# **AE Order Number Banner**

**Application Number:** pMSG2325249984

SWD-2570

WaterBridge Stateline LLC [330129]



August 28, 2023

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

Subject: WaterBridge Stateline LLC – Berdan Fed SWD #1
Application for Authorization to Inject

To Whom It May Concern,

On behalf of WaterBridge Stateline LLC (WaterBridge), ALL Consulting, LLC (ALL) is submitting the enclosed Application for Authorization to Inject for the Berdan Fed SWD #1, a proposed saltwater disposal well, in Eddy County, NM.

Should you have any questions regarding the enclosed application, please contact Oliver Seekins at (918) 382-7581 or oseekins@all-llc.com.

Sincerely, ALL Consulting

Oliver Seekins

Oliver Sookins

Consultant

RECEIVED:	REVIEWER:	TYPE:	APP NO:									
	- Geologi	ABOVE THIS TABLE FOR OCCU CO OIL CONSERV Cal & Engineering ancis Drive, Sant	' <b>ATION DIVISIOI</b> g Bureau –									
		RATIVE APPLICATI										
THIS	CHECKLIST IS MANDATORY FOR A REGULATIONS WHICH RE	LL ADMINISTRATIVE APPLIC EQUIRE PROCESSING AT THE										
Applicant:			OGI	RID Number:								
Well Name:			API:									
			B 10 1									
1) <b>TYPE OF APPL</b>	ICATION: Check those	<b>INDICATED BELO</b> which apply for [A	<b>OW</b> A]	STHE TYPE OF APPLICATION								
	n – Spacing Unit – Simul NSL NSP <sub>(PF</sub>	roject area) $\square$ NS		]sd								
[   ] Com [ [    ] Inje	one only for [1] or [1] nmingling – Storage – M DHC	ure Increase – Enh	anced Oil Recov	ery FOR OCD ONLY								
A. Offse B. Roya C. Appli D. Notifi E. Notifi F. Surfa G. For a	N REQUIRED TO: Check toperators or lease hole lity, overriding royalty or cation requires published ation and/or concurred cation and/or concurred ce owner lit of the above, proof optice required	ders wners, revenue ov ed notice ent approval by SI ent approval by BI	vners _O LM	Notice Complete  Application Content Complete								
3) CERTIFICATIO administrative understand th	N: I hereby certify that a approval is accurate hat no action will be talare submitted to the Div	and <b>complete</b> to a ken on this applica	the best of my kr	nowledge. I also								
N	lote: Statement must be comple	eted by an individual with	n managerial and/or su	upervisory capacity.								
			<u>8/24/2023</u> Date									
Print or Type Name												
			Phone Number	er -								
Oliver S	Seekins											
Signature	-		e-mail Addres	ŝ								

STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

#### Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, New Mexico 87505

FORM C-108 Revised June 10, 2003

#### APPLICATION FOR AUTHORIZATION TO INJECT

	THE DESCRIPTION OF THE PROPERTY OF THE POPULATION OF THE POPULATIO
I.	PURPOSE:Secondary RecoveryPressure MaintenanceXDisposalStorage Application qualifies for administrative approval?X YesNo
II.	OPERATOR: WaterBridge Stateline LLC
	ADDRESS: _5555 San Felipe, Ste. 1200 Houston, TX 77056
	CONTACT PARTY: Oliver Seekins PHONE: 918.382.7581
III.	WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection.  Additional sheets may be attached if necessary.
IV.	Is this an expansion of an existing project?YesXNo  If yes, give the Division order number authorizing the project:
V.	Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.
VI.	Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
VII.	Attach data on the proposed operation, including:
	<ol> <li>Proposed average and maximum daily rate and volume of fluids to be injected;</li> <li>Whether the system is open or closed;</li> <li>Proposed average and maximum injection pressure;</li> <li>Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,</li> <li>If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).</li> </ol>
*VIII.	Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.
IX.	Describe the proposed stimulation program, if any.
*X.	Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).
*XI.	Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
XII.	Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.
XIII.	Applicants must complete the "Proof of Notice" section on the reverse side of this form.
XIV.	Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.
	NAME: Oliver Seekins TITLE: Consultant
	SIGNATURE: Oliver Seekins DATE: 8/24/2023
*	E-MAIL ADDRESS: oseekins@all-llc.com  If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal:

Application for Authorization to Inject Well Name: Berdan Fed SWD #1

### III - Well Data (The Wellbore Diagram is included as Attachment 1)

A.

#### (1) General Well Information:

Operator: WaterBridge Stateline LLC (OGRID No. 330129)

Lease Name & Well Number: Berdan Fed SWD #1

Location Footage Calls: 1,476 FNL & 292 FEL Legal Location: Unit Letter H, S8 T20S R27E

Ground Elevation: 3,366'

Proposed Injection Interval: 8,450'- 9,200'

County: Eddy

#### (2) Casing Information:

Туре	Hole Size	Casing Size	Casing Weight	Setting Depth	Sacks of Cement	Estimated TOC	Method Determined
Surface	24"	20"	94.0 lb/ft	575'	585	Surface	Circulation
Intermediate 1	17-1/2"	13-3/8"	54.5 lb/ft	2,500'	1,645	Surface	Circulation
Production Casing	12-1/4"	9-5/8"	53.5 lb/ft	9,300′	2,300	2,220′	CBL
Tubing	N/A	5-1/2"	26.0 lb/ft	8,420'	N/A	N/A	N/A

DV Tool set at: 5,800'

#### (3) Tubing Information:

5-1/2" (26.0 lb/ft) ceramic-coated tubing with a setting depth of 8,420'

(4) Packer Information: Baker Hughes Hornet or equivalent packer set at 8,420'

В.

(1) Injection Formation Name: Cisco

Pool Name: SWD; Cisco Pool Code: 96099

- (2) Injection Interval: Perforated injection between 8,450'- 9,200'
- (3) Drilling Purpose: New drill for saltwater disposal
- (4) Other Perforated Intervals: No other perforated intervals exist.
- (5) Overlying Oil and Gas Zones: Below are the approximate formation tops for known oil and gas producing zones in the area.
  - Queen (1,160')
  - Bone Spring (5,715')
  - Wolfcamp (8,075')

**Underlying Oil and Gas Zones:** Below are the approximate formation tops for known oil and gas producing zones in the area.

Strawn (9,230')

#### V – Well and Lease Maps

The following maps and documents are included in **Attachment 2**:

- 2-mile Oil & Gas Well Map
- 1/2-Mile Well Detail List
- 2-Mile Lease Map
- 2-Mile Mineral Ownership Map
- 2-Mile Surface Ownership Map
- Potash Lease Map

#### VI – AOR Well List

There are no wells located within the 1/2-mile AOR, as shown by the 2-mile Oil & Gas Well Map included in *Attachment 2*.

#### VII – Proposed Operation

- (1) Proposed Maximum Injection Rate: 30,000 bpd Proposed Average Injection Rate: 17,500 bpd
- (2) A closed-loop system will be used.
- (3) Proposed Maximum Injection Pressure: 1,690 psi (surface)
  Proposed Average Injection Pressure: approximately 1,099 psi (surface)
- (4) Source Water Analysis: It is expected that the injectate will consist of produced water from production wells completed in the Wolfcamp, Delaware and Bone Spring formations.

  Analysis of water from these formations is included as *Attachment 3*.
- (5) Injection Formation Water Analysis: The proposed SWD will be injecting water into the Cisco formation which is a non-productive zone known to be compatible with formation water from the Wolfcamp, Delaware and Bone Spring formations. Water analyses from the Cisco formation in the area are included as **Attachment 4**.

#### VIII - Geologic Description

The proposed injection interval includes the Cisco formation from 8,450′- 9,200′ feet. This formation consists of interbedded carbonate rocks including dolomites and limestones. Several thick intervals of porous and permeable carbonate rock capable of taking water are present within the subject formation in the area.

The base of the USDW is the Yates formation at a depth of approximately 550 feet. Water well depths in the area range from approximately 130-300 feet below the ground surface.

Additional geologic information can be found in karst analysis included as Attachment 6.

#### IX – Proposed Stimulation Program

A small cleanup acid job may be used to remove mud and drill cuttings from the formation. However, no other formation stimulation is currently planned.

#### X – Logging and Test Data

Logs will be submitted to the Division upon completion of the well.

#### XI – Fresh Groundwater Samples

Based on a review of data from the New Mexico Office of the State Engineer, one (1) groundwater well is located within 1 mile of the proposed SWD location. However, conversations with the water well owners and an in-person investigation have revealed that water well RA-08646 was permitted, but never drilled. As such, no water well samples were collected.

A water well map and details of the water well within 1 mile is included as **Attachment 5**.

#### XII – No Hydrologic Connection Statement

No faulting is present in the area that would provide a hydrologic connection between the injection interval and overlying USDWs. Additionally, the casing program has been designed to ensure there will be no hydrologic connection between the injection interval and overlying USDWs.

A signed No Hydrologic Connection Statement is included as **Attachment 7.** 

#### XIII - Proof of Notice

A Public Notice was filed with the Carlsbad Current-Argus newspaper and an affidavit is included in **Attachment 8**.

A copy of the application was mailed to the OCD district office, landowner, and all identified affected parties within 1/2-mile of the proposed SWD location. A list of the recipients, as well as delivery confirmations, are included in *Attachment 8*.

#### **Karst Analysis**

In addition to the information formally requested as part of the C-108 application, ALL Consulting has included a Karst analysis as **Attachment 6** to address the identified concerns of permitting an SWD in a high-risk Karst area.

#### Attachment 1:

- C-102
- Wellbore Diagram

#### **Attachment 2:** Area of Review Information:

- 2-Mile Oil & Gas Well Map
- 1/2-Mile Well Detail List
- 2-Mile Lease Map
- 2-Mile Mineral Ownership Map
- 2-Mile Surface Ownership Map
- Potash Lease Map

**Attachment 3:** Source Water Analyses

**Attachment 4:** Injection Formation Water Analyses

Attachment 5: Water Well Map and Well Data

- Water Well Map
- Well Data

**Attachment 6:** Karst Analysis

**Attachment 7:** No Hydrologic Connection Statement

**Attachment 8:** Public Notice Affidavit and Notice of Application Confirmations

- C-102
- Wellbore Diagram

District I 1625 N. French Dr., Hobbs, NM 88240 Phone: (575) 393-6161 Fax: (575) 393-0720 District II 811 S. First St. Artesia, NM 88210 Phone: (575) 748-1283 Fax: (575) 748-9720

1220 S. St. Francis Dr., Santa Fe, NM 87505 Phone: (505) 476-3460 Fax: (505) 476-3462

District III 1000 Rio Brazos Road, Aztec, NM 87410 Phone: (505) 334-6178 Fax: (505) 334-6170 District IV

## State of New Mexico Energy, Minerals & Natural Resources Department OIL CONSERVATION DIVISION 1220 South St. Francis Dr. Santa Fe, NM 87505

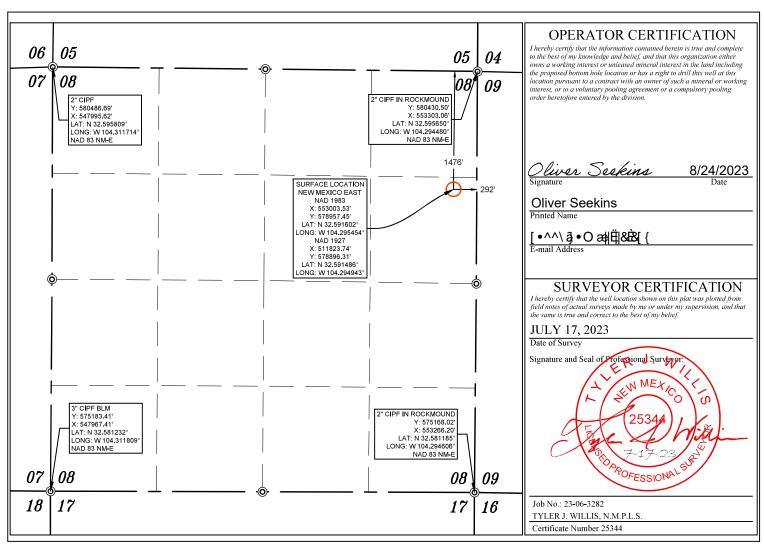
Form C-102 Revised August 1, 2011 Submit one copy to appropriate District Office

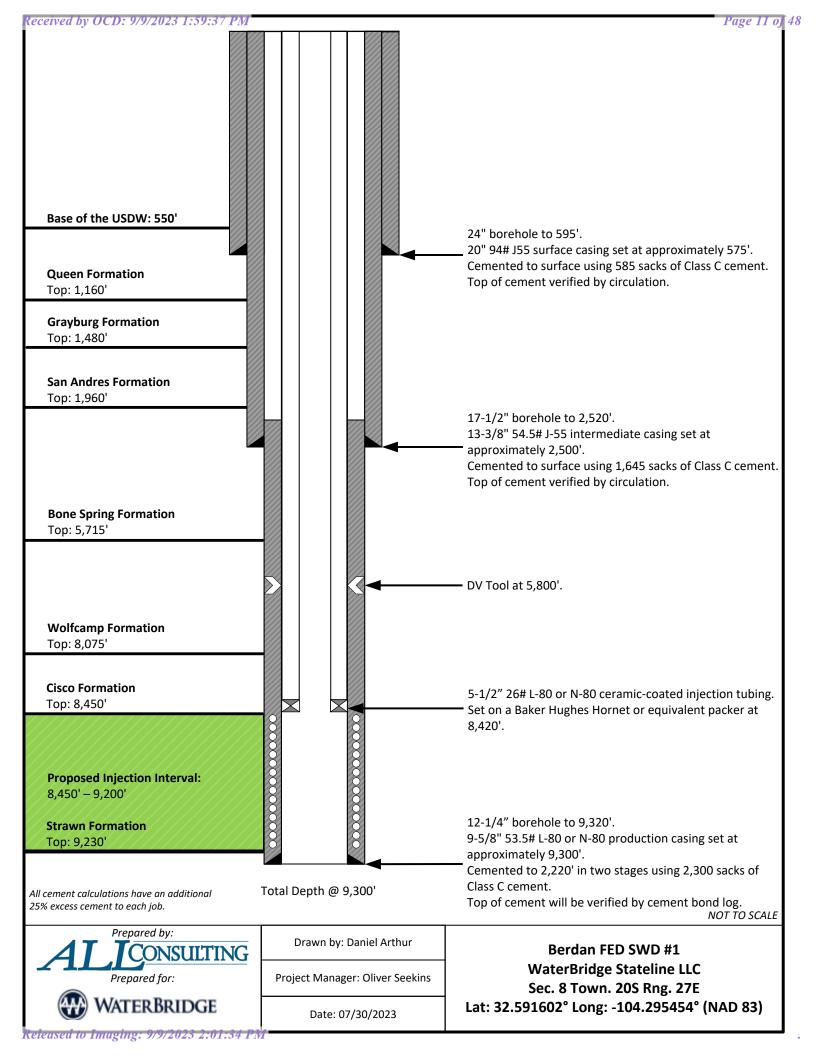
☐ AMENDED REPORT

#### WELL LOCATION AND ACREAGE DEDICATION PLAT

API	Number			Pool Code <b>96099</b>		Pool Name SWD; CISCO							
Property Co	Property Code Property Name BERDAN FED SWD												
0GRID No 330192				Operator Name Elevation WATERBRIDGE STATELINE LLC 3366'									
			•										
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County				
Н	8	20 S	27 E		1476	NORTH	292	EAST	EDDY				
			Bot	tom Hole	Location If Dif	ferent From Surfa	.ce						
UL or lot no.	Section	Township	Range	Range Lot Idn Feet from the North/South line Feet from the East/We									
Dedicated Acres	Joint or	Infill	Consolidation Code Order No.										

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.





## **HORNET** Packer

Product Family No. H64682

#### **HORNET EL Packer**

#### Product Family No. H64683

#### **APPLICATION**

The mechanically set HORNET™ packer offers ease of operation with quarter-turn right to set and release. Converting it for wireline-setting applications is simple and inexpensive. The HORNET packer provides for landing in compression, tension, or neutral positions. Every component from the jay track, to the internal bypass, to the packing-element system and the upper slip assembly has been developed to ensure the HORNET's setting and releasing reliability.

The HORNET EL packer is run and set on electric line using an E- $4^{\text{TM}}$  (Product Family No. H43702) with a slow-set power charge or a  $J^{\text{TM}}$  setting tool (Product Family No. H41371) and a special wireline adapter kit. An L- $10^{\text{TM}}$  type on/off seal nipple is run on top of the packer to connect the tubing to the packer and to house a blanking plug when the packer is used as a temporary bridge plug.

#### **Advantages**

#### Upper Slip Assembly:

- Thoroughly tested across API minimum to maximum casing ID tolerances for each specified casing weight, for setting and releasing reliability
- Slip-wicker configuration providing bidirectional-load support with solid upper cone to support highest tensile loads
- Staged-release action eliminates high-overpull requirement
- Minimal set-down weight required to anchor slips

#### Internal Bypass Seal:

- Durable bypass seal design provides sealing after unloading, under differential pressures
- No O-ring sealing system

#### Packing Element System:

- Fully tested to combined ratings at the API's maximum ID tolerance
- Patented enhancements to control overboost
- High-performance, three-piece element system

#### Lower Slip and Jay Assembly:

- Slips and drag blocks tested to maximum API tolerance ID for positive set and ease of release
- One-quarter-turn right setting and releasing action
- Packoff of packing elements with applied tension or compression
- Spacing in jay ensures opening of internal bypass, before slip releasing action begins—important to both ease of release and safety
- Automatically returns to running position

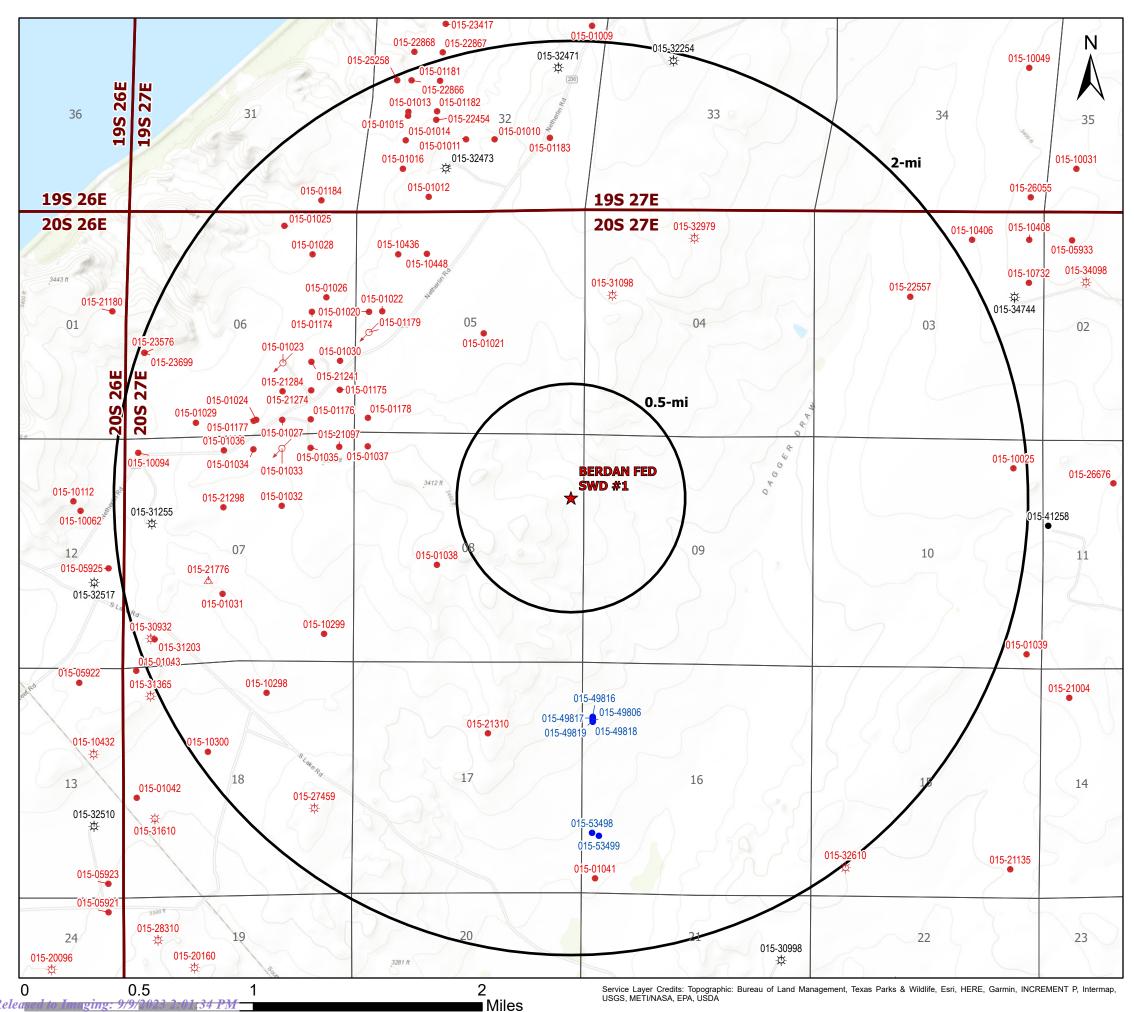


Area of Review Information:

- 2-mile Oil & Gas Well Map
- 1/2-Mile Well Detail List
- 2-mile Lease Map
- 2-mile Mineral Ownership Map
- 2-mile Surface Ownership Map
- Potash Lease Map

Received by OCD: 9/9/2023 1:59:37 PM

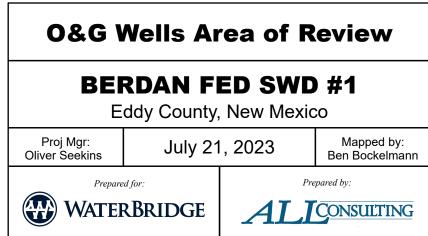
Page 14 of 48



## Legend

- ★ Proposed SWD
- Gas, Active (11)
- Gas, Plugged (12)
- Injection, Plugged (3)
- Oil, Active (1)
- Oil, New (7)
- Oil, Plugged (78)
- △ Salt Water Disposal, Plugged (1)

Source Info: NMOCD O&G Wells updated 3/15/2022 (https://www.emnrd.nm.gov/ocd/ocd-data/ftp-server/l)



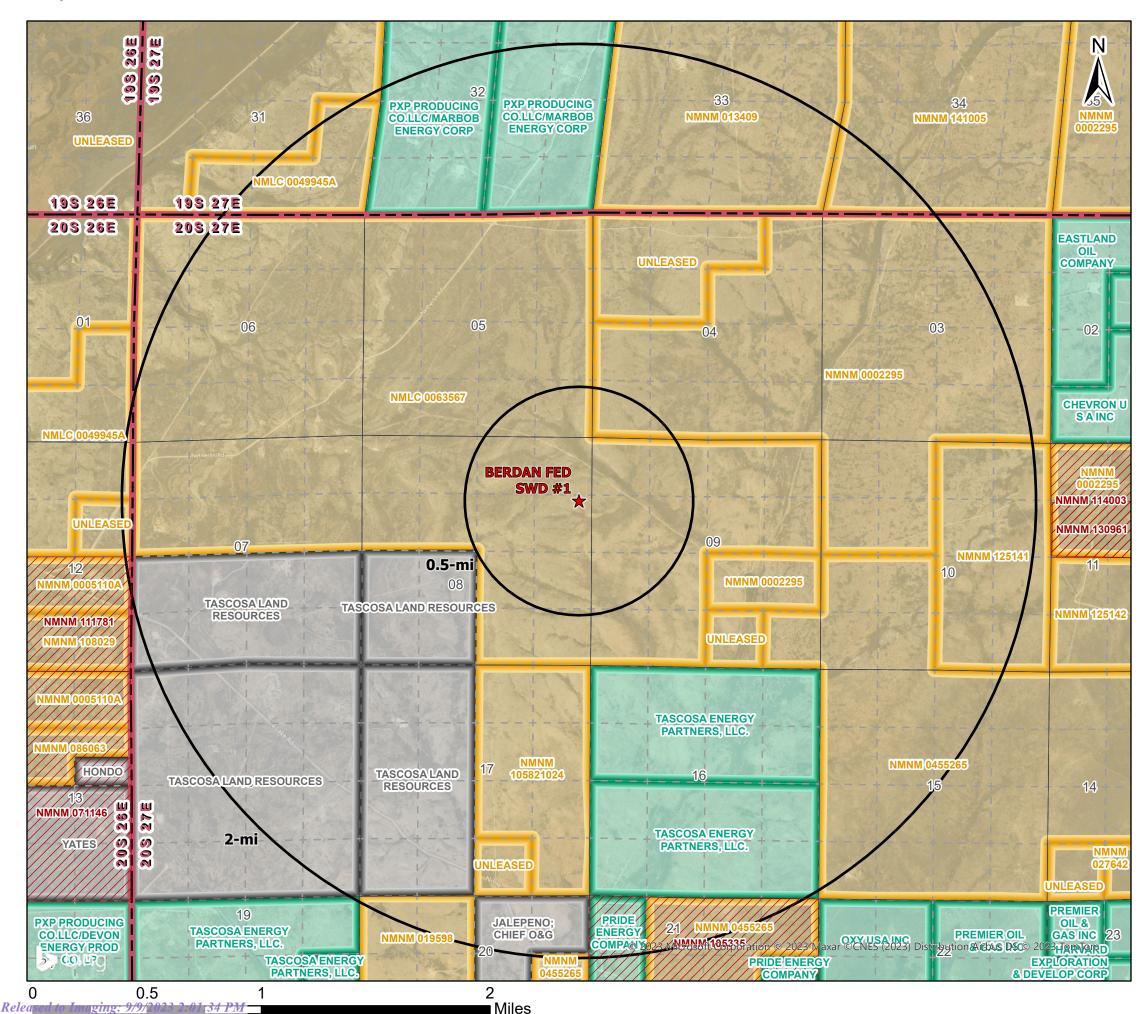
P	
age 15	
of 48	

Received by OCD: 9/9/2023 1:59:37 PM

AOR Tabulation for Berdan Fed SWD #1 (Top of Injection Interval: 8,450 - 9,200')												
Well Name API# Well Type Operator Spud Date Location (Sec., Tn., Rng.) Total Vertical Depth (feet) Penetrate Inj. Zone?												
Notes: There are no wells within the 1/2-mile AOR.												

Received by OCD: 9/9/2023 1:59:37 PM

Page 16 of 48



## Legend

★ Proposed SWD
 BLM Communitization Units
 NMSLO Mineral Leases
 Private Mineral Leases
 BLM Mineral Leases

#### 1/2-mile AOR Lessees/Unit Operators:

- MRC Delaware Resources LLC (BLM Lessee)
- Jalapeno Corporation (BLM Lessee)
- Tascosa Land Resources (Private Lessee)
- Trigg Oil & Gas LP (BLM Lessee)
- Yates Energy Corp (BLM Lessee)

Source Info: BLM Mineral Leases (https://catalog.data.gov/dataset/blm-new-mexico-mineral-ownership). NMSLO Mineral Leases (http://www.nmstatelands.org/maps-gis/gis-data-download/). Where applicable, Private Mineral Leases were identified utilizing Enverus, Midland Maps, or operator identified lease data.



## **BERDAN FED SWD #1**

Eddy County, New Mexico

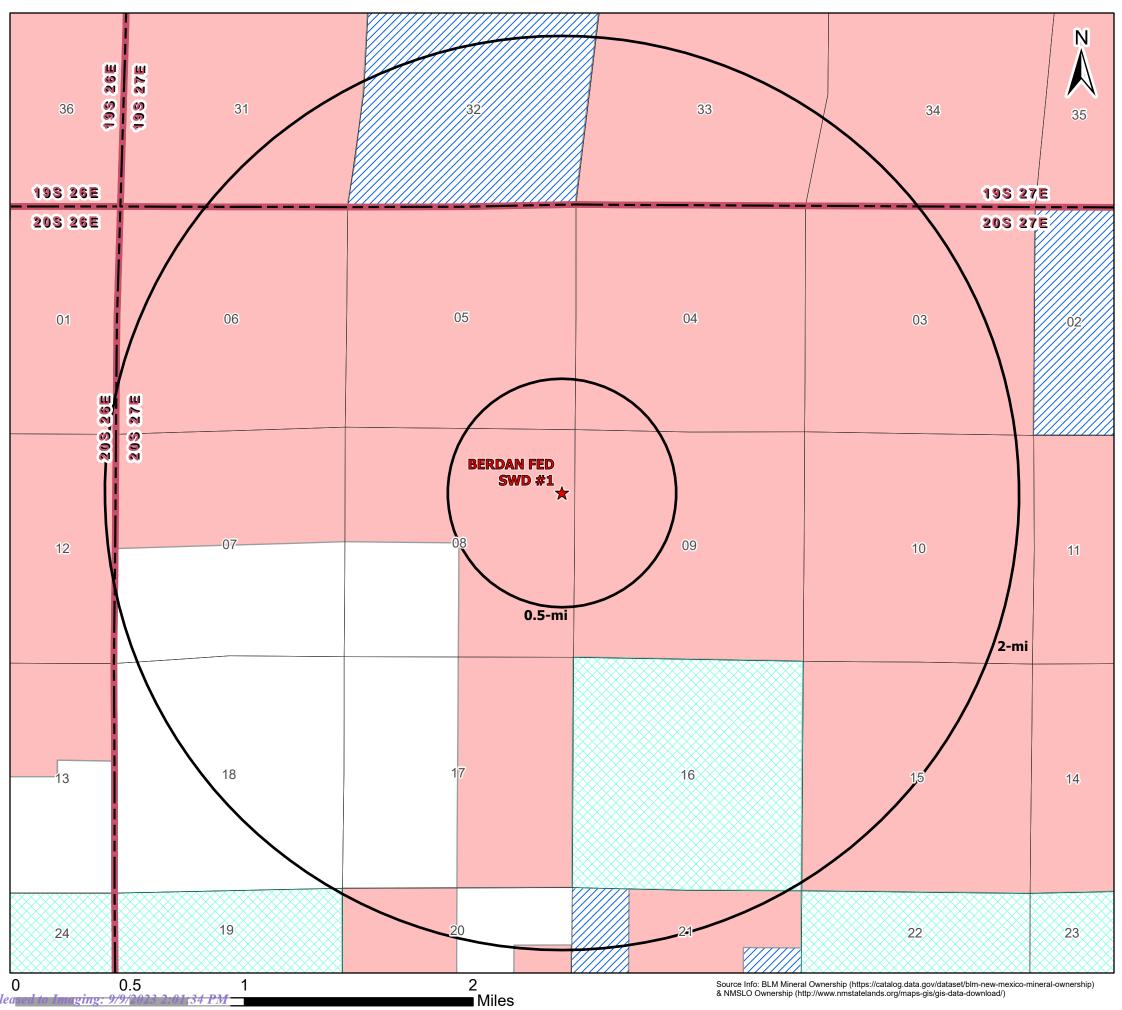
Proj Mgr: Oliver Seekins August 15, 2023

Mapped by: Ben Bockelmann





Page 17 of 48 Received by OCD: 9/9/2023 1:59:37 PM



# Legend

★ Proposed SWD

Private minerals

//// Subsurface minerals (NMSLO)

Surface and Subsurface minerals (NMSLO)

All minerals are owned by U.S. (BLM)

# **Mineral Ownership Area of Review**

## **BERDAN FED SWD #1**

Eddy County, New Mexico

Proj Mgr: Oliver Seekins

July 21, 2023

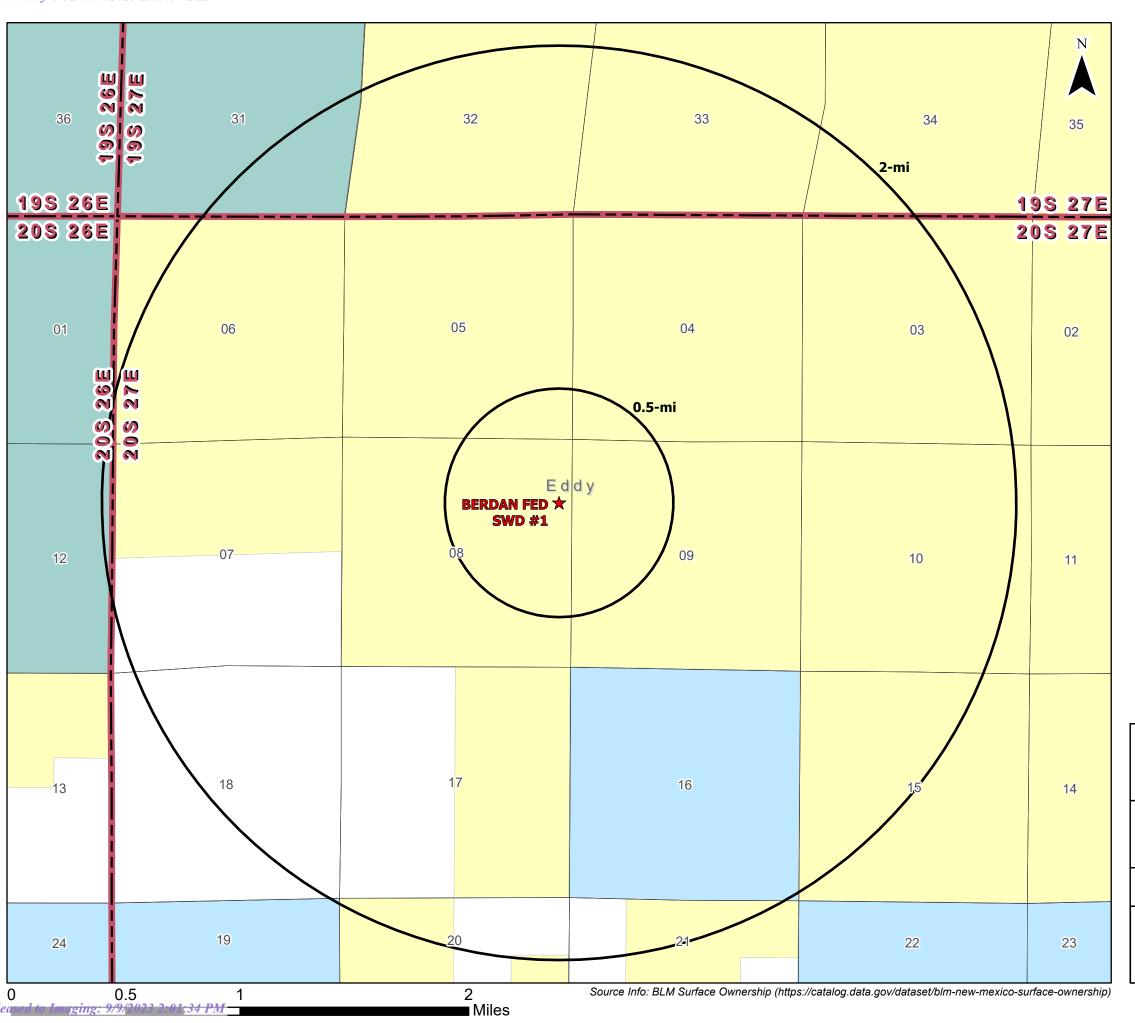
Mapped by: Ben Bockelmann

Prepared for: WATERBRIDGE WATERBRIDGE



Source Info: BLM Mineral Ownership (https://catalog.data.gov/dataset/blm-new-mexico-mineral-ownership) & NMSLO Ownership (http://www.nmstatelands.org/maps-gis/gis-data-download/)

Received by OCD: 9/9/2023 1:59:37 PM



## Legend

★ Proposed SWD

# Surface Ownership

Bureau of Land Management

Bureau of Reclamation

Private

State

# **Surface Ownership Area of Review**

## **BERDAN FED SWD #1**

Eddy County, New Mexico

Proj Mgr: Oliver Seekins

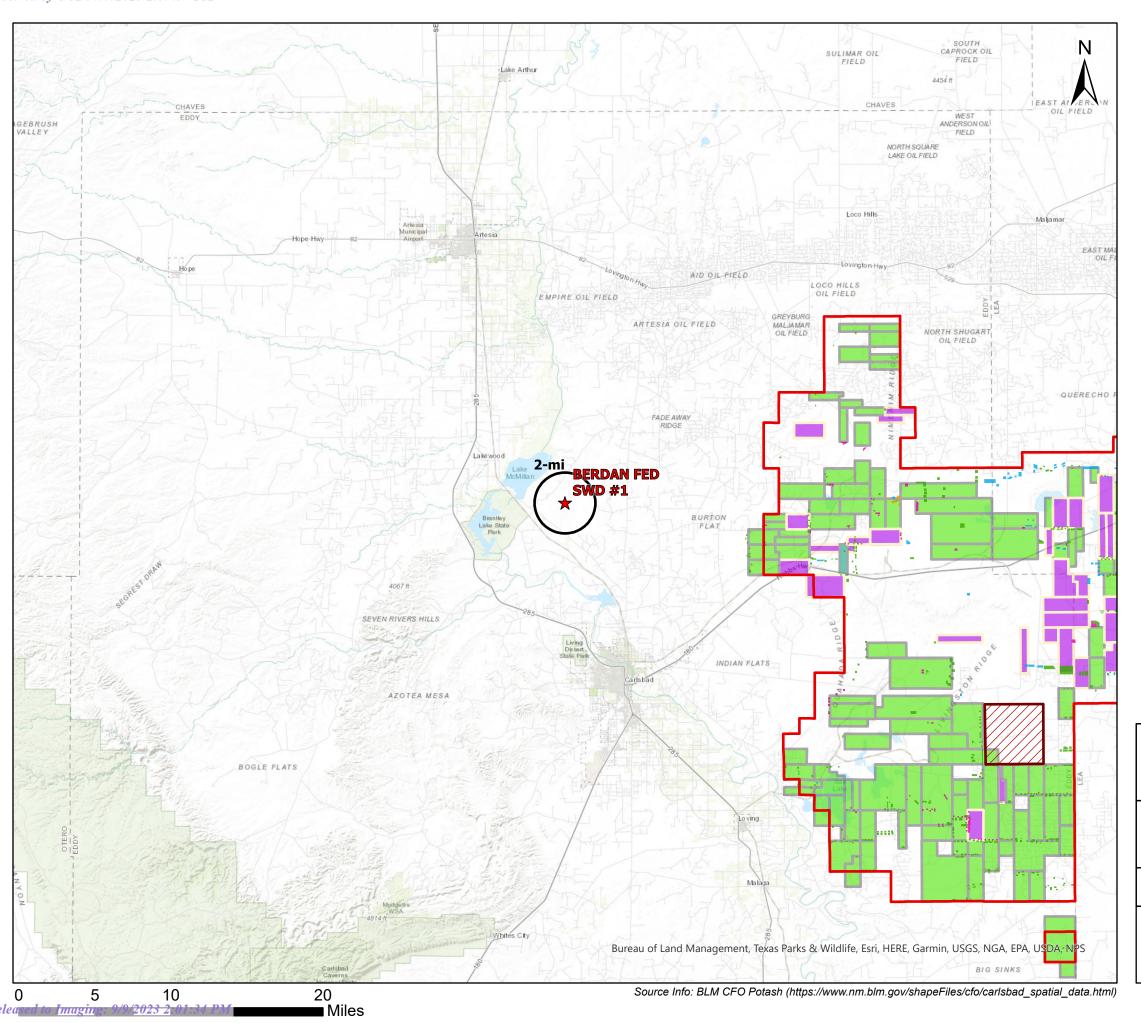
July 21, 2023

Mapped by: Ben Bockelmann





Received by OCD: 9/9/2023 1:59:37 PM



# Legend

★ Proposed SWD

SOPA 1986

WIPP Facility

**Drill Islands** 

Status, Depth Buffer

Approved, Half Mile

Approved, Quarter Mile

Nominated, Half Mile

Nominated, Quarter Mile

# Development Areas

## Status

Approved

Pending

Pending NMOCD Order

# **Potash Leases Area of Review**

## **BERDAN FED SWD #1**

Eddy County, New Mexico

Proj Mgr: Oliver Seekins July 21, 2023

Mapped by: Ben Bockelmann





Source Water Analyses

							Sr	ource Wate	er Analysis								
WaterBridge Stateline LLC																	
Well Name	API	Latitude	Longitude	Section	Township	Range	Unit	Ftgns	Ftgew	County	State	Field	Formation	Tds (mg/L)	Chloride (mg/L)	.) Bicarbonate (mg/L)	Sulfate (mg/
CHAPARRAL ST #002	3001503612	32.6227493	-104.1034851	32	19S	29E	D	660N	660W	EDDY	NM	BURTON NORTH	BONE SPRING	33,760	15,600	290	5,500
STONEWALL DS FEDERAL COM #002	3001521640	32.5426216	-104.1979904	29	20S	28E	J	1980S	1980E	EDDY	NM	AVALON	BONE SPRING	131,898	85,954	635	5 2,419
AGATE PWU 21 #008H	3001540512	32.63937	-104.088295	21	19S	29E	M	130S	50W	EDDY	NM		BONE SPRING 1ST SAND	-	162,925	549	290
JASPER 32 STATE COM #007H	3001540584	32.6235924	-104.0945587	32	19S	29E	В	340N	1875E	EDDY	NM		BONE SPRING 1ST SAND	213,293	134,925		603
DIAMOND PWU 22 #005H	3001540822	32.6514969	-104.0702057	22	19S	29E	D	725N	330W	EDDY	NM	'	BONE SPRING 1ST SAND	208,209	129,492	'	622
BURTON FLAT DEEP STATE FEDERAL COM #048H	3001540518	32.5435829	-104.1755981	28	20S	28E	I	2310S	400E	EDDY	NM		BONE SPRING 1ST SAND	187,017	109,200	695	1
CERF 10 FEDERAL #003H	3001541058	32.498394	-104.1872559	9	21S	27E	A	1275N	300E	EDDY	NM		BONE SPRING 1ST SAND	195,011	115,854	2,318	1
LONE TREE DRAW 13 STATE #011H	3001542084	32.4871941	-104.1449509	13	21S	27E	С	150N	2130W	EDDY	NM		BONE SPRING 1ST SAND	195,134	113,705	2,403	1
EMERALD PWU 20 #001H	3001538338	32.6525154	-104.1045456	20	19S	29E	D	400N	330W	EDDY	NM		BONE SPRING 2ND SAND	214,079	129,500	110	1
ONYX PWU 29 #003H	3001539373	32.6304665	-104.1045609	29	19S	29E	L	2145S	330W	EDDY	NM		BONE SPRING 2ND SAND	204,175	122,800	98	1
LONE TREE DRAW 13 STATE #007H	3001541650	32.4871902	-104.1454391	13	21S	27E	С	150N	1980W	EDDY	NM	J.	BONE SPRING 2ND SAND	210,720	125,168	183	I
BURTON FLAT DEEP UNIT #054H	3001540503	32.5063286	-104.1687851	2	21S	27E	L	1570S	50W	EDDY	NM		BONE SPRING 2ND SAND	209,153	125,000	769	1
LONGBOARD PWU 20 #001H	3001540025	32.6494904	-104.1044693	20	19S	29E	Е	1500N	355W	EDDY	NM	, , , , , , , , , , , , , , , , , , ,	BONE SPRING 3RD SAND	76,582	45,756		93
TURQUOISE PWU 27 #010H	3001543321	32.63249412	-104.0721759	28	19S	29E	Н	2382N	274E	EDDY	NM	,	BONE SPRING 3RD SAND	105,001	62,695	!	6
DIAMOND PWU 22 #011H	3001542809	32.64525903	-104.0718382	21	19S	29E	I	2295S	170E	EDDY	NM		BONE SPRING 3RD SAND	117,585	71,782	!	5:
CONNIE C STATE #002	3001502301	32.6337662	-104.1241302	25	19S	28E	Н	1980N	660E	EDDY	NM	OUTPOST	DELAWARE	55,498	32,420	601	9
SPIKE FEDERAL #001	3001527070	32.561882	-104.1288605	24	20S	28E	G	1650N	1980E	EDDY	NM	RUSSELL	DELAWARE	7,792	4,767	93	1
AVALON DELAWARE UNIT #262	3001524414	32.5386696	-104.2152328	30	20S	28E	0	560S	1980E	EDDY	NM	AVALON	DELAWARE	110,018	105,500	1,320	1,3
INDIAN FLATS BASS FEDERAL #005	3001522671	32.4303894	-104.0584564	35	21S	28E	N	330S	2310W	EDDY	NM	INDIAN FLATS	DELAWARE	144,959	95,968	3 200	1,8
INDIAN FLATS BASS FEDERAL #006	3001522673	32.4303932	-104.0561905	35	21S	28E	0	330S	2310E	EDDY	NM	INDIAN FLATS	DELAWARE	163,756	110,195	135	1,6
GOLDEN D FEDERAL #002	3001527060	32.488533	-104.004631	8	21S	29E	О	660S	1980E	EDDY	NM	GOLDEN LANE SOUTH	DELAWARE	242,051	173,806	282	2 7
ZINNIA BKC FEDERAL #001	3001527939	32.5462379	-104.0686035	27	20S	29E	Е	1980N	910W	EDDY	NM	BURTON FLAT	DELAWARE/WOLFCAMP	189,739	116,724	427	7
LONE TREE DRAW 13 STATE COM #002H	3001540372	32.4871712	-104.1494293	13	21S	27E	D	150N	750W	EDDY	NM		DELAWARE-BRUSHY CANYON	207,014	127,509	183	3 1,7
BH MATLOCK #001	3001500109	32.6845169	-104.440567	1	19S	25E	N	660S	1980W	EDDY	NM		WOLFCAMP	20,306	10,360	1,829	9
ANGELL ST #004	3001502280	32.6479454	-104.1791229	21	19S	28E	G	1980N	1980E	EDDY	NM	MILLMAN EAST	WOLFCAMP	118,720	70,200	2,700	1,0
STATE AC COM #001	3001522299	32.5572166	-104.1806107	21	20S	28E		1980S	1980E	EDDY	NM	BURTON FLAT NORTH	WOLFCAMP	43,441	26,100	446	5
FED UNION #001	3001502416	32.5527229	-104.1623917	22	20S	28E	0	330S	1650E	EDDY	NM		WOLFCAMP	55,965	32,400	252	2 2,2

Injection Formation Water Analyses

Released											•••						
o Ima												er Analysis sco Formation					
Well Name	API	Latitude	Longitude	Section	Township	Range							Formation	Tds (mg/L)	Chloride (mg/L)	Bicarbonate (mg/L)	Sulfate (mg/L)
JENNY COM #001	3001526469	32.6635513	-104.5134354	17	198	25E			660W	EDDY		DAGGER DRAW	CISCO	-	46,850	183	13
DAGGER DRAW #002	3001500116	32.6299515	-104.5175476	30	19S	25E	I	1969S	629E	EDDY	NM	DAGGER DRAW	CISCO	7,858	-	-	-
JOHN AGU #002	3001526468	32.5792274	-104.5523987	14	20S	24E	A	660N	660E	EDDY	NM	DAGGER DRAW	CISCO	216,236	53,321	72,619	952
SPRING SWD #001	3001500129	32.5206604	-104.3944092	4	21S	25E	A	660N	830E	EDDY	NM	SEVEN RIVERS HILLS	CISCO	31,485	17,000	635	2,500
INDIAN BASIN #001	3001510093	32.4758987	-104.5762329	14	21S	23E	K	1650S	1650W	EDDY	NM	INDIAN BASIN	CISCO	8,531	3,238	846	1,700
MARATHON FEDERAL #001	3001510373	32.4613838	-104.5590591	24	21S	23E	K	1650S	1650W	EDDY	NM	INDIAN BASIN	CISCO	162,225	99,300	32	750

- Water Well Map
- Well Data

Received by OCD: 9/9/2023 1:59:37 PM Page 25 of 48



Miles

# Legend

★ Proposed SWD

## **NMOSE PODs**

### **Status**

- Active (0)
- Pending (0)
- Change Location of Well (0)
- Capped (0)
- Plugged (0)
- Incomplete (0)
- Unknown (1)

# **Water Wells Area of Review**

## **BERDAN FED SWD #1**

Eddy County, New Mexico

Proj Mgr: Oliver Seekins

July 21, 2023

Mapped by: Ben Bockelmann





SourceInfo: https://geospatialdata-ose.opendata.arcgis.com/

Received by OCD: 9/9/2023 1:59:37 PM

	Water Well Sampling Rationale												
	Waterbridge Stateline LLC - Berdan Fed SWD #1												
Water Wells	Owner	Available Contact Information	Use	Location	Sampling Required	Notes							
RA 08646	DBR Land LLC	Dustin Droll Phone Number (Cell): 325-656-3054 Phone Number (Work): 432-218-5856	Livestock Watering	09-20S-27E 32.585549, -104.284857	No	DBR Land Holdings sent a ranch hand out to the permitted location and confirmed that no well was drilled in association with the NMOSE  Water well RA-08646.							

Released to Imaging: 9/9/2023 2:01:34 PM

Karst Analysis



#### WATERBRIDGE STATELINE LLC – BERDAN FED SWD #1 RESPONSES TO HIGH-RISK KARST AREAS

#### Introduction

ALL Consulting (ALL) has been informed by the New Mexico Oil Conservation Division (OCD) that the proposed locations of Waterbridge Stateline LLC's (Waterbridge) Berdan Fed SWD #1 Class II saltwater disposal (SWD) well application are within the area OCD has designated as high-risk karst. **Figure 1** is the location of the proposed SWD. OCD has requested that ALL include additional information within these applications to address OCD's concerns with the high-risk karst area. This additional information needs to include:

- 1. An explanation on how ALL determined the deepest underground sources of drinking water (USDW);
- 2. An evaluation of the geology to determine that there was no direct evidence of karst features in the immediate area;
- 3. Provide an affirmative statement that the proposed well designs and confining zones will protect the USDW; and
- 4. Provide a detailed description of both the upper and lower confining zones above and below the proposed injection interval in the Cisco Formation.

#### **Karst in Southeastern New Mexico**

ALL has reviewed more recently published geologic publications on the Capitan Reef Complex and karst areas in southeastern New Mexico and then also examined the well completion records and the closest open hole geophysical logs to the proposed MOA Fed SWD #1 well location. Anthropogenic sinkholes in the Permian salt beds of southeastern New Mexico are often associated with historic oilfield development due to improperly cased oil and water supply wells and salt-solution mining activity (Land 2013). Manmade sinkholes are caused by the dissolution of the salt beds in the Upper Permian Salado Formation by introduction of freshwater or groundwater into the salt beds. **Figure 2** shows the location of these sinkholes in southeastern New Mexico. Naturally occurring sinkholes are often associated with upward migration of groundwater flow from karstic aquifers of regional extent that underlie the Permian evaporite deposits (Land 2013). In the area of Dagger Draw, naturally occurring sinkholes in the Seven Rivers Formation are exposed along the eastern shore of Lake McMillan and are probably confined to a narrow band along the base of the McMillan Escarpment (Cox 1967).

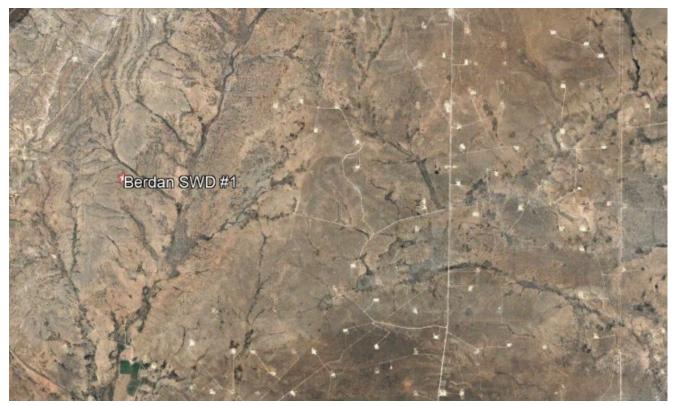


Figure 1. Map Showing the Proposed Location of the Berdan Fed SWD #1

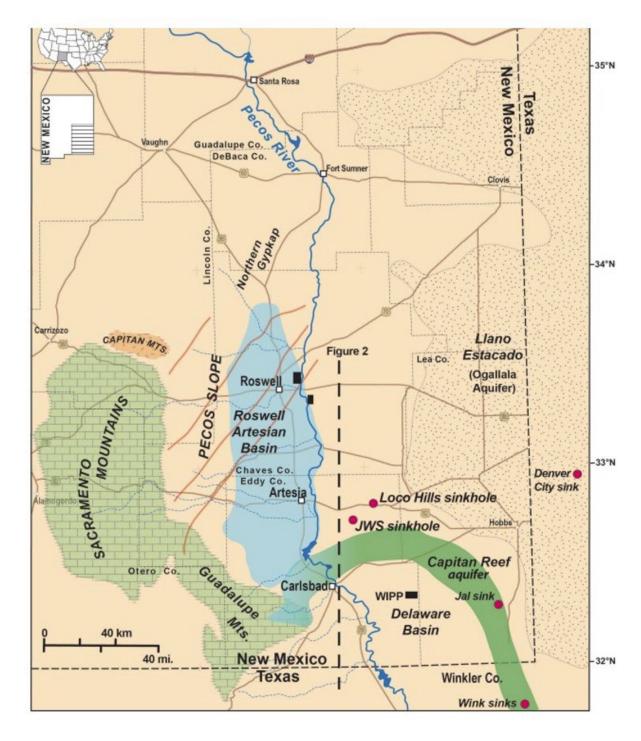


Figure 2. Regional Map of the Lower Pecos Region of Southeastern New Mexico Showing Location of Sinkholes (Land 2013)

#### Geology of the Dagger Draw Area

The surficial and shallow geology in the Dagger Draw area consists of the Tansill Formation, Yates Formation, Seven Rivers Formation, and Queen Formation of the Upper Permian Artesia Group. According to the snip of the surficial geologic map of Cox (1967), the surface geology of the area of the proposed Berdan Fed SWD #1 well location is the Tansill Formation. **Figure 3** is a snip of this surficial geologic map showing the proposed SWD location in relation to the Tansill Formation surface geology.

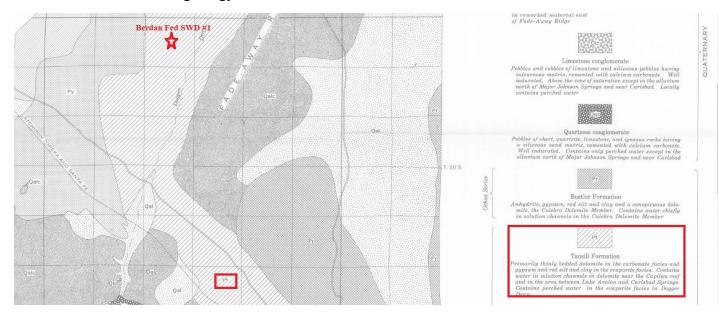


Figure 3. Map Showing the Surficial Geology of the Proposed SWD Location (Cox 1967)

Additionally, ALL evaluated and assessed the shallow geology in the area by reviewing open hole geophysical logs. Well API No. 015-10298, which is located southwest of the Berdan Fed SWD #1 location, has a shallow gamma ray log section and ALL has identified the shallow geologic formations on this log snip in **Figure 4**.

The Tansill Formation, which overlies the Yates Formation, is primarily thinly bedded dolomite in the carbonate facies and gypsum, red silt, and clay from the evaporite facies (Cox 1967). The Tansill Formation in the Dagger Draw area contains perched water in the evaporite facies (Cox 1967). The Yates Formation consists of about 300 feet of alternating beds of sandstone and dolomite in the carbonate facies and about the same thickness of gypsum, red clay, silt, and sandstone in the evaporite facies (Cox 1967). The Yates Formation yields water to stock wells near the Pecos River between Lake McMillan and Lake Avalon (Cox 1967). Most of these stock wells are in the evaporite facies of the Yates Formation near Rocky Arroyo west of the river and near Dagger Draw east of the Pecos River (Cox 1967). Underlying the Yates Formation is the Seven Rivers Formation. The Seven Rivers Formation consists of about 300 feet of dolomite with a few sandy beds in the carbonate facies and anhydrite, gypsum, red silt, and clay in the evaporite facies between the uppermost sandstone in the Queen Formation and the basal sandstone of the Yates Formation (Cox 1967). Groundwater moves through solution channels in

the Yates Formation east of the Pecos River between Major Johnson Springs and Lake Avalon (Cox 1967).

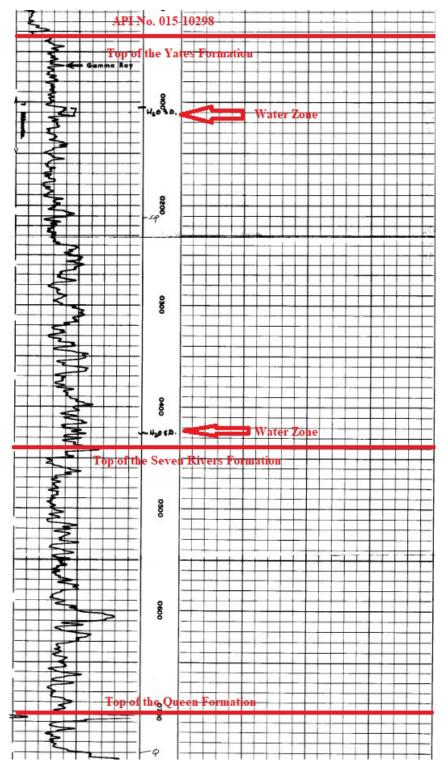


Figure 4. Gamma Ray Geophysical Log from Well API No. 015-10298 Showing the Tops of the Shallow Formations and Occurrence of Water Zones in the Well

#### Addressing OCD's High-Risk Karst Area Concerns

Based on ALL's extensive geologic and hydrogeologic evaluation of the Dagger Draw area and Berdan Fed SWD #1 proposed well location, below are ALL's responses to these OCD concerns.

- 1. An explanation on how ALL determined the deepest underground sources of drinking water (USDW).
  - a. ALL determined the base of the USDW after geological and hydrogeological analysis and evaluation of several open hole geophysical logs and publications within the vicinity of the proposed SWD. Figure 4 shows locations of water zones within the Yates Formation. Figure 5 is a map showing the different groundwater zones and the location of the proposed SWD. Based on ALL's analysis, the base of the USDW will be the bottom of the Yates Formation and using the ground elevations of the proposed SWD the base of the USDW will be approximately 525 to 550 feet below the surface. ALL is proposing that Waterbridge set 20" surface casing to a depth of 575 feet and cement back to the surface to ensure isolation of the base of the USDW.
- 2. An evaluation of the geology to determine that there was no direct evidence of karst features in the immediate area.
  - a. ALL performed an extensive geologic and hydrogeologic assessment of potential high-risk karst in the immediate area of the proposed SWDs in the Dagger Draw. Based on the evaluation of published geologic and hydrogeologic reports and maps, the immediate area of the proposed SWDs does not look to be an area of risk for karst development. Additionally, ALL assessed Google Earth and scanned the immediate area for any evidence of active or inactive surface sinkholes and none were detected. Based on ALL's research on the published reports on the karst, the naturally occurring sinkholes were located farther to the west in the area of Lake McMillan. If during the drilling into the Seven River Formation, circulation is lost due to dissolution of evaporites or solution channels, a drilling mud program may be implemented along with the utilization of lost circulation material (LCM) as needed.
- 3. Provide an affirmative statement that the proposed well designs and confining zones will protect the USDW.
  - a. ALL's proposed well construction and cementing plans will provide multiple layers of protection of the USDW. The surface casing will be set 25 feet below the base of the USDW and cemented back to the surface. An intermediate casing string set into the top of the San Andres Formation and cemented back to the surface and then the production casing will be set through the proposed injection interval in the Cisco Formation and cemented back in two stages up into the intermediate casing string for approximately 200 feet. The well construction and cementing plan provide for three layers of isolation and protection of the USDW from any possible migration of injection fluids

out of the proposed injection interval. There are multiple confining zones in both shale and in low porosity and low permeable carbonate rocks which will prevent upward migration of injected fluids. Additionally, there is at least 7,900 feet of vertical separation between the top of the Cisco Formation and the base of the USDW. There is no hydrologic connection between the Cisco injection interval and the USDW.

- 4. Provide a detailed description of both the upper and lower confining zones above and below the proposed injection interval in the Cisco Formation.
  - a. There are multiple shale beds that will serve as upper confinement above the top of the proposed injection interval in the Cisco Formation (Figure 6). Additional confining zones can be located farther above these zones on this open hole geophysical log for API No. 015-10298. There is lower confinement with shale beds at the base of the Cisco Formation (Figure 7) and with the low porosity and low permeability carbonate rocks directly below the Cisco Formation in the upper part of the Strawn Formation, which is also labeled on Figure 7. Both upper and lower confining zones will act as barriers to fluid flow out of the permitted Cisco Formation injection zone.

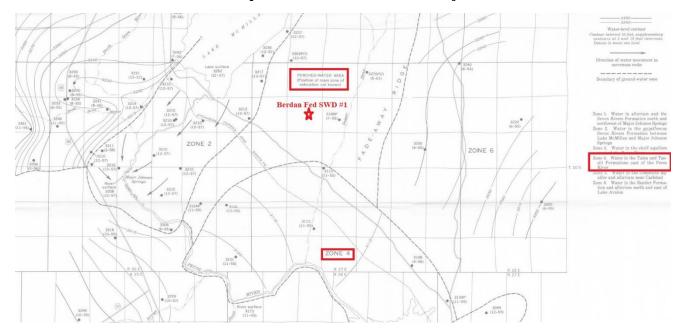


Figure 5. Map Showing the Location of the Proposed SWD in Relation to the Groundwater in the Permian Formations in the Immediate Area (Cox 1967)

#### References

Cox, E.R. 1967. "Geology and Hydrology Between Lake McMillan and Carlsbad Springs Eddy County, New Mexico." U.S. Geological Survey Water Supply Paper 1828, <a href="https://pubs.usgs.gov/wsp/1828/report.pdf">https://pubs.usgs.gov/wsp/1828/report.pdf</a> (accessed June 9, 2022).;

Land, Lewis. 2013. "Evaporite Karst in the Permian Basin Region of West Texas and Southeastern New Mexico: The Human Impact." 13<sup>th</sup> Sinkhole Conference, NCKRI Symposium 2, <u>www.researchgate.net/publication/313021019</u> (accessed June 9, 2022).

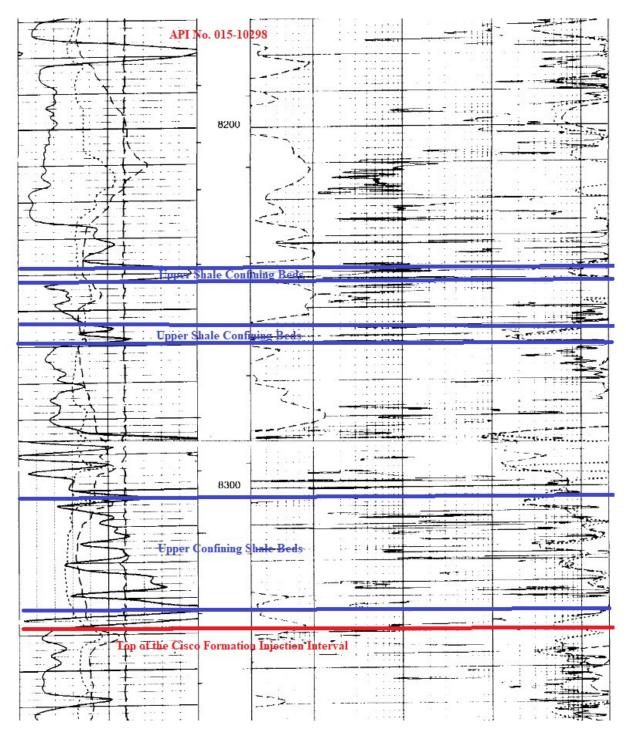


Figure 6. Open Hole Geophysical Log of API No. 015-10298 Showing the Upper Confining Zones for the Proposed Cisco Formation SWDs

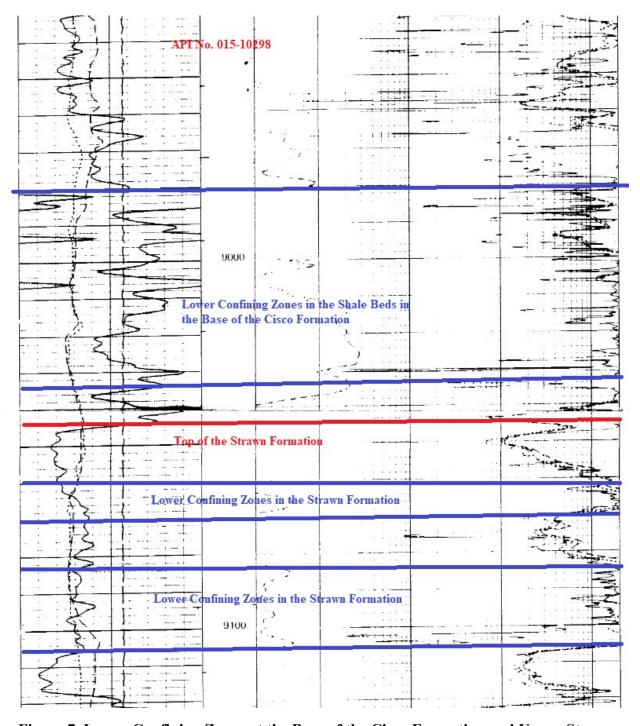


Figure 7. Lower Confining Zones at the Base of the Cisco Formation and Upper Strawn Formation in the Open Hole Geophysical Log for API No. 015-10298

**ALL Consulting, LLC** 

	_August 15, 2023_
Tom Tomastik	Date
Chief Geologist and Regulatory Specialist	
Certified Petroleum Geologist #6354	

Som Tomastik

August 15, 2023

Tom Tomastik

Date

Chief Geologist and Regulatory Specialist

Certified Petroleum Geologist #6354

**ALL Consulting, LLC** 



### Attachment 7

No Hydrologic Connection Statement



# RE: Waterbridge Operating LLC - Berdan Fed SWD #1 application, Eddy County, New Mexico

ALL Consulting LLC (ALL) has performed a thorough hydrologic investigation related to the saltwater disposal well (SWD) listed above. The investigation was conducted to determine if there were any existing or potential connections between the proposed injection intervals in the Cisco Formation and the deepest underground source of drinking water (USDW).

ALL performed an assessment and analysis of the subsurface geophysical log data along with published documents on the groundwater in this vicinity of Eddy County, New Mexico. Based on ALL's assessment and analysis there is containment through multiple confining zones above the Cisco Formation and the USDW and over 7,900 feet of vertical separation between the base of the USDW and the top of the injection interval. Additionally, there is no evidence of extensive faulting that would allow for communication between the USDW and the Cisco Formation.

Tom Tomastik

Date

8/14/2023

Chief Geologist and Regulatory Specialist

For Journtle

ALL Consulting LLC

#### **Attachment 8**

Public Notice Affidavit and Notice of Application Confirmations

### APPLICATION FOR AUTHORIZATION TO INJECT

NOTICE IS HEREBY GIVEN: That WaterBridge Stateline LLC, 5555 San Felipe, Suite 1200, Houston, TX 77056, is requesting that the New Mexico Oil Conservation Division administratively approve the APPLICATION FOR AUTHORIZATION TO INJECT as follows:

PURPOSE: The intended purpose of the injection well is to dispose of salt water produced from permitted oil and gas wells.

WELL NAME AND LOCATION:	Berdan Fed SWD #1		
	Located 12.42 miles northwest of Carlsbad, NM		
	SE 1/4 NE 1/4 (UL H) Section 8, Township 20S, Range 27E		
1,476 FNL & 292 FEL			
	Eddy County, NM		
NAME AND DEPTH OF DISPOSA	AL ZONE: Cisco (8,450' – 9,200')		
EXPECTED MAXIMUM INJECT	ION RATE: 30,000 bbls/day		
EXPECTED MAXIMUM INJECT	ION PRESSURE: 1,690 psi (surface)		

Objections or requests for hearing must be filed with the New Mexico Oil Conservation Division within 15 days. Any objection or request for hearing should be mailed to the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505.

Additional information may be obtained by contacting Oliver Seekins at 918-382-7581.

## Carlsbad Current Argus.

#### Affidavit of Publication Ad#0005791560 This is not an invoice

ALL CONSULTING
1718 SOUTH CHEYENNE AVE

**TULSA, OK 74119** 

I, a legal clerk of the Carlsbad Current Argus, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the State wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof in editions dated as follows:

08/11/2023

Legal Clerk

Subscribed and sworn before me this August 11, 2023.

State of WI, County of Brown NOTARY PUBLIC

My commission expires

KATHLEEN ALLEN Notary Public State of Wisconsin

Ad # 0005791560
PO #: • PN:1703.SWD.02 – WaterBridge –
BERIANTSWITH1

#### APPLICATION FOR AUTHORIZATION TO INJECT

NOTICE IS HEREBY GIVEN: That WaterBridge Stateline LLC, 5555 San Felipe, Suite 1200, Houston, TX 77056, is requesting that the New Mexico Oil Conservation Division administratively approve the APPLICATION FOR AUTHORIZATION TO INJECT as follows:

PURPOSE: The intended purpose of the injection well is to dispose of salt water produced from permitted oil and gas wells.

WELL NAME AND LOCATION: Berdan Fed SWD #1 Located 12.42 miles northwest of Carlsbad, NM SE ¼ NE ¼ (UL H) Section 8, Township 20S, Range 27E 1,476 FNL & 292 FEL Eddy County, NM

NAME AND DEPTH OF DISPOSAL ZONE:Cisco (8,450' – 9,200') EXPECTED MAXIMUM INJECTION RATE: 30,000 bbls/day EXPECTED MAXIMUM INJECTION PRESSURE:1,690 psi (surface)

Objections or requests for hearing must be filed with the New Mexico Oil Conservation Division within 15 days. Any objection or request for hearing should be mailed to the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505.

Additional information may be obtained by contacting Oliver Seekins at 918-382-7581. #0005791560, Current Argus, August 11, 2023

Page 44 of 48 Received by OCD: 9/9/2023 1:59:37 PM

Berdan Fed SWD #1 - Notice of Application Recipients								
Affected Party Classification	Entity - Proof of Notice	Entity - As Mapped / Exhibited	Address	City	State	Zip Code		
Surface / Mineral Owner	Bureau of Land Management New Mexico	N/A	620 E Greene St	Carlsbad	NM	88220		
NMOCD District Office	New Mexico Oil Conservation District District 2	N/A	506 W Texas	Artesia	NM	88210		
BLM - Lessee**	EOG Resources Inc	N/A	P.O. Box 2267	Midland	TX	79702		
BLM - Lessee	MRC Delaware Resources Limited Liability Corporation	MRC Delaware Resources LLC	5400 Lyndon B Johnson FWY	Dallas	TX	75240		
BLM - Lessee	Jalapeno Corporation	Jalapeno Corporation	P.O. Box 1608	Albuquerque	NM	87103		
BLM - Lessee	Trigg Oil & Gas Limited Partnership	Trigg Oil & Gas LP	P.O. Box 520	Roswell	NM	88202		
BLM - Lessee	Yates Energy Corporation	Yates Energy Corp	P.O. Box 2323	Roswell	NM	88202		
Fee - Leesee	Tascosa Land Resources	TASCOSA LAND RESOURCES	P.O. Box 134	Amarillo	TX	79105		

Released to Imaging: 9/9/2023 2:01:34 PM

**Notes:** The affected parties above received notification of this C-108 application.

\*\* EOG Resources Inc was notified because of its 2016 acquisition of Yates Petroleum Corporation.



9414 8118 9956 2066 4941 05

Yates Energy Corporation PO BOX 2323 ROSWELL NM 88202-2323

ALL Consulting, LLC 1718 S Cheyenne Ave Tulsa OK 74119

### CERTIFIED MAIL®



9414 8118 9956 2066 4941 36

Tascosa Land Resources PO BOX 134 AMARILLO TX 79105-0134

ALL Consulting, LLC 1718 S Cheyenne Ave Tulsa OK 74119

### CERTIFIED MAIL®



0444 9449 9956 2066 4943 65

EOG Resources Inc. PO BOX 2267 MIDLAND TX 79702-2267 \$7.189 US POSTAGE FIRST-CLASS FROM 74119 AUG 28 2023 stamps endicia

\$7.180 US POSTAGE FIRST-CLASS FROM 74119 AUG 28 2023 stamps endicia



**Bureau of Land Management New Mexico** 620 E GREENE ST CARLSBAD NM 88220-6292

ALL Consulting, LLC 1718 S Cheyenne Ave Tulsa OK 74119

### CERTIFIED MAIL®



Trigg Oil & Gas Limited Partnership PO BOX 520 ROSWELL NM 88202-0520

AUG 28 20 stamp

\$7.1

\$7.18 US POSTAG FIRST-CLAS FROM 741

AUG 28 20: stamps

ALL Consulting, LLC 1718 S Cheyenne Ave Tulsa OK 74119

### CERTIFIED MAIL®



Jalapeno Corporation PO BOX 1608 ALBUQUERQUE NM 87103-1608 S7.180 US POSTAGE FIRST-CLASS FROM 74119 AUG 28 2023 Stamps endicia

ALL Consulting, LLC 1718 S Cheyenne Ave Tulsa OK 74119

## CERTIFIED MAIL®



9414 8118 9956 2066 4943 34

MRC Delaware Resources LLC 5400 LBJ FWY STE 1500 DALLAS TX 75240-1017

ALL Consulting, LLC 1718 S Cheyenne Ave Tulsa OK 74119

### CERTIFIED MAIL®



0444 9419 9956 2066 4940 68

New Mexico Oil Conservation Division District 2 506 W TEXAS AVE ARTESIA NM 88210-2041 \$7. JS POST FROM 7 AUG 28 star

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

District II 811 S. First St., Artesia, NM 88210 Phone: (575) 748-1283 Fax: (575) 748-9720

District III 1000 Rio Brazos Rd., Aztec, NM 87410 Phone:(505) 334-6178 Fax:(505) 334-6170

1220 S. St Francis Dr., Santa Fe, NM 87505 Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 263492

#### **CONDITIONS**

Operator:	OGRID:
WaterBridge Stateline LLC	330129
5555 San Felipe	Action Number:
Houston, TX 77056	263492
	Action Type:
	[IM-SD] Admin Order Support Doc (ENG) (IM-AAO)

#### CONDITIONS

Created By		Condition Date
mgebremichael	None	9/9/2023