06/2025	ND	6.27	104	6.00	3.69	
Total BTEX	<0.300	0.300	04/06/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *103 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**240**	16.0	04/04/2025	ND	480	120	400	6.90	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/04/2025	ND	196	98.2	200	0.0255	
DRO >C10-C28*	**12.9**	10.0	04/04/2025	ND	206	103	200	1.37	
EXT DRO >C28-C36	<10.0	10.0	04/04/2025	ND					

Surrogate: 1-Chlorooctane *93.5 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *91.0 %* *40.6-153*

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Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	04/03/2025	Sampling Date:	04/01/2025
Reported:	04/09/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	25A - 01241	Sample Received By:	Tamara Oldaker
Project Location:	EOG		

Sample ID: TP25 - 13 0.0' (H251968-06)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/06/2025	ND	1.97	98.6	2.00	4.53	
Toluene*	<0.050	0.050	04/06/2025	ND	1.93	96.4	2.00	6.47	
Ethylbenzene*	<0.050	0.050	04/06/2025	ND	2.03	101	2.00	5.53	
Total Xylenes*	<0.150	0.150	04/06/2025	ND	6.27	104	6.00	3.69	
Total BTEX	<0.300	0.300	04/06/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *101 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**96.0**	16.0	04/04/2025	ND	480	120	400	6.90	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/04/2025	ND	196	98.2	200	0.0255	
DRO >C10-C28*	<10.0	10.0	04/04/2025	ND	206	103	200	1.37	
EXT DRO >C28-C36	<10.0	10.0	04/04/2025	ND					

Surrogate: 1-Chlorooctane *75.7 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *70.9 %* *40.6-153*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Analytical Results For:

VERTEX RESOURCE
CHANCE DIXON
3101 BOYD DRIVE
CARLSBAD NM, 88220
Fax To: NA

Received:	04/03/2025	Sampling Date:	04/01/2025
Reported:	04/09/2025	Sampling Type:	Soil
Project Name:	STARK 5 FED COM #701H	Sampling Condition:	Cool & Intact
Project Number:	25A - 01241	Sample Received By:	Tamara Oldaker
Project Location:	EOG		

Sample ID: TP25 - 13 2.0' (H251968-07)

BTEX 8021B mg/kg Analyzed By: JH

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/06/2025	ND	1.97	98.6	2.00	4.53	
Toluene*	<0.050	0.050	04/06/2025	ND	1.93	96.4	2.00	6.47	
Ethylbenzene*	<0.050	0.050	04/06/2025	ND	2.03	101	2.00	5.53	
Total Xylenes*	<0.150	0.150	04/06/2025	ND	6.27	104	6.00	3.69	
Total BTEX	<0.300	0.300	04/06/2025	ND					

Surrogate: 4-Bromofluorobenzene (PID *105 %* *71.5-134*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**80.0**	16.0	04/04/2025	ND	480	120	400	6.90	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	04/04/2025	ND	196	98.2	200	0.0255	
DRO >C10-C28*	<10.0	10.0	04/04/2025	ND	206	103	200	1.37	
EXT DRO >C28-C36	<10.0	10.0	04/04/2025	ND					

Surrogate: 1-Chlorooctane *89.1 %* *44.4-145*

Surrogate: 1-Chlorooctadecane *86.0 %* *40.6-153*

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Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

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Celey D. Keene, Lab Director/Quality Manager

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

CARDINAL Laboratories
101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name: Vertex Resource Services (Direct Bill to EOG Resources Inc)	BILL TO
Project Manager: Chance Dixon	P.O. #:
Address: 3101 Boyd Drive	Company: EOG Resources
City: Carlsbad State: NM Zip: 88220	Attn: Chase Settle
Phone #: 575.725.5001 Fax #:	Address:
Project #: 25A-01241 Project Owner:	City:
Project Name: Stark 5 Fed Com #701H	State: Zip:
Project Location:	Phone #:
Sampler Name: A. Ludvik	Fax #:

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	ANALYSIS REQUEST: BTEX (8021)	TPH:8015D(GRO / DRO / MRO)	Chloride
H251968																	
1	TP25-06 0.0'	G	1			X					X		04.01.25	10:00	X	X	X
2	TP25-06 2.0'	G	1			X					X		04.01.25	10:05	X	X	X
3	TP25-11 2.0'	G	1			X					X		04.01.25	11:50	X	X	X
4	TP25-12 0.0'	G	1			X					X		04.01.25	12:35	X	X	X
5	TP25-12 2.0'	G	1			X					X		04.01.25	12:45	X	X	X
6	TP25-13 0.0'	G	1			X					X		04.01.25	12:55	X	X	X
7	TP25-13 2.0'	G	1			X					X		04.01.25	13:05	X	X	X

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Relinquished By:	Date: 4-3-25	Received By:	Verbal Result: ☐ Yes ☐ No Add'l Phone #:
	Time: 1315		Please Email Results: Chance Dixon (cdixon@vertexresource.com), Andrew Ludvik (aludvik@vertexresource.com), permian@vertexresource.com
Relinquished By:	Date:	Received By:	REMARKS: Direct Bill to EOG Resources Inc.
	Time:		

Delivered By: (Circle One) Sampler - UPS - Bus - Other:

Observed Temp. °C -1.5
Corrected Temp. °C -1.2

Sample Condition: Cool ☑ Yes Intact ☑ Yes ☐ No ☐ No

CHECKED BY: (Initials) CD

Turnaround Time: Standard ☑ Bacteria (only) Sample Condition
Rush: ☐ Cool Intact Observed Temp. °C
Thermometer ID #113 #140
Correction Factor -0.5°C +0.3°
CD 4/3/25
☐ Yes ☐ Yes ☐ No ☐ No Corrected Temp. °C

FORM-006 R 3.2 10/07/21

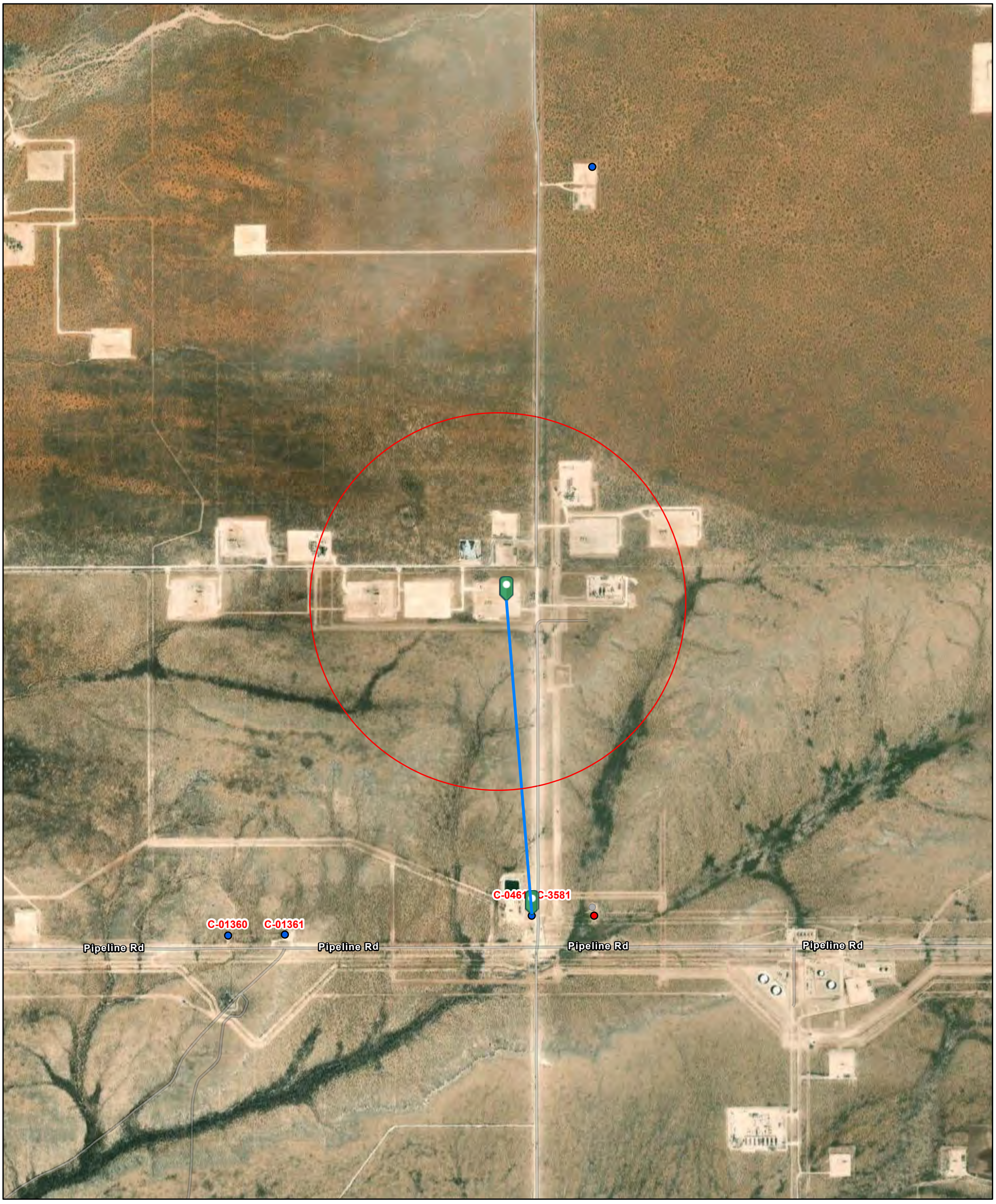
Received by OCD: 6/4/2025 9:26:57 AM

Released to Imaging: 7/15/2025 11:46:43 AM

ATTACHMENT 5

Closure Criteria Determination			
Site Name: Stark 5 Federal Com #701H			
Spill Coordinates: 32.0777943, -103.8962151		X: 604173.10	Y: UTM 3549591.56
Site Specific Conditions		Value	Unit
1	Depth to Groundwater (nearest reference)	**200**	feet
	Distance between release and nearest DTGW reference	**4,434**	feet
		0.84	miles
	Date of nearest DTGW reference measurement	**July 11, 2011**	
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	1,378	feet
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	37,478	feet
4	Within 300 feet from an occupied residence, school, hospital, institution or church	65,313	feet
5	i) Within 500 feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, **or**	1,378	feet
	ii) Within 1000 feet of any fresh water well or spring	1,378	feet
6	Within incorporated municipal boundaries or within a defined municipal fresh water field covered under a municipal ordinance adopted pursuant to Section 3-27-3 NMSA 1978 as amended, unless the municipality specifically approves	No	feet
7	Within 300 feet of a wetland	12,630	feet
8	Within the area overlying a subsurface mine	No	feet
	Distance between release and nearest registered mine	**100,897**	feet
9	Within an unstable area (Karst Map)	Medium	Critical High Medium Low
	Distance between release and nearest unstable area	0	feet
10	Within a 100-year Floodplain	500	year
	Distance between release and nearest FEMA Zone A (100-year Floodplain)	**4,646**	feet
11	Soil Type	Upton-Simona complex	
12	Ecological Classification	Shallow	
13	Geology	Qep	
	NMAC 19.15.29.12 E (Table 1) Closure Criteria	<50'	<50' 51-100' >100'

OSE POD Location Map



3/22/2025, 12:45:34 PM

Override 1

GIS WATERS PODs

Active

Plugged

1:18,056

0 0.17 0.35 0.7 mi

0 0.28 0.55 1.1 km

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community, Maxar

Online web user

This is an unofficial map from the OSE's online application.

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 Nbr	Q64	Q16	Q4	Sec	Tws	Rng	X	Y	Map
	C 03483	SE	SE	SE	05	26S	30E	604296.3	3548251.4	

* UTM location was derived from PLSS - see Help

Driller License:	1509	**Driller Company:**	BMS DRILLING COMPANY		
Driller Name:	BEAUREGARD, RICHARD				
Drill Start Date:	2011-06-03	**Drill Finish Date:**	2011-06-08	**Plug Date:**	
Log File Date:	2011-07-14	**PCW Rcv Date:**		**Source:**	Shallow
Pump Type:	SUBMER	**Pipe Discharge Size:**		**Estimated Yield:**	35
Casing Size:	8.00	**Depth Well:**	700	**Depth Water:**	200

Water Bearing Stratifications:

Top	Bottom	Description
200	255	Sandstone/Gravel/Conglomerate
285	320	Sandstone/Gravel/Conglomerate
320	360	Sandstone/Gravel/Conglomerate
510	650	Shale/Mudstone/Siltstone

Casing Perforations:

Top	Bottom
180	260
280	360
500	680

Meter Information

Meter Number:	14452	**Meter Make:**	MASTERMETER
Meter Serial Number:	32530329	**Meter Multiplier:**	100.0000
Number of Dials:	6	**Meter Type:**	Diversion

Unit of Measure: Gallons **Reading Frequency:** Monthly (No Reading Expected)

Meter Readings (in Acre-Feet)

Read Date	Year	Mtr Reading	Flag	Rdr	Comment	Mtr Amount	Online
2011-07-11	2011	9.700	A	bd	WELL TO BE SET UP FOR COM SALE	0.000	
2014-04-01	2014	188668.000	A	RPT		0.000	
2014-04-02	2014	44195.000	A	RPT		0.000	
2014-07-01	2014	62284.000	A	RPT		5.551	
2014-10-01	2014	91448.000	A	RPT		8.950	
2014-12-31	2014	126199.000	A	RPT		10.665	
2015-02-01	2015	138888.000	A	RPT		3.894	
2015-03-02	2015	150578.000	A	RPT		3.588	
2015-04-01	2015	157715.000	A	RPT		2.190	
2015-04-30	2015	170037.000	A	RPT		3.781	
2015-05-31	2015	182144.000	A	RPT		3.716	
2015-07-01	2015	188338.000	A	RPT		1.901	
2015-08-31	2015	209416.000	A	RPT		6.469	
2016-01-01	2015	244328.000	A	mb		10.714	
2016-02-01	2016	245605.000	A	mb		0.392	
2016-03-02	2016	246331.000	A	mb		0.223	
2016-04-01	2016	246331.000	A	mb		0.000	
2016-05-01	2016	248057.000	A	mb		0.530	
2016-06-01	2016	262631.000	A	mb		4.473	
2016-07-01	2016	271192.000	A	mb		2.627	
2016-08-01	2016	273040.450	A	mb		0.567	
2016-09-01	2016	283122.550	A	mb		3.094	
2016-10-01	2016	290786.300	A	mb		2.352	

YTD Meter Amounts:

Year	Amount
2011	0.000
2014	25.166
2015	36.253
2016	14.258

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Water Right Summary

get image list

WR File Number:	C 03483	**Subbasin:**	C	**Cross Reference:**
Primary Purpose:	STK 72-12-1 LIVESTOCK WATERING			
Primary Status:	PMT Permit			
Total Acres:		**Subfile:**		**Header:**
Total Diversion:	3.000	**Cause/Case:**		
Owner:	PASCHAL RANCH LLC	**Owner Class:**	Owner	
Contact:	JANEY LOREE PASCHAL			
Owner:	DK FARMS INC	**Owner Class:**	Owner	
Contact:	DAVID KIRK			
Owner:	BUREAU OF LAND MANAGEMENT	**Owner Class:**	Owner	
Contact:	TY ALLEN			

Documents on File

(acre

Transaction Images	Trn #	Doc	File/Act	Status 1	Status 2	Transaction Desc.	From/To	Acres	Diversio
get images	721910	COWNF	2022-03-17	CHG	PRC	C 03483 POD1	T		0.000
get images	727280	COWNF	2022-03-14	CHG	PRC	C 03483 POD3	T		0.000
get images	588093	72121	2016-05-31	PMT	APR	C 03483 POD1	T		3.000
get images	543409	COWNF	2014-03-17	CHG	PRC	C 03483	T	0.000	0.000
get images	476565	EXPL	2011-04-15	PMT	LOG	C 03483	T	0.000	0.000

Current Points of Diversion

POD Number	Well Tag	Source	Q64	Q16	Q4	Sec	Tws	Rng	X	Y	Map	Other Location Desc
C 03483		Shallow	SE	SE	SE	05	26S	30E	604296.3	3548251.4		.5 MI E. OF C-1361;PIPELINE
C 03483 POD2				SW	SW	04	26S	30E	604565.8	3548253.6		
C 03483 POD3			SE	SW	SW	04	26S	30E	604557.8	3548291.0		

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

Source

Acres	Diversion	CU	Use	Priority	Source	Description
0.000	0.000		EXP		GW	

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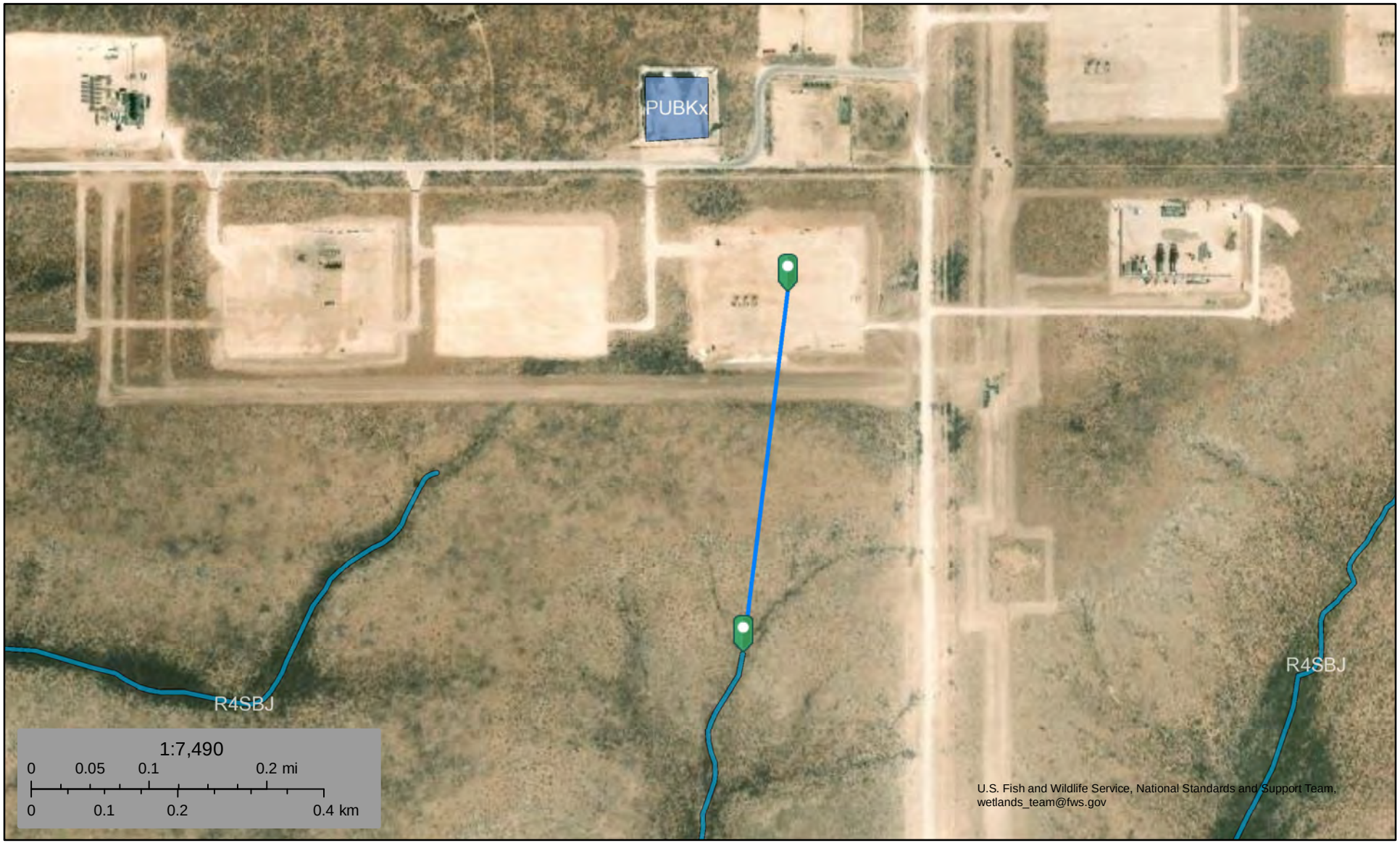
U.S. Fish and Wildlife Service
National Wetlands Inventory

Stark 5 Federal Com #701H
Watercourse 1,378ft



March 22, 2025

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.

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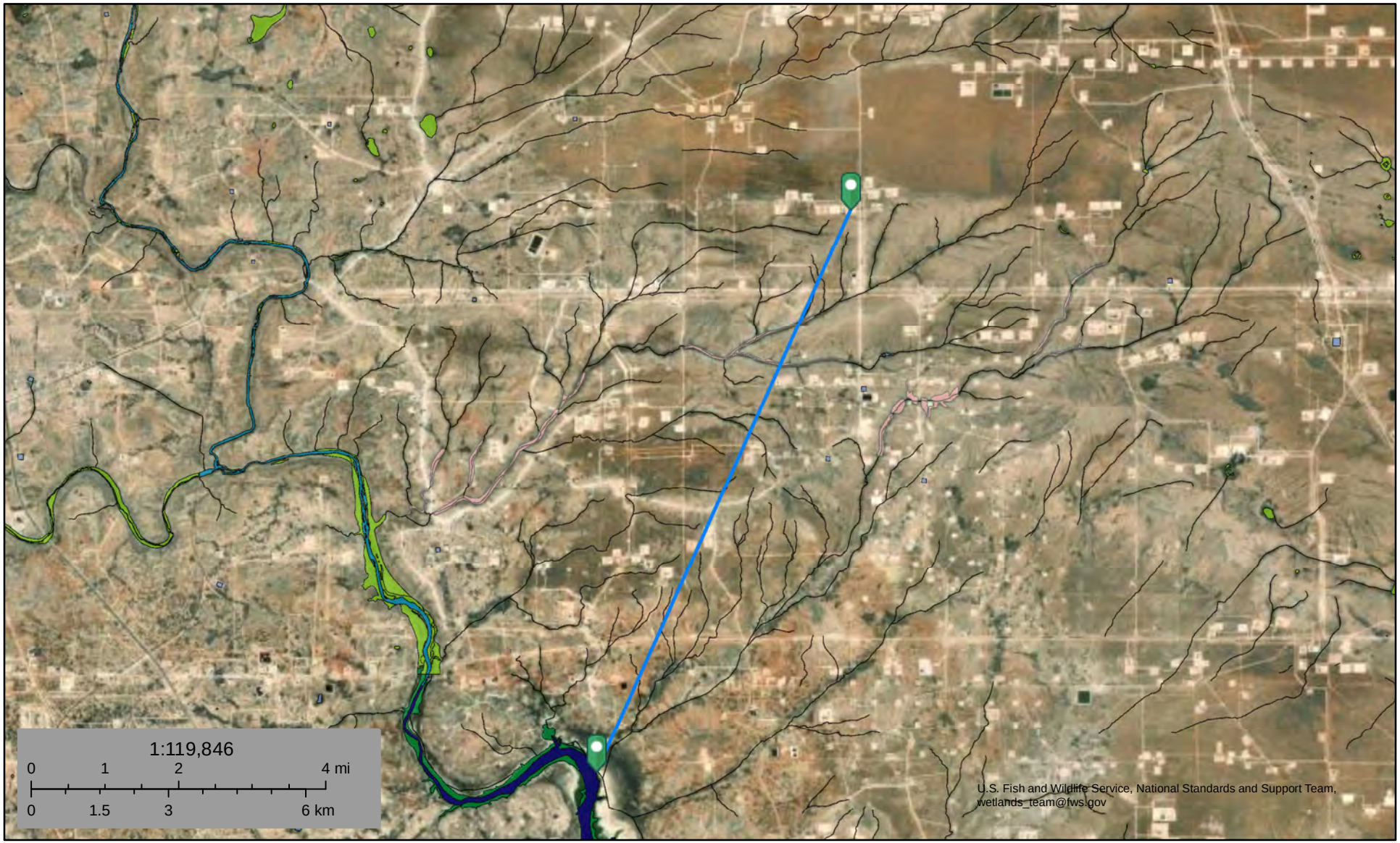
U.S. Fish and Wildlife Service
National Wetlands Inventory

Stark 5 Federal Com #701H
Lake 37,478ft



March 22, 2025

Wetlands

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

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National Wetlands Inventory (NWI)
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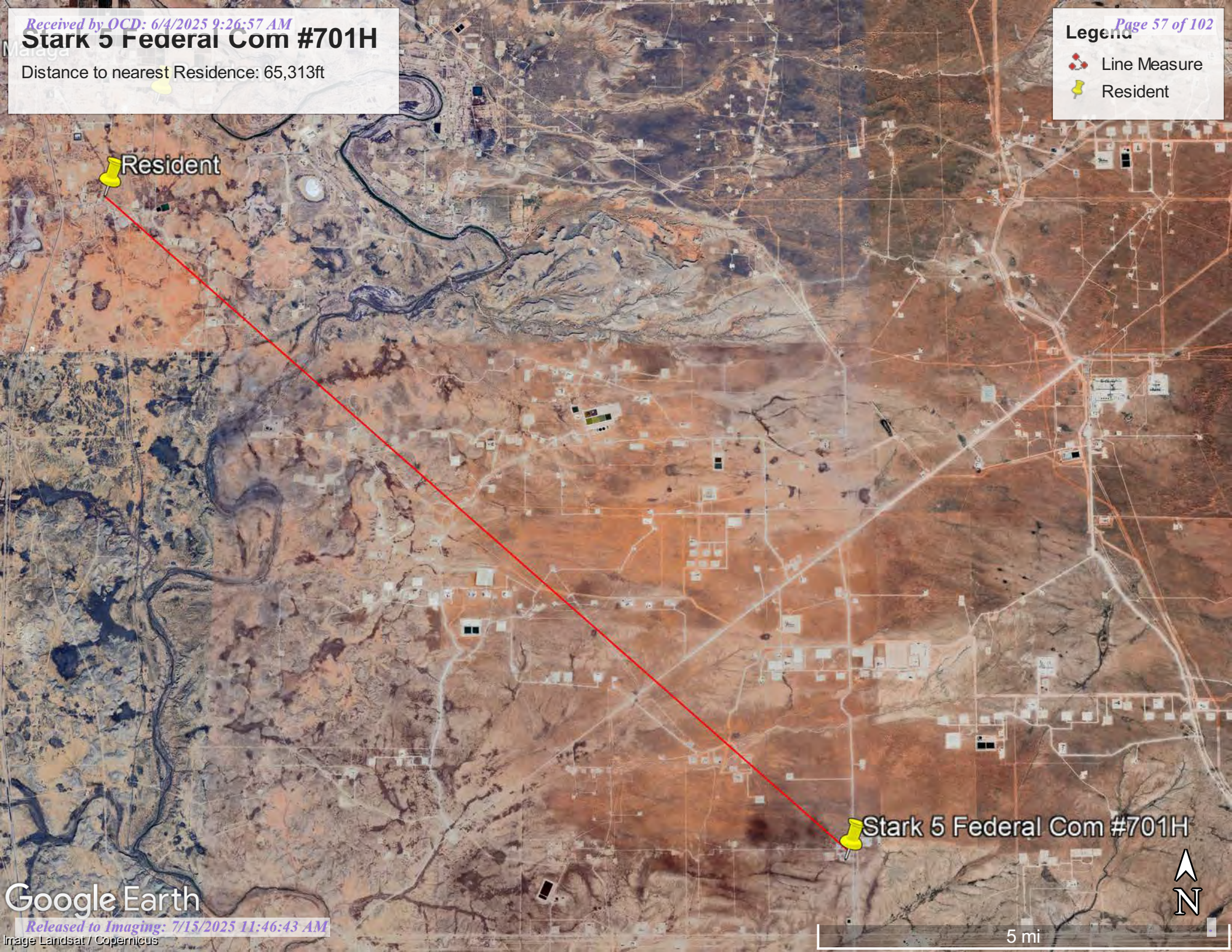
Stark 5 Federal Com #701H

Distance to nearest Residence: 65,313ft



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Active & Inactive Points of Diversion

(with Ownership Information)

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

WR File Nbr	Sub basin	Use	Diversion	Owner	County	POD Number	Well Tag	Code	Grant	Source	q64	q16	q4	Sec	Tws	Range	X	Y	Map	Distance
C 03581	CUB	EXP	0.000	JANEY LOREE PASCHAL	ED	C 03581 POD1				Shallow	SE	SE	SE	05	26S	30E	604298.2	3548291.8		1,305.8
C 03608	C	PRO	0.000	DEVON ENERGY CORP.	ED	C 03581 POD1				Shallow	SE	SE	SE	05	26S	30E	604298.2	3548291.8		1,305.8
C 04612	C	STK	3.000	JANEY LOREE PASCHALL DBA PASCHAL RANCH LLC	ED	C 04612 C-3581	NA				SE	SE	SE	05	26S	30E	604298.2	3548291.8		1,305.8
C 03483	C	STK	3.000	PASCHAL RANCH LLC	ED	C 03483				Shallow	SE	SE	SE	05	26S	30E	604296.3	3548251.4		1,345.8
C 03501	C	PRO	0.000	DEVON ENERGY CO.	ED	C 03483				Shallow	SE	SE	SE	05	26S	30E	604296.3	3548251.4		1,345.8
C 03502	C	PRO	0.000	DEVON ENERGY CO	ED	C 03483				Shallow	SE	SE	SE	05	26S	30E	604296.3	3548251.4		1,345.8
C 03503	C	PRO	0.000	DEVON ENERGY CO.	ED	C 03483				Shallow	SE	SE	SE	05	26S	30E	604296.3	3548251.4		1,345.8
C 03483	C	STK	3.000	PASCHAL RANCH LLC	ED	C 03483 POD3					SE	SW	SW	04	26S	30E	604557.8	3548291.0		1,356.3
					ED	C 03483 POD2						SW	SW	04	26S	30E	604565.8	3548253.6		1,394.4

Record Count: 9

Filters Applied:

UTM Filters (in meters):
Easting: 604173.10
Northing: 3549591.56
Radius: 1610.0

Sorted By: Distance

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

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U.S. Fish and Wildlife Service
National Wetlands Inventory

Stark 5 Federal Com #701H
Wetland 12,630ft

March 22, 2025

Wetlands

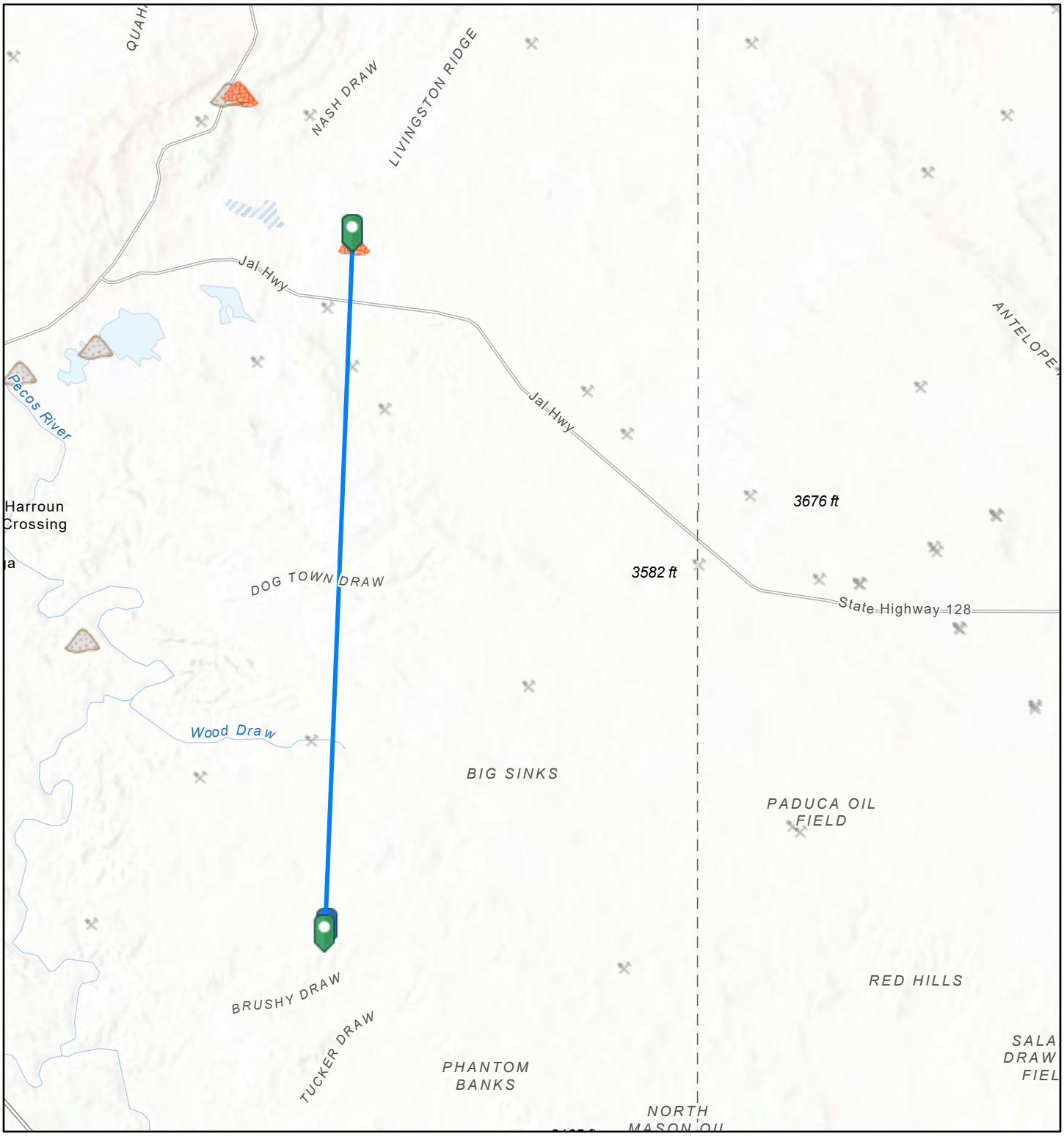
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

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

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

Released to Imaging: 7/15/2025 11:46:43 AM

Stark 5 Federal Com #701H Mine 100,897ft



3/22/2025, 1:02:06 PM

1:288,895

0 2 4 8 mi

0 3.25 6.5 13 km

Registered Mines

- Aggregate, Stone etc.
- Aggregate, Stone etc.
- Aggregate, Stone etc.
- Potash
- Salt

Esri, NASA, NGA, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

EMNRD MMD GIS Coordinator

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

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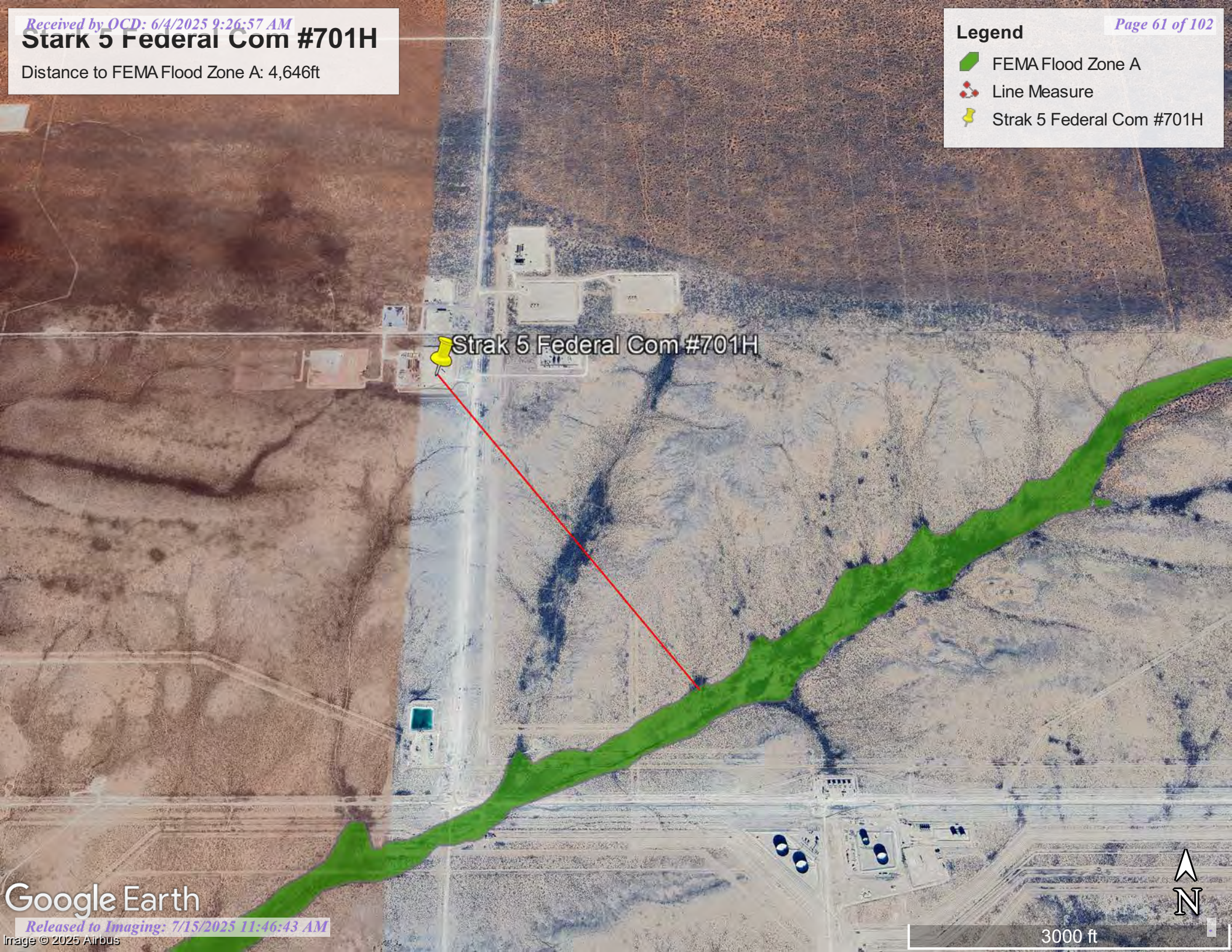
Stark 5 Federal Com #701H

Distance to FEMA Flood Zone A: 4,646ft

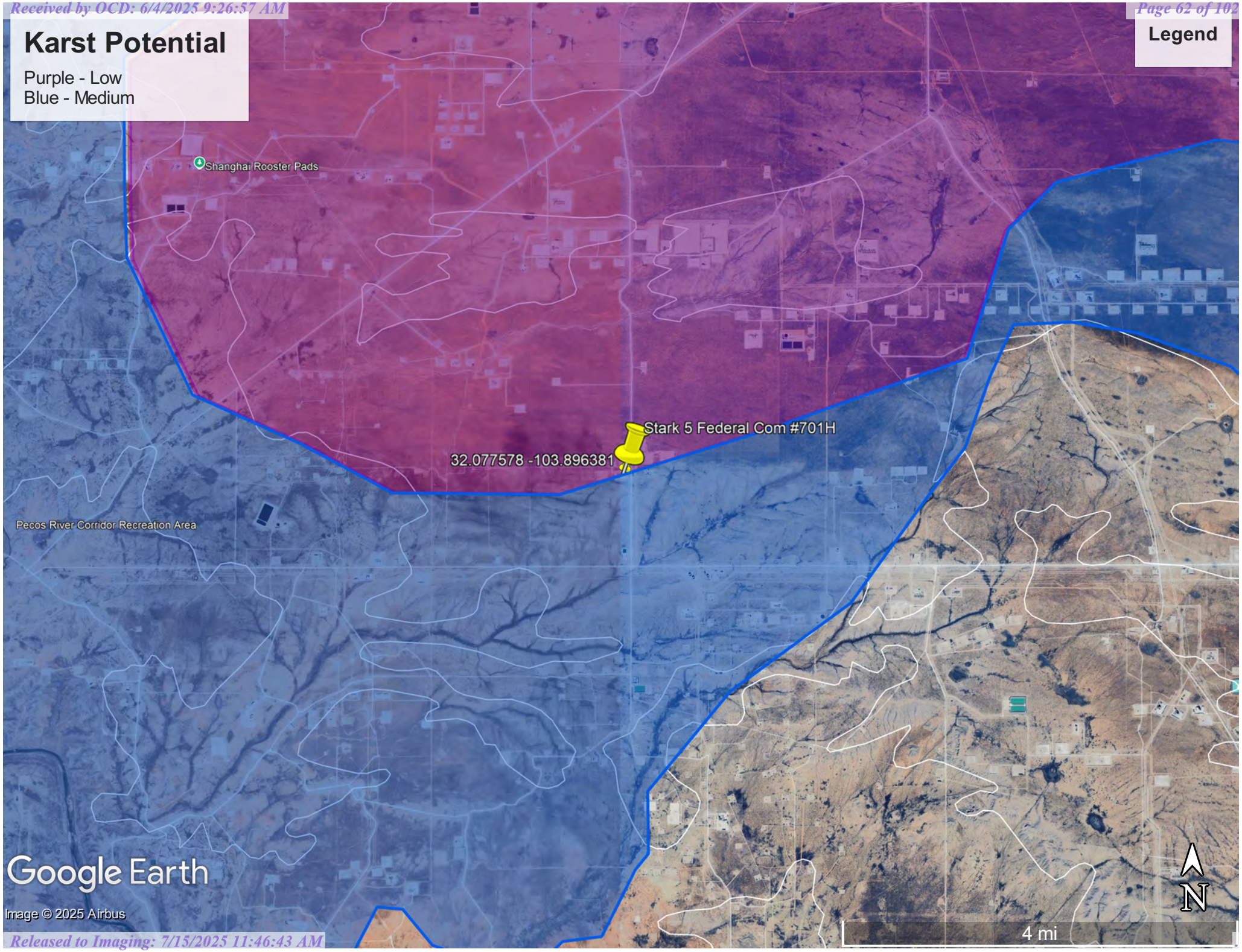


Released to Imaging: 7/15/2025 11:46:43 AM

Karst Potential

Purple - Low
Blue - Medium

Legend

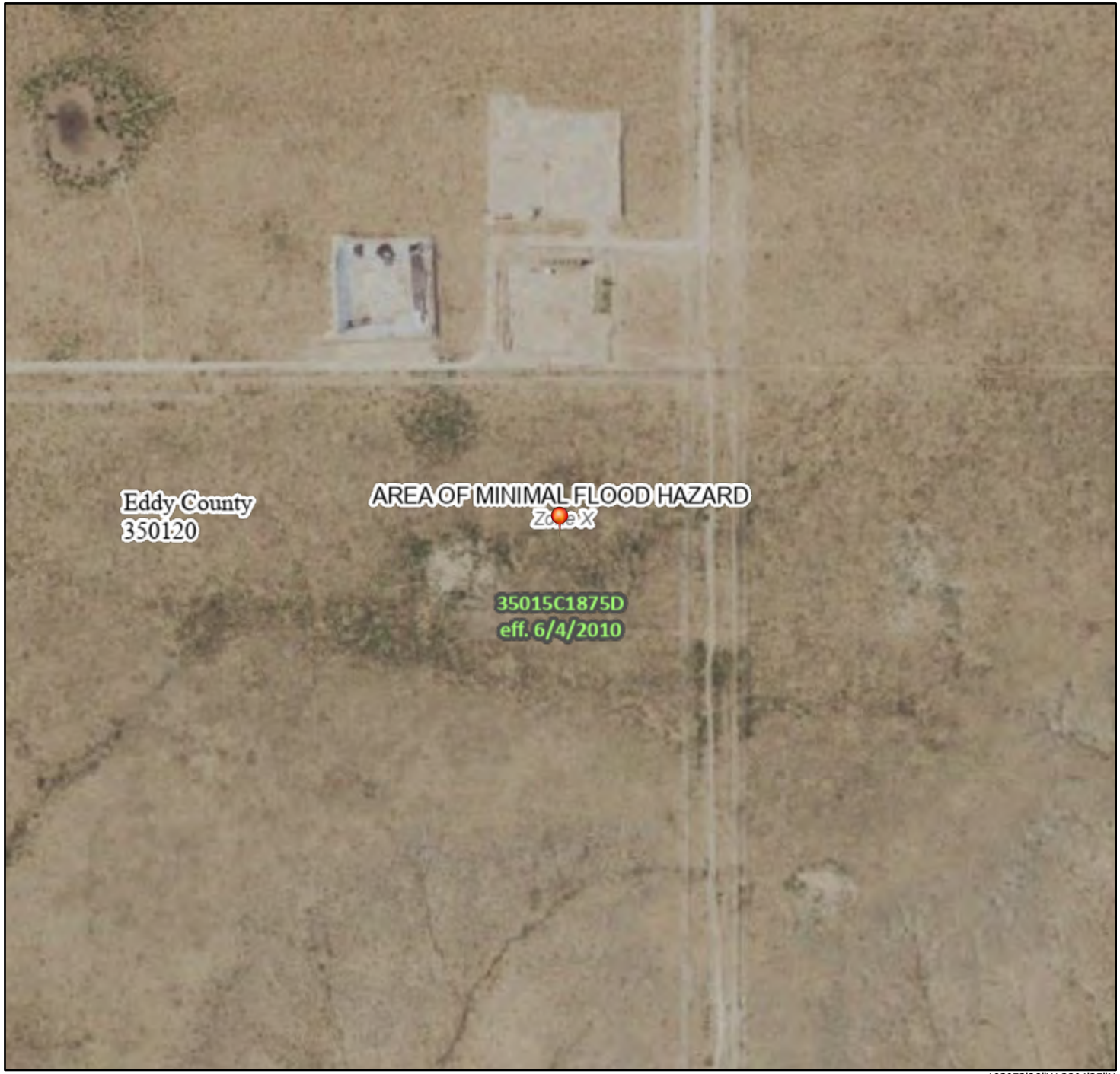


Received by OCD: 6/4/2025 9:26:57 AM

National Flood Hazard Layer FIRMette

FEMA

103°54'5"W 32°4'55"N



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

1:6,000

103°53'28"W 32°4'25"N

Basemap Imagery Source: USGS National Map 2023

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 3/22/2025 at 7:03 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

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Eddy Area, New Mexico

US—Upton-Simona complex, 1 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: 1w66
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

Upton and similar soils: 40 percent
Simona and similar soils: 35 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Upton

Setting

Landform: Ridges, fans
Landform position (three-dimensional): Side slope, rise
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from limestone

Typical profile

H1 - 0 to 9 inches: gravelly loam
H2 - 9 to 13 inches: gravelly loam
H3 - 13 to 21 inches: cemented
H4 - 21 to 60 inches: very gravelly loam

Properties and qualities

Slope: 1 to 15 percent
Depth to restrictive feature: 7 to 20 inches to petrocalcic
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 75 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R070BC025NM - Shallow
Hydric soil rating: No

Description of Simona

Setting

Landform: Plains, alluvial fans
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Mixed alluvium and/or eolian sands

Typical profile

H1 - 0 to 6 inches: gravelly fine sandy loam
H2 - 6 to 20 inches: gravelly fine sandy loam
H3 - 20 to 24 inches: indurated

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: 7 to 20 inches to petrocalcic
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R070BD002NM - Shallow Sandy
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 9 percent
Hydric soil rating: No

Pajarito

Percent of map unit: 8 percent
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Dune land

Percent of map unit: 8 percent
Hydric soil rating: No

USDA Natural Resources Conservation Service

Ecological site R070BC025NM
Shallow

Accessed: 03/22/2025

General information

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

Figure 1. Mapped extent

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

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on knolls, ridges, hillslopes alluvial fans and escarpments. Slopes range fro 0 to 25 percent and average about 7 percent. Direction of slope varies and is usually not significant. Elevations range from 2,842 to 4,500 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Ridge (3) Fan piedmont
Flooding frequency	None
Ponding frequency	None
Elevation	2,842–4,500 ft
Slope	0–25%
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 180 to 220 days. The last killing frost is late March or early April, and the first killing frost is in late October or early November.

Temperature and rainfall both favor warm season perennial plant growth. In years of abundant spring moisture, annual forbs and cool season grasses can make up an important component of this site. Because of the shallow soil depth, the vegetation on this site can take advantage of moisture almost anytime it falls. Strong winds that blow from the west and southwest blow from January through June, which accelerates soil drying at a critical time for cool season plant growth.

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

Table 3. Representative climatic features

Frost-free period (average)	220 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

The soils of this site are shallow to very shallow. Soils are derived from mixed calcareous eolian deposits derived from sedimentary rock. Surface layers are very cobbly loam, very gravelly loam, gravelly loam, cobbly loam, gravelly fine sandy loam or gravelly sandy loam.

There is an indurated caliche layer or limestone bedrock that occurs within 20 inches and averages less than 10 inches. Limestone or caliche layer may be the restrictive layer.

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

Characteristic soils:

Lozier
Potter
Tencee
Upton
Ector
Kimbrough

Table 4. Representative soil features

Surface texture	(1) Gravelly loam (2) Extremely gravelly loam (3) Extremely cobbly loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Very slow to moderately slow
Soil depth	4–20 in
Surface fragment cover <=3"	15–40%
Available water capacity (0-40in)	1 in
Calcium carbonate equivalent (0-40in)	15–60%

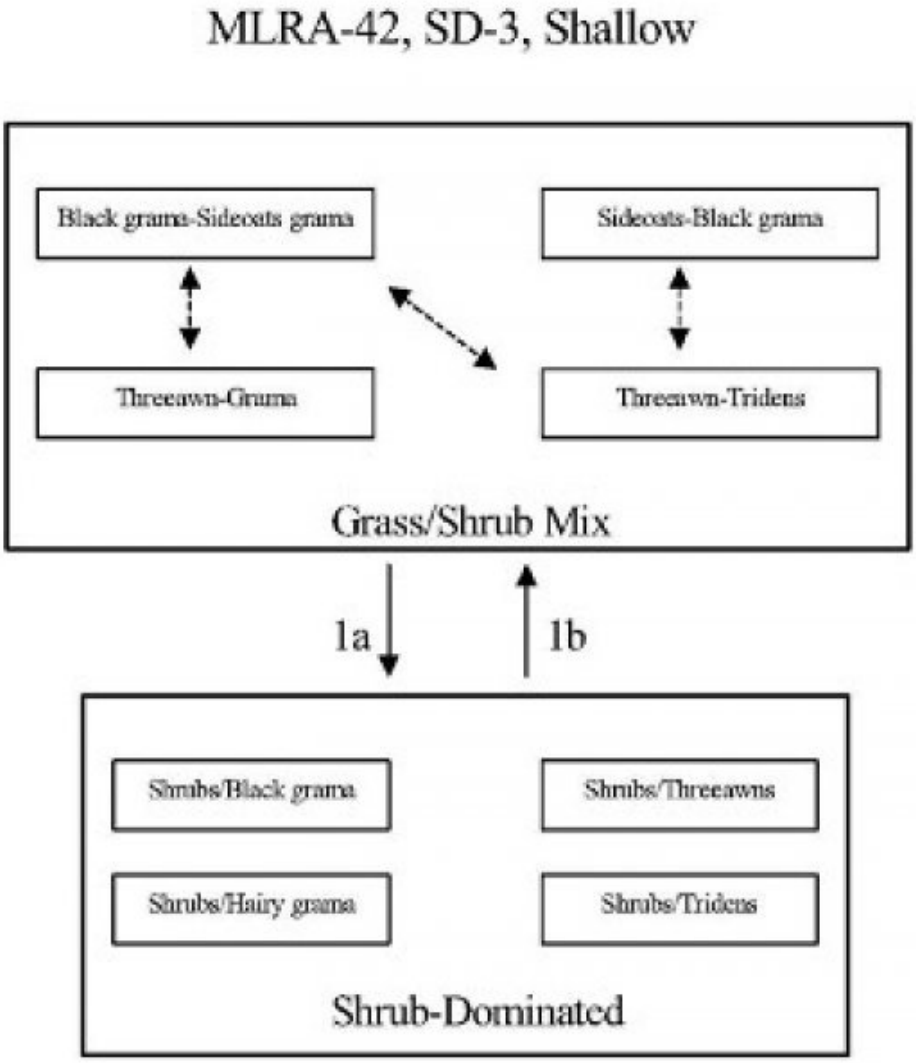
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–1
Soil reaction (1:1 water) (0-40in)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	13–42%
Subsurface fragment volume >3" (Depth not specified)	0–1%

Ecological dynamics

Overview:
The Shallow site is associated with and Limestone Hills, Loamy, and Shallow Sandy sites. When associated with Limestone Hills, the Shallow site occurs on the summits, foot slopes and toeslopes of hills. Loamy sites often occur as areas between low elongated hills with rounded crests (Shallow site). When the Shallow Sandy site and Shallow site occur in association, the Shallow Sandy soils occupy the tops of low ridges and the Shallow site soils occur on the steeper sideslopes of the ridge. The historic plant community of the Shallow site has the aspect of a grassland/shrub mix, dominated by grasses, but with shrubs common throughout the site. Black grama is the dominant grass species; creosotebush, mesquite, and catclaw mimosa are common shrubs. Overgrazing and or extended drought can reduce grass cover, effect a change in grass species dominance, and may result in a shrub-dominated state. 1

State and transition model

Plant Communities and Transitional Pathways (diagram)



1a. Extended drought, overgrazing, no fire

1b. Brush control, Prescribed grazing

State 1
Grass/Shrub Mix

Community 1.1
Grass/Shrub Mix

Grassland/Shrub Mix: The historic plant community is dominated by black grama with sideoats grama as the sub-dominant. Blue grama, hairy grama, bush muhly, and sand dropseed also occur in significant amounts. Sideoats grama can occur as the dominant grass with black grama as sub-dominant on the western side of the Land Resource Unit SD-3. This may be due to higher average elevation on the west side. Retrogression within this state due to extended drought or overgrazing will cause a decrease in species such as black grama, sideoats grama, blue grama, and bush muhly. Threeawns may become the dominant grass species due to a decline in more palatable grasses or because of its ability to quickly recover following drought. Continued loss of grass cover and associated increase in amount of bare ground may result in a shrub-dominated state. Decreased fire frequencies may also be

an important component in the cause of this transition. Diagnosis: Grass cover is fairly uniform, however, surface gravel, cobble, and bare ground make up a large percent of total ground cover, and grass production during unfavorable years may only average 150-175 pounds per acre. Shrubs are common with canopy cover averaging five to ten percent. Evidence of erosion such as rills and gullies are rare, but may occur on slopes greater than eight percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	168	352	536
Shrub/Vine	63	131	200
Forb	20	42	64
Total	**251**	**525**	**800**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	5-10%
Grass/grasslike foliar cover	10-15%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	5-8%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	40-60%

Figure 5. Plant community growth curve (percent production by month). NM2825, R042XC025NM Shallow HCPC. R042XC025NM Shallow HCPC 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
Shrub-Dominated

Community 2.1
Shrub-Dominated

Shrub-Dominated: This state is characterized by an increase in shrubs and a decrease in grass cover relative to grassland/shrub mix. As grass cover decreases shrubs increase, especially creosotebush, catclaw mimosa, whitethorn acacia, and mesquite. Each of these shrub species may become dominant in localized areas or across the site, depending on the spatial variability in soil characteristics and landscape position. Black grama, threeawns, hairy grama, or hairy tridens may be the dominant grass species. Fluffgrass, burrograss and broom snakeweed increase in representation. The Shallow site is resistant to state change, due to the natural rock armor of the soil and a shallow impermeable layer. The amount of rock fragments on the soil surface assist in retarding erosion. On Shallow sites with low slope, the shallow depth to either a petrocalcic layer or limestone bedrock helps to keep water perched and available to shallow rooted grasses for extended periods. 2 Diagnosis: Shrubs are the dominant species, especially creosotebush, catclaw mimosa, whitethorn acacia, or mesquite. Grass cover is variable ranging

from patchy with large connected bare areas present to sparse with only a limited amount in shrub inter-spaces. Transition to Shrub-Dominated (1a) Overgrazing and or extended periods of drought, and suppression of natural fire regimes are thought to cause this transition. As grass cover is lost, soil fertility and available soil moisture decline, due to the reduction of organic matter and decreased infiltration.3 Shrubs have the ability to extract nutrients and water from a greater area of soil than grasses and are better able to utilize limited water. Competition by shrubs for water and nutrients limits grass recruitment and establishment. Fire historically may have played a part in suppressing shrub expansion; fire suppression may therefore facilitate shrub expansion. Key indicators of approach to transition: *Decrease or change in composition or distribution of grass cover. *Increase in size and frequency of bare patches. *Increase in amount of shrub seedlings. Transition back to Grassland/Shrub Mix (1b) Brush control is necessary to re-establish grasses. Prescribed grazing will help to ensure proper forage utilization and sustain grass cover. Once the transition is reversed and grass cover is re-established, periodic use of prescribed fire may assist in maintaining the Grassland/Shrub state.

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				105–158	
	black grama	BOER4	*Bouteloua eriopoda*	105–158	–
2				79–105	
	sideoats grama	BOCU	*Bouteloua curtipendula*	79–105	–
3				79–105	
	blue grama	BOGR2	*Bouteloua gracilis*	79–105	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	79–105	–
4				26–53	
	bush muhly	MUPO2	*Muhlenbergia porteri*	26–53	–
5				16–26	
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	16–26	–
6				26–53	
	sand dropseed	SPCR	*Sporobolus cryptandrus*	26–53	–
7				16–26	
	hairy woollygrass	ERPI5	*Erioneuron pilosum*	16–26	–
8				5–16	
	ear muhly	MUAR	*Muhlenbergia arenacea*	5–16	–
9				5–16	
	New Mexico feathergrass	HENE5	*Hesperostipa neomexicana*	5–16	–
10				5–16	
	low woollygrass	DAPU7	*Dasyochloa pulchella*	5–16	–
11				16–26	
	Grass, perennial	2GP	*Grass, perennial*	16–26	–
Forb					
12				11–26	
	stemless four-nerve daisy	TEACE	*Tetraneuris acaulis var. epunctata*	11–26	–
13				5–16	
	woolly groundsel	PACA15	*Packera cana*	5–16	–
14				5–16	

14				5–16	
	globemallow	SPHAE	*Sphaeralcea*	5–16	–
15				5–16	
	bladderpod	LESQU	*Lesquerella*	5–16	–
16				5–16	
	cassia	CASSI	*Cassia*	5–16	–
17				11–26	
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	11–26	–
Shrub/Vine					
18				5–16	
	littleleaf sumac	RHMI3	*Rhus microphylla*	5–16	–
19				5–16	
	creosote bush	LATR2	*Larrea tridentata*	5–16	–
20				5–16	
	littleleaf ratany	KRER	*Krameria erecta*	5–16	–
21				5–16	
	javelina bush	COER5	*Condalia ericoides*	5–16	–
22				5–16	
	American tarwort	FLCE	*Flourensia cernua*	5–16	–
23				5–16	
	crown of thorns	KOSP	*Koeberlinia spinosa*	5–16	–
24				11–26	
	honey mesquite	PRGL2	*Prosopis glandulosa*	11–26	–
	honey mesquite	PRGL2	*Prosopis glandulosa*	11–26	–
25				5–16	
	catclaw mimosa	MIACB	*Mimosa aculeaticarpa var. biuncifera*	5–16	–
26				5–16	
	pricklypear	OPUNT	*Opuntia*	5–16	–
27				11–26	
	mariola	PAIN2	*Parthenium incanum*	11–26	–
	mariola	PAIN2	*Parthenium incanum*	11–26	–
28				5–16	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	5–16	–
29				16–26	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	16–26	–

Animal community

This site provides habitats which support a resident animal community that is characterized by desert cottontail, spotted ground squirrel, Merriam's kangaroo rat, cactus mouse, white-throated woodrat, gray fox, spotted skunk, roadrunner, Swainson's hawk, white-necked raven, cactus wren, pyrrhuloxia, lark sparrow, mourning dove, scaled quail, leopard lizard, round-tailed horned lizard, prairie rattlesnake, marbled whiptail, and greater earless lizard. Where associated with limestone hills, mule deer utilize this site.

Where large woody shrubs occur, most resident birds and scissor-tailed flycatcher, morning dove, lark sparrow and

Swainson's hawk nest.

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
Lozier---------- D
Potter---------- C
Tencee---------- D
Upton---------- C
Kimbrough---------- D
Upton---------- D
Ector---------- D

Recreational uses

This site offers recreation potential for hiking, horseback riding, rock hunting, nature photography and bird hunting and birding. During years of abundant spring moisture, a colorful array of wild flowers is displayed during May and June. A few summer and fall flowers also occur.

Wood products

This site has no potential for wood production.

Other products

This site is suited for grazing by all kinds and classes of livestock during all seasons of the year. Missmanagement will cause a decrease in black grama, sideoats grama, and blue grama, bush muhly and New Mexico feathergrass. A corresponding increase in bare ground will occur. There will also be an increase in muhlys, fluffgrass, creosotebush, javalinabush, catclaw, and mesquite. This site will respond best to a system of management that rotates the season of use.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month
Similarity Index-------- Ac/AUM
100 - 76---------- 3.7 – 4.5
75 – 51---------- 4.3 – 5.5
50 – 26---------- 5.3 – 10.0
25 – 0---------- 10.1 +

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 (SD-3). 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:

1. Humphrey, R.R. 1974. Fire in the deserts and desert grassland of North America. In: Kozlowski, T. T.; Ahlgren, C. E., eds. Fire and ecosystems. New York: Academic Press: 365-400.

2. Hennessy, J.T., R.P. Gibbens, J.M. Tromble, and M. Cardenas. 1983. Water properties of caliche. J. Range Manage. 36: 723-726.

3. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. Soil Quality Information Sheets. Rangeland Soil Quality—Infiltration, Organic Matter, Rangeland Sheets 5,6. [Online]. Available: http://www.statlab.iastate.edu/survey/SQI/range.html

Contributors

David Trujillo
Don Sylvester

Rangeland health reference sheet

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

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

Indicators

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

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

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

5. **Number of gullies and erosion associated with gullies:**

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

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

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

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

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

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

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

    Dominant:

    Sub-dominant:

    Other:

    Additional:

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

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

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

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

17. **Perennial plant reproductive capability:**

Stark 5 Federal Com #701H Geology

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0 1 2 4 mi

0 1.5 3 6 km

Lithologic Units

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

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

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

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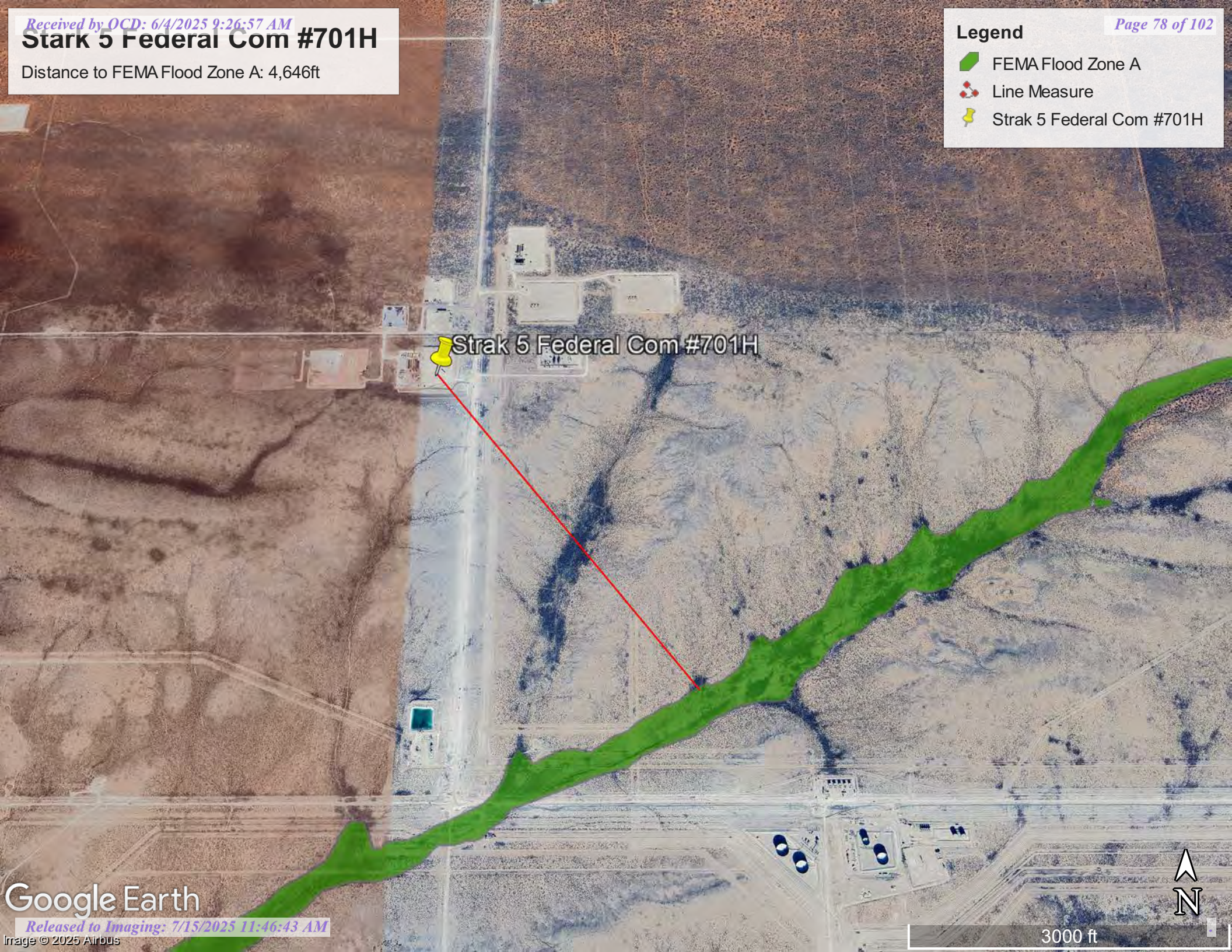
Stark 5 Federal Com #701H

Distance to FEMA Flood Zone A: 4,646ft



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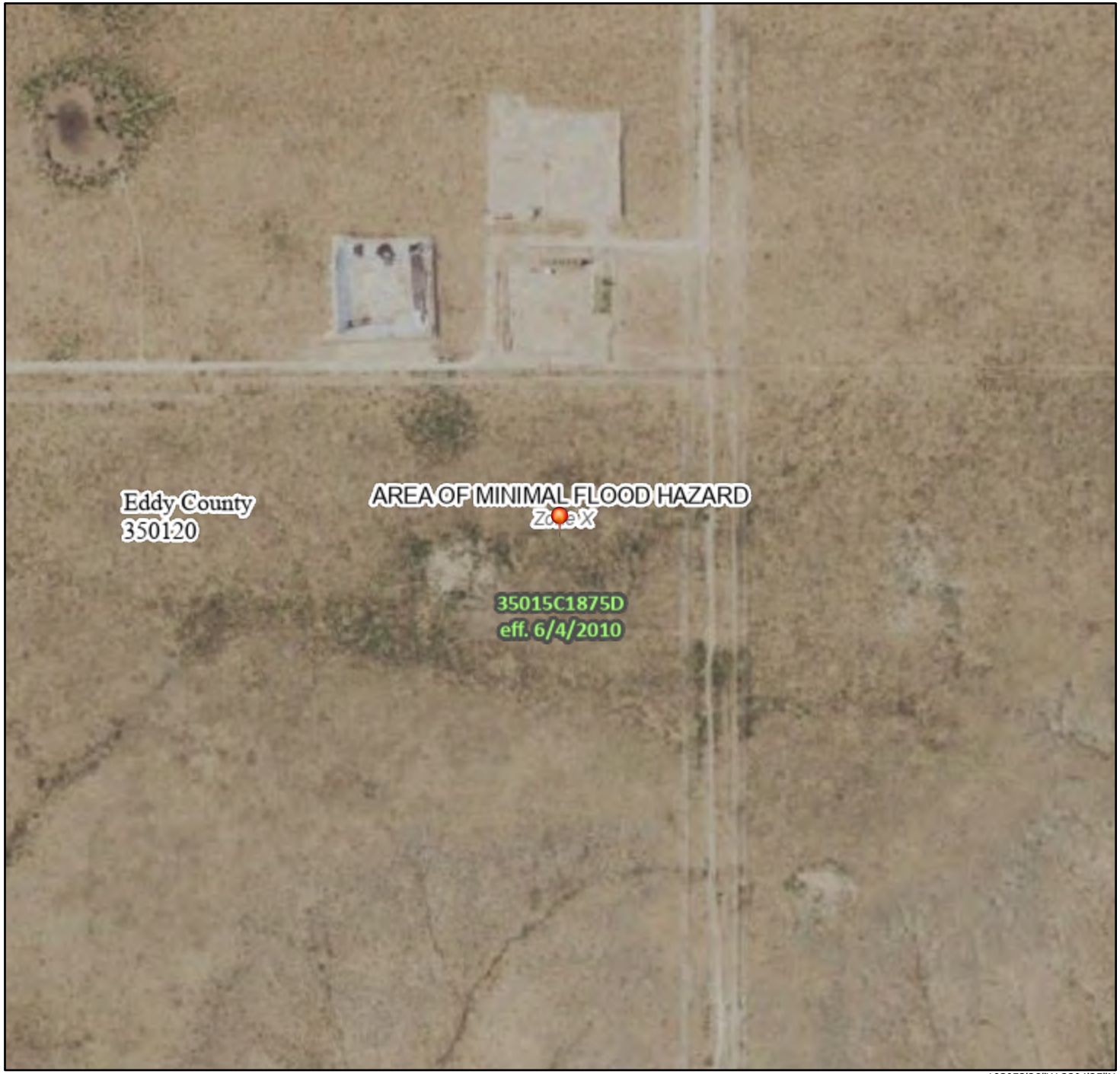
National Flood Hazard Layer FIRMette

FEMA

103°54'5"W 32°4'55"N



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

1:6,000

103°53'28"W 32°4'25"N

Basemap Imagery Source: USGS National Map 2023

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 3/22/2025 at 7:03 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

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Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
US	Upton-Simona complex, 1 to 15 percent slopes, eroded	6.2	100.0%
Totals for Area of Interest		**6.2**	**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.

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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.

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Eddy Area, New Mexico

US—Upton-Simona complex, 1 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: 1w66
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

Upton and similar soils: 40 percent
Simona and similar soils: 35 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Upton

Setting

Landform: Ridges, fans
Landform position (three-dimensional): Side slope, rise
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from limestone

Typical profile

H1 - 0 to 9 inches: gravelly loam
H2 - 9 to 13 inches: gravelly loam
H3 - 13 to 21 inches: cemented
H4 - 21 to 60 inches: very gravelly loam

Properties and qualities

Slope: 1 to 15 percent
Depth to restrictive feature: 7 to 20 inches to petrocalcic
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 75 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R070BC025NM - Shallow
Hydric soil rating: No

Description of Simona

Setting

Landform: Plains, alluvial fans
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Mixed alluvium and/or eolian sands

Typical profile

H1 - 0 to 6 inches: gravelly fine sandy loam
H2 - 6 to 20 inches: gravelly fine sandy loam
H3 - 20 to 24 inches: indurated

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: 7 to 20 inches to petrocalcic
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R070BD002NM - Shallow Sandy
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 9 percent
Hydric soil rating: No

Pajarito

Percent of map unit: 8 percent
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Dune land

Percent of map unit: 8 percent
Hydric soil rating: No

USDA Natural Resources Conservation Service

Ecological site R070BC025NM
Shallow

Accessed: 03/22/2025

General information

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

Figure 1. Mapped extent

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

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on knolls, ridges, hillslopes alluvial fans and escarpments. Slopes range fro 0 to 25 percent and average about 7 percent. Direction of slope varies and is usually not significant. Elevations range from 2,842 to 4,500 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Ridge (3) Fan piedmont
Flooding frequency	None
Ponding frequency	None
Elevation	2,842–4,500 ft
Slope	0–25%
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 180 to 220 days. The last killing frost is late March or early April, and the first killing frost is in late October or early November.

Temperature and rainfall both favor warm season perennial plant growth. In years of abundant spring moisture, annual forbs and cool season grasses can make up an important component of this site. Because of the shallow soil depth, the vegetation on this site can take advantage of moisture almost anytime it falls. Strong winds that blow from the west and southwest blow from January through June, which accelerates soil drying at a critical time for cool season plant growth.

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

Table 3. Representative climatic features

Frost-free period (average)	220 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

The soils of this site are shallow to very shallow. Soils are derived from mixed calcareous eolian deposits derived from sedimentary rock. Surface layers are very cobbly loam, very gravelly loam, gravelly loam, cobbly loam, gravelly fine sandy loam or gravelly sandy loam.

There is an indurated caliche layer or limestone bedrock that occurs within 20 inches and averages less than 10 inches. Limestone or caliche layer may be the restrictive layer.

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

Characteristic soils:

Lozier
Potter
Tencee
Upton
Ector
Kimbrough

Table 4. Representative soil features

Surface texture	(1) Gravelly loam (2) Extremely gravelly loam (3) Extremely cobbly loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Very slow to moderately slow
Soil depth	4–20 in
Surface fragment cover <=3"	15–40%
Available water capacity (0-40in)	1 in
Calcium carbonate equivalent (0-40in)	15–60%

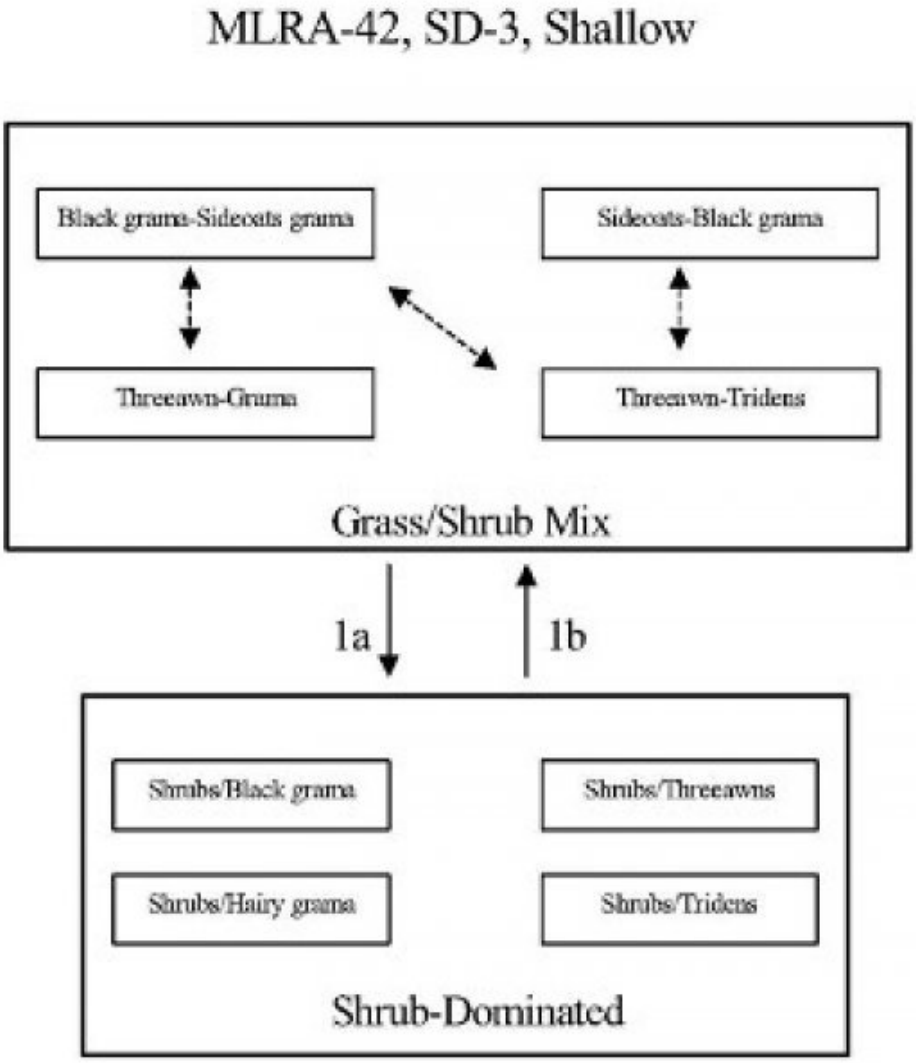
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–1
Soil reaction (1:1 water) (0-40in)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	13–42%
Subsurface fragment volume >3" (Depth not specified)	0–1%

Ecological dynamics

Overview:
The Shallow site is associated with and Limestone Hills, Loamy, and Shallow Sandy sites. When associated with Limestone Hills, the Shallow site occurs on the summits, foot slopes and toeslopes of hills. Loamy sites often occur as areas between low elongated hills with rounded crests (Shallow site). When the Shallow Sandy site and Shallow site occur in association, the Shallow Sandy soils occupy the tops of low ridges and the Shallow site soils occur on the steeper sideslopes of the ridge. The historic plant community of the Shallow site has the aspect of a grassland/shrub mix, dominated by grasses, but with shrubs common throughout the site. Black grama is the dominant grass species; creosotebush, mesquite, and catclaw mimosa are common shrubs. Overgrazing and or extended drought can reduce grass cover, effect a change in grass species dominance, and may result in a shrub-dominated state. 1

State and transition model

Plant Communities and Transitional Pathways (diagram)



1a. Extended drought, overgrazing, no fire

1b. Brush control, Prescribed grazing

State 1
Grass/Shrub Mix

Community 1.1
Grass/Shrub Mix

Grassland/Shrub Mix: The historic plant community is dominated by black grama with sideoats grama as the sub-dominant. Blue grama, hairy grama, bush muhly, and sand dropseed also occur in significant amounts. Sideoats grama can occur as the dominant grass with black grama as sub-dominant on the western side of the Land Resource Unit SD-3. This may be due to higher average elevation on the west side. Retrogression within this state due to extended drought or overgrazing will cause a decrease in species such as black grama, sideoats grama, blue grama, and bush muhly. Threeawns may become the dominant grass species due to a decline in more palatable grasses or because of its ability to quickly recover following drought. Continued loss of grass cover and associated increase in amount of bare ground may result in a shrub-dominated state. Decreased fire frequencies may also be

an important component in the cause of this transition. Diagnosis: Grass cover is fairly uniform, however, surface gravel, cobble, and bare ground make up a large percent of total ground cover, and grass production during unfavorable years may only average 150-175 pounds per acre. Shrubs are common with canopy cover averaging five to ten percent. Evidence of erosion such as rills and gullies are rare, but may occur on slopes greater than eight percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	168	352	536
Shrub/Vine	63	131	200
Forb	20	42	64
Total	**251**	**525**	**800**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	5-10%
Grass/grasslike foliar cover	10-15%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	5-8%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	40-60%

Figure 5. Plant community growth curve (percent production by month). NM2825, R042XC025NM Shallow HCPC. R042XC025NM Shallow HCPC 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
Shrub-Dominated

Community 2.1
Shrub-Dominated

Shrub-Dominated: This state is characterized by an increase in shrubs and a decrease in grass cover relative to grassland/shrub mix. As grass cover decreases shrubs increase, especially creosotebush, catclaw mimosa, whitethorn acacia, and mesquite. Each of these shrub species may become dominant in localized areas or across the site, depending on the spatial variability in soil characteristics and landscape position. Black grama, threeawns, hairy grama, or hairy tridens may be the dominant grass species. Fluffgrass, burrograss and broom snakeweed increase in representation. The Shallow site is resistant to state change, due to the natural rock armor of the soil and a shallow impermeable layer. The amount of rock fragments on the soil surface assist in retarding erosion. On Shallow sites with low slope, the shallow depth to either a petrocalcic layer or limestone bedrock helps to keep water perched and available to shallow rooted grasses for extended periods. 2 Diagnosis: Shrubs are the dominant species, especially creosotebush, catclaw mimosa, whitethorn acacia, or mesquite. Grass cover is variable ranging

from patchy with large connected bare areas present to sparse with only a limited amount in shrub inter-spaces. Transition to Shrub-Dominated (1a) Overgrazing and or extended periods of drought, and suppression of natural fire regimes are thought to cause this transition. As grass cover is lost, soil fertility and available soil moisture decline, due to the reduction of organic matter and decreased infiltration.3 Shrubs have the ability to extract nutrients and water from a greater area of soil than grasses and are better able to utilize limited water. Competition by shrubs for water and nutrients limits grass recruitment and establishment. Fire historically may have played a part in suppressing shrub expansion; fire suppression may therefore facilitate shrub expansion. Key indicators of approach to transition: *Decrease or change in composition or distribution of grass cover. *Increase in size and frequency of bare patches. *Increase in amount of shrub seedlings. Transition back to Grassland/Shrub Mix (1b) Brush control is necessary to re-establish grasses. Prescribed grazing will help to ensure proper forage utilization and sustain grass cover. Once the transition is reversed and grass cover is re-established, periodic use of prescribed fire may assist in maintaining the Grassland/Shrub state.

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				105–158	
	black grama	BOER4	*Bouteloua eriopoda*	105–158	–
2				79–105	
	sideoats grama	BOCU	*Bouteloua curtipendula*	79–105	–
3				79–105	
	blue grama	BOGR2	*Bouteloua gracilis*	79–105	–
	hairy grama	BOHI2	*Bouteloua hirsuta*	79–105	–
4				26–53	
	bush muhly	MUPO2	*Muhlenbergia porteri*	26–53	–
5				16–26	
	cane bluestem	BOBA3	*Bothriochloa barbinodis*	16–26	–
6				26–53	
	sand dropseed	SPCR	*Sporobolus cryptandrus*	26–53	–
7				16–26	
	hairy woollygrass	ERPI5	*Erioneuron pilosum*	16–26	–
8				5–16	
	ear muhly	MUAR	*Muhlenbergia arenacea*	5–16	–
9				5–16	
	New Mexico feathergrass	HENE5	*Hesperostipa neomexicana*	5–16	–
10				5–16	
	low woollygrass	DAPU7	*Dasyochloa pulchella*	5–16	–
11				16–26	
	Grass, perennial	2GP	*Grass, perennial*	16–26	–
Forb					
12				11–26	
	stemless four-nerve daisy	TEACE	*Tetraneuris acaulis var. epunctata*	11–26	–
13				5–16	
	woolly groundsel	PACA15	*Packera cana*	5–16	–
14				5–16	

14				5–16	
	globemallow	SPHAE	*Sphaeralcea*	5–16	–
15				5–16	
	bladderpod	LESQU	*Lesquerella*	5–16	–
16				5–16	
	cassia	CASSI	*Cassia*	5–16	–
17				11–26	
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	11–26	–
Shrub/Vine					
18				5–16	
	littleleaf sumac	RHMI3	*Rhus microphylla*	5–16	–
19				5–16	
	creosote bush	LATR2	*Larrea tridentata*	5–16	–
20				5–16	
	littleleaf ratany	KRER	*Krameria erecta*	5–16	–
21				5–16	
	javelina bush	COER5	*Condalia ericoides*	5–16	–
22				5–16	
	American tarwort	FLCE	*Flourensia cernua*	5–16	–
23				5–16	
	crown of thorns	KOSP	*Koeberlinia spinosa*	5–16	–
24				11–26	
	honey mesquite	PRGL2	*Prosopis glandulosa*	11–26	–
	honey mesquite	PRGL2	*Prosopis glandulosa*	11–26	–
25				5–16	
	catclaw mimosa	MIACB	*Mimosa aculeaticarpa var. biuncifera*	5–16	–
26				5–16	
	pricklypear	OPUNT	*Opuntia*	5–16	–
27				11–26	
	mariola	PAIN2	*Parthenium incanum*	11–26	–
	mariola	PAIN2	*Parthenium incanum*	11–26	–
28				5–16	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	5–16	–
29				16–26	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	16–26	–

Animal community

This site provides habitats which support a resident animal community that is characterized by desert cottontail, spotted ground squirrel, Merriam's kangaroo rat, cactus mouse, white-throated woodrat, gray fox, spotted skunk, roadrunner, Swainson's hawk, white-necked raven, cactus wren, pyrrhuloxia, lark sparrow, mourning dove, scaled quail, leopard lizard, round-tailed horned lizard, prairie rattlesnake, marbled whiptail, and greater earless lizard. Where associated with limestone hills, mule deer utilize this site.

Where large woody shrubs occur, most resident birds and scissor-tailed flycatcher, morning dove, lark sparrow and

Swainson's hawk nest.

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
Lozier---------- D
Potter---------- C
Tencee---------- D
Upton---------- C
Kimbrough---------- D
Upton---------- D
Ector---------- D

Recreational uses

This site offers recreation potential for hiking, horseback riding, rock hunting, nature photography and bird hunting and birding. During years of abundant spring moisture, a colorful array of wild flowers is displayed during May and June. A few summer and fall flowers also occur.

Wood products

This site has no potential for wood production.

Other products

This site is suited for grazing by all kinds and classes of livestock during all seasons of the year. Missmanagement will cause a decrease in black grama, sideoats grama, and blue grama, bush muhly and New Mexico feathergrass. A corresponding increase in bare ground will occur. There will also be an increase in muhlys, fluffgrass, creosotebush, javalinabush, catclaw, and mesquite. This site will respond best to a system of management that rotates the season of use.

Other information

Guide to Suggested Initial Stocking Rate Acres per Animal Unit Month
Similarity Index-------- Ac/AUM
100 - 76---------- 3.7 – 4.5
75 – 51---------- 4.3 – 5.5
50 – 26---------- 5.3 – 10.0
25 – 0---------- 10.1 +

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 (SD-3). 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:

1. Humphrey, R.R. 1974. Fire in the deserts and desert grassland of North America. In: Kozlowski, T. T.; Ahlgren, C. E., eds. Fire and ecosystems. New York: Academic Press: 365-400.

2. Hennessy, J.T., R.P. Gibbens, J.M. Tromble, and M. Cardenas. 1983. Water properties of caliche. J. Range Manage. 36: 723-726.

3. U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. Soil Quality Information Sheets. Rangeland Soil Quality—Infiltration, Organic Matter, Rangeland Sheets 5,6. [Online]. Available: http://www.statlab.iastate.edu/survey/SQI/range.html

Contributors

David Trujillo
Don Sylvester

Rangeland health reference sheet

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

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

Indicators

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

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

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

5. **Number of gullies and erosion associated with gullies:**

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

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

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

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

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

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

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

    Dominant:

    Sub-dominant:

    Other:

    Additional:

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

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

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

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

17. **Perennial plant reproductive capability:**

Stark 5 Federal Com #701H Geology

3/22/2025, 1:44:37 PM

1:144,448

0 1 2 4 mi

0 1.5 3 6 km

Lithologic Units

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

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

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

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QUESTIONS

Operator: EOG RESOURCES INC 5509 Champions Drive Midland, TX 79706	OGRID: 7377
	Action Number: 470602
	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

QUESTIONS

Prerequisites	
Incident ID (n#)	**nAPP2515532575**
Incident Name	**NAPP2515532575 STARK 5 FEDERAL COM #701H @ 30-015-48307**
Incident Type	**Produced Water Release**
Incident Status	**Remediation Plan Received**
Incident Well	**[30-015-48307] STARK 5 FEDERAL COM #701H**

Location of Release Source	
Please answer all the questions in this group.	
Site Name	Stark 5 Federal Com #701H
Date Release Discovered	03/15/2025
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: Other | Tank (Any) | Produced Water | Released: 100 BBL | Recovered: 0 BBL | Lost: 100 BBL.
Is the concentration of chloride in the produced water >10,000 mg/l	Yes
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)	Original field reporting indicated a release of 4 bbls due to high winds causing liner damage to the AST. Site assessment and delineation lead to the calculation of the release volume being 100 bbls.

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QUESTIONS (continued)

Operator: EOG RESOURCES INC 5509 Champions Drive Midland, TX 79706	OGRID: 7377
	Action Number: 470602
	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: Chase Settle Title: Safety & Environmental Rep II Email: chase_settle@eogresources.com Date: 06/04/2025

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QUESTIONS (continued)

Operator: EOG RESOURCES INC 5509 Champions Drive Midland, TX 79706	OGRID: 7377
	Action Number: 470602
	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 100 and 500 (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 1000 (ft.) and ½ (mi.)
Any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)	Greater than 5 (mi.)
An occupied permanent residence, school, hospital, institution, or church	Greater than 5 (mi.)
A spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes	Between 1000 (ft.) and ½ (mi.)
Any other fresh water well or spring	Between 1000 (ft.) and ½ (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	Between 1 and 5 (mi.)
Categorize the risk of this well / site being in a karst geology	Medium
A 100-year floodplain	Between ½ and 1 (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)	8160
TPH (GRO+DRO+MRO)	(EPA SW-846 Method 8015M)	51
GRO+DRO	(EPA SW-846 Method 8015M)	51
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		07/04/2025
On what date will (or did) the final sampling or liner inspection occur		07/04/2025
On what date will (or was) the remediation complete(d)		09/04/2025
What is the estimated surface area (in square feet) that will be reclaimed		57569
What is the estimated volume (in cubic yards) that will be reclaimed		7611
What is the estimated surface area (in square feet) that will be remediated		57569
What is the estimated volume (in cubic yards) that will be remediated		7611
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)

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	Action Number: 470602
	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	LEA LAND LANDFILL [fEEM0112342028]
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: Chase Settle Title: Safety & Environmental Rep II Email: chase_settle@eogresources.com Date: 06/04/2025
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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	Action Number: 470602
	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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	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

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

CONDITIONS

Operator: EOG RESOURCES INC 5509 Champions Drive Midland, TX 79706	OGRID: 7377
	Action Number: 470602
	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:	7/15/2025
scwells	1) As this site is categorized in a medium karst zone, within one of the setbacks of 19.15.29.12.C.(4) NMAC, a variance to collect samples at a frequency more than 200 ft2 is denied. All confirmation floor and sidewall samples must represent an area no greater than 200 ft2 pursuant to 19.15.29.12.D.(1) NMAC.	7/15/2025
scwells	2) Under the Site Characterization portion of the C-141 application the minimum distances to the following are incorrect and require updates upon C-141 application resubmission and within report: any lakebed, sinkhole, or playa lake (1-5 miles E/refer to pg. 55 of report) and a wetland (1000 ft -1/2 mile are wetland riverines/refer to pg. 54 of report).	7/15/2025
scwells	Submit remediation closure report to the OCD by 10/13/2025.	7/15/2025