June 6, 2025

EMNRD – Oil Conservation Division
506 W. Texas
Artesia, New Mexico 88210

SUBJECT: Liner Inspection and Closure Report for Cotton Draw Unit 219 Battery – May 16, 2025 Site Visit

Incident ID: nAPP2511826834
Facility ID (Name): fAPP2123135798 (COTTON DRAW UNIT 219 CTB)
Facility Location: Unit M of Section 2, Township 25 South, Range 31 East, New Mexico
Facility GPS Coordinates: 32.152331, -103.743680
Eddy County, New Mexico

Introduction

KLJ Engineering (KLJ) has prepared this report on behalf of Devon Energy Production Company, LP (Devon) to detail the recent liner inspection conducted at the Cotton Draw Unit 219 Battery (Site) on May 16, 2025, following the release of produced water that occurred on April 27, 2025.

Site Information and Background

The Site is located approximately 21.95 miles southeast of Loving, New Mexico, on Federal land, Bureau of Land Management (BLM) property. The Site lies within Unit M, Section 2, Township 25 South, Range 31 East, in Eddy County. KLJ conducted a liner inspection and associated site characterization in accordance with 19.15.29.11 and 19.15.29.12 of the New Mexico Administrative Code (NMAC) to assess the integrity of the containment system and evaluate any potential environmental impacts resulting from a release.

Release Description and Immediate Response

On April 27, 2025, a Devon lease operator discovered that a water tank had developed a hole due to corrosion at its base, resulting in the release of approximately 14 barrels (bbls) of produced water. Initial response actions were conducted by the operator and included source elimination, photographic documentation of the affected area, volume estimation, and an attempt to recover released fluids. Photographic documentation of the secondary containment, liner, tanks, and equipment where the release occurred is included in the Liner Inspection Field Notes & Photolog Report (**Appendix A**).

Devon submitted the initial Notice of Release (NOR) to the New Mexico Energy, Minerals, and Natural Resources Department – Oil Conservation Division (NMOCD) on April 28, 2025, through the Operator's Electronic Permitting and Payment Portal. The initial Form C-141 was subsequently submitted on April 30, 2025.

Site Characterization Summary

The Site lies within Qa – Alluvium (Holocene to upper Pleistocene), featuring interlayered sands and loamy fine sands (New Mexico Bureau of Geology and Mineral Resources). Terrain for the Site and immediate surrounding area includes uplands, plains, dunes, fan piedmonts and inter dunal areas at elevations of 2,800 – 5,000 feet above mean sea level (amsl). Parent material consists of mixed alluvium and/or eolian

sands, with 8–13 inches of average annual precipitation. Soil within the Site tends to be well-drained, with very low runoff potential and moderate water-holding capacity.

The USDA – Web Soil Survey (WSS) identifies the predominant soil type at the Site as Berino Complex that are moderately deep or very deep, with surface textures ranging from loamy fine sand, fine sandy loam, loamy very fine sand, to gravelly sandy loam. Subsurface layers include loamy fine sand, course sandy loam, fine sandy loam, or loam that averages <18% clay and <15% carbonates. Substratum includes a fine sandy loam, or gravelly fine sandy loam with <15% gravel and with <40% calcium carbonate while some layers high in lime or caliche fragments may occur at depths of 20–30 inches. The soils are prone to wind erosion if left bare.

Vegetation reflects a grassland community dominated by black grama, dropseeds, and bluestems, with scattered shinnery oak and sand sage. Transitions to shrub-dominated states (e.g., mesquite or snakeweed) may occur with decreased grass cover and include grasses/honey mesquite, grasses/broom snakeweed, or grasses/sand sage. Heavy grazing and/or drought are influential drivers in decreasing grassland-dominated plant communities within proximity of the Site.

No surface water features were identified within 300 feet of the Site. The nearest significant watercourse is 4.28 miles southeast; the closest playa lake is 6.27 miles southwest, and the nearest wetland is 1.33 miles southwest (USFWS NWI, 2025). These distances comply with the requirements of 19.15.29.12(C)(4) NMAC.

Per the New Mexico Office of the State Engineer (NMOSE) Points of Diversion (POD) Map, the nearest POD is C-03830-POD1, located 0.28 miles northeast, with a recorded groundwater depth of 300 feet below ground surface (bgs). The nearest freshwater well used for stock water, POD C-02245, is located 0.36 miles southeast of the Site.

Karst potential for the Site is identified as low, with the nearest area of medium karst potential located 6.21 miles to the southwest. The Site is in a FEMA flood hazard area identified as FEMA Zone X (undetermined hazard); the nearest identified FEMA flood hazard area, classified as Zone A, is 2.26 miles to the southwest.

Additional information detailing the results of the site characterization findings can be found in **Appendix B**.

Closure Criteria

Table 1 summarizes key site and incident information relevant to closure evaluation, as required under **19.15.29.12 NMAC**. This includes details such as release source, location, containment status, and site-specific features that may influence closure requirements. While contamination thresholds, sampling depths, and applicable concentration limits are not listed in this table, the information provided supports regulatory assessment of whether the release meets criteria for closure. In accordance with **NMAC 19.15.29.12(B)(4)**, if the release occurred within lined, impermeable secondary containment with no evidence of escape, it may qualify for reduced remediation requirements or a **No Further Action (NFA)** determination.

Table 1: Release Information and Closure Criteria Limits			
Depth to Ground Water Determination: > 100 feet bgs			
Site Name	Cotton Draw Unit 219 Battery	Company	Devon Energy Production Company, LP
Facility ID/API Number	fAPP2123135798	PLSS/GPS	M-2-25S-31E/32.152331, -103.743680
Lease ID	NMNM0503/NMNM70928X/ NMNM042625	Land Status	Bureau of Land Management
Incident ID	nAPP2511826834	Date Of Release	4/27/2025
Source of Release	Corrosion on bottom of tank	Volume Released/Recovered	14 bbls/14 bbls pw
Specific Features	Low Karst Potential, DTGW pod within 0.5-mile radius, no surface water within proximity, and FEMA Zone X		

Liner Inspection Activities

KLJ Environmental Specialists conducted a site visit on May 16, 2025, to perform a liner inspection. Notification was submitted to Devon via email on May 13, 2025, and official notification was submitted via the through the Operator's Electronic Permitting and Payment Portal on May 14, 2025, in accordance with Subsection D of 19.15.29.12 NMAC prior to the inspection. A copy of the notification is provided in **Appendix C**. KLJ personnel conducted a visual inspection of the secondary containment to verify liner integrity and confirmed that it was intact with no observed integrity issues. The visual inspection included observations for any perforations in the liner that could lead to a breach of the secondary containment. The inspection concluded with no signs of rips, cuts, tears, or weathering in any condition that showed signs of the liner needing repairs or replacements. Photographic documentation of the liner inspection is included in the Liner Inspection Field Notes & Photolog Report (**Appendix A**).

Conclusion

Based on the findings of the liner inspection, KLJ concludes that liner integrity is adequate to contain fluids and there are no further actions required in relation to incident nAPP2511826834.

Based on the site assessment and activities conducted, Devon respectfully requests closure of incident nAPP2511826834 with a No Further Action (NFA) determination.

Submitted and prepared by:
KLJ Engineering

Written By
Name: Monica Peppin
Title: Environmental Specialist II
Signature: _____

Reviewed By
Name: Will Harmon, P.G.
Title: Environmental Project Manager
Signature: _____

Included Appendices

Appendix A – LINER INSPECTION FIELD NOTES & PHOTOLOG REPORT
Appendix B – CLOSURE CRITERIA RESEARCH
Appendix C – CORRESPONDENCE

APPENDIX A

LINER INSPECTION FIELD NOTES & PHOTOLOG REPORT

Environmental Liner Inspection Field Notes & Photolog Report

Site & Incident Information

Client:	Devon Energy	**Date:**	5.16.2025
Site Name:	Cotton Draw Unit 219 Battery	**Arrival Time:**	11:30 AM
Incident ID:	nAPP2511826834	 **Photo of Lease Sign**
Client Contact:	Jim Raley		
Land Status:	BLM		
County:	Eddy		
Lease ID:	BL23140000		
Facility ID/API #:	fAPP2123135798		
32.15231, -103.743680			

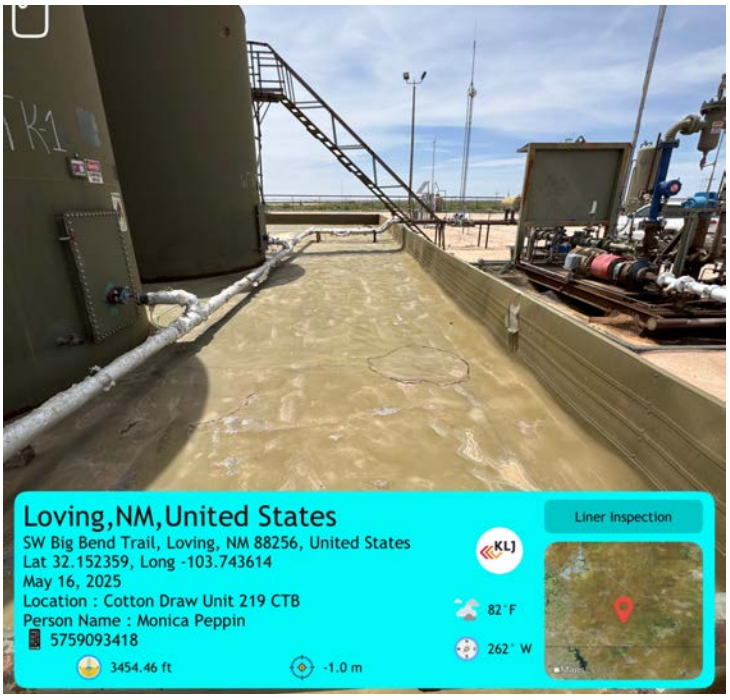
Observations and Field Notes

11:30 AM - Arrive on site. Complete JHA and check surroundings for hazards.
11:38 AM - Begin liner inspection by walking around containment area and checking for any perforations, rips, tears, punctures, or degradation of liner.
11:45 AM - Liner inspected around all equipment, tanks, walls, and outside area of containment.
12:00 PM - Complete walk around and begin taking photos of containment area. Photos taken at all different angles and positions around the containment to verify liner integrity.
12:06 PM - Liner was cleaned prior to inspection and liner is able to withhold fluids as expected.
12:10 PM - Complete field notes and upload photos to report. Email copy of field report to upload to file.

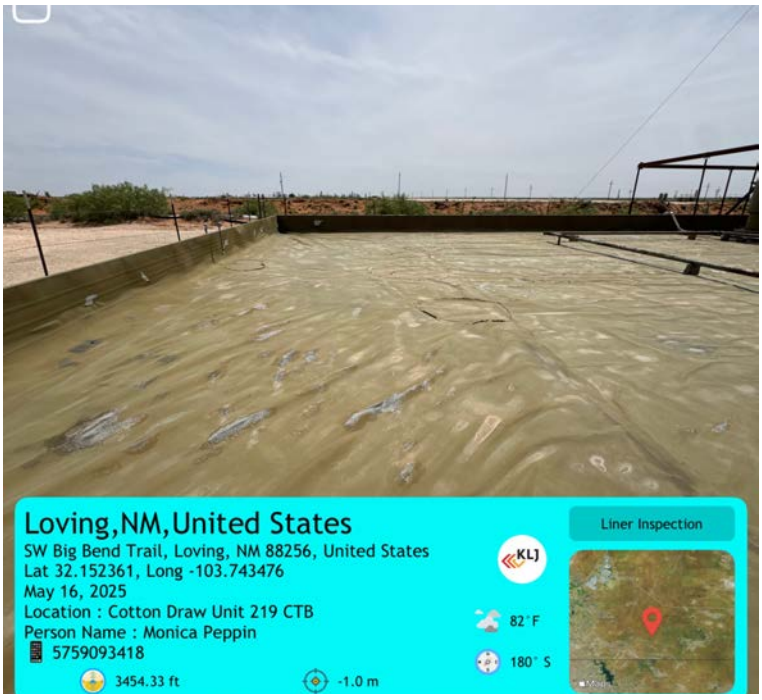
Photolog

East view of north wall of containment.

Southeast view of open area from north wall.



East view of north wall of containment.

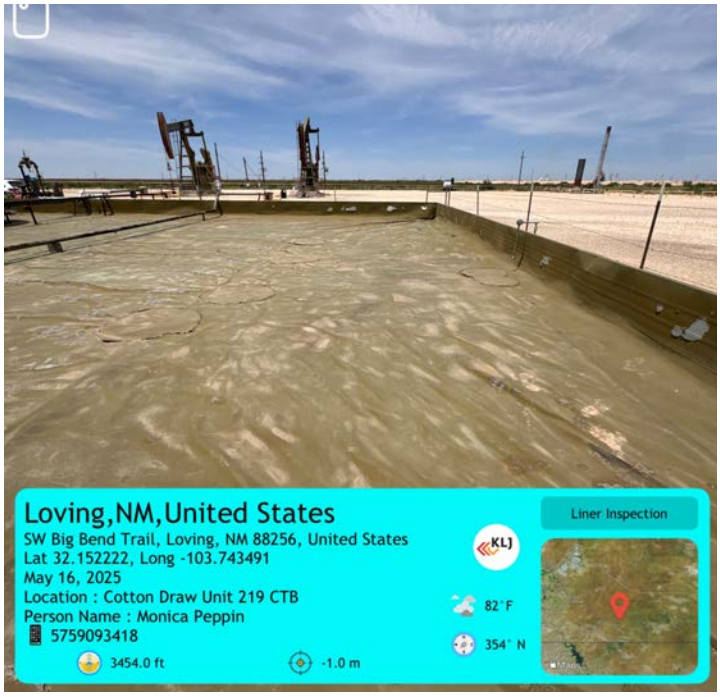


Facing south viewing liner on east side of containment.

Photolog

View from northeast corner looking towards tanks.

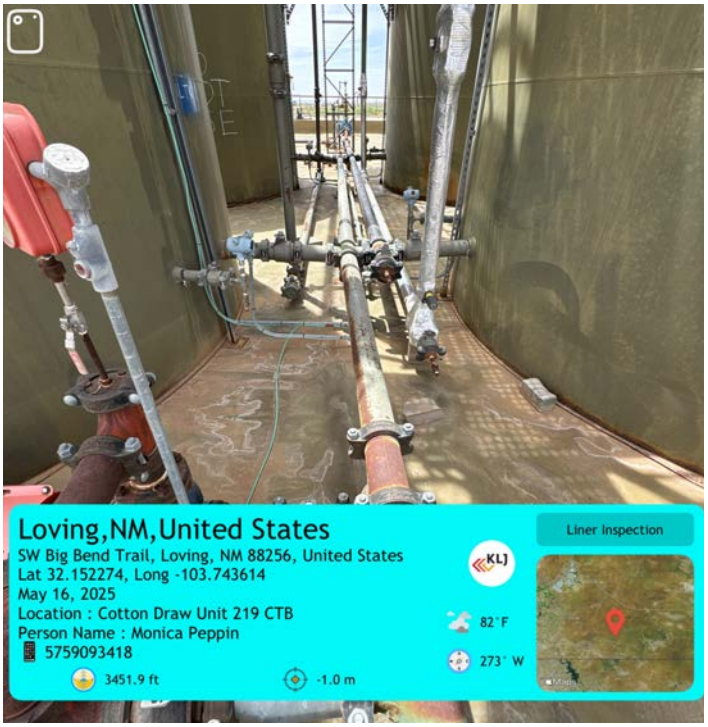
View from southeast corner towards tanks.



View of east wall facing north from south side of containment.

Facing northeast viewing liner on east end of containment.

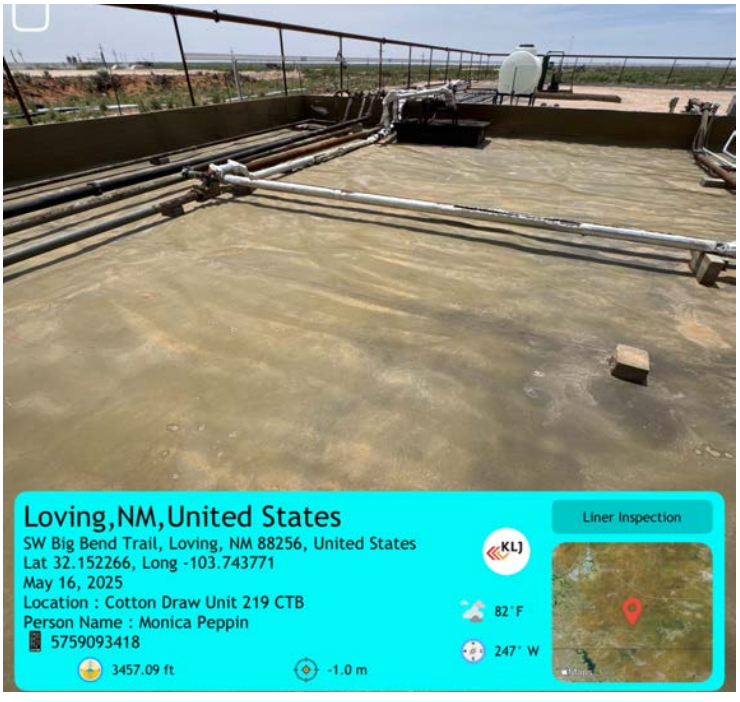
Photolog



Liner between tanks facing west from east side of containment.

Liner between tanks facing south from north side.

East wall of containment from south corner facing north.



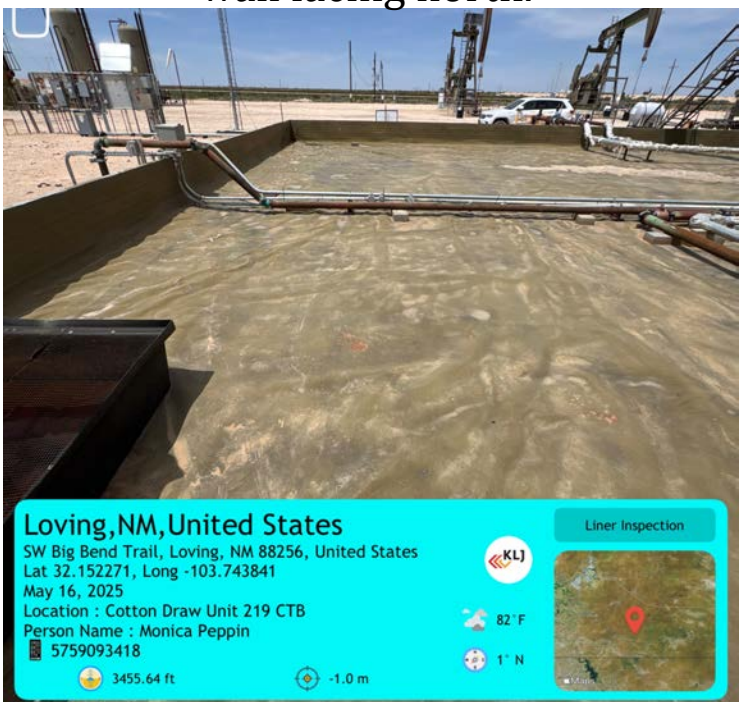
Liner area in southwest corner of containment view taken near tank.

Photolog

View of liner on south end from west wall facing east.

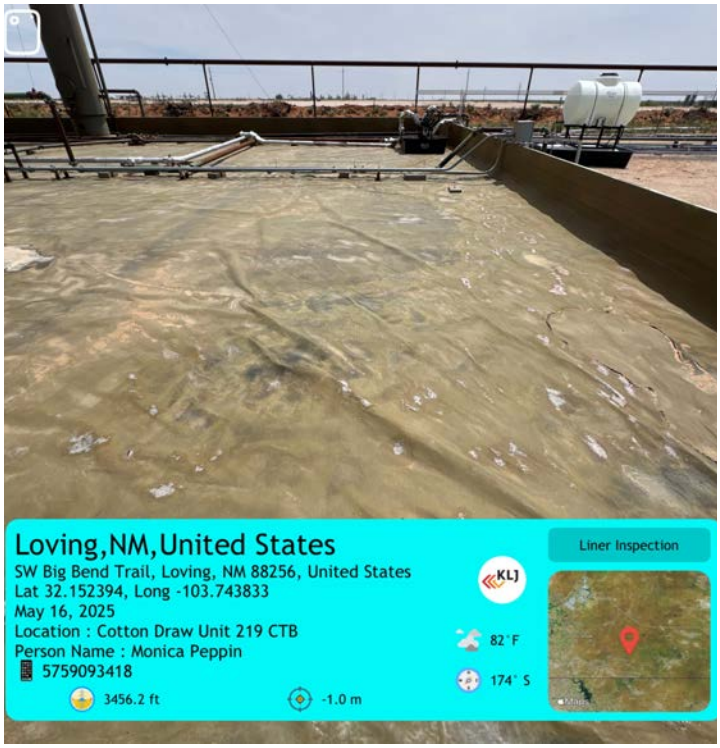
View of liner near pumps and west wall facing north.

View of liner under piping and near equipment from southwest corner.

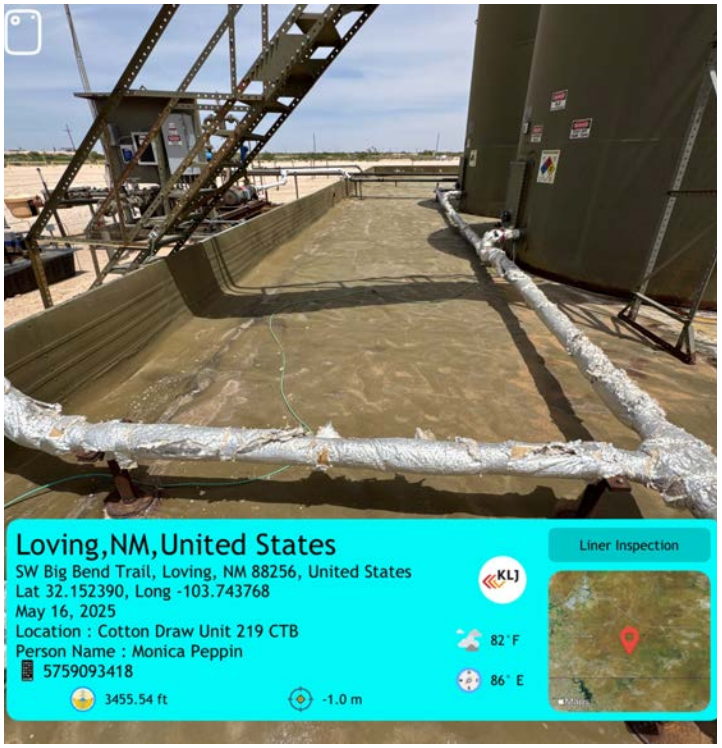


West side of containment viewing southwest corner of liner.

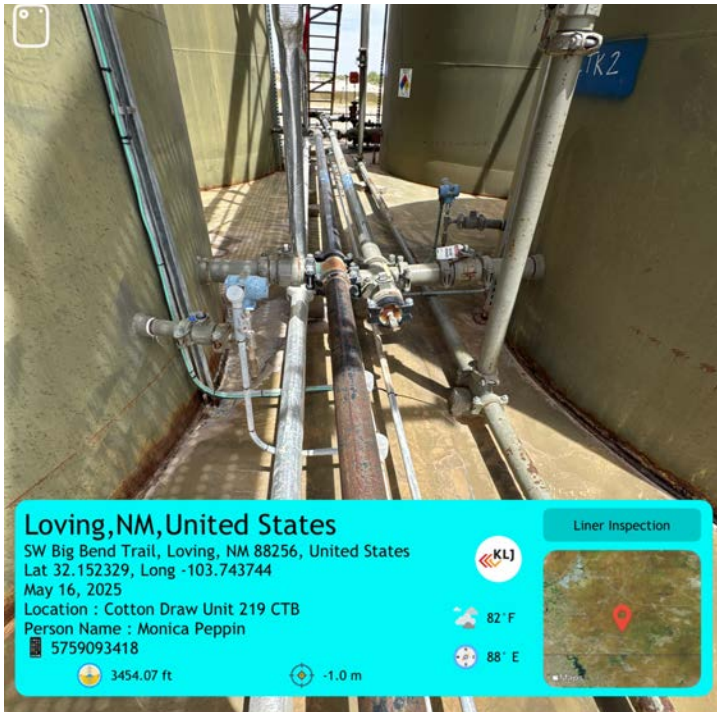
Photolog



West wall view from north side facing south.



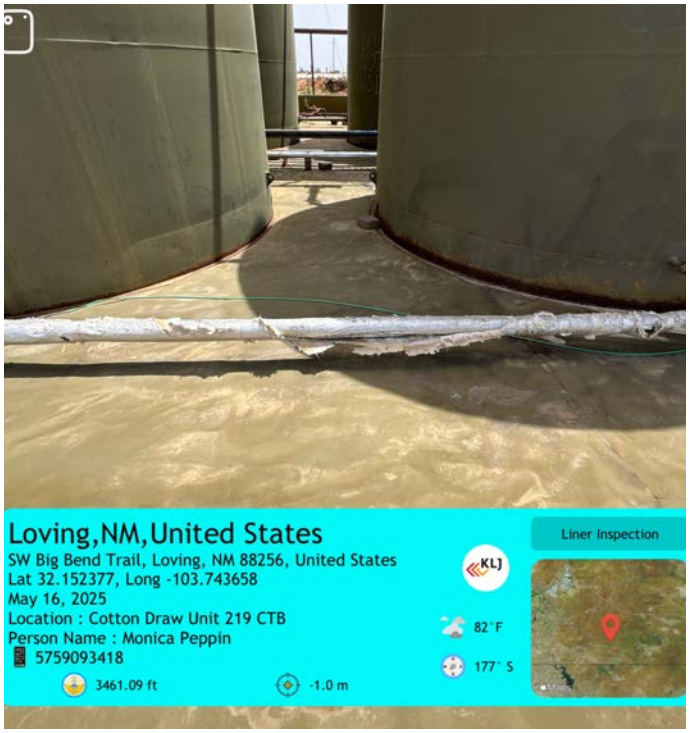
View from west wall of north side of containment.



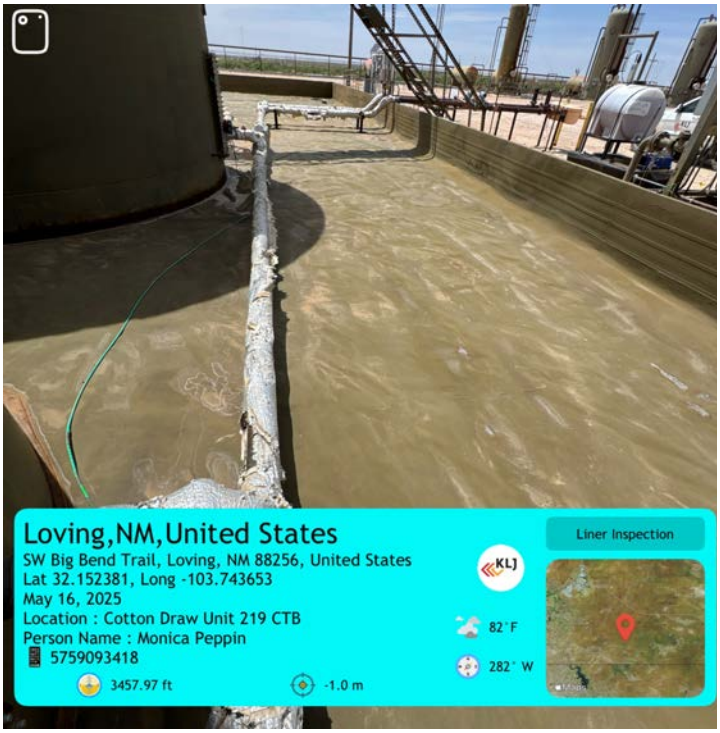
View of liner between tanks facing east from west side.

View of west end from between tanks facing west.

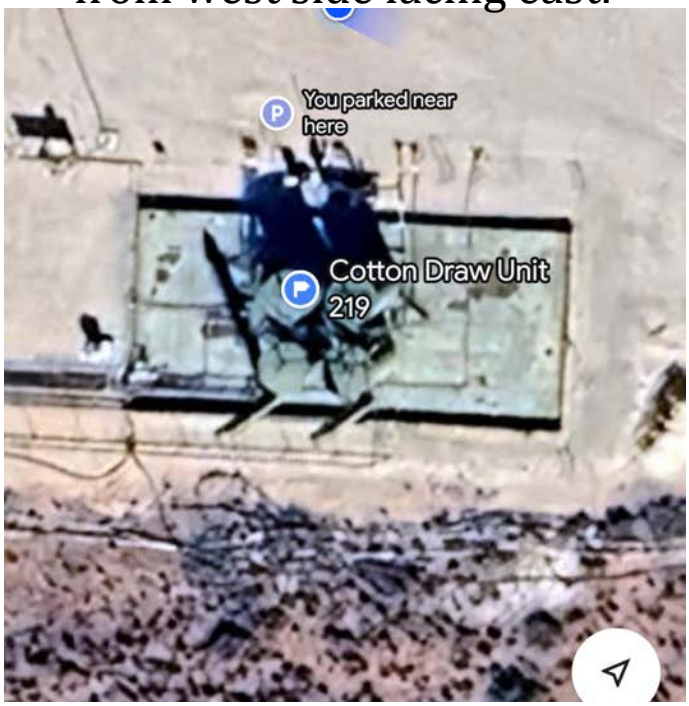
Photolog



View of liner between tanks from west side facing east.



View of liner near equipment of north end facing west.



Aerial view of containment screenshot from google maps.

Additional Notes & Recommendations

- Upload documents to folder
- Compile data and start drafting closure report
- Submit report for approval
- Liner integrity is confirmed. No signs of degrading or wear and tear of liner, photos taken as visual observation
- Liner is capable of containing fluids from going onto the ground outside of the secondary containment.

Acknowledgement & Signature

Technician: Monica Peppin

Date: May 16, 2025

Signature:

Departure Time: 12:30 PM

APPENDIX B

CLOSURE CRITERIA RESEARCH

Cotton Draw Unit #219 Site Diagram

Coordinates: 32.152331, -103.743680
Approx. Containment Area: 7,624 sq ft

Cotton Draw Unit #219 DTGW & Domestic Well Map

5/8/2025, 2:45:25 PM

GIS WATERS PODs
Override 1
Active
Override 1
Pending

Nearest DTGW Pod
C-03830-Pod1
DTGW
300 ft
Distance
0.28 miles
Nearest Domestic Well
C-02245
Distance
0.36 miles

1:9,153
0 0.05 0.1 0.2 mi
0 0.1 0.2 0.4 km

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

WELL ..KECUKIJ & LUl:i

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

OSE POD NUMBER {WELL NUMBER): 1	OSE FILE NUMBER(S): C◆3830
WELL OWNER NAME(S): ROCKHOUSE RANCH INC.	PHONE {OPTIONAL): 575-995◆6920
WELL OWNER MAILING ADDRESS: 1108 W PIEARCE ST.	CITY: CARLSBAD STATE: NM ZIP: 88220

WELL LOCATION (FROMGPS)	DEGREES	MINUTES	SECONDS	
LATITUDE	32	09	22	N
LONGffiJDE	103	44	31	W

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

DESCRIPTION RELATING WELL LOCATION TO STREIT ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHJIP, RANGE) WHERE AVAILABLE: SE 1/4,NE 1/4, SE 1/4, SECTION 2, TOWNSHIP 25S, RANGE 31 E

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRJLLING COMPANY
WD-1607	LUIS A. (TONY) DURAN	DURAN DRILLING

DRILLING STARTED	DRILUNG ENDED	DEPTH OF COMPLETED WELL (IT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
1/28/15	I 2/02/15	I 451	450	300

STATIC WATER LEVEL IN COMPLETED WELL (FT):

COMPLETED WELL IS: 0 ARTESIAN 0 DRYHOLE Ⓡ SHALLOW (UNCONFINED)

DRJLLING FLUID: C AIR (i MUD ADDITIVES - SPECIFY: DRILLING MUD

DRILLING METHOD: (i ROTARY C HAMMER C CABLE TOOL (' OTHER- SPECIFY:

DEPTH (feet bgl) FROM	TO	BOREHOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections o fscreen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	220	12	STEEL	STEEL PERF	7	1/4	
220	450	12	STEELPERF	STEEL	7	1/4	1/8

DEPTH (feet bgl) FROM	TO	BOREHOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
V	;,,v	12	[illegible]		[illegible]
Zu	4:U	12	[illegible]		

FOR OSE INTERNAL USE WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER 3'&3D I POD NUMBER , I TRN NUMBER c.5it>ODOS

25S.31E.2.424

EADL

DEPTH (feet bgl) FROM	TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES/NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES{gpm)
0	1	1	TOPSOIL	OY @N	
1	4	3	CALICHE	OY ®N	
4	1o	9	:::IANU	OY ®N	
90	99	9	(;LAY	OY ®N	
99	190	91	SAND	OY @N	
190	250	60	BRUWNGLAY	OY @N	
250	265	15	SAND	OY ®N	
265	340	75	CLAY	OY ®N	
340	348	8	SAND	OV @N	
348	378	30	GRAVEL	®Y0 N	10
378	384	6	CALV	OV @N	
384	448	64	SAND	®Y0 N	5
448	450	2	RED BED	OV @N	
				OV @N	
				OV ON	
				OY ON	
				OY ON	
				OY ON	
				OY ON	
				OY ( ) N	
				OY ( ) N	

4. HYDROGEOLOGIC LOG OF WELL

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: 0 PUMP OAIRLIFT @ BAILER 0 OTHER- SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm): 15

5. TEST; RIG SUPERVISION

WELL TEST TEST RESULTS -ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METH. 91?, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PI!>D

MISCELLANEOUS INFORMATION:

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED 0NSITE SUPERVISION OF WELL CONSTRUCTION 0THE ;rHANJJ NSEE:

LUIS A. DURAN

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES TIIAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:

£.,,.,A !,ul,f.I?. 2-02-15

SIGNATUO F D R I L L E R I PRINT SIGNEE NAME DATE

FOR OSE INTERNAL USE

FILE NUMBER C.,-.:3:83 POD NUMBER / TRN NUMBER 61.0005

WR-20 WELL RECORD & LOG (Version 06/08/2012)

25S.3E.2.424

EXPL

Water Right Summary

get image list

WR File Number:	C 02245	**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:	TWIN WELLS RANCH LLC	**Owner Class:**	Agent		
Contact:	STEVEN MCCUTCHEON				

Documents on File

(acre

Transaction Images	Trn#	Doc	File/Act	Status 1	Status 2	Transaction Desc.	From/To	Acres	Diversio
get images	722418	COWNF	2022-03-28	CHG	PRC	C 02245	T		0.000
getimag	469232	72121	1992-01-28	PMT	APR	C 02245	T		3.000

Current Points of Diversion

POD Number	Well Tag	Source	Q64	Q16	Q4	Sec	Tws	Rng	X	y	Map	Other Location Desc
C 02245				NW	NW	12	25S	31 E	619018.0	3557785.0 *	8	

• UTM location was derived from PLSS - see Help

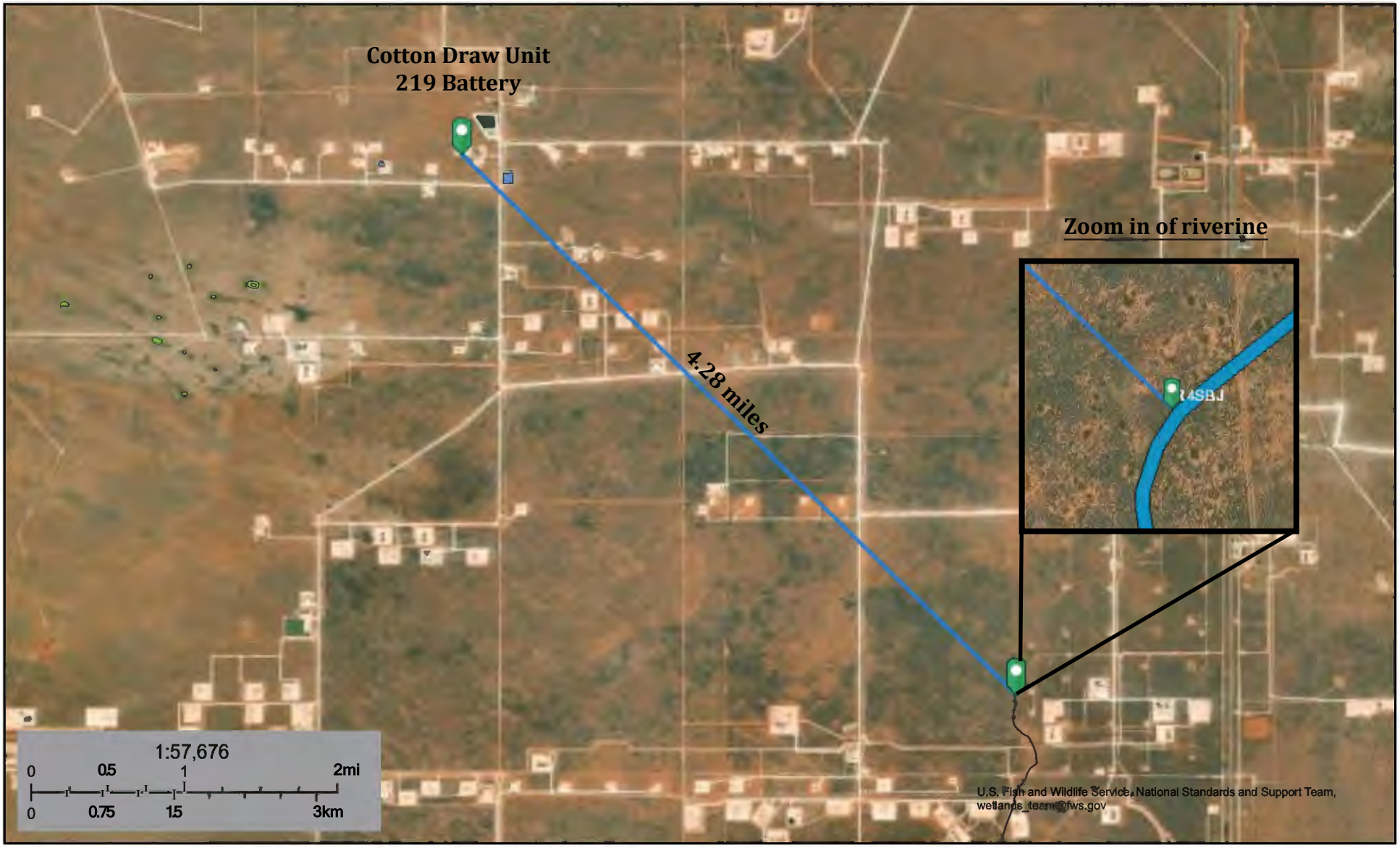
5/8/25 2:22 PM MST Water Rights Summary

U.S. Fish and Wildlife Service
National Wetlands Inventory

Cotton Draw Unit 219 Battery

Nearest Significant Watercourse: Riverine

Distance: 4.28 miles



May 8, 2025

Wetlands

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

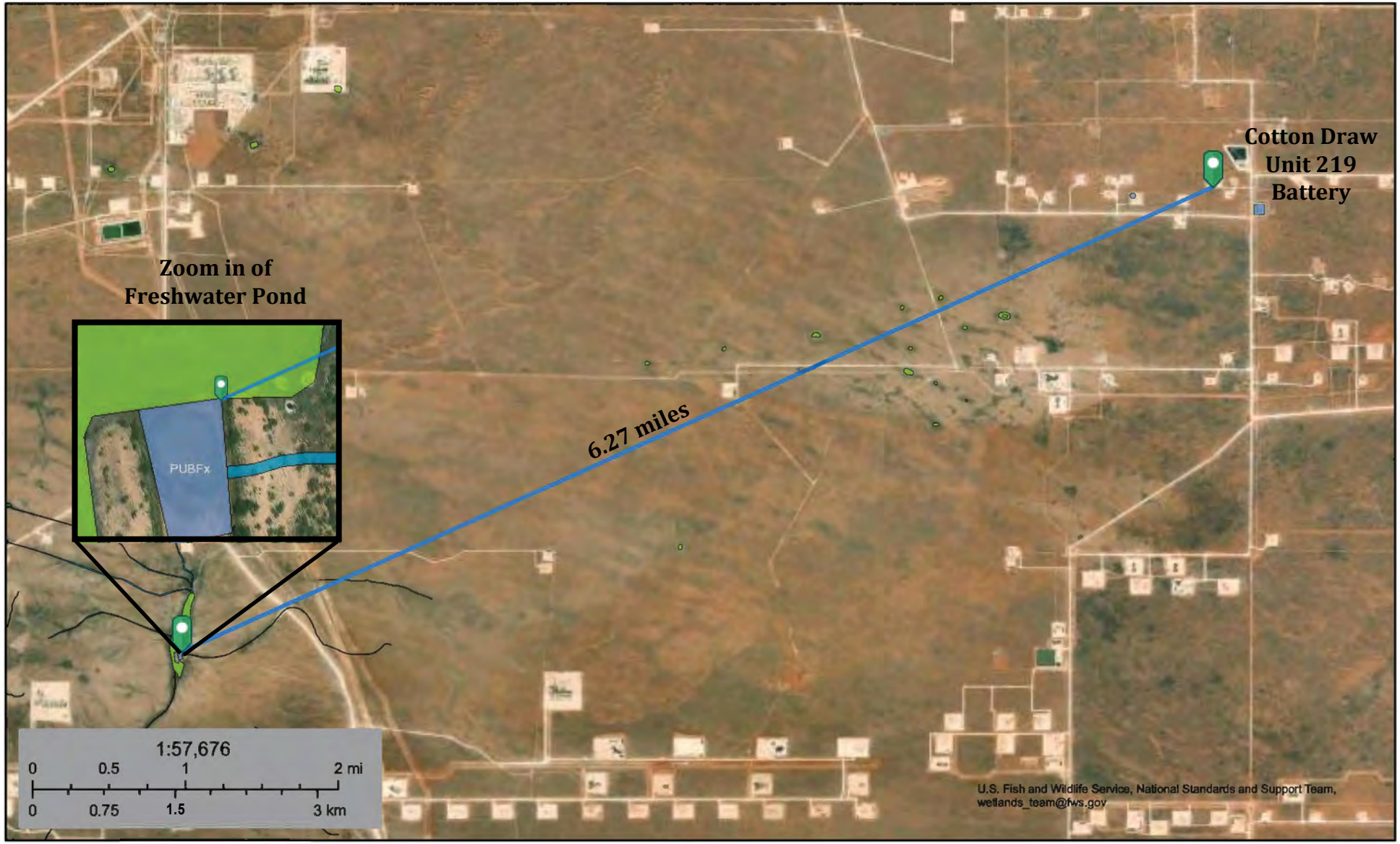
This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

U.S. Fish and Wildlife Service
National Wetlands Inventory

Cotton Draw Unit 219 Battery

Nearest Playa Lake: Freshwater Pond

Distance: 6.27 miles



May 29, 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.

Cotton Draw Unit
#219 Battery
Nearest Resident Distance: 5.67 miles

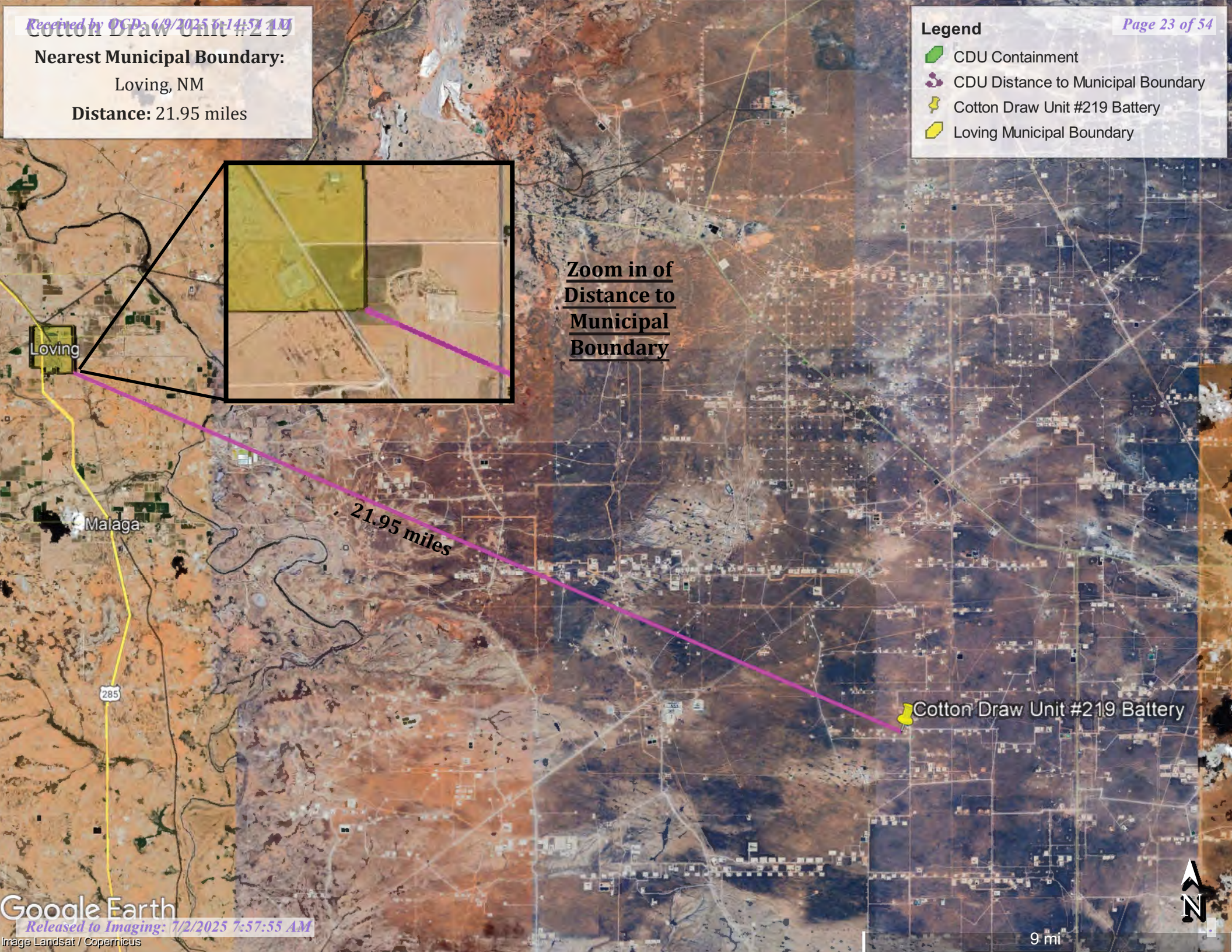
Legend
Distance to Residence
Cotton Draw Unit 219

Zoom in of Residence

Cotton Draw Unit #219

Nearest Municipal Boundary:
Loving, NM
Distance: 21.95 miles

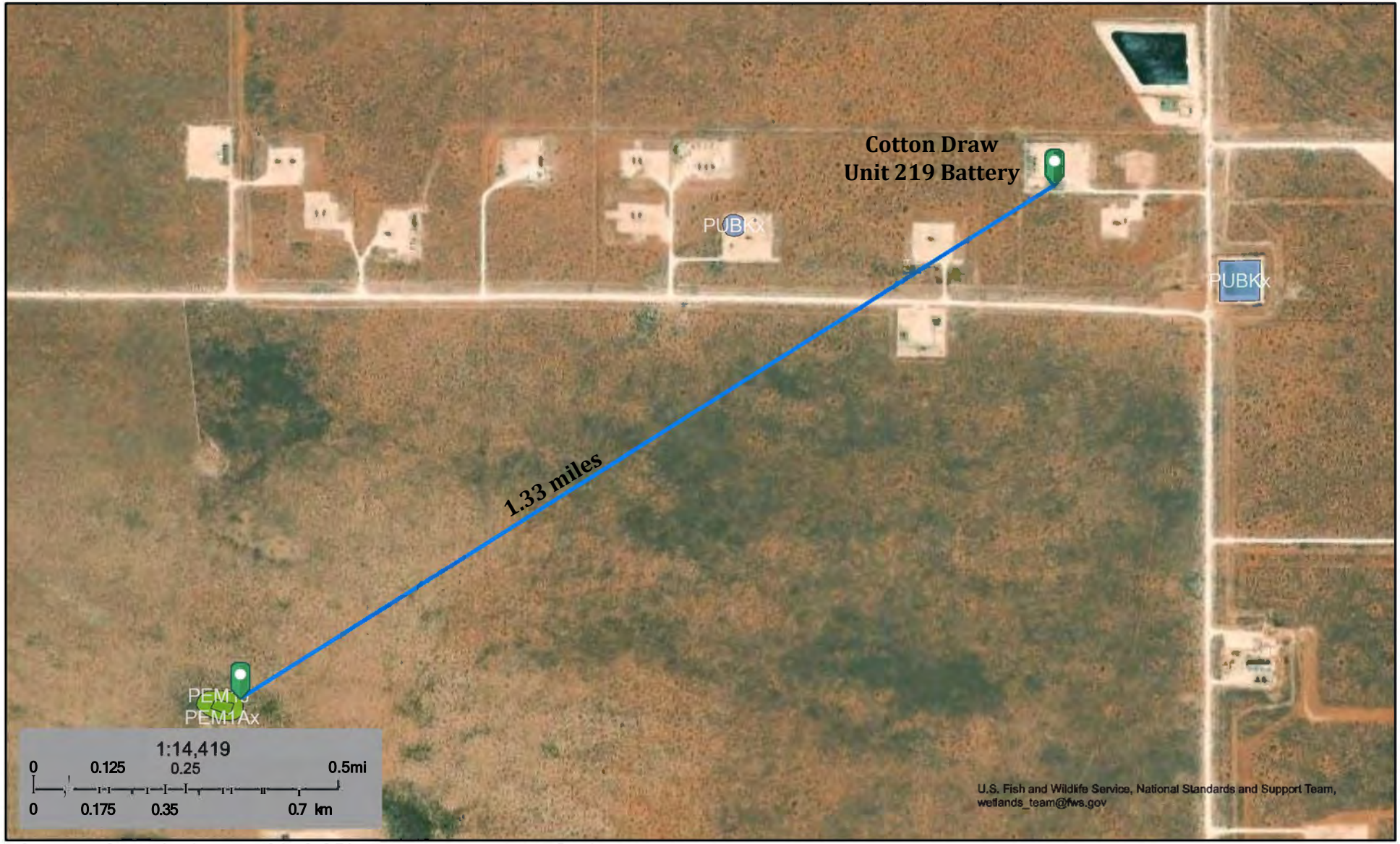
Legend
- CDU Containment
- CDU Distance to Municipal Boundary
- Cotton Draw Unit #219 Battery
- Loving Municipal Boundary



U.S. Fish and Wildlife Service
National Wetlands Inventory

Cotton Draw Unit 219 Battery

Nearest Wetland: Freshwater Emergent
Distance: 1.33 miles



May 8, 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.

Cotton Draw Unit 219 Battery Subsurface Mines Map

5/8/2025, 6:21 :36 PM

1:288,895

0 2 4 8 mi

0 3.25 6.5 13 km

- Uranium Occurrence - No Production
- Minor Uranium - Produced
- Major Uranium Deposits - Not Produced
- Major Uranium Deposits
- Uranium Mills
- Counties

REE_Districts

- Fe skarn, carbonate-hosted Pb-Zn
- REE-Th-U veins, fluorite veins

Mines
None in Area

New Mexico Bureau of Geology and Mineral Resources, New Mexico Bureau of Geology & Mineral Resources, NMBGMR, SLM, Earthstar Geographies, NMBGMR

ArcGIS Web AppBuilder

New Mexico Bureau of Geology & Mineral Resources | Bureau of Land Management | New Mexico Bureau of Geology and Mineral Resources | New Mexico Bureau of Geology & Mineral Resources |

Cotton Draw Unit #219 Battery Karst Proximity

0 0.3 0.6 1.2 mi

N

New Mexico State Land Office

Disclaimer:
The New Mexico State Land Office assumes no responsibility or liability for, or in connection with the accuracy, reliability or use of the information provided herein with respect to State Land Office data or data from other sources.

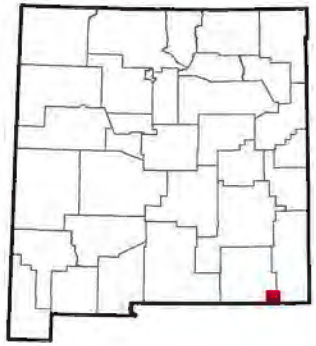
Data pertaining to New Mexico State Trust Lands are provisional and subject to revision, and do not constitute an official record of title. Official records may be reviewed at the New Mexico State Land Office in Santa Fe, New Mexico.

Map Created: 5/8/2025

Karst_Potential_NM
Potential
[= 3 c r i t i c a l

High
Medium

Karst Potential
Low
Nearest Karst Feature
Medium
Distance
6.21 miles



National Flood Hazard Layer FIRMette

FEMA

Cotton Draw Unit 219 Battery

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
- 513 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

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 5/8/2025 at 11:46 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.

Basemap Imagery Source: USGS National Map 2023

Cotton Draw Unit 219 Battery Soil Map

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 20, 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
BB	Serino complex, 0 to 3 percent slopes, eroded	5.7	100.0%
Totals for Area of Interest		**5.7**	**100.0%**

Eddy Area, New Mexico

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

Map Unit Setting

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

Map Unit Composition

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

Description of Berino

Setting

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

Typical profile

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

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): ?e
Hydrologic Soil Group: B
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Description of Pajarito

Setting

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

Typical profile

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

Properties and qualities

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

Interpretive groups

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

Minor Components

Pajarito

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

Wink

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

Cacique

Percent of map unit: 4 percent

Ecological site: R070BD004NM - Sandy
Hydric soil rating: No

Kermit

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

Data Source Information

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 20, Sep 3, 2024

USDA Natural Resources
Conservation Service

Ecological site R070BD003NM
Loamy Sand

Accessed: 05/08/2025

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

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

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

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

Table 2. Representative physiographic features

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

Climatic features

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

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

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

Table 3. Representative climatic features

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

Influencing water features

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

Soil features

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

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

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

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

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

Characteristic soils are:
Maljamar
Serino
Parjarito
Palomas
Wink
Pyote

Table 4. Representative soil features

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

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

Ecological dynamics

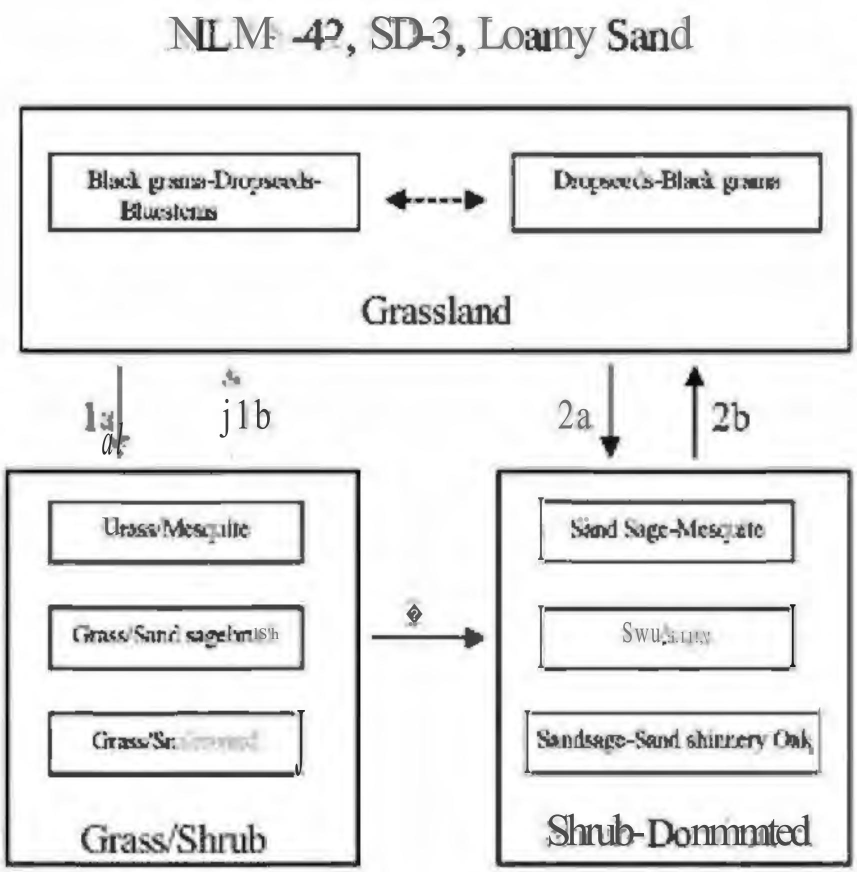
Overview

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

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

State and transition model

Plant Communities and Transitional Pathways (diagram):



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

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

3. Continued loss of grass cover, erosion.

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

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

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

Table 5. Annual production by plant type

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

Table 6. Ground cover

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

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

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

State 2
Grass/Shrub

Community 2.1
Grass/Shrub

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

State 3
Shrub Dominated

Community 3.1
Shrub Dominated

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

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

Additional community tables

Table 7. Community 1.1 plant community composition

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

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

Animal community

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

Hydrological functions

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

Recreational uses

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

Wood products

This site has no potential for wood products.

Other products

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

Other information

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

Inventory data references

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

Other references

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

Contributors

Don Sylvester
Quinn Hodgson

Rangeland health reference sheet

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

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

Indicators

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

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

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

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

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

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

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

---

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

---

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

---

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

---

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

---

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

    Dominant:

    Sub-dominant:

    Other:

    Additional:

---

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

---

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

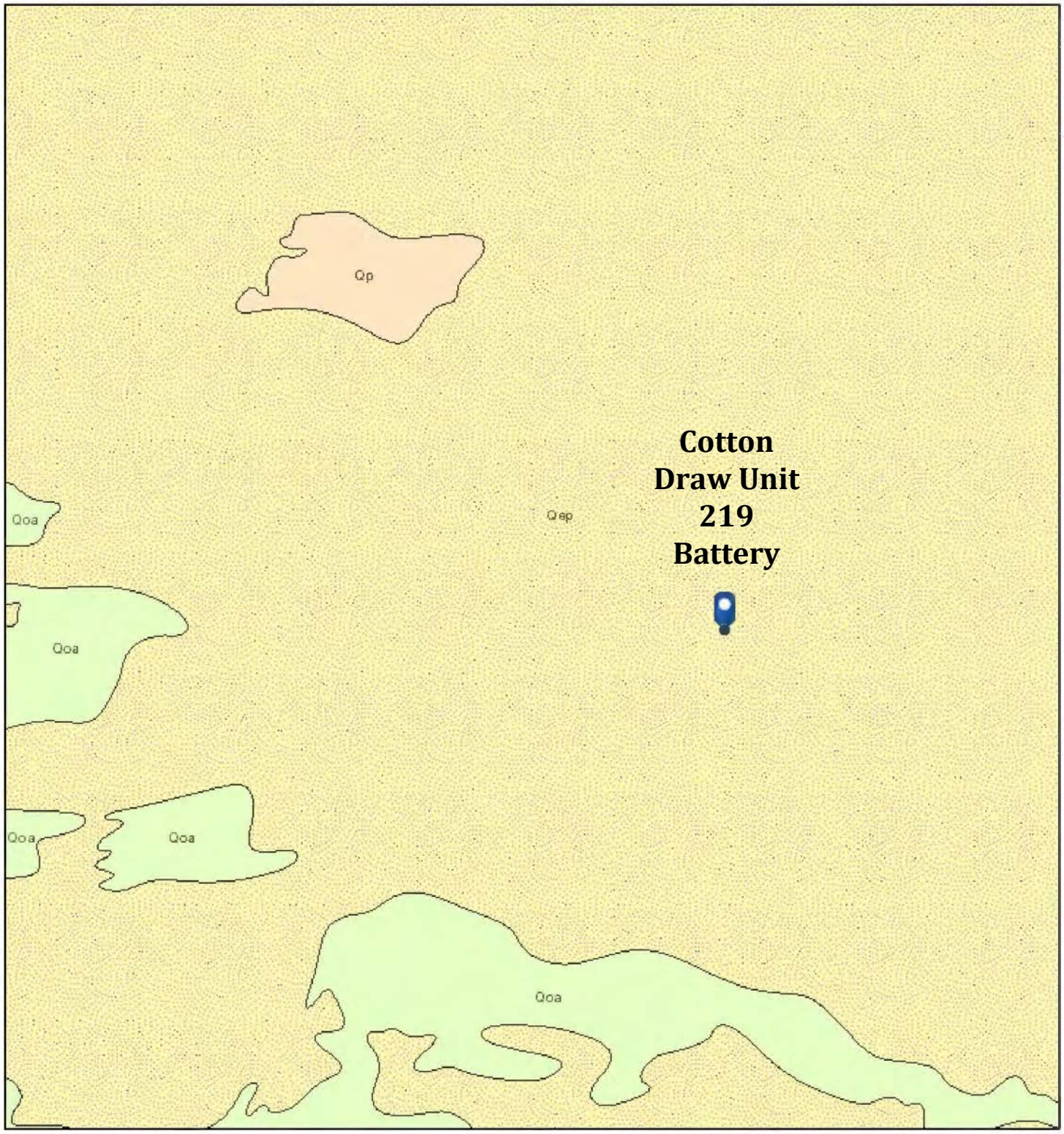
---

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

---

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

Cotton Draw Unit #219 - Geological Map



5/8/2025, 4:59: 13 PM

1:144,448

0 1 2 4mi

0 1.5 3 6 km

Lithologic Units

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

Earthstar Geographies. NMBGMR

APPENDIX C

CORRESPONDENCE

Outlook

RE: [EXTERNAL] nAPP2511826834 Cotton Draw Unit 219 CTB Liner Notification

From Raley, Jim <Jim.Raley@dvn.com>
Date Wed 2025-05-14 7:12 AM
To Monica Peppin <Monica.Peppin@kljeng.com>
Cc Will Harmon <will.harmon@kljeng.com>

Submitted 5/14/2025

Jim Raley | Environmental Professional - Permian Basin
5315 Buena Vista Dr., Carlsbad, NM 88220
C: (575)689-7597 | jim.raley@dvn.com

devon

From: Monica Peppin <Monica.Peppin@kljeng.com>
Sent: Tuesday, May 13, 2025 2:56 PM
To: Raley, Jim <Jim.Raley@dvn.com>
Cc: Will Harmon <will.harmon@kljeng.com>
Subject: [EXTERNAL] nAPP2511826834 Cotton Draw Unit 219 CTB Liner Notification

Jim,

Please see the liner notification below for the Cotton Draw Unit 219 CTB. If I need to change anything or reschedule, just let me know. I have it scheduled for Friday. Notification will need to be sent to State Land Office, the SLO website shows it to be on State Trust Land.

KLJ Engineering anticipates conducting liner inspection activities at the following site on Friday, May 16, 2025 at approximately 11:00 AM. Details Below:

Proposed Date:	Friday, May 16, 2025
Time Frame:	10:30 - 11:30 AM
Site Name:	Cotton Draw Unit 219 CTB
Incident ID:	nAPP2511826834
API/Facility ID:	fAPP2123135798/BL23140000

Liner Inspection Notification	
Incident ID and Site Name:	nAPP2511826834 Cotton Draw Unit 219 CTB
API # and Corresponding Agency:	fAPP2123135798 NMOCD/SLO Lease ID: BL23140000
Question	**Answer (Fill In)**
What is the liner inspection surface area in square feet (secondary containmet):	7624 sq ft
Have all the impacted materials been removed from the liner and cleaned?	Yes
Liner inspection date pursuant to Subparagraph (a) of Paragraph (5) of Subsection A of 19.15.29.11 NMAC: 48 HOURS PRIOR TO INSPECTION	5.19.25
Time liner inspection will commence:	11:00 AM

Please provide any information necessary for observers to contact inspector: (Name and Number)	Monica Peppin 575.909.3418
Please provide any information necessary for navigation to liner inspection site and coordinates (Lat/Long)	128/Buck Jackson, SE on buck jackson 4.74 miles, left on buckthorn east .80 miles, at Y stay right, south for 0.88 miles, at Y left SE 1.50 miles, left east 1.92 miles, right north 0.16 miles, and left go west 0.20 miles end on location 32.152331, -103.743680

Thank you,
Monica

Monica Peppin, A.S.
Environmental Specialist II
KLJ
575-213-9010 Direct
575-909-3418 Cell
Carlsbad, NM 88220
kljeng.com

Book time to meet with me

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Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

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

QUESTIONS

Action 471867

QUESTIONS

Operator: DEVON ENERGY PRODUCTION COMPANY, LP 333 West Sheridan Ave. Oklahoma City, OK 73102	OGRID: 6137
	Action Number: 471867
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Prerequisites	
Incident ID (n#)	**nAPP2511826834**
Incident Name	**NAPP2511826834 COTTON DRAW UNIT 219 CTB @ 0**
Incident Type	**Produced Water Release**
Incident Status	**Remediation Closure Report Received**
Incident Facility	**[fAPP2123135798] COTTON DRAW UNIT 219 CTB**

Location of Release Source	
Please answer all the questions in this group.	
Site Name	COTTON DRAW UNIT 219 CTB
Date Release Discovered	04/27/2025
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: Equipment Failure | Tank (Any) | Produced Water | Released: 14 BBL | Recovered: 14 BBL | Lost: 0 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)	Small hole developed on water tank, allowing release of fluids to lined secondary containment. Fluids fully recovered.

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QUESTIONS (continued)

Operator: DEVON ENERGY PRODUCTION COMPANY, LP 333 West Sheridan Ave. Oklahoma City, OK 73102	OGRID: 6137
	Action Number: 471867
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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	**No**
Reasons why this would be considered a submission for a notification of a major release	*Unavailable.*
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: James Raley Title: EHS Professional Email: jim.raley@dvn.com Date: 06/09/2025

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QUESTIONS (continued)

Operator: DEVON ENERGY PRODUCTION COMPANY, LP 333 West Sheridan Ave. Oklahoma City, OK 73102	OGRID: 6137
	Action Number: 471867
	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	NM OSE iWaters Database Search
Did this release impact groundwater or surface water	No
What is the minimum distance, between the closest lateral extents of the release and the following surface areas:	
A continuously flowing watercourse or any other significant watercourse	Between 1 and 5 (mi.)
Any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)	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	Greater than 5 (mi.)
Categorize the risk of this well / site being in a karst geology	Low
A 100-year floodplain	Between 1 and 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	05/16/2025
On what date will (or did) the final sampling or liner inspection occur	05/16/2025
On what date will (or was) the remediation complete(d)	05/16/2025
What is the estimated surface area (in square feet) that will be remediated	7624
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 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: 471867
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

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.)	
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	Yes
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: James Raley Title: EHS Professional Email: jim.raley@dvn.com Date: 06/09/2025
The OCD recognizes that proposed remediation measures may have to be minimally adjusted in accordance with the physical realities encountered during remediation. If the responsible party has any need to significantly deviate from the remediation plan proposed, then it should consult with the division to determine if another remediation plan submission is required.	

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QUESTIONS (continued)

Operator: DEVON ENERGY PRODUCTION COMPANY, LP 333 West Sheridan Ave. Oklahoma City, OK 73102	OGRID: 6137
	Action Number: 471867
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Liner Inspection Information	
Last liner inspection notification (C-141L) recorded	**461844**
Liner inspection date pursuant to Subparagraph (a) of Paragraph (5) of Subsection A of 19.15.29.11 NMAC	**05/19/2025**
Was all the impacted materials removed from the liner	**Yes**
What was the liner inspection surface area in square feet	**7624**

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	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	7624
What was the total volume (cubic yards) remediated	0
Summarize any additional remediation activities not included by answers (above)	Liner inspected

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (in .pdf format) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

I hereby agree and sign off to the above statement	Name: James Raley Title: EHS Professional Email: jim.raley@dvn.com Date: 06/09/2025

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CONDITIONS

Operator: DEVON ENERGY PRODUCTION COMPANY, LP 333 West Sheridan Ave. Oklahoma City, OK 73102	OGRID: 6137
	Action Number: 471867
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Liner inspection approved, release resolved.	7/2/2025