Incident Number: NAPP2509749496



Incident Closure

HAT MESA 31/32 STATE BATTERY

Unit B, Section 31, Township 20 South, Range 33 East

Facility ID: fAPP2126349697

County: Lea

Vertex File Number: 25A-04266

Prepared for:

ExxonMobil Upstream Company

Prepared by:

Vertex Resource Services Inc.

Date:

August 2025

ExxonMobil Upstream Company

Hat Mesa 31/32 State Battery

Incident Closure August 2025

HAT MESA 31/32 STATE BATTERY

Unit B, Section 31, Township 20 South, Range 33 East

Facility ID: fAPP2126349697

County: Lea

Prepared for:

ExxonMobil Upstream Company

3104 East Greene Street

Carlsbad, New Mexico 88220

New Mexico Oil Conservation Division

506 West Texas Avenue

Artesia, New Mexico 88210

Prepared by:

Vertex Resource Services Inc.

3101 Boyd Drive

Carlsbad, New Mexico 88220

Riley Arnoldr
Riley Arnold B.Sc.

ENVIRONMENTAL TECHNICIAN, REPORTING

August 4, 2025

Date

Chad Hensley, B.Sc. GCNR

SENIOR PROJECT MANAGER, REPORT REVIEW

August 4, 2025

Date

ExxonMobil Upstream Company Hat Mesa 31/32 State Battery

Incident Closure August 2025

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	Site Characteristics	
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ExxonMobil Upstream Company

Hat Mesa 31/32 State Battery

Incident Closure August 2025

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Figure 1. Release Area Schematic

List of Appendices

Appendix A. Daily Field Report – Liner inspection

Appendix B. Closure Criteria Research Documentation

ExxonMobil Upstream Company Hat Mesa 31/32 State Battery Incident Closure August 2025

1.0 Introduction

ExxonMobil Upstream Company (ExxonMobil) retained Vertex Resource Services Inc. (Vertex) to conduct a liner inspection and an Incident Closure for a produced water release that occurred on April 4, 2025, at HAT MESA 31/32 STATE BATTERY, facility ID fAPP2126349697 (hereafter referred to as the "site"). ExxonMobil submitted an initial C-141 Release Notification to New Mexico Oil Conservation Division (NMOCD) on April 21, 2025. Incident ID number NAPP2509749496 was assigned to this incident.

This report provides a description of the release assessment and liner inspection activities associated with the site. The information presented demonstrates that closure criteria established in 19.15.29.11(A)(5)(a) of the *New Mexico Administrative Code* (NMAC; New Mexico Oil Conservation Division, 2018) related to NMOCD has been met and all applicable regulations are being followed. This document is intended to serve as a final report to obtain approval from NMOCD for closure of this release as per NMAC 19.15.29.11, with the understanding that restoration is currently not required due to the release being contained in the lined tank battery.

2.0 Incident Description

The release occurred on April 4, 2025, due to equipment failure. The incident was reported on April 21, 2025, and involved the release of approximately 40 barrels (bbl.) of produced water into lined containment. Approximately 40 bbl. of free fluid was removed during the initial clean-up. The volume calculation is included in Appendix A. Additional details relevant to the release are presented in the C-141 Report. The Daily Field Report and site photographs are included in Appendix B.

3.0 Site Characteristics

The site is located approximately 35 miles northeast of Carlsbad, New Mexico. The legal location for the site is Unit B, Section 31, Township 20 South, Range 33 East in Lea County, New Mexico. The release area is located on state property. An aerial photograph and site schematic are presented on Figure 1.

The location is typical of oil and gas exploration and production sites in the Permian Basin and is currently used for oil and gas storage.

4.0 Closure Criteria Determination

The nearest active well to the site is a New Mexico Office of the State Engineer (NMOSE) monitoring well located approximately 0.1 miles east of the site (United States Geological Survey, 2025). Data from 2025 shows the NMOSE borehole recorded a depth to groundwater of 105 feet below ground surface. Information pertaining to the depth to groundwater determination is included in Appendix B.

There is no surface water present at the site. The nearest significant watercourse, as defined in Subsection P of 19.15.17.7 NMAC, is a lakebed (National Wetlands Inventory) located approximately 0.5 miles or greater than of the site (United States Fish and Wildlife Service, 2025). At the site, there are no continuously flowing watercourses or

ExxonMobil Upstream Company Hat Mesa 31/32 State Battery Incident Closure August 2025

significant watercourses, lakebeds, sinkholes, playa lakes or other critical water/community features as outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC.

7

8

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10

11

12

13

mine

area

Soil Type

Geology

1 - 5 mi

5mi <

5mi <

5mi <

Gravelly loam, fine sandy loam

Fine sandy loam

Qep

(Y/N)

Critical High

Medium

Low

year

<50'

51-100' >100'

No

Low

>500

>100'

Site Nar	ne: Hat Mesa 31/32 State Battery					
Release	Coordinates: 32.53488,-103.70004					
Site Spe	cific Conditions	Value	Unit			
	Depth to Groundwater (nearest reference)	100-5	500 ft			
1	Distance between release and nearest DTGW reference	1 - 100 ft				
	Date of nearest DTGW reference measurement	June 9, 2025				
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	5mi <				
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	1 - 5 mi				
4	Within 300 feet from an occupied residence, school, hospital, institution or church	1-5	5 mi			
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	5mi <				
	ii) Within 1000 feet of any fresh water well or spring	5mi <				
6	Within incorporated municipal boundaries or within a defined municipal fresh water field covered under a municipal ordinance adopted	No	(Y/N)			

pursuant to Section 3-27-3 NMSA 1978 as amended, unless the municipality specifically approves

Within the area overlying a subsurface mine

Within an unstable area (Karst Map)

Within a 100-year Floodplain

A (100-year Floodplain)

Ecological Classification

Distance between release and nearest registered

Distance between release and nearest unstable

Distance between release and nearest FEMA Zone

NMAC 19.15.29.12 E (Table 1) Closure Criteria

Within 300 feet of a wetland

ExxonMobil Upstream Company Hat Mesa 31/32 State Battery Incident Closure August 2025

5.0 Liner Inspection

Notification that a liner inspection was scheduled to be completed was provided to the NMOCD on July 25, 2025. Visual observation of the liner was completed on all sides and the base of the containment, around equipment, and of all seams in the liner on July 30, 2025. As evidenced in the Daily Field Report (Appendix A), it was verified that the liner was intact and had the ability to contain the release. The Daily Field Report with photographs of the liner inspection is included in Appendix A.

6.0 Closure Request

The release area was fully contained in the lined containment and meets the closure criteria of NMAC 19.15.29.11. Based on these findings, ExxonMobil requests that this release be closed.

Should you have any questions or concerns, please do not hesitate to contact Chad Hensley at 575.200.6167 or chensley@vertexresource.com

7.0 References

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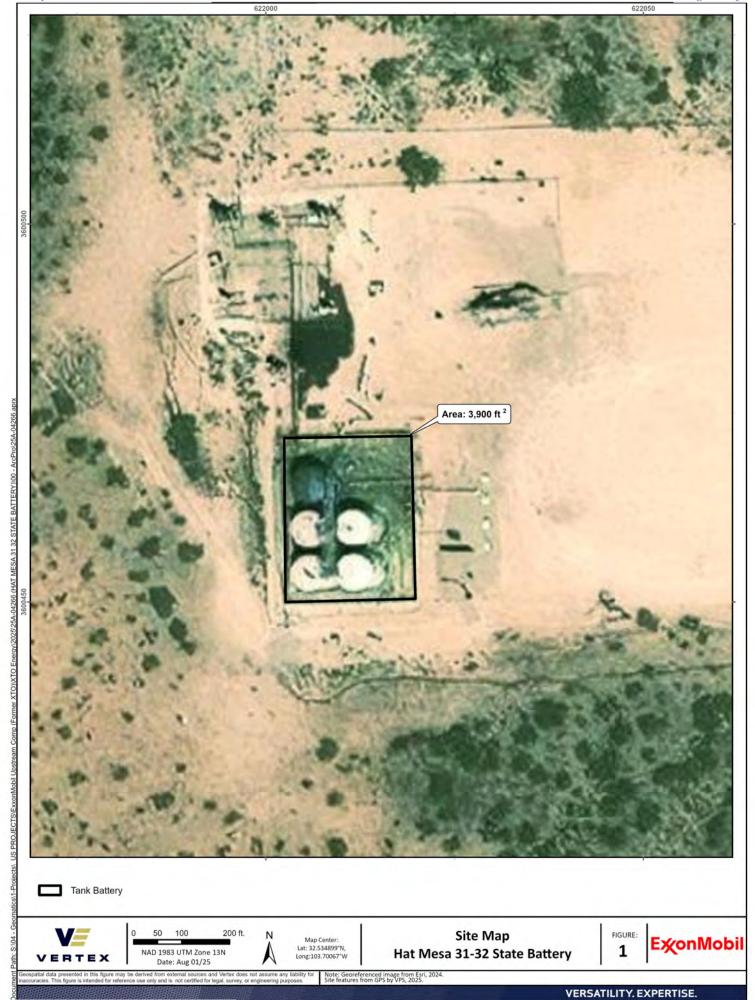
ExxonMobil Upstream Company Hat Mesa 31/32 State Battery Incident Closure August 2025

8.0 Limitations

This report has been prepared for the sole benefit of ExxonMobil Upstream Company (ExxonMobil). This document may not be used by any other person or entity, with the exception of the New Mexico Oil Conservation Division without the express written consent of Vertex Resource Services Inc. (Vertex) and ExxonMobil. Any use of this report by a third party, or any reliance on decisions made based on it, or damages suffered as a result of the use of this report are the sole responsibility of the user.

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

Figures



APPENDIX A – Daily Field Report – Liner Inspection

Client:

Daily Site Visit Report

	V	
V	ER'	- v

Site Location Name: HAT MESA 31/32 STATE

BATTERY

ExxonMobil

Inspection Date: 7/30/2025

Summary of Times

Incident ID #:

API#:

Arrived at Site 7/30/2025 8:30 AM

Departed Site 7/30/2025 10:00 AM

Field Notes

9:03 Travel to site/ safety paperwork

9:03 Liner inspection preformed

9:25 Liner is in perfect condition, no rips or tears, no patches required

Next Steps & Recommendations

1 Reporting



Site Photos

Viewing Direction: North



South east corner facing north

Viewing Direction: North



From south side Center of retainer, in between tanks

Viewing Direction: West



South east corner facing west

Viewing Direction: North



South west corner facing north





South west corner facing east



From west side of retainer, between tanks facing east



Northwest corner facing south



Northwest corner facing east





Center of retainer facing south, in between tanks



Northeast corner facing south



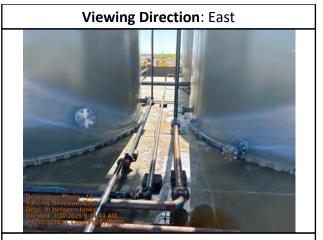
Northeast corner facing west



Center of retainer facing west, in between tanks







In between tanks

In between tanks



In between tanks



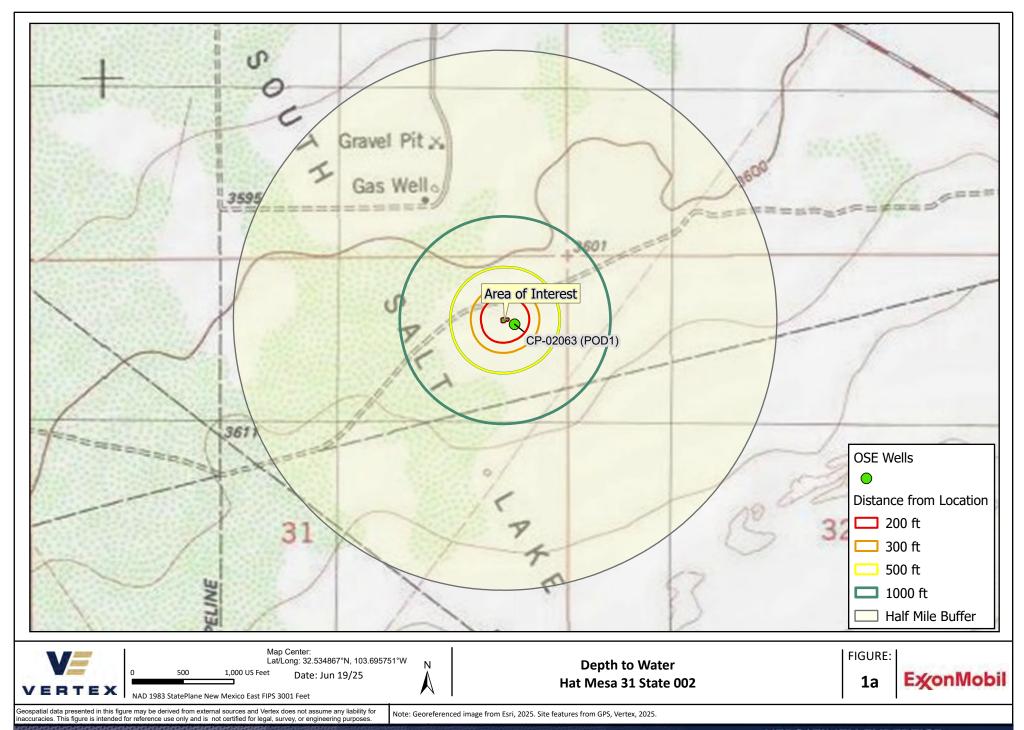
Daily Site Visit Signature

Inspector: Riley Arnold

Signature:

APPENDIX B – Closure Criteria Research Documentation

Closure C	riteria Determination					
	e: Hat Mesa 31/32 State Battery					
	fic Conditions	Value	Unit			
ite speci	Depth to Groundwater (nearest reference)	100-500 ft				
1	Distance between release and nearest DTGW reference		00 ft			
	Date of nearest DTGW reference measurement	June 9), 2025			
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	5m	ni <			
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	1 - !	5 mi			
4	Within 300 feet from an occupied residence, school, hospital, institution or church	1 - !	5 mi			
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	5m	ni <			
	ii) Within 1000 feet of any fresh water well or spring	5mi <				
6	Within incorporated municipal boundaries or within a defined municipal fresh water field covered under a municipal ordinance adopted pursuant to Section 3-27-3 NMSA 1978 as amended, unless the municipality specifically approves	No	(Y/N)			
7	Within 300 feet of a wetland	1 - 5 mi				
	Within the area overlying a subsurface mine	No	(Y/N)			
8	Distance between release and nearest registered mine	5mi <				
9	Within an unstable area (Karst Map)	Low	Critical High Medium Low			
	Distance between release and nearest unstable area	5mi <				
	Within a 100-year Floodplain	>500 year				
10	Distance between release and nearest FEMA Zone A (100-year Floodplain)	5mi <				
11	Soil Type Gravelly loam, fine sandy lo					
12	Ecological Classification	Fine sandy loam				
13	Geology	Q	ер			
	NMAC 19.15.29.12 E (Table 1) Closure Criteria	>100'	<50' 51-100' >100'			





2904 W 2nd St. Roswell, NM 88201 Volce: 575.624,2420 fax: 575.624,2421 www.atkinseng.com

June 20, 2025

DII-NMOSE 1900 W 2nd Street Roswell, NM 88201

Hand Delivered to the DII Office of the State Engineer

Re: Well Record C-2063 Pod-1

To whom it may concern:

Attached please find a well log & record and a plugging record, in duplicate, for a one (1) soil borings, C-2063 Pod-1.

If you have any questions, please contact me at 575.499.9244 or lucas@atkinseng.com.

Sincerely,

Lucas Middleton

Enclosures: as noted above

Gran Middle

DSE DII ROSI ELLA



WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

N.	OSE POD NO. (V POD 1 (TW-)		WELL TAG ID NO. N/A			OSE FILE NO(S).					
ЭСАТІС	WELL OWNER							PHONE (OPTIONAL)						
WELL LA		WELL OWNER MAILING ADDRESS 106 W Green St. Car									TATE VM	88220	ZIP	
GENERAL AND WELL LOCATION	WELL LOCATION (FROM GPS)	1	TITUDE	GREES 32 103	MINUTES 32 41		NDS 85 N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND * DATUM REQUIRED: WGS 84						
1. GENE	DESCRIPTION	RELATIN	IG WELL LOCATION TO 20S R33E. Hat Me	STREET ADD				S (SECTION, TO	WNSHJIP, RA	NGE) WHER	E AVA	ILABLE		
	LICENSE NO. 1249		NAME OF LICENSED		Jackie D. Atkins					WELL DRILI tkins Engin		OMPANY Associates, In	nc.	
	DRILLING STAI 06/09/20		DRILLING ENDED 06/09/2025		OMPLETED WELL (FT orary Well Materia		1	LE DEPTH (FT) ±105	DEPTH W	ATER FIRST	FIRST ENCOUNTERED (FT) N/A			
Z	COMPLETED W	ELL IS:	ARTESIAN *add Centralizer info be	DRY HO	LE SHALLO	W (UNC	ONFINED)		WATER LEV PLETED WEI		L	OATE STATIC I	MEASURED	
RMATIC	DRILLING FLUID: AIR MUD ADDITIVES - SPECIFY: DRILLING METHOD: ROTARY HAMMER CABLE TOOL OTHER - SPECIFY: Hollow Stem								Auger	CHECK HI	ERE IF I	PITLESS ADAF	TER IS	
CASING INFORMATION	DEPTH (feet bgl) FROM TO DIAM (inches)			GRADE CON		ASING NECTION TYPE	INSIDE DIAM. THIC		SING WALL SLO HICKNESS SIZ (inches) (inch					
	0	105	±6.25	note	Soil Boring		TYPE (add coupling diameter)		-			-	••	
DRILLING &														
2.									BE 3.	e tony	Gran water par	8,0		
	DEPTH (feet bgl) BORE HOLE			LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE- RANGE BY INTERVAL			AMOUNT (cubic feet)			METHOD OF PLACEMENT				
ATERIA	FROM	ТО	DIAM. (inches)	*(if using Co	*(if using Centralizers for Artesian wells- indicate the spacing be N/A					ле тесту		TENCE		
ANNULAR MATERIAL														
3. ANN														
	OSE INTERNA E NO.	AL USE			POD NO)		WR-2		ECORD &	LOG	Version 09/2	2/2022)	
-	CATION				10010			WELL TAG I				PAGE	1 OF 2	

PAGE 2 OF 2

WELL TAG ID NO.

	DEPTH (f	eet bgl)		COLOR AN	ND TYPE OF MATERIA	L ENCOUN	ΓERED -	WATER	ESTIMATED YIELD FOR
	FROM	то	THICKNESS (feet)		ER-BEARING CAVITII pplemental sheets to fu			BEARING? (YES / NO)	WATER- BEARING ZONES (gpm)
	0	6	6	(Caliche, semi-consolidate	d, tan/white		Y ✓N	
	6	19	13	Sand,	fine-grained, with calic	ne, tan and wh	ite	Y ✓N	1
	19	39	10	Si	and, fine-grained, clay, ta	nnish brown		Y ✓N	
	39	69	30	Clay, with	n fine-grained sand semi-	consolidated,	Brown	Y ✓N	
	69	105	36		Clay, Stiff, High plasti	c, Brown		Y ✓N	
П	-							Y N	
VEL								Y N	
OF V								Y N	
90								Y N	
ICL								Y N	
.0G								Y N	
EOI								Y N	
4. HYDROGEOLOGIC LOG OF WELL								Y N	
TXD								Y N	
4. I								Y N	
								Y N	
								Y N	
								Y N	
								Y N	
								Y N	
								Y N	
	METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: TOT							TAL ESTIMATED	
	PUMP	ПА	IR LIFT	BAILER O	THER – SPECIFY:		W	ELL YIELD (gpm):	
	_	TECT	респто атт	A CIL A CODY OF DA	TA COLLECTED DID	NC WELL T	ESTING INCLU	DING DISCUARGE	METHOD
NOIS	WELL TEST	STAR	T TIME, END TIME	ME, AND A TABLE S	TA COLLECTED DUR HOWING DISCHARGI	AND DRAV	VDOWN OVER T	THE TESTING PERI	OD.
	MISCELLAN	EOUS IN	FORMATION: Te	mporary well materi	al removed and soil b	oring backfil	lled using drill c	uttings from total d	lepth to ten feet
TEST; RIG SUPERVI	11 0		be	low ground surface(bgs), then hydrated be	ntonite chips	s ten feet bgs to	surface.	
GSI							-27		
C; RI									
(ES)	PRINT NAM	E(S) OF D	RILL RIG SUPER	VISOR(S) THAT PRO	OVIDED ONSITE SUPE	RVISION OF	WELL CONSTR	UCTION OTHER T	HAN LICENSEE:
5.1	Cameron Pru	ıitt							
	THE LINDER	SIGNED	HEREBY CERTIE	IES THAT TO THE I	BEST OF HIS OR HER	KNOWLEDO	E AND BELIEF.	THE FOREGOING	IS A TRUE AND
RE	CORRECT R	ECORD O	F THE ABOVE D	ESCRIBED HOLE AT	ND THAT HE OR SHE	WILL FILE T	HIS WELL REC	ORD WITH THE ST	ATE ENGINEER
ATU	AND THE PI	ERMII HC	LDEK WITHIN 3	UDA 15 AFTER CON	IPLETION OF WELL I	KILLING:			
SIGNATURE	Ja	e Or		Ja	ickie D. Atkins			06/20/2025	
6. S	Jack Atkins		025 07:48 MDT)	R / PRINT SIGNEE	NAME	_	-	DATE	-
		PIOINAI	OVE OF DIMETE	K / IKINI SIONEE	TA MATE			DAIL	
FOI	R OSE INTERN	IAL USE			1	-		RECORD & LOG (Ve	ersion 09/22/2022)
FIL	E NO.				POD NO.		TRN NO.		

LOCATION



PLUGGING RECORD



NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

	ENERAL / WELL OWNERSHIP:								
State	Engineer Well Number: CP-2063 POD-1								
Well	owner: Exxon Mobil			Phone No.: 575-628-0451					
Maili	ing address: 106 W Green St.								
City:	Carlsbad	State	»:	NM		Zip code	88220		
<u>II. W</u>	VELL PLUGGING INFORMATION: Name of well drilling company that plug	gged well:	Jackie D. /	Atkins (Atkins E	Engineering As	ssociates	Inc.)		
2)	New Mexico Well Driller License No.:	1249			Expiratio	on Date:	04/30/27		
3)	Well plugging activities were supervised Cameron Pruitt	by the foll	lowing well	l driller(s)/rig s	upervisor(s):				
4)	Date well plugging began: 06/17/2025	5	Date	well plugging (concluded: 06	3/17/202	25		
5)	GPS Well Location: Latitude: Longitude:	32 103	deg, deg,	32 min, 41 min,	5.85 s	sec sec, WGS	84		
6)	Depth of well confirmed at initiation of p by the following manner: water level pro		105	ft below gro	ound level (bgl	l),			
7)	Static water level measured at initiation of								
8)	Date well plugging plan of operations wa	as approve	d by the Sta	ite Engineer: _	05/13/2025				
9)	Were all plugging activities consistent w differences between the approved pluggi								
					0SE DII 20 CO	ROSWA W 25 A	3.20		

Version: September 8, 2009

Page 1 of 2

Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with 10) horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging <u>Material Used</u> (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
-	0-10' Hydrated Bentonite	Approx. 15 gallons	15 gallons	Boring	
-	10' 105' Drill Cuttings	Approx. 151 gallons	151 gallons	Boring	
				.03	
-					
				OSE DII 20 JU)	ROSWELL NA 1°25 am9:20
t-		MULTIPLY E cubic feet x 7.4 cubic yards x 201.5	BY AND OBTAIN BOS = gallons gallons		

III. SIGNATURE:

I,	Jackie D. Atkins	say	that I	am	familiar	with	the	rules	of th	e Office	of the	State
Εı	ngineer pertaining to the plugging of wells and that each	ch a	nd all	of the	e stateme	nts in	this	Plugg	ing R	ecord an	d attach	ments
ar	e true to the best of my knowledge and belief.											

Jackatkins (Jun 20, 2025 07:48 MDT)	06/20/2025			
Signature of Well Driller	Date			

Signature of Well Driller

Version: September 8, 2009 Page 2 of 2

WR-20 Well Record and Log-packet-forsign

Final Audit Report

2025-06-20

Created:

2025-06-20

By:

Lucas Middleton (lucas@atkinseng.com)

Status:

Signed

Transaction ID:

CBJCHBCAABAAUDRjg2-cTP4LK_OCw1T5KdRCnje7O46N

"WR-20 Well Record and Log-packet-forsign" History

Document created by Lucas Middleton (lucas@atkinseng.com) 2025-06-20 - 1:11:28 PM GMT

2020 00 20 1.11.20 1 M CM

Document emailed to Jack Atkins (jack@atkinseng.com) for signature 2025-06-20 - 1:11:53 PM GMT

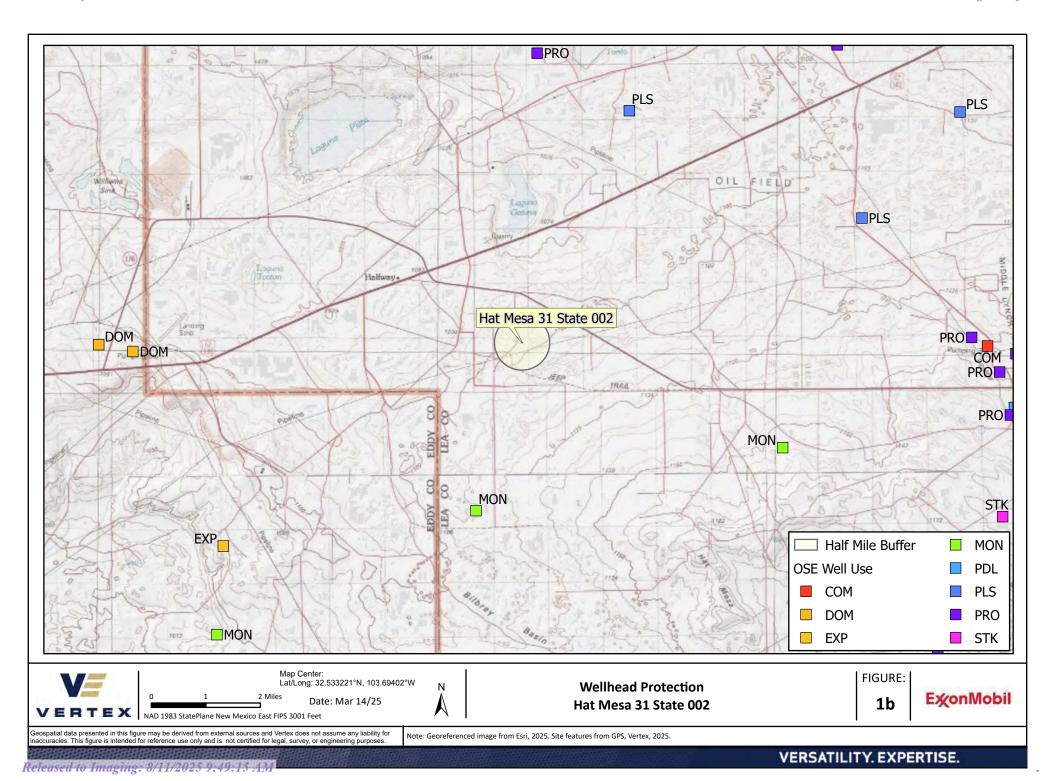
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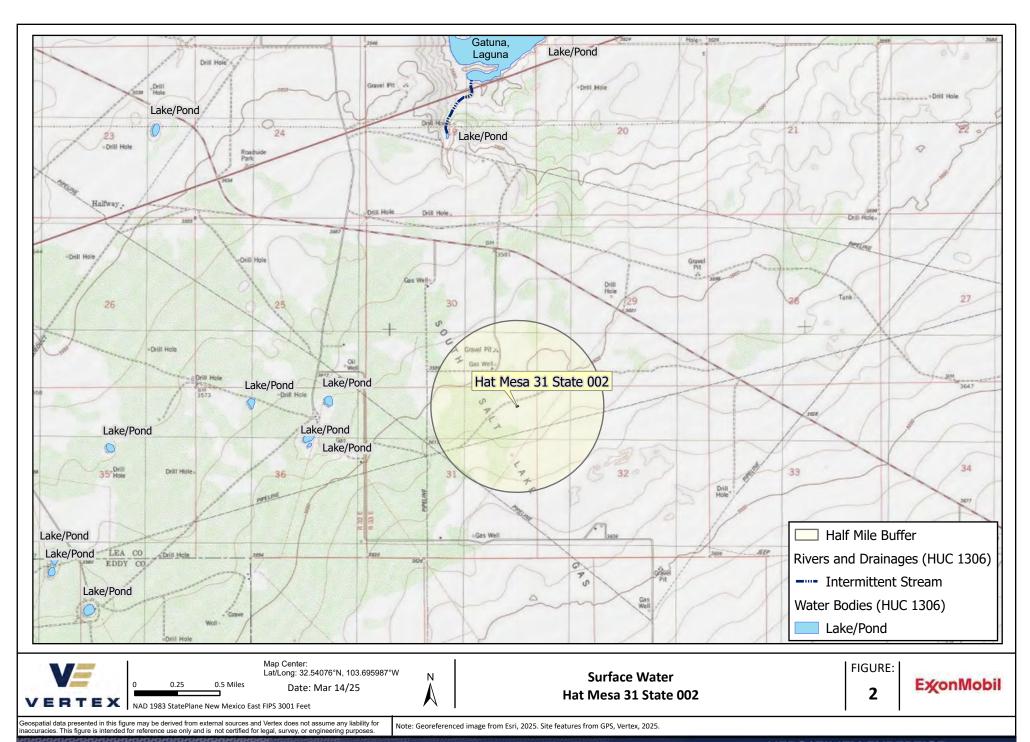
Document e-signed by Jack Atkins (jack@atkinseng.com)
Signature Date: 2025-06-20 - 1:48:22 PM GMT - Time Source: server

Agreement completed. 2025-06-20 - 1:48:22 PM GMT

> DSE DIL ROSWELL NM 20 JUN '25 Ax9:21











Map Center: Lat/Long: 32.535409°N, 103.695606°W 1,600 US Feet

Date: Mar 14/25

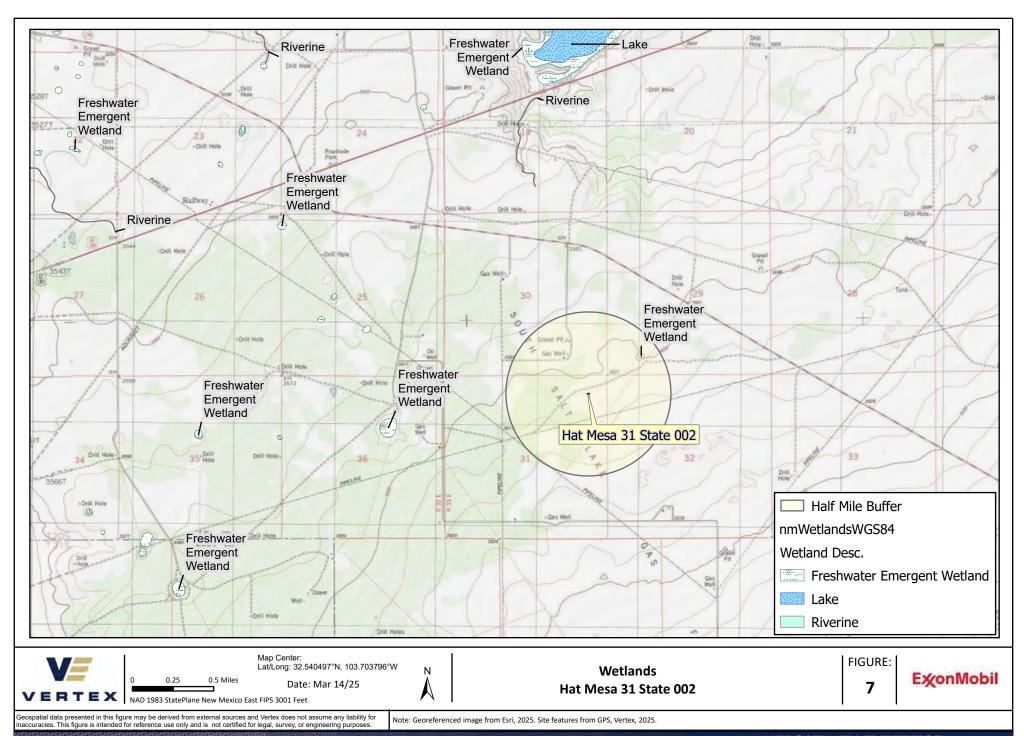
NAD 1983 StatePlane New Mexico East FIPS 3001 Feet

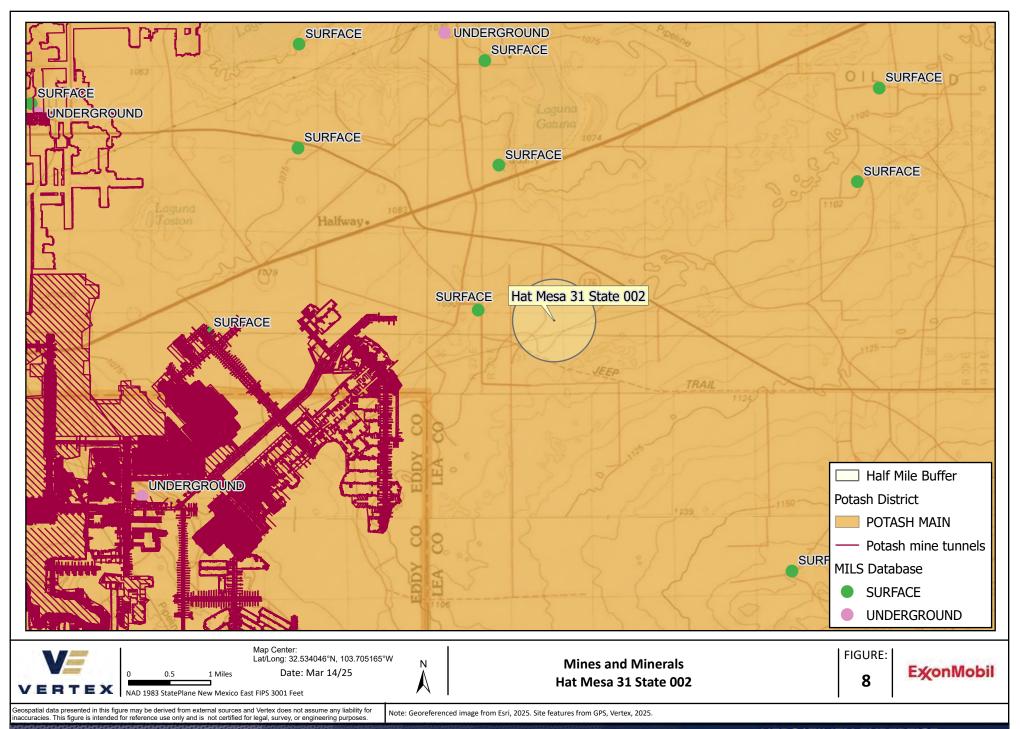
Nearby Structures Hat Mesa 31 State 002 FIGURE: 4

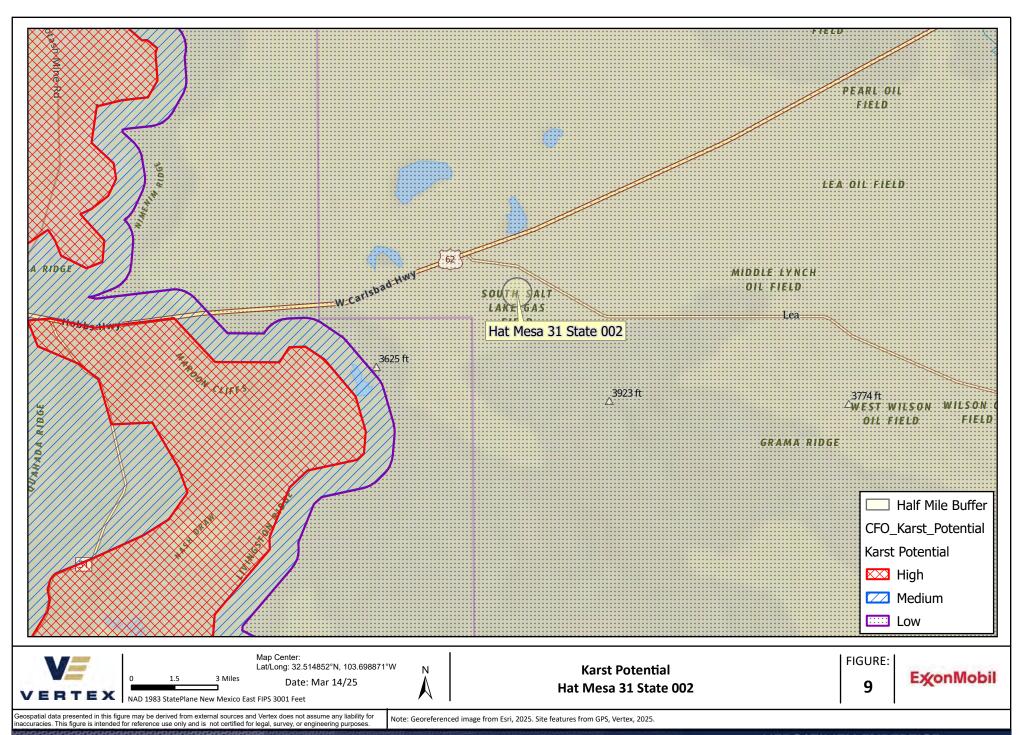
E‰onMobil

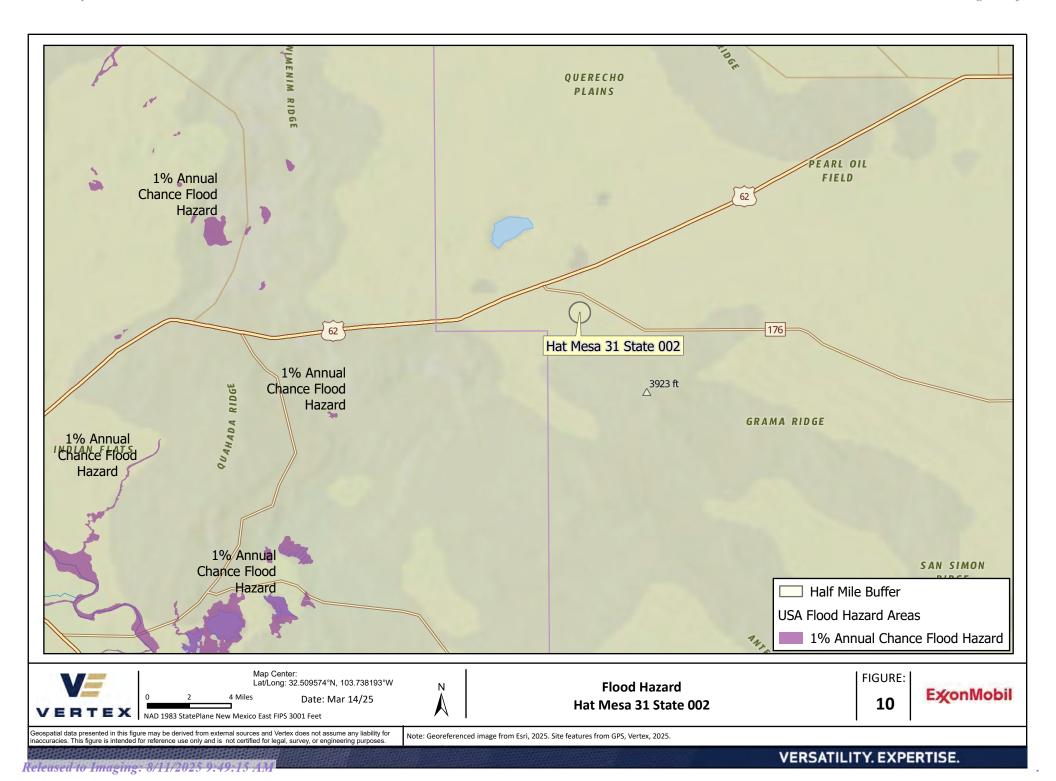
Geospatial data presented in this figure may be derived from external sources and Vertex does not assume any liability for inaccuracies. This figure is intended for reference use only and is not certified for legal, survey, or engineering purposes.

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











MAP LEGEND

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Δ

Water Features

Transportation

 \sim

Background

Spoil Area

Stony Spot

Wet Spot

Other

Rails

US Routes

Major Roads

Local Roads

Very Stony Spot

Special Line Features

Streams and Canals

Interstate Highways

Aerial Photography

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons



Soil Map Unit Lines



Soil Map Unit Points

Special Point Features

യ

Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20.000.

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Lea County, New Mexico Survey Area Data: Version 21, Sep 3, 2024

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

Date(s) aerial images were photographed: Feb 7, 2020—May 12, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI	
ко	Kimbrough gravelly loam, dry, 0 to 3 percent slopes	12.4	27.0%	
SE	Simona fine sandy loam, 0 to 3 percent slopes	33.7	73.0%	
Totals for Area of Interest		46.1	100.0%	

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

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

Lea County, New Mexico

KO—Kimbrough gravelly loam, dry, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tw43 Elevation: 2,500 to 4,800 feet

Mean annual precipitation: 14 to 16 inches Mean annual air temperature: 57 to 63 degrees F

Frost-free period: 180 to 220 days

Farmland classification: Not prime farmland

Map Unit Composition

Kimbrough, dry, and similar soils: 80 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kimbrough, Dry

Setting

Landform: Playa rims, plains
Down-slope shape: Convex, linear
Across-slope shape: Concave, linear

Parent material: Loamy eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 3 inches: gravelly loam Bw - 3 to 10 inches: loam

Bkkm1 - 10 to 16 inches: cemented material Bkkm2 - 16 to 80 inches: cemented material

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 4 to 18 inches to petrocalcic

Drainage class: Well drained Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

low (0.00 to 0.01 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum content: 95 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: R077DY049TX - Very Shallow 12-17" PZ

Hydric soil rating: No

Minor Components

Eunice

Percent of map unit: 10 percent

Landform: Plains

Down-slope shape: Linear Across-slope shape: Convex

Ecological site: R077DY049TX - Very Shallow 12-17" PZ

Hydric soil rating: No

Spraberry

Percent of map unit: 6 percent Landform: Playa rims, plains Down-slope shape: Convex, linear

Across-slope shape: Linear

Ecological site: R077DY049TX - Very Shallow 12-17" PZ

Hydric soil rating: No

Kenhill

Percent of map unit: 4 percent

Landform: Plains

Down-slope shape: Linear Across-slope shape: Linear

Ecological site: R077DY038TX - Clay Loam 12-17" PZ

Hydric soil rating: No

SE—Simona fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: dmr2 Elevation: 3,000 to 4,200 feet

Mean annual precipitation: 10 to 15 inches
Mean annual air temperature: 58 to 62 degrees F

Frost-free period: 190 to 205 days

Farmland classification: Not prime farmland

Map Unit Composition

Simona and similar soils: 85 percent *Minor components*: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Simona

Setting

Landform: Plains

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Calcareous eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 8 inches: fine sandy loam

Bk - 8 to 16 inches: gravelly fine sandy loam Bkm - 16 to 26 inches: cemented material

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 7 to 20 inches to petrocalcic

Drainage class: Well drained Runoff class: Very 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: 35 percent

Gypsum, maximum content: 1 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 2.0

Available water supply, 0 to 60 inches: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): 6s Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D

Ecological site: R070BD002NM - Shallow Sandy

Hydric soil rating: No

Minor Components

Kimbrough

Percent of map unit: 8 percent

Ecological site: R077CY037TX - Very Shallow 16-21" PZ

Hydric soil rating: No

Lea

Percent of map unit: 7 percent

Ecological site: R077CY028TX - Limy Upland 16-21" PZ

Hydric soil rating: No



Ecological site R070BD002NM Shallow Sandy

Accessed: 04/08/2025

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.

Associated sites

R070BD004NM	Sandy	Ì
	Sandy sites often occur in association or in a complex with Shallow Sandy Sites.	

Similar sites

R070BD004NM	Sandy
	Sandy ecological sites are similar to Shallow Sandy sites in species composition and Transition pathways.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occures on plains, alluvial fans, uplands, or fan piedmonts. The parent material consists of mixed loamy alluvium or eolian material derived from igneous and sedimentory bedrock. The petrocalcic layer is at a depth of 10 to 25 inches and undulating.

Slopes are nearly level to undulating, usually less than 9 percent. Elevations range from 2,842 to 4,500 feet.

Table 2. Representative physiographic features

Landforms	(1) Plain(2) Fan piedmont(3) Alluvial fan
Elevation	866–1,372 m
Slope	1–9%
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation ranges from 8 to 13 inches. Variations of 5 inches, more or less, are common.

Over 80 percent of the precipitation falls from April through October. Most of the summer precipitation comes in the form of high intensity – short duration thunderstorms.

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

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

Temperature and rainfall both favor warm season perennial plant growth. In years of abundant spring moisture, annual forbs and cool season grasses can make up an important component of the site. The vegetation of this site can take advantage of the moisture and the time it falls. Because of the soil profile, little moisture can be stored in the soil for any length of time. Moisture is readily available to the plants from the time it falls. Strong winds from the southwest blow from January through June which rapidly dries out the soil profile during a critical period for plant growth.

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

Table 3. Representative climatic features

Frost-free period (average)	221 days
Freeze-free period (average)	240 days
Precipitation total (average)	330 mm

Influencing water features

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

Soil features

Soils are very shallow to shallow, less than 20 inches in depth. Surface and subsurface textures are gravelly loamy sand, gravelly fine sandy loam or fine sandy loam.

An indurated calache layer occurs at depths of 6 to 25 inches and is at an average of 15 inches from the surface. Underlying material textures are very gravelly fine sandy loam, very gravelly sandy loam, gravelly fine sandy loam. Gravels are calcium carbonate concretions, calcium carbonate content ranges from 30 to 65 percent.

The indurated caliche layer typically holds water up in the profile for short periods within the root zone of plants. These soils will blow if left unprotected by vegetation.

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

Characteristic soils are:

Simona

Jerag

Table 4. Representative soil features

Surface texture	(1) Fine sandy loam(2) Loamy fine sand(3) Gravelly fine sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained to moderately well drained
Permeability class	Moderately slow to moderate

Soil depth	18–61 cm
Surface fragment cover <=3"	5–25%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	2.54–5.08 cm
Calcium carbonate equivalent (0-101.6cm)	5–15%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	7.4–8
Subsurface fragment volume <=3" (Depth not specified)	5–25%
Subsurface fragment volume >3" (Depth not specified)	0%

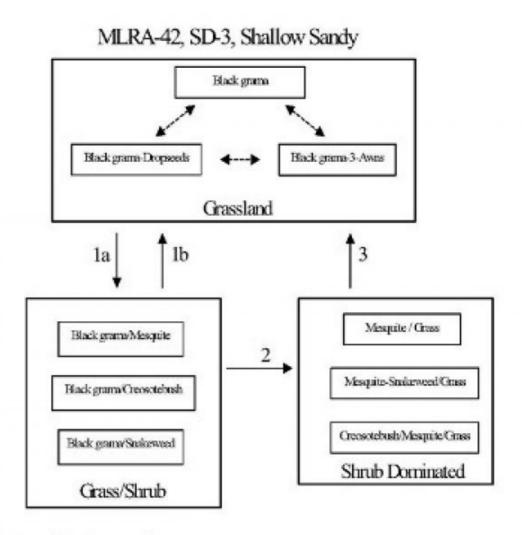
Ecological dynamics

Overview

The Shallow Sandy site occurs on upland plains, and tops of low ridges and mesas, associated with Sandy, Loamy Sand, and Shallow sites. Coarse to moderately coarse soil surface textures, shallow depth (<20 inches) to an indurated caliche layer (petrocalcic horizon), and an overwhelming dominance by black grama help to distinguish this site. The historic plant community of the Shallow Sandy site is a black grama dominated grassland sparsely dotted with shrubs. Shrubs, especially mesquite and creosotebush can increase or colonize due to the dispersal of shrub seeds by livestock or wildlife. This increase in mesquite and colonization of creosotebush may be enhanced by proximity to areas with existing high shrub densities. Fire suppression, and the loss of grass cover due to overgrazing or drought may facilitate the increase and encroachment of shrubs. Persistent loss of grass cover, competition for resources by shrubs, and periods of climate with increased winter precipitation and dry summers, may initiate the transition to a shrub-dominated state.

State and transition model

Plant Communities and Transitional Pathways (diagram)



Seed dispersal, drought, overgrazing, fire suppression.

- Prescribed fire, brush control, prescribed grazing.
- Persistent loss of grass cover, resource competition, increased winter precipitation.
- Brush control, range seeding, prescribed grazing.

State 1 Historic Climax Plant Community

Community 1.1 Historic Climax Plant Community

Grassland: This site responds well to management and is resistant to state change, due to the shallow depth to petrocalcic horizon and sandy surface textures. The sandy surface textures allow rapid water infiltration and the petrocalcic horizon helps to keep water perched and available to shallow rooted grasses. Black grama is the dominant species in the historic plant community, averaging 50 to 60 percent of the total production for this site. Bush muhly, blue grama, and dropseeds are present as sub-dominants. Typically, yucca, javalinabush, range ratany, prickly pear, and mesquite are sparsely dotted across the landscape. Leatherweed croton, cutleaf

happlopappus, wooly groundsel, and threadleaf groundsel are common forbs. Continuous heavy grazing or extended periods of drought will cause a loss of grass cover characterized by a decrease in black grama, bush muhly, blue and sideoats grama, plains bristlegrass, and Arizona cottontop. Dropseeds and or threeawns may increase and become sub-dominant to black grama. Continued loss of grass cover in conjunction with dispersal of shrub seeds and fire suppression is believed to cause the transition to a state with increased amounts of shrubs (Grass/Shrub state). Diagnosis: Black grama is the dominant grass species. Grass cover uniformly distributed. Shrubs are a minor component averaging only two to five percent canopy cover. Litter cover is high (40-50 percent of area), and litter movement is limited to smaller size class litter and short distances (<. 5m). Other grasses that could appear on this site would include: six-weeks grama, fluffgrass, false-buffalograss, hairy grama, little bluestem, bristle panicum, cane bluestem, Indian ricegrass, tridens spp., and red lovegrass. Other woody plants include: pricklypear, cholla, fourwing saltbush, catclaw mimosa, winterfat, American tarbush and mesquite. Other forbs include: globemallow, verbena, desert holly, senna, plains blackfoot, trailing fleabane, fiddleneck, deerstongue, wooly Indianwheat, and locoweed.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	531	731	930
Forb	87	120	152
Shrub/Vine	54	74	94
Total	672	925	1176

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	30-35%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	40-50%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	15-25%

Figure 5. Plant community growth curve (percent production by month). NM2802, R042XC002NM-Shallow Sandy-HCPC. SD-3 Shallow Sandy - Warm season plant community.

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

State 2 Grass/Shrub

Community 2.1 Grass/Shrub

Grass/Shrub: This state is characterized by the notable presence of shrubs, especially mesquite, broom snakeweed, and/or creosotebush, however grasses remain as the dominant species. Black grama is the dominant

grass species. Threeawns and or dropseeds are sub-dominant. The susceptibility of the Shallow Sandy site to shrub encroachment may be higher when located adjacent to other sites with high densities of mesquite or creosotebush. Retrogression within this site is characterized by decreases in grass cover and increasing densities of shrubs. Diagnosis: Black grama remains as the dominant grass species. Grass cover varies in response to the amount of shrub increase, ranging from uniform to patchy. Shrubs are found at increased densities relative to the grassland state, especially mesquite, creosotebush, or broom snakeweed. Transition to Grass/Shrub (1a) Historically fire may have kept mesquite and other shrubs in check by completely killing some species and disrupting seed production cycles and suppressing the establishment of shrub seedlings in others. Fire suppression combined with seed dispersal by livestock and wildlife is believed to be the factors responsible for the establishment and increase in shrubs.1, 3 Loss of grass cover due to overgrazing, prolonged periods of drought, or their combination, reduces fire fuel loads and increases the susceptibility of the site to shrub establishment. Key indicators of approach to transition: Increase in the relative abundance of dropseeds and threeawns Presence of shrub seedlings Loss of organic matter—evidenced by an increase in physical soil crusts 8 Transition back to Grassland (1b) Brush control is necessary to initiate the transition back to the grassland state. If adequate fuel loads remain, possibly the reintroduction of fire as a management tool will assist in the transition back, however, mixed results have been observed concerning the effects of fire on black grama grasslands.6 Prescribed grazing will help ensure adequate rest following brush control and will assist in the establishment and maintenance of grass cover capable of sustaining fire.

State 3 Shrub Dominated

Community 3.1 Shrub Dominated

Shrub-Dominated: Across the range of soil types included in the Shallow Sandy site, mesquite is typically the dominant shrub, but it does occur as a co-dominant or sub-dominant species with creosotebush or broom snakeweed. Mesquite tends to dominate when the Shallow Sandy site occurs as part of a complex or in association with Sandy or Loamy Sand sites. Creosotebush tends to dominate on Shallow Sandy sites that occur as part of, or adjacent to Shallow Sites. Broom snakeweed increases in response to heavy grazing, but tends to cycle in and out depending on timing of rainfall. However, once the site is dominated by shrubs and snakeweed becomes well established, it tends to remain as a major component in the shrub dominated state. Diagnosis: Mesquite, creosotebush, or snakeweed cover is high, exceeding that of grasses. Grass cover is patchy with large connected bare areas present. Black grama, threeawns, or dropseeds may be the dominant grass. Evidence of accelerated wind erosion in the form of pedestalling of plants, and soil deposition around shrub bases may be common. Transition to Shrub-Dominated (2) Persistent loss of grass cover and the resulting increased competition between shrubs and remaining grasses for dwindling resources (especially soil moisture) may drive this transition.5 Additionally periods of increased winter precipitation may facilitate periodic episodes of shrub expansion and establishment. 4 Key indicators of approach to transition: Increase in size and frequency of bare patches. Loss of grass cover in shrub interspaces. Increased signs of erosion, evidenced by pedestalling of plants, and soil and litter deposition on leeward side of plants. 7 Transition back to Grassland (3) Brush control is necessary to reduce competition from shrubs and reestablish grasses. Range seeding may be necessary if insufficient grasses remain, The benefits, and costs, will vary depending upon the degree of site degradation, and adequate precipitation following seeding.

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name Symbol		Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)	
Grass	/Grasslike	•		•		
1	Warm Season			463–555		
	black grama	BOER4	Bouteloua eriopoda	463–555	_	
2	Warm Season	•		46–93		
	bush muhly	MUPO2	Muhlenbergia porteri	46–93	_	
3	Warm Season	-		46–93		

	1				
	blue grama	BOGR2	Bouteloua gracilis	46–93	_
4	Warm Season			28–46	
	sideoats grama	BOCU	Bouteloua curtipendula	28–46	_
5	Warm Season			46–93	
	spike dropseed	SPCO4	Sporobolus contractus	46–93	-
	sand dropseed	SPCR	Sporobolus cryptandrus	46–93	_
	mesa dropseed	SPFL2	Sporobolus flexuosus	46–93	-
6	Warm Season			19–46	
	threeawn	ARIST	Aristida	19–46	ı
7	Warm Season	Warm Season			
	Arizona cottontop	DICA8	Digitaria californica	46–93	_
	plains bristlegrass	SEVU2	Setaria vulpiseta	46–93	_
8	Warm Season			46–93	
	mat sandbur	CELO3	Cenchrus longispinus	46–93	_
	hooded windmill grass	CHCU2	Chloris cucullata	46–93	_
9	Other Perennial Grasses	-		28–46	
	Grass, perennial	2GP	Grass, perennial	28–46	_
Shru	b/Vine				
10	Shrub			9–28	
	javelina bush	COER5	Condalia ericoides	9–28	_
11	Shrub			9–28	
	yucca	YUCCA	Yucca	9–28	_
12	Shrub			9–28	
	jointfir	EPHED	Ephedra	9–28	_
	littleleaf ratany	KRER	Krameria erecta	9–28	_
13	Shrub			9–28	
	featherplume	DAFO	Dalea formosa	9–28	_
14	Shrub			9–28	
	broom snakeweed	GUSA2	Gutierrezia sarothrae	9–28	_
15	Other Shrubs	1	•	28–46	
	Shrub (>.5m)	2SHRUB	Shrub (>.5m)	28–46	_
Forb	•	•			
16	Forb			19–46	
	leatherweed	CRPOP	Croton pottsii var. pottsii	19–46	_
	Goodding's tansyaster	MAPIG2	Machaeranthera pinnatifida ssp. gooddingii var. gooddingii	19–46	_
17	Forb	!		19–46	
	woolly groundsel	PACA15	Packera cana	19–46	_
	threadleaf ragwort	SEFLF	Senecio flaccidus var. flaccidus	19–46	_
18	Forb	1	1	9–28	
	whitest evening primrose	OEAL	Oenothera albicaulis	9–28	_
19	Other Forbs		1	9–28	
	Forb (herbaceous, not grass nor grass-like)	2FORB	Forb (herbaceous, not grass nor grass- like)	9–28	_
		-			

Animal community

This site provides habitats which support a resident animal community that is characterized by pronghorn antelope, swift fox, black-tailed jackrabbit, spotted ground squirrel, Ord's kangaroo rat, northern grasshopper mouse, coyote, horned lark, meadowlark, lark bunting, scaled quail, morning dove, side-blotched lizard, round-tailed horned lizard, marbled whiptail, prairie rattlesnake and ornate box turtle.

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 Jarag D Simona D

Recreational uses

This site offers recreation for hiking, horseback riding, nature observation and photography, and quail and dove hunting. During years of abundant spring moisture, this site displays a riot of color from wildflowers during May and June. A few summer and fall flowers also occur.

Wood products

The natural potential plant community of this site affords little or no wood products. Where the site has been invaded by mesquite or cholla cactus the roots and stems of these plants provide attractive material for a variety of curiosities, such as lamps and small furniture.

Other products

This site is suitable for grazing by all kinds and classes of livestock during all seasons of the year. Because of the sandy textures and shallow profile, this site will respond rapidly to management. As this site deteriorates, plants such as black grama, bush muhly, blue and sideoats grama, plains bristlegrass and Arizona cottontop, will decrease and be replaced by plants such as threeawns, mesquite, creosote bush, and broom snakeweed. This also causes a decrease in ground cover, leaving the soil to blow. This site responds 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 $100 - 76 \ 2.5 - 3.5$ $75 - 51 \ 3.2 - 4.6$ $50 - 26 \ 4.5 - 7.5$ $25 - 0 \ 7.6 +$

Inventory data references

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

Other references

Literature References:

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Contributors

David Trujillo Don Sylvester

Rangeland health reference sheet

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

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

Indicators

1.	Number and extent of rills:
2.	Presence of water flow patterns:
3.	Number and height of erosional pedestals or terracettes:
4.	Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):
5.	Number of gullies and erosion associated with gullies:
6.	Extent of wind scoured, blowouts and/or depositional areas:
7.	Amount of litter movement (describe size and distance expected to travel):
8.	Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):
9.	Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):
10.	Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:
11.	Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):
12.	Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):
	Dominant:
	Sub-dominant:
	Other:
	Additional:

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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:

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QUESTIONS

Action 493875

QUESTIONS

Operator:	OGRID:
XTO ENERGY, INC	5380
6401 Holiday Hill Road	Action Number:
Midland, TX 79707	493875
	Action Type:
	[C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Prerequisites		
Incident ID (n#)	nAPP2509749496	
Incident Name	NAPP2509749496 HAT MESA 31/32 STATE BATTERY @ 0	
Incident Type	Oil Release	
Incident Status	Remediation Closure Report Received	

Location of Release Source		
Please answer all the questions in this group.		
Site Name	Hat Mesa 31/32 State Battery	
Date Release Discovered	04/04/2025	
Surface Owner	State	

Incident Details			
Please answer all the questions in this group.	Please answer all the questions in this group.		
Incident Type	Oil 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	Cause: Equipment Failure Tank (Any) Crude Oil Released: 40 BBL Recovered: 40 BBL Lost: 0 BBL.	
Produced Water Released (bbls) Details	Not answered.	
Is the concentration of chloride in the produced water >10,000 mg/l	No	
Condensate Released (bbls) Details	Not answered.	
Natural Gas Vented (Mcf) Details	Not answered.	
Natural Gas Flared (Mcf) Details	Not answered.	
Other Released Details	Not answered.	
Are there additional details for the questions above (i.e. any answer containing Other, Specify, Unknown, and/or Fire, or any negative lost amounts)	This release was in a lined containment, with no liquids outside of the lined containment.	

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QUESTIONS, Page 2

Action 493875

QUESTIONS (continued)

VTO ENERGY INC	OGNID.
XTO ENERGY, INC 6401 Holiday Hill Road	5380 Action Number:
Midland, TX 79707	493875
	Action Type:
	[C-141] Remediation Closure Request C-141 (C-141-v-Closure)
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.	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 s	rafety hazard that would coult in injury
The source of the release has been stopped	True
	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.
	ation immediately after discovery of a release. If remediation has begun, please prepare and attach a narrative of ted or if the release occurred within a lined containment area (see Subparagraph (a) of Paragraph (5) of valuation in the follow-up C-141 submission.
to report and/or file certain release notifications and perform corrective actions for releathe OCD does not relieve the operator of liability should their operations have failed to a	knowledge and understand that pursuant to OCD rules and regulations all operators are required ases which may endanger public health or the environment. The acceptance of a C-141 report by adequately investigate and remediate contamination that pose a threat to groundwater, surface t does not relieve the operator of responsibility for compliance with any other federal, state, or
I hereby agree and sign off to the above statement	Name: Ashley Mcafee Email: ashley.a.mcafee@exxonmobil.com Date: 04/07/2025

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QUESTIONS, Page 3

Action 493875

QUESTIONS (continued)

Operator:	OGRID:
XTO ENERGY, INC	5380
6401 Holiday Hill Road	Action Number:
Midland, TX 79707	493875
	Action Type:
	[C-141] Remediation Closure Request C-141 (C-141-v-Closure)

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	Direct Measurement		
Did this release impact groundwater or surface water	No		
What is the minimum distance, between the closest lateral extents of the release ar	nd the following surface areas:		
A continuously flowing watercourse or any other significant watercourse	Greater than 5 (mi.)		
Any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)	Between 1 and 5 (mi.)		
An occupied permanent residence, school, hospital, institution, or church	Between 1 and 5 (mi.)		
A spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes	Greater than 5 (mi.)		
Any other fresh water well or spring	Between 1 and 5 (mi.)		
Incorporated municipal boundaries or a defined municipal fresh water well field	Greater than 5 (mi.)		
A wetland	Between 1 and 5 (mi.)		
A subsurface mine	Greater than 5 (mi.)		
An (non-karst) unstable area	Greater than 5 (mi.)		
Categorize the risk of this well / site being in a karst geology	Low		
A 100-year floodplain	Greater than 5 (mi.)		
Did the release impact areas not on an exploration, development, production, or storage site	No		

Remediation Plan		
Please answer all the questions that apply or are indicated. This information must be provided to the appropriate district office no later than 90 days after the release discovery date.		
Requesting a remediation plan approval with this submission	Yes	
Attach a comprehensive report demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined, pursuant to 19.15.29.11 NMAC and 19.15.29.13 NMAC.		
Have the lateral and vertical extents of contamination been fully delineated	Yes	
Was this release entirely contained within a lined containment area	Yes	
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	07/29/2025	
On what date will (or did) the final sampling or liner inspection occur	07/30/2025	
On what date will (or was) the remediation complete(d)	07/30/2025	
What is the estimated surface area (in square feet) that will be remediated	0	
What is the estimated volume (in cubic yards) that will be remediated	0	
These estimated dates and measurements are recognized to be the best guess or calculation at t	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, Page 4

Action 493875

QUESTIONS (continued)

ı	Operator:	OGRID:
ı	XTO ENERGY, INC	5380
ı	6401 Holiday Hill Road	Action Number:
ı	Midland, TX 79707	493875
ı		Action Type:
ı		[C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Remediation Plan (continued)			
lease 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.)			
Is (or was) there affected material present needing to be removed	Yes		
Is (or was) there a power wash of the lined containment area (to be) performed	No		
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.

Name: Ashley Mcafee I hereby agree and sign off to the above statement Email: ashley.a.mcafee@exxonmobil.com Date: 08/08/2025

The OCD recognizes that proposed remediation measures may have to be minimally adjusted in accordance with the physical realities encountered during remediation. If the responsible party has any need to significantly deviate from the remediation plan proposed, then it should consult with the division to determine if another remediation plan submission is required.

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QUESTIONS, Page 6

Action 493875

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QUESTIONS (continued)					
Operator:	OGRID:				
XTO ENERGY, INC 6401 Holiday Hill Road	5380				
Midland, TX 79707	Action Number: 493875				
,	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)				
QUESTIONS	[0-141] Remediation Glosule Request 0-141 (0-141-9-Glosule)				
Liner Inspection Information					
Last liner inspection notification (C-141L) recorded	493820				
Liner inspection date pursuant to Subparagraph (a) of Paragraph (5) of Subsection A of 19.15.29.11 NMAC	07/30/2025				
Was all the impacted materials removed from the liner	Yes				
What was the liner inspection surface area in square feet	3900				
Remediation Closure Request					
Only answer the questions in this group if seeking remediation closure for this release because all re	emediation steps have been completed.				
Requesting a remediation closure approval with this submission	Yes				
Have the lateral and vertical extents of contamination been fully delineated	Yes				
Was this release entirely contained within a lined containment area	Yes				
What was the total surface area (in square feet) remediated	0				
What was the total volume (cubic yards) remediated	0				
Summarize any additional remediation activities not included by answers (above)	N/A				
	closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents or				
to report and/or file certain release notifications and perform corrective actions for releathe OCD does not relieve the operator of liability should their operations have failed to a water, human health or the environment. In addition, OCD acceptance of a C-141 report	knowledge and understand that pursuant to OCD rules and regulations all operators are required ses which may endanger public health or the environment. The acceptance of a C-141 report by adequately investigate and remediate contamination that pose a threat to groundwater, surface t does not relieve the operator of responsibility for compliance with any other federal, state, or ally restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed no notification to the OCD when reclamation and re-vegetation are complete.				
I hereby agree and sign off to the above statement	Name: Ashley Mcafee Email: ashley.a.mcafee@exxonmobil.com Date: 08/08/2025				

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CONDITIONS

Action 493875

CONDITIONS

Operator:	OGRID:
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6401 Holiday Hill Road	Action Number:
Midland, TX 79707	493875
	Action Type:
	[C-141] Remediation Closure Request C-141 (C-141-v-Closure)

CONDITIONS

Created E	y Condition	Condition Date
rhamle	We have received your Remediation Closure Report for Incident #NAPP2509749496 HAT MESA 31/32 STATE BATTERY, thank you. This Remediation Closure Report is approved.	8/11/2025