

# Initial Application Part I

Received: 11/07/2019

*This application is placed in file for record. It MAY or MAY NOT have been reviewed to be determined Administratively Complete*



November 07, 2019

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

Subject: Vista Disposal Solutions, LLC – Muir Federal SWD #2  
Application for Authorization to Inject

To Whom It May Concern,

On behalf of Vista Disposal Solutions, LLC (Vista), ALL Consulting, LLC (ALL) is submitting the enclosed Application for Authorization to Inject for the Muir Federal SWD #2, a proposed salt water disposal well, in Lea County, NM. Additionally, the public notice for this application was published on November 2nd, 2019, and the affidavit is included with the application.

Should you have any questions regarding the enclosed application, please contact Dan Arthur at (918) 382-7581 or [darthur@all-llc.com](mailto:darthur@all-llc.com).

Sincerely,  
ALL Consulting

Dan Arthur  
President/Chief Engineer

LSI3G-191107-C-1080

Revised March 23, 2017

|                   |               |           |                       |
|-------------------|---------------|-----------|-----------------------|
| RECEIVED: 11/7/19 | REVIEWER: BLL | TYPE: SWD | APP NO: pBL1932946313 |
|-------------------|---------------|-----------|-----------------------|

ABOVE THIS TABLE FOR OCD DIVISION USE ONLY

**NEW MEXICO OIL CONSERVATION DIVISION**  
 - Geological & Engineering Bureau -  
 1220 South St. Francis Drive, Santa Fe, NM 87505

**ADMINISTRATIVE APPLICATION CHECKLIST**

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Applicant: \_\_\_\_\_ OGRID Number: \_\_\_\_\_  
 Well Name: \_\_\_\_\_ API: \_\_\_\_\_  
 Pool: \_\_\_\_\_ Pool Code: \_\_\_\_\_

**SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED BELOW**

**1) TYPE OF APPLICATION:** Check those which apply for [A]

A. Location - Spacing Unit - Simultaneous Dedication

☐ NSL

☐ NSP (PROJECT AREA)

☐ NSP (PRORATION UNIT)

☐ SD

SWD-2318

B. Check one only for [ I ] or [ II ]

[ I ] Commingling - Storage - Measurement

☐ DHC

☐ CTB

☐ PLC

☐ PC

☐ OLS

☐ OLM

[ II ] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery

☐ WFX

☐ PMX

☐ SWD

☐ IPI

☐ EOR

☐ PPR

**2) NOTIFICATION REQUIRED TO:** Check those which apply.

A. ☐ Offset operators or lease holders

B. ☐ Royalty, overriding royalty owners, revenue owners

C. ☐ Application requires published notice

D. ☐ Notification and/or concurrent approval by SLO

E. ☐ Notification and/or concurrent approval by BLM

F. ☐ Surface owner

G. ☐ For all of the above, proof of notification or publication is attached, and/or,

H. ☐ No notice required

**FOR OCD ONLY**
☐

Notice Complete

☐

Application  
Content  
Complete

**3) CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

**Note:** Statement must be completed by an individual with managerial and/or supervisory capacity.

Print or Type Name

*J. Daniel Arthur*

Signature



Date

Phone Number

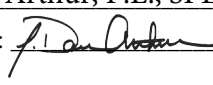
e-mail Address

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**

- I. PURPOSE: \_\_\_\_\_ Secondary Recovery \_\_\_\_\_ Pressure Maintenance   X   Disposal  
\_\_\_\_\_ Storage Application qualifies for administrative approval?   X   Yes \_\_\_\_\_ No
- II. OPERATOR: Vista Disposal Solutions, LLC  
ADDRESS: 12444 NM 10th St., Building G, Suite 202-512, Yukon, OK 73099  
CONTACT PARTY Nate Alleman 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? \_\_\_\_\_ Yes   X   No  
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:
1. Proposed average and maximum daily rate and volume of fluids to be injected;
  2. Whether the system is open or closed;
  3. Proposed average and maximum injection pressure;
  4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
  5. 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.).
- \*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: Dan Arthur, P.E., SPEC TITLE: President/Chief Engineer  
SIGNATURE:  DATE: 11/07/2019  
E-MAIL ADDRESS: darthur@all-llc.com
- XV. 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: \_\_\_\_\_



DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

Side 2

### III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

- (1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.
- (2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.
- (3) A description of the tubing to be used including its size, lining material, and setting depth.
- (4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

- (1) The name of the injection formation and, if applicable, the field or pool name.
- (2) The injection interval and whether it is perforated or open-hole.
- (3) State if the well was drilled for injection or, if not, the original purpose of the well.
- (4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.
- (5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

### XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

- (1) The name, address, phone number, and contact party for the applicant;
- (2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;
- (3) The formation name and depth with expected maximum injection rates and pressures; and,
- (4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

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NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

Application for Authorization to Inject  
Well Name: Muir Federal SWD #2

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

#### A.

##### (1) General Well Information:

Operator: Vista Disposal Solutions, LLC (OGRID No. 329051)  
Lease Name & Well Number: Muir Federal SWD #2  
Location Footage Calls: 1,245' FSL & 200' FEL  
Legal Location: Unit Letter P, S30 T26S R34E  
Ground Elevation: 3,350'  
Proposed Injection Interval: 17,500' – 18,780'  
County: Lea

##### (2) Casing Information:

| Type           | Hole Size | Casing Size | Casing Weight | Setting Depth | Sacks of Cement | Estimated TOC | Method Determined |
|----------------|-----------|-------------|---------------|---------------|-----------------|---------------|-------------------|
| Surface        | 24"       | 20"         | 133.0 lb/ft   | 775'          | 790             | Surface       | Circulation       |
| Intermediate 1 | 14-3/4"   | 13-3/8"     | 68.0 lb/ft    | 5,330'        | 1,190           | Surface       | Circulation       |
| Intermediate 2 | 12-1/4"   | 9-5/8"      | 53.5 lb/ft    | 14,760'       | 4,898           | Surface       | Circulation       |
| Liner          | 8-1/2"    | 7-5/8"      | 39.0 lb/ft    | 17,500'       | 225             | 14,560'       | CBL               |

**Note:** A DV Tool will be set at 5,000'

##### (3) Tubing Information:

4-1/2" (composite weight string) of fiberglass-coated tubing with setting depth of 17,480'

**(4) Packer Information:** SC-2 or equivalent packer set at 17,480'

#### B.

**(1) Injection Formation Name:** Devonian and Silurian formations

**Pool Name:** SWD; DEVONIAN - SILURIAN

**Pool Code:** 97869

**(2) Injection Interval:** Open-hole injection between 17,500' – 18,780'

**(3) Drilling Purpose:** New Drill for Salt Water 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.

- Permian Delaware Mountain Group (5,330')
- Bone Spring (10,510')
- Wolfcamp (12,520')
- Atoka (15,100')
- Morrow (16,450')

**Underlying Oil and Gas Zones:** No underlying oil and gas zones exist.

## V – Well and Lease Maps

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

- 2-mile Oil & Gas Well Map
- 2-mile Lease Map
- 2-mile Mineral Ownership Map
- 2-mile Surface Ownership Map
- 1.5-mile Deep SWD Map (Devonian/Silurian SWDs)
- 1-mile Well Detail List
- Potash Lease Map

## VI – AOR Well List

There are no wells within the 1-mile AOR that penetrate the proposed injection zone.

A list of the wells within the 1-mile AOR is included in **Attachment 2**.

## VII – Proposed Operation

- (1) **Proposed Maximum Injection Rate:** 40,000 bpd  
**Proposed Average Injection Rate:** 20,000 bpd
- (2) A **closed system** will be used.
- (3) **Proposed Surface Maximum Injection Pressure:** 3,500 psi (based on 0.2 psi per foot)  
**Proposed Average Surface Injection Pressure:** approximately 1,500 – 2,000 psi
- (4) **Source Water Analysis:** It is expected that the injectate will consist of produced water from production wells completed in the Wolfcamp and Bone Spring formations. Analysis of water from these formations is included in **Attachment 3**.
- (5) **Injection Formation Water Analysis:** The proposed SWD will be injecting water into the Devonian and Silurian formations which is a non-productive zone in this area known to be compatible with formation water from the Wolfcamp and Bone Spring formations. Water analyses from the Devonian-Silurian formation in the area are included in **Attachment 4**.

## VIII – Geologic Description

The proposed injection interval includes the Devonian and Silurian formations from 17,500 – 18,780 feet. These formations consist of carbonate rocks which include light colored dolomite and chert intervals interspersed with some tight limestone intervals. Several thick sections of porous dolomite capable of accepting injected fluids are present within the subject formations in the area.

The base of the deepest Underground Source of Drinking Water (USDW) is at a depth of approximately 750 feet. Surface casing will be set at a depth of 775 feet, which is 25 feet below the top of the Rustler formation, which isolates the USDW. Geophysical log assessment was conducted to accurately determine the top of the Rustler formation, and the top and the base of the Salado formation in this area. Water well depths in the area range from approximately 135 - 300 feet below ground surface.

## **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**

Geophysical 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, no groundwater wells were located within 1-mile radius of the proposed SWD location; therefore, no groundwater samples were collected in association with this application.

A water well map of the area is included in **Attachment 5**.

## **XII – No Hydrologic Connection Statement**

ALL Consulting has examined available geologic and engineering data, and has found no evidence of faulting present in the area that would provide a hydrologic connection between the injection interval and overlying USDWs. Additionally, the casing and cementing program has been designed to further ensure there will be no hydrologic connection between the injection interval and overlying USDWs. A letter from a knowledgeable and qualified expert stating that there is a low risk of seismic activity from the proposed injection activities is included in **Attachment 6**.

## **XIII – Proof of Notice**

A Public Notice was filed with the Hobbs News-Sun newspaper and an affidavit is included in **Attachment 7**.

A copy of the application was mailed to the OCD District Office, landowner, and leasehold operators within 1-mile of the proposed SWD location. A list of the recipients, as well as delivery confirmations, are included in **Attachment 7**.



# Attachments

**Attachment 1:**

- C-102
- Wellbore Diagram

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

- 2-mile Oil & Gas Well Map
- 2-mile Lease Map
- 2-mile Mineral Ownership Map
- 2-mile Surface Ownership Map
- 1.5-mile Deep SWD Map (Devonian/Silurian SWDs)
- 1-mile Well Detail List
- Potash Lease Map

**Attachment 3:** Source Water Analyses

**Attachment 4:** Injection Formation Water Analyses

**Attachment 5:** Water Well Map and Well Data

**Attachment 6:** Induced Seismicity Assessment Letter

**Attachment 7:** Public Notice Affidavit and Notice of Application Confirmations

**Attachment 1**

- 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

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

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

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

|                                 |   |  |
|---------------------------------|---|--|
| <sup>1</sup> API Number         | <sup>2</sup> Pool Code<br>97869                             | <sup>3</sup> Pool Name<br>SWD; Devonian – Silurian |
| <sup>4</sup> Property Code      | <sup>5</sup> Property Name<br>Muir Federal SWD              | <sup>6</sup> Well Number<br>2                      |
| <sup>7</sup> GRID No.<br>329051 | <sup>8</sup> Operator Name<br>Vista Disposal Solutions, LLC | <sup>9</sup> Elevation<br>3350'                    |

<sup>10</sup>Surface Location

| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
| P             | 30      | 26-S     | 34-E  |         | 1245'         | South            | 200'          | East           | Lea    |

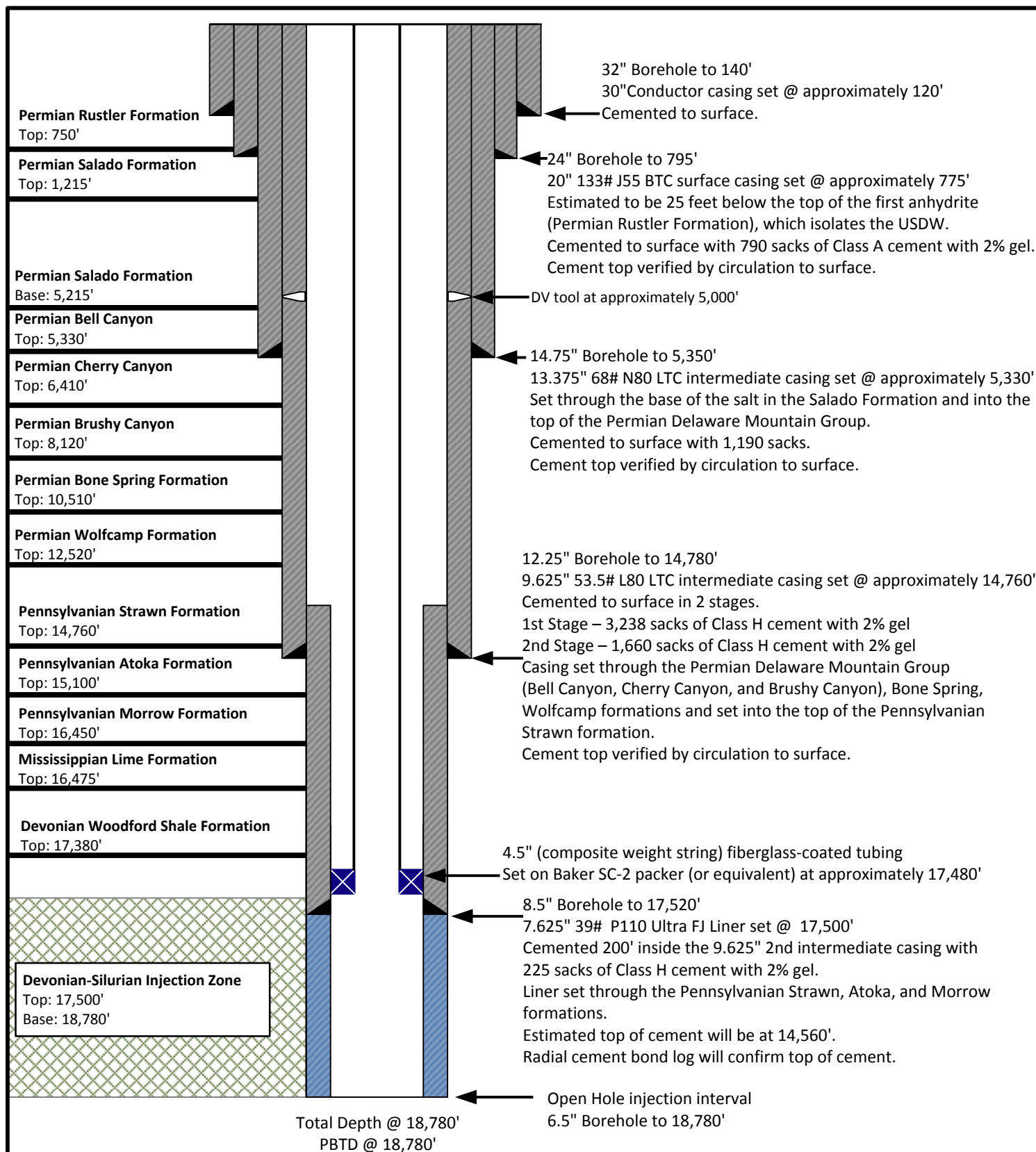
<sup>11</sup>Bottom Hole Location If Different From Surface

| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---------------|---------|----------|-------|---------|---------------|------------------|---------------|----------------|--------|
|               |         |          |       |         |               |                  |               |                |        |

|                               |                               |                                  |                         |
|-------------------------------|-------------------------------|----------------------------------|-------------------------|
| <sup>12</sup> Dedicated Acres | <sup>13</sup> Joint or Infill | <sup>14</sup> Consolidation Code | <sup>15</sup> 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.

|  |  |
|--|--|
|  | <p><sup>17</sup>OPERATOR CERTIFICATION</p> <p>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p><i>Nate Alleman</i>      11/07/2019<br/>Signature      Date</p> <p><b>Nate Alleman</b><br/>Printed Name</p> <p><b>nalleman@all-llc.com</b><br/>E-mail Address</p> |
|  | <p><sup>18</sup>SURVEYOR CERTIFICATION</p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p>10-9-2019<br/>Date of Survey</p> <p><i>Michael L. Stanford</i><br/>Signature and Seal of Professional Surveyor</p> <p><b>10324</b><br/>Certificate Number</p>   |



*Note: Listed depths and cement volumes are approximates based on available information. All cement calculations use yield of 1.18 cubic foot per sack and include 25% excess.*

NOT TO SCALE



Drawn by: Joshua Ticknor

Project Manager:  
Dan Arthur

Date: 11/07/2019

**Vista Disposal Solutions, LLC**  
**Muir Federal SWD #2**

**SC-2 Packer****1 Introduction**

The SC-2™ packer is Baker Hughes, a GE company (BHGE)' primary packer for cased hole gravel pack and frac pack applications where a high performance retrievable packer is required.

**2 Description**

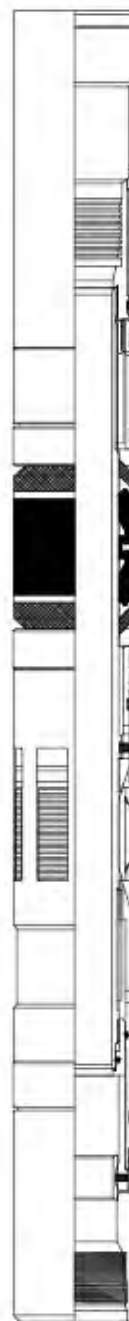
The SC-2 packer is a fully retrievable, high-performance retainer production packer. Although the packer was originally designed for premium gravel pack applications, it may also be used as a standard completion packer in wells where a premium retrievable production packer is required.

The SC-2 packer is fully compatible with standard BHGE sealing accessories, including retrievable and expendable plugs.

Refer to the specifications guide in the Packer Size/Model Availability Guide, Specification Guide, and Packer/Accessory Guide for SC™ and HP™ Packers (Product Family H48861), Unit 5750 under Sand Control Tools for packer/accessory size and packer size/model availability.

**3 Application**

The SC-2 packer is primarily used in gravel pack or frac pack applications where a higher differential pressure production rating, treating pressure rating and temperature are required. The SC-2 may also be used as a production packer.

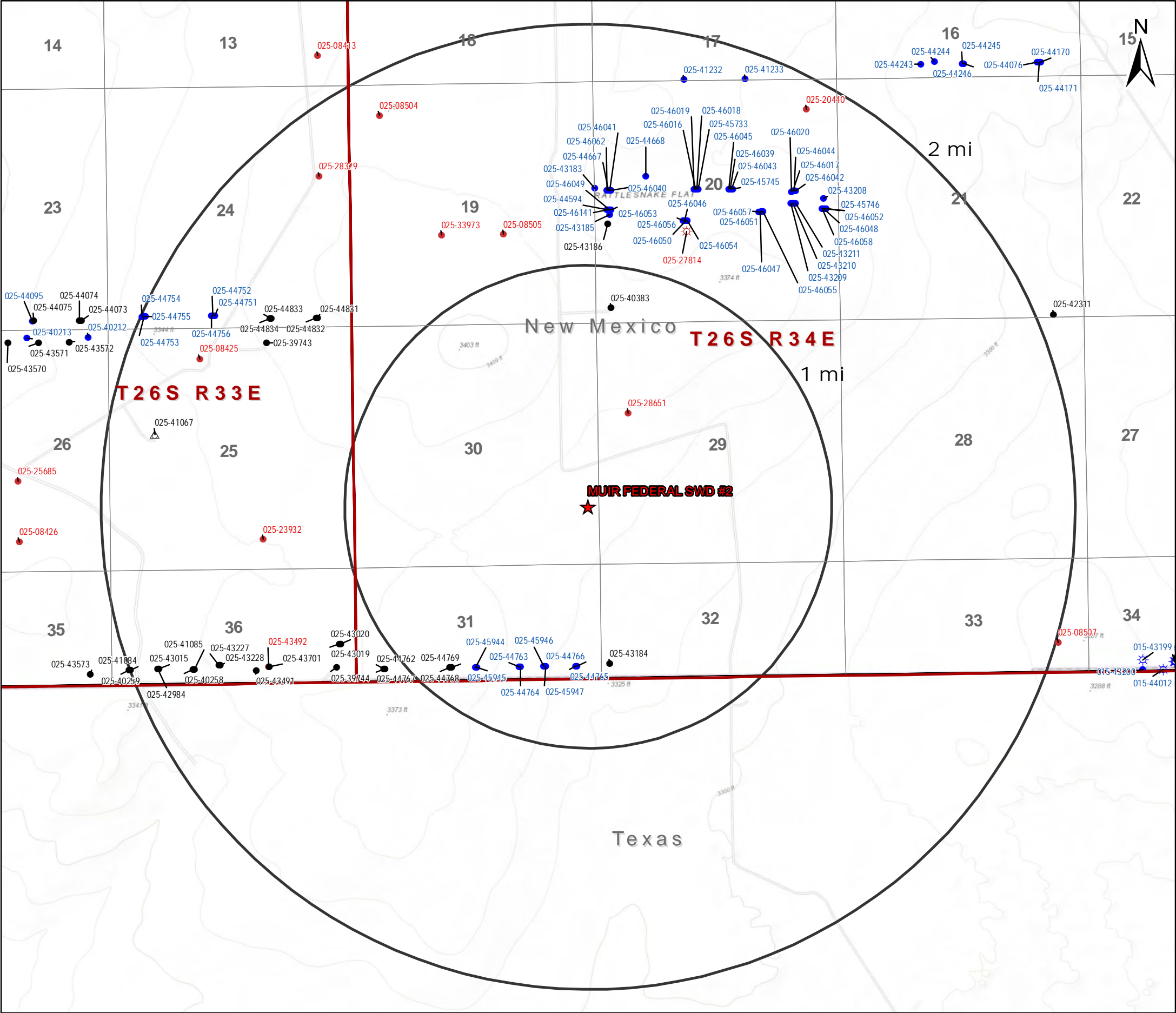


## **Attachment 2**

### Area of Review Information:

- 2-mile Oil & Gas Well Map
- 2-mile Lease Map
- 2-mile Mineral Ownership Map
- 2-mile Surface Ownership Map
- 1.5-mile Deep SWD Map (Devonian/Silurian SWDs)
- 1-mile Well Detail List
- Potash Lease Map





Legend

- ★ Proposed SWD
- NMOCD O&G Wells**
  - ⚙ Gas, New (5)
  - ⚙ Gas, Plugged (1)
  - Oil, Active (33)
  - Oil, New (66)
  - Oil, Plugged (13)
  - △ Salt Water Injection, Active (1)

O&G Wells Area of Review

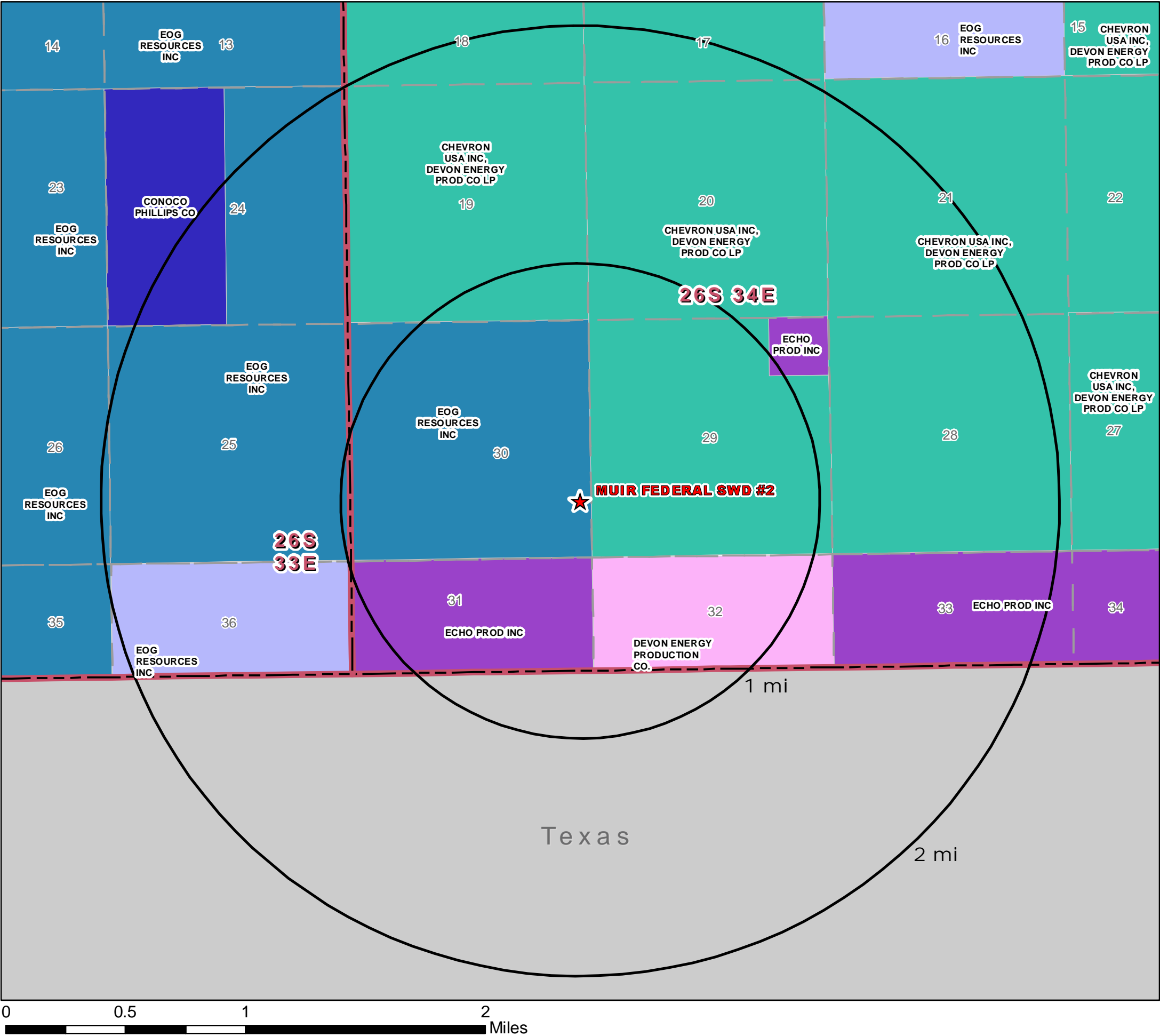
MUIR FEDERAL SWD #2  
Lea County, New Mexico

Proj Mgr:  
Dan Arthur

October 22, 2019

Mapped by:  
Ben Bockelmann





**Legend**

- ★ Proposed SWD

**BLM Mineral Leases**

- CHEVRON USA INC, DEVON ENERGY PROD CO LP
- CONOCO PHILLIPS CO
- ECHO PROD INC
- EOG RESOURCES INC

**NMSLO Mineral Leases**

- DEVON ENERGY PRODUCTION CO.
- EOG RESOURCES INC

N

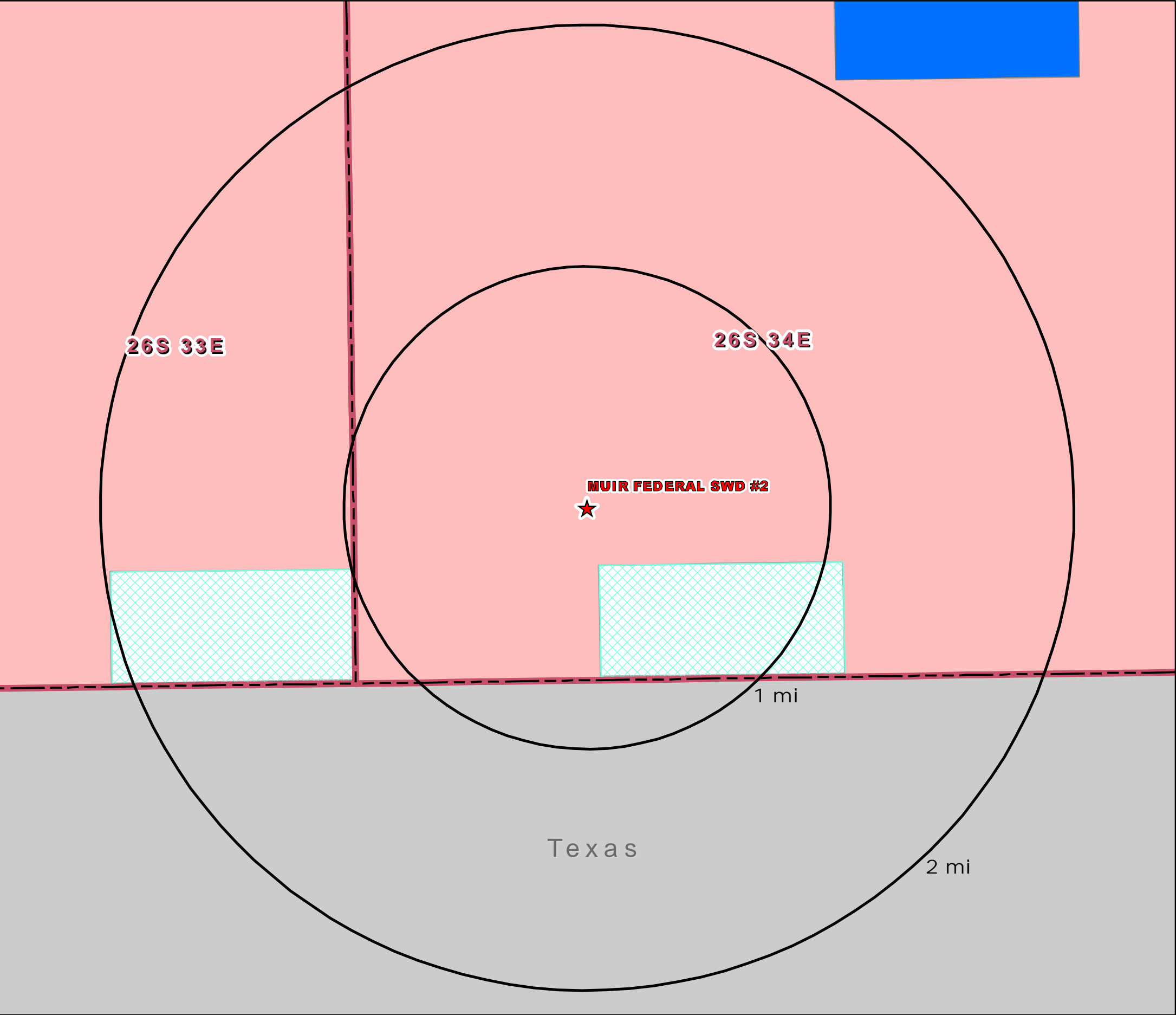
Mineral Lease  
Area of Review

MUIR FEDERAL SWD #2  
Lea County, New Mexico

|                         |                   |                              |
|-------------------------|-------------------|------------------------------|
| Proj Mgr:<br>Dan Arthur | November 06, 2019 | Mapped by:<br>Ben Bockelmann |
|-------------------------|-------------------|------------------------------|

|  |   |
|--|---|
| Prepared for:<br> | Prepared by:<br> |
|--|---|





**Legend**

★ Proposed SWD

**Mineral Ownership**

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

Subsurface minerals (NMSLO)

Surface and Subsurface minerals (NMSLO)

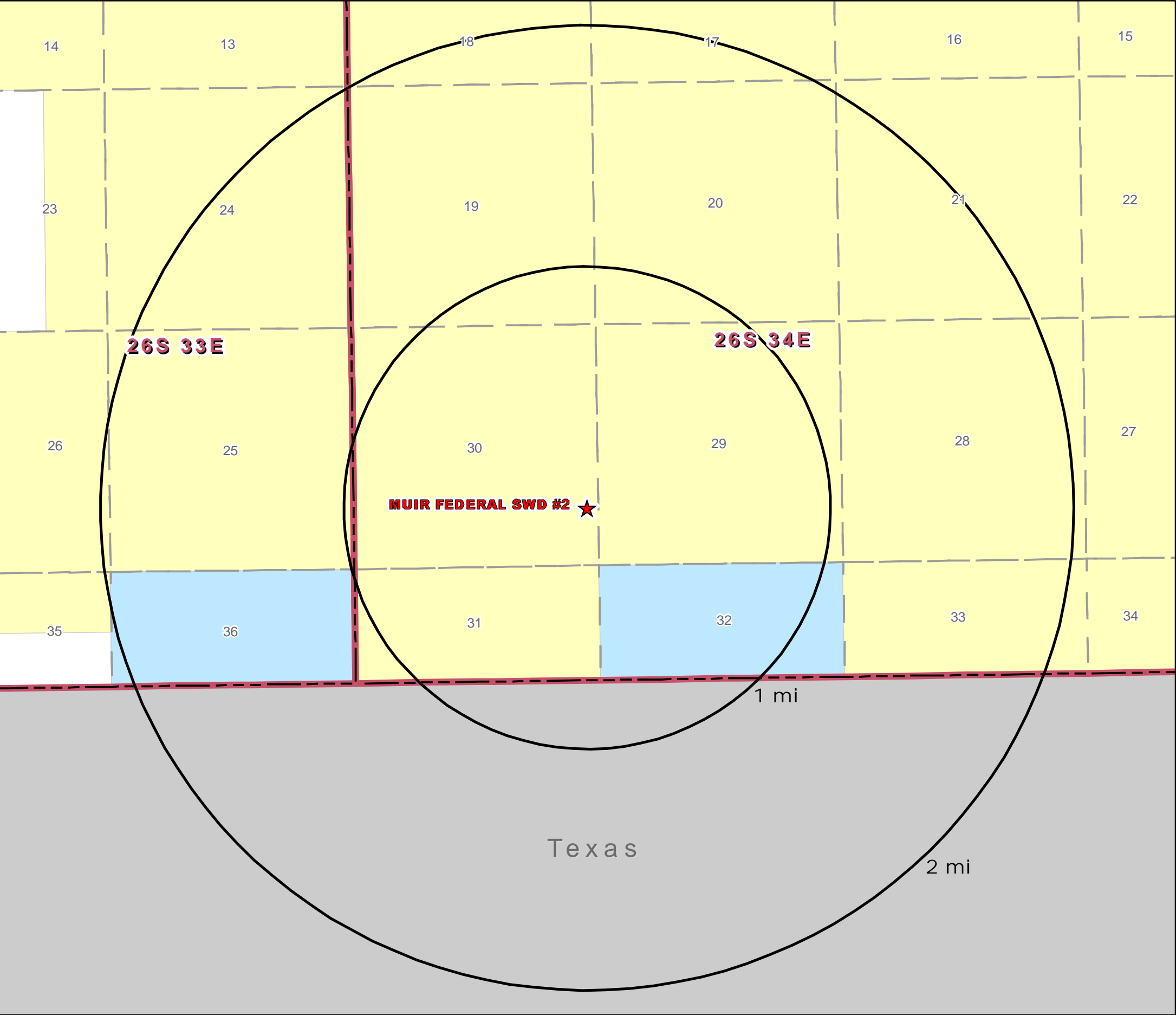
Private minerals



|  |                   |   |
|--|-------------------|---|
| Mineral Ownership<br>Area of Review  |                   |   |
| MUIR FEDERAL SWD #2<br>Lea County, New Mexico  |                   |   |
| Proj Mgr:<br>Dan Arthur  | November 06, 2019 | Mapped by:<br>Ben Bockelmann  |
| Prepared for:<br> |                   | Prepared by:<br> |



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/>)



**Legend**

★ Proposed SWD

**Surface Ownership**

BLM

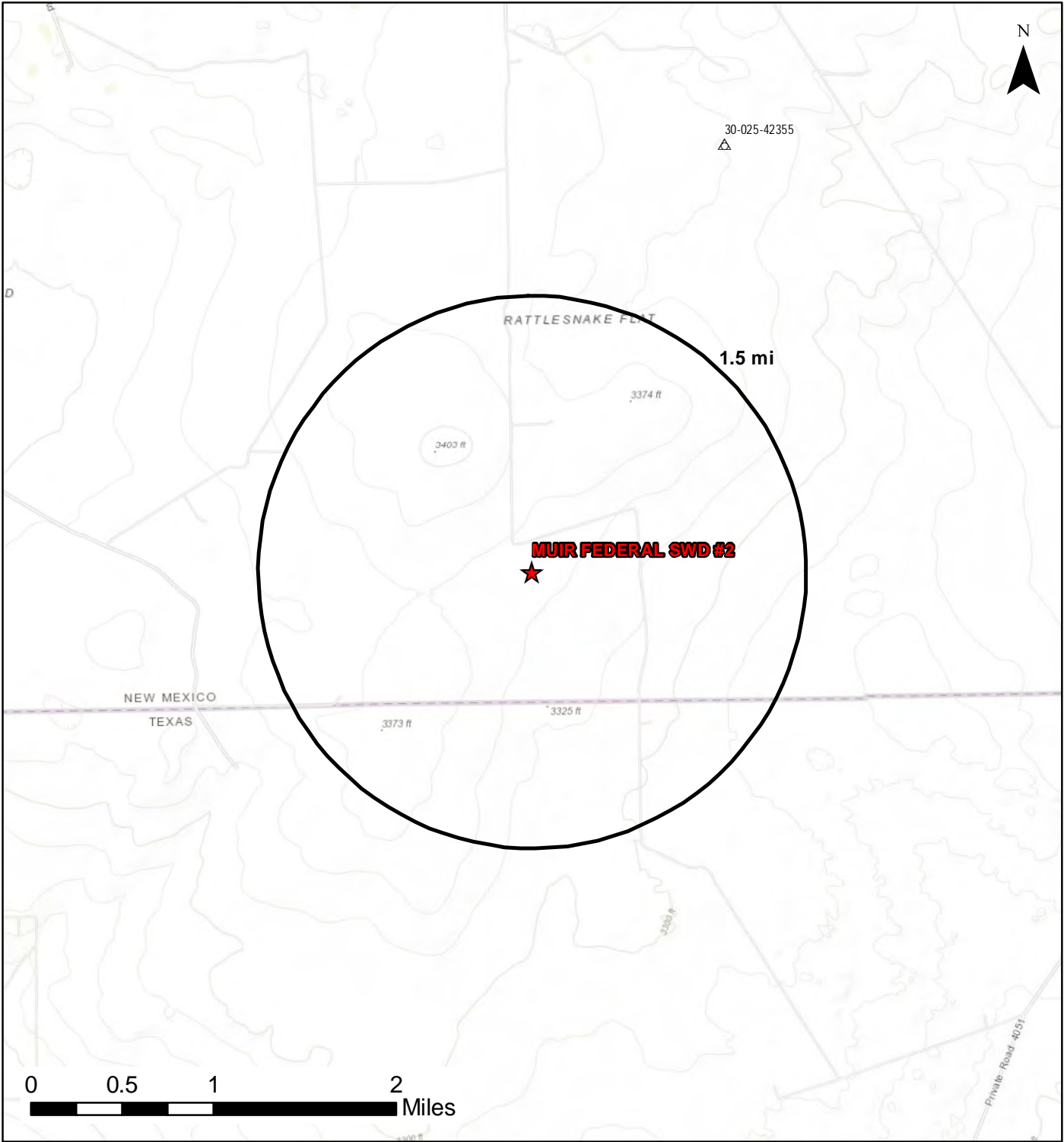
Private



State



Source Info: BLM Surface Ownership (<https://catalog.data.gov/dataset/blm-new-mexico-surface-ownership>)

|  |                   |   |
|--|-------------------|---|
| Surface Ownership<br>Area of Review  |                   |   |
| MUIR FEDERAL SWD #2<br>Lea County, New Mexico  |                   |   |
| Proj Mgr:<br>Dan Arthur  | November 06, 2019 | Mapped by:<br>Ben Bockelmann  |
| Prepared for:<br> |                   | Prepared by:<br> |

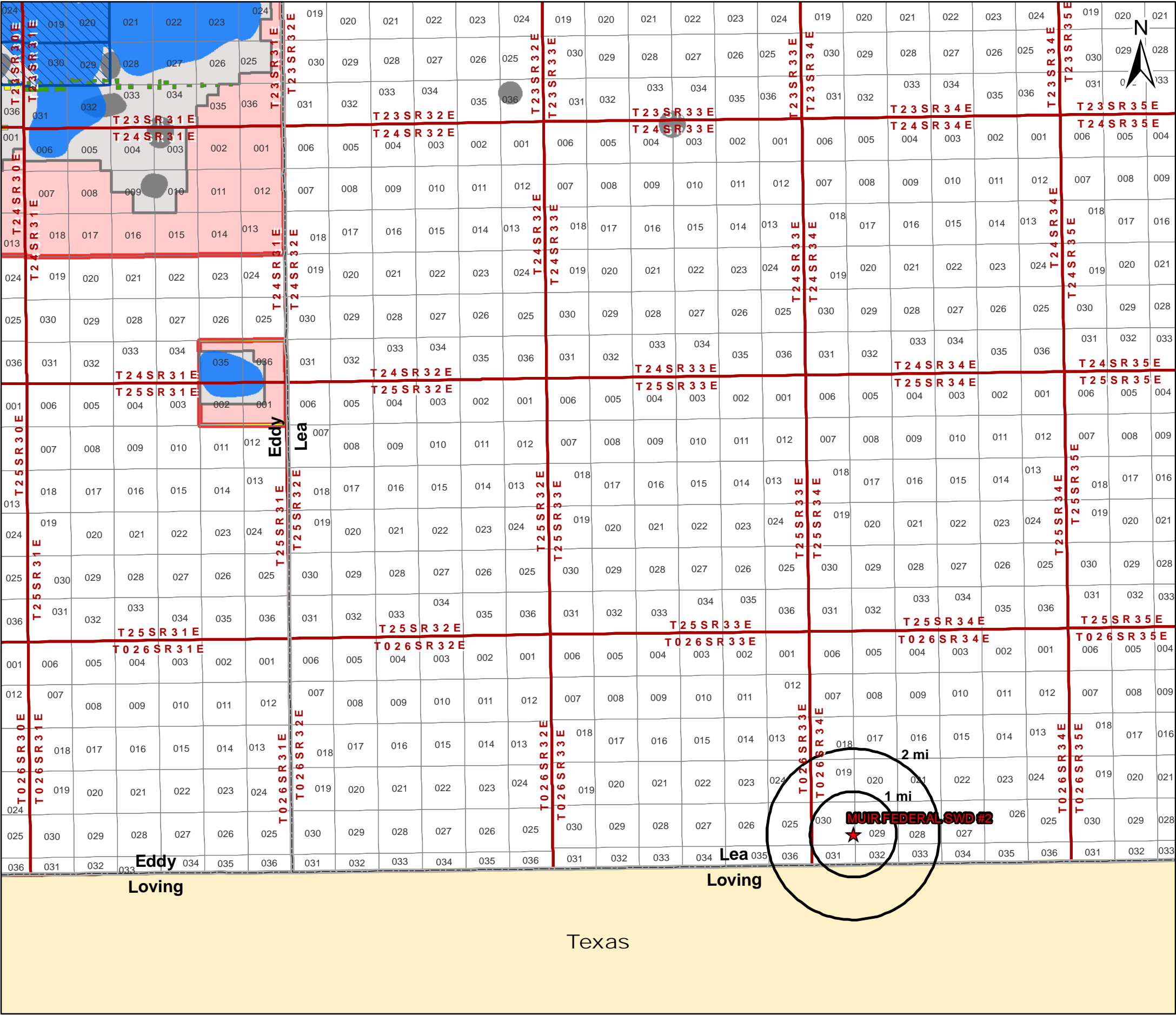


|  |              |  |   |
|--|--------------|--|---|
| MUIR FEDERAL SWD #2<br>Deep SWDs AOR   |              |  | <b>Legend</b><br><br>★ Proposed SWD <b>Devonian/Silurian SWDs</b><br><br>△ Salt Water Injection, Active (1) |
| Proj Mgr:<br>Dan Arthur  | Oct 24, 2019 | Mapped by:<br>Ben Bockelmann   |   |
| <div>Prepared for:</div> <div> <b>VISTA</b><br/><small>DESIGN SOLUTIONS LLC</small></div>   |              | <div>Prepared by:</div> <div> <b>ALL</b> CONSULTING</div> |   |
| <small>Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community</small> |              |  |   |

## AOR Tabulation for Muir Federal SWD #2 (Top of Injection Interval: 17,500')

| Well Name                                | API#         | Well Type | Operator  | Spud Date   | Location (Sec., Tn., Rng.) | Total Vertical Depth (feet) | Penetrate Inj. Zone? |
|--|--------------|-----------|---|-------------|----------------------------|-----------------------------|----------------------|
| PRE-ONGARD WELL #001                     | 30-025-28651 | Plugged   | PRE-ONGARD WELL OPERATOR (Gulf Oil Corporation) | 3/31/1984   | E-29-26S-34E               | Plugged (15562)             | No                   |
| PHILLY 31 FEDERAL COM #706H              | 30-025-44763 | O         | EOG RESOURCES INC                               | 6/19/2019   | 4-31-26S-34E               | 12720                       | No                   |
| PHILLY 31 FEDERAL COM #709H              | 30-025-44766 | O         | EOG RESOURCES INC                               | 6/22/2019   | 5-31-26S-34E               | 12724                       | No                   |
| PHILLY 31 FEDERAL COM #704H              | 30-025-44769 | O         | EOG RESOURCES INC                               | 6/27/2018   | 3-31-26S-34E               | 12763                       | No                   |
| PHILLY 31 FEDERAL COM #708H              | 30-025-44765 | O         | EOG RESOURCES INC                               | Not Drilled | 5-31-26S-34E               | Proposed (12711)            | No                   |
| PHILLY 31 FEDERAL COM #703H              | 30-025-44768 | O         | EOG RESOURCES INC                               | 7/25/2018   | 3-31-26S-34E               | 12723                       | No                   |
| PHILLY 31 FEDERAL COM #711H              | 30-025-45946 | O         | EOG RESOURCES INC                               | Not Drilled | 5-31-26S-34E               | Proposed (12718)            | No                   |
| PHILLY 31 FEDERAL COM #710H              | 30-025-45945 | O         | EOG RESOURCES INC                               | Not Drilled | 3-31-26S-34E               | Proposed (12723)            | No                   |
| PHILLY 31 FEDERAL COM #705H              | 30-025-45944 | O         | EOG RESOURCES INC                               | Not Drilled | 3-31-26S-34E               | Proposed (12715)            | No                   |
| PHILLY 31 FEDERAL COM #712H              | 30-025-45947 | O         | EOG RESOURCES INC                               | Not Drilled | 5-31-26S-34E               | Proposed (12720)            | No                   |
| PHILLY 31 FEDERAL COM #707H              | 30-025-44764 | O         | EOG RESOURCES INC                               | 6/20/2019   | 4-31-26S-34E               | 12747                       | No                   |
| GREEN WAVE 20 32 FEDERAL STATE COM #003H | 30-025-43184 | O         | DEVON ENERGY PRODUCTION COMPANY, LP             | 8/28/2017   | L-20-26S-34E               | 10917                       | No                   |
| GREEN WAVE 20 FEDERAL #001H              | 30-025-40383 | O         | DEVON ENERGY PRODUCTION COMPANY, LP             | 3/25/2012   | M-20-26S-34E               | 9487                        | No                   |

**Notes:** No wells within the 1-mile AOR penetrate the injection interval.



**Legend**

- ★ Proposed SWD
- Potash Leases
- Ore Type - Measured
- Ore Type - Indicated
- KPLA
- SOPA
- Drill Islands**
- Status**
- Approved
- Nominated

Potash Leases  
Area of Review

MUIR FEDERAL SWD #2  
Lea County, New Mexico

Proj Mgr:  
Dan Arthur

October 22, 2019

Mapped by:  
Ben Bockelmann

Prepared for:

**VISTA**  
ENERGY SOLUTIONS, LLC

Prepared by:

**ALL**CONSULTING

**Attachment 3**

Source Water Analyses

Wolfcamp



## Water Analysis

Date: 23-Aug-11

2708 West County Road, Hobbs NM 88240

Phone (575) 392-5556 Fax (575) 392-7307

Analyzed For

Brushy Draw 1#1

| Company | Well Name | County | State      |
|---------|-----------|--------|------------|
|         | BD        | Lea    | New Mexico |

Sample Source

Swab Sample

Sample #

1

Formation

Depth

Specific Gravity 1.170

SG @ 60 °F

1.172

pH 6.30

Sulfides

Absent

Temperature (°F) 70

Reducing Agents

## Cations

|                    |         |        |        |        |
|--------------------|---------|--------|--------|--------|
| Sodium (Calc)      | in Mg/L | 77,962 | in PPM | 66,520 |
| Calcium            | in Mg/L | 4,000  | in PPM | 3,413  |
| Magnesium          | in Mg/L | 1,200  | in PPM | 1,024  |
| Soluble Iron (FE2) | in Mg/L | 10.0   | in PPM | 9      |

## Anions

|                               |         |         |        |         |
|-------------------------------|---------|---------|--------|---------|
| Chlorides                     | in Mg/L | 130,000 | in PPM | 110,922 |
| Sulfates                      | in Mg/L | 250     | in PPM | 213     |
| Bicarbonates                  | in Mg/L | 127     | in PPM | 108     |
| Total Hardness (as CaCO3)     | in Mg/L | 15,000  | in PPM | 12,799  |
| Total Dissolved Solids (Calc) | in Mg/L | 213,549 | in PPM | 182,209 |
| Equivalent NaCl Concentration | in Mg/L | 182,868 | in PPM | 156,031 |

## Scaling Tendencies

\*Calcium Carbonate Index

507,520

Below 500,000 Remote / 500,000 - 1,000,000 Possible / Above 1,000,000 Probable

\*Calcium Sulfate (Gyp) Index

1,000,000

Below 500,000 Remote / 500,000 - 10,000,000 Possible / Above 10,000,000 Probable

\*This Calculation is only an approximation and is only valid before treatment of a well or several weeks after treatment.

Remarks

RW=.048@70F

Report #

3188



Sec 22, T25S, R28E

Bone Spring

## Water Analysis Report by Baker Petrolite

North Permian Basin Region

P.O. Box 740

Sundown, TX 79372-0740

(806) 229-8121

Lab Team Leader - Sheila Hernandez

(432) 495-7240

|                     |                          |                  |                               |
|---------------------|--------------------------|------------------|-------------------------------|
| Company:            |                          | Sales RDT:       | 33514.1                       |
| Region:             | PERMIAN BASIN            | Account Manager: | TONY HERNANDEZ (575) 910-7135 |
| Area:               | ARTESIA, NM              | Sample #:        | 534665                        |
| Lease/Platform:     | PINOCHLE 'BPN' STATE COM | Analysis ID #:   | 106795                        |
| Entity (or well #): | 2 H                      | Analysis Cost:   | \$90.00                       |
| Formation:          | UNKNOWN                  |                  |                               |
| Sample Point:       | WELLHEAD                 |                  |                               |

| Summary                    |              | Analysis of Sample 534665 @ 75 F |          |         |            |         |         |
|----------------------------|--------------|----------------------------------|----------|---------|------------|---------|---------|
| Sampling Date:             | 03/10/11     | Anions                           | mg/l     | meq/l   | Cations    | mg/l    | meq/l   |
| Analysis Date:             | 03/18/11     | Chloride:                        | 109618.0 | 3091.92 | Sodium:    | 70275.7 | 3056.82 |
| Analyst:                   | SANDRA GOMEZ | Bicarbonate:                     | 2135.0   | 34.99   | Magnesium: | 195.0   | 18.04   |
| TDS (mg/l or g/m3):        | 184911.1     | Carbonate:                       | 0.0      | 0.      | Calcium:   | 844.0   | 42.12   |
| Density (g/cm3, tonne/m3): | 1.113        | Sulfate:                         | 747.0    | 15.55   | Strontium: | 220.0   | 5.02    |
| Anion/Cation Ratio:        | 1            | Phosphate:                       |          |         | Barium:    | 0.8     | 0.01    |
|                            |              | Borate:                          |          |         | Iron:      | 6.5     | 0.23    |
|                            |              | Silicate:                        |          |         | Potassium: | 889.0   | 22.22   |
|                            |              |                                  |          |         | Aluminum:  |         |         |
| Carbon Dioxide:            | 0.50 PPM     | Hydrogen Sulfide:                |          | 0 PPM   | Chromium:  |         |         |
| Oxygen:                    |              | pH at time of sampling:          |          | 7       | Copper:    |         |         |
| Comments:                  |              | pH at time of analysis:          |          |         | Lead:      |         |         |
|                            |              | pH used in Calculation:          |          | 7       | Manganese: | 0.100   | 0.      |
|                            |              |                                  |          |         | Nickel:    |         |         |

| Conditions |              | Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl |        |  |        |                                |        |                                |        |                             |        |                       |
|------------|--------------|---|--------|--|--------|--------------------------------|--------|--------------------------------|--------|-----------------------------|--------|-----------------------|
| Temp       | Gauge Press. | Calcite<br>CaCO <sub>3</sub>  |        | Gypsum<br>CaSO <sub>4</sub> ·2H <sub>2</sub> O |        | Anhydrite<br>CaSO <sub>4</sub> |        | Celestite<br>SrSO <sub>4</sub> |        | Barite<br>BaSO <sub>4</sub> |        | CO <sub>2</sub> Press |
| F          | psi          | Index   | Amount | Index  | Amount | Index                          | Amount | Index                          | Amount | Index                       | Amount | psi                   |
| 80         | 0            | 1.06  | 188.52 | -1.20  | 0.00   | -1.18                          | 0.00   | -0.11                          | 0.00   | 0.58                        | 0.29   | 1.72                  |
| 100        | 0            | 1.10  | 206.05 | -1.29  | 0.00   | -1.20                          | 0.00   | -0.15                          | 0.00   | 0.35                        | 0.29   | 2.35                  |
| 120        | 0            | 1.12  | 224.17 | -1.38  | 0.00   | -1.19                          | 0.00   | -0.17                          | 0.00   | 0.16                        | 0.00   | 3.17                  |
| 140        | 0            | 1.13  | 243.17 | -1.42  | 0.00   | -1.18                          | 0.00   | -0.18                          | 0.00   | 0.00                        | 0.00   | 4.21                  |

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: The reported CO<sub>2</sub> pressure is actually the calculated CO<sub>2</sub> fugacity. It is usually nearly the same as the CO<sub>2</sub> partial pressure.



**Attachment 4**

Injection Formation Water Analyses

| Injection Formation Water Analysis   |            |           |              |         |          |       |      |       |       |        |       |         |              |           |         |              |                 |             |
|--|------------|-----------|--------------|---------|----------|-------|------|-------|-------|--------|-------|---------|--------------|-----------|---------|--------------|-----------------|-------------|
| Vista Disposal Solutions, LLC - Devonian and Silurian-Fusselman Formations |            |           |              |         |          |       |      |       |       |        |       |         |              |           |         |              |                 |             |
| Wellname   | API        | Latitude  | Longitude    | Section | Township | Range | Unit | Ftgns | Ftgew | County | State | Company | Field        | Formation | Tds_mgL | Chloride_mgL | Bicarbonate_mgL | Sulfate_mgL |
| STATE B COM #001   | 3002509716 | 32.179405 | -103.2212524 | 36      | 24S      | 36E   | C    | 600N  | 1880W | LEA    | NM    |         | CUSTER       | DEVONIAN  | 176234  | 107400       | 128             | 1004        |
| FARNSWORTH FEDERAL #006  | 3002511950 | 32.077725 | -103.162468  | 4       | 26S      | 37E   | A    | 660N  | 990E  | LEA    | NM    |         | CROSBY       | DEVONIAN  | 31931   | 20450        | 302             | 591         |
| ARNOTT RAMSAY NCT-B #003   | 3002511863 | 32.092228 | -103.1784439 | 32      | 25S      | 37E   | A    | 660N  | 660E  | LEA    | NM    |         | CROSBY       | DEVONIAN  |         | 100382       | 476             |             |
| ARNOTT RAMSAY NCT-B #003   | 3002511863 | 32.092228 | -103.1784439 | 32      | 25S      | 37E   | A    | 660N  | 660E  | LEA    | NM    |         | CROSBY       | DEVONIAN  | 158761  |              |                 |             |
| COPPER #001  | 3002511818 | 32.099484 | -103.1656723 | 28      | 25S      | 37E   | J    | 1980S | 1981E | LEA    | NM    |         | CROSBY       | DEVONIAN  | 27506   | 15270        | 1089            | 1079        |
| STATE NJ A #001  | 3002511398 | 32.164749 | -103.1273346 | 2       | 25S      | 37E   | A    | 663N  | 660E  | LEA    | NM    |         | JUSTIS NORTH | DEVONIAN  | 105350  | 59300        | 660             | 4950        |
| WESTATES FEDERAL #004  | 3002511389 | 32.161129 | -103.1241226 | 1       | 25S      | 37E   | E    | 1980N | 330W  | LEA    | NM    |         | JUSTIS NORTH | FUSSELMAN | 80880   | 46200        | 340             | 3050        |
| WESTATES FEDERAL #004  | 3002511389 | 32.161129 | -103.1241226 | 1       | 25S      | 37E   | E    | 1980N | 330W  | LEA    | NM    |         | JUSTIS NORTH | FUSSELMAN | 84900   | 48600        | 840             | 2650        |
| WESTATES FEDERAL #004  | 3002511389 | 32.161129 | -103.1241226 | 1       | 25S      | 37E   | E    | 1980N | 330W  | LEA    | NM    |         | JUSTIS NORTH | FUSSELMAN | 72200   | 41000        | 370             | 2960        |
| WESTATES FEDERAL #004  | 3002511389 | 32.161129 | -103.1241226 | 1       | 25S      | 37E   | E    | 1980N | 330W  | LEA    | NM    |         | JUSTIS NORTH | FUSSELMAN | 80900   | 46200        | 340             | 3050        |
| WESTATES FEDERAL #004  | 3002511389 | 32.161129 | -103.1241226 | 1       | 25S      | 37E   | E    | 1980N | 330W  | LEA    | NM    |         | JUSTIS NORTH | FUSSELMAN | 77600   | 44000        | 550             | 3240        |
| WESTATES FEDERAL #004  | 3002511389 | 32.161129 | -103.1241226 | 1       | 25S      | 37E   | E    | 1980N | 330W  | LEA    | NM    |         | JUSTIS NORTH | FUSSELMAN | 135000  | 77000        | 650             | 5810        |
| WESTATES FEDERAL #004  | 3002511389 | 32.161129 | -103.1241226 | 1       | 25S      | 37E   | E    | 1980N | 330W  | LEA    | NM    |         | JUSTIS NORTH | FUSSELMAN | 114000  | 65000        | 280             | 5110        |
| WESTATES FEDERAL #004  | 3002511389 | 32.161129 | -103.1241226 | 1       | 25S      | 37E   | E    | 1980N | 330W  | LEA    | NM    |         | JUSTIS NORTH | FUSSELMAN | 135000  | 77000        | 500             | 5320        |
| WESTATES FEDERAL #008  | 3002511393 | 32.162121 | -103.1241226 | 1       | 25S      | 37E   | E    | 1620N | 330W  | LEA    | NM    |         | JUSTIS NORTH | FUSSELMAN | 91058   | 51020        | 376             | 4783        |
| WESTATES FEDERAL #008  | 3002511393 | 32.162121 | -103.1241226 | 1       | 25S      | 37E   | E    | 1620N | 330W  | LEA    | NM    |         | JUSTIS NORTH | FUSSELMAN | 86847   | 50450        | 363             | 2544        |
| STATE Y #009   | 3002511777 | 32.10582  | -103.1113434 | 25      | 25S      | 37E   | A    | 990N  | 990E  | LEA    | NM    |         | JUSTIS       | FUSSELMAN | 219570  | 129000       | 960             | 4630        |
| STATE Y #009   | 3002511777 | 32.10582  | -103.1113434 | 25      | 25S      | 37E   | A    | 990N  | 990E  | LEA    | NM    |         | JUSTIS       | FUSSELMAN | 163430  | 96000        | 290             | 3780        |
| SOUTH JUSTIS UNIT #023C  | 3002511760 | 32.106728 | -103.1184616 | 25      | 25S      | 37E   | C    | 660N  | 2080W | LEA    | NM    |         | JUSTIS       | FUSSELMAN | 63817   | 35870        | 360             | 3442        |
| CARLSON A #002   | 3002511764 | 32.100384 | -103.1113434 | 25      | 25S      | 37E   | I    | 2310S | 990E  | LEA    | NM    |         | JUSTIS       | FUSSELMAN | 208280  | 124000       | 510             | 3400        |
| CARLSON B 25 #004  | 3002511784 | 32.096756 | -103.1113434 | 25      | 25S      | 37E   | P    | 990S  | 990E  | LEA    | NM    |         | JUSTIS       | FUSSELMAN | 184030  | 112900       | 68              | 1806        |

**Attachment 5**

Water Well Map and Well Data





**Legend**

★ Proposed SWD

**NMOSE PODs**

**Status**

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

Water Wells Area of Review

Muir Federal SWD #2  
Lea County, New Mexico

Proj Mgr:  
Dan Arthur

October 15, 2019

Mapped by:  
Ben Bockelmann

Prepared by:





Note: No water wells are present within 1 mile of the proposed SWD location.

**Attachment 6**

Induced Seismicity Assessment Letter



November 7, 2019

Mr. Phillip Goetze, P.G.  
NM EMNRD – Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, NM 87505

Subject: Induced Seismicity Potential Statement for the Muir Federal SWD #2

Dear Mr. Goetze,

This letter provides information regarding the seismic potential associated with injection operations associated with Vista Disposal Solutions, LLC (Vista), proposed Muir Federal SWD #2, hereinafter referred to as the “Subject Well.”

As outlined herein, based on my experience as an expert on the issue of induced seismicity, it is my opinion that the potential for the proposed injection well to cause injection-induced seismicity is expected to be minimal, at best. This conclusion is based on (1) the lack of historic seismic activity and faulting in the area, (2) the low fault slip potential (FSP) of Precambrian faults in the area, (3) the presence of confining layers, and (4) the overall vertical distance between the proposed injection zone and basement rock.

The Subject Well, is located 1,245’ FSL & 200’ FEL of Section 30, in T26-S and R34-E of Lea County, New Mexico. Historically, the Eddy and Lea Counties area has experienced very limited recorded seismic activity (per the U.S. Geological Survey [USGS] earthquake catalog database). There has been one known seismic event located within a 25-mile radius of the proposed Subject Well. The closest recorded seismic event was a M2.9 that occurred on December 4<sup>th</sup>, 1984, and was located approximately 17.9 miles northwest of the Subject Well (See Exhibit 1). The closest Class IID well injecting into the same formations (Devonian-Silurian) of the Subject Well is approximately 2.6 miles to the northeast (See Exhibit 1).

Vista does not own either 2D or 3D seismic reflection data in the area of the Subject Well. Fault data from USGS indicates that the closest known fault is approximately 9.8 miles east of the Subject Well (See Exhibit 1).

In a recent paper written by Snee and Zoback (2018) entitled “State of Stress in the Permian Basin, Texas and New Mexico: Implications for Induced Seismicity,” the authors found that large groups of mostly north-south striking Precambrian basement faults, predominantly located along the Central Basin Platform, the western Delaware Basin, and large parts of the Northwest Shelf (which includes Eddy and Lea counties, New Mexico) have low FSP at the modeled fluid-pressure

Induced Seismicity Potential Statement for the Muir Federal SWD #2  
November 7, 2019

perturbation. The map in Exhibit 2 depicts the low probability risk of FSP for the Delaware Basin and Northwest Shelf areas (Snee and Zoback 2018).

Geologic analysis indicates that the proposed Devonian-Silurian injection zone is overlain by approximately 200 to 400 feet of Woodford Shale, which is the upper confining zone and will serve as a barrier for upward injection fluid migration. Additionally, the Simpson Group that lies directly below the Montoya Formation will act as a lower confining zone to prohibit fluids from migrating downward into the underlying Ellenberger Formation and Precambrian basement rock. See the stratigraphic column for the Delaware Basin included in Exhibit 3.

In the Eddy and Lea Counties area of New Mexico, the Simpson Group is comprised of a series of Middle to Upper Ordovician carbonates, several sandstones, and sandy shales that range from approximately 350 to 650 feet thick (Jones 2008). This group of rocks is capped by the limestones of the Bromide Formation, which is approximately 200 feet thick in this area (Jones 2008). The closest deep well drilled into the Precambrian basement was completed by the Skelly Oil Company in 1975. This well is located in Section 17, Range 36E, Township 25S of Lea County (API No.30-025-25046) and encountered 602 feet of Ellenburger Formation before reaching the top of the Precambrian granite at a depth of 18,920 feet. Based on the estimated thickness of the Simpson Group and Ellenburger Formation in this area, the Precambrian basement should be approximately 1,000 to 1,200 feet below the bottom of the proposed injection zones in the Subject Well.

### **Conclusion**

As an expert on the issue of induced seismicity, it is my opinion that the potential for the proposed injection well to cause injection-induced seismicity is expected to be minimal, at best. This conclusion is based on (1) the lack of historic seismic activity and faulting in the area, (2) the low FSP of Precambrian faults in the area, (3) the presence of confining layers, and (4) the overall vertical distance between the proposed injection zone and basement rock.

Sincerely,  
ALL Consulting



J. Daniel Arthur, P.E., SPEC  
President and Chief Engineer

Enclosures  
References  
Exhibits



Induced Seismicity Potential Statement for the Muir Federal SWD #2  
November 7, 2019

## **References**

Induced Seismicity Potential Statement for the Muir Federal SWD #2  
November 7, 2019

Ball, Mahlon M. 1995. "Permian Basin Province (044)." In *National Assessment of United States Oil and Gas Resources—Results, Methodology, and Supporting Data*. U.S. Geological Survey. <https://certmapper.cr.usgs.gov/data/noga95/prov44/text/prov44.pdf> (accessed June 18, 2018).

Green, G.N., and G.E. Jones. 1997. "The Digital Geologic Map of New Mexico in ARC/INFO Format." U.S. Geological Survey Open-File Report 97-0052. <https://mrdata.usgs.gov/geology/state/state.php?state=NM> (accessed June 14, 2018).

Jones, Rebecca H. 2008. "The Middle-Upper Ordovician Simpson Group of the Permian Basin: Deposition, Diagenesis, and Reservoir Development." [http://www.beg.utexas.edu/resprog/permianbasin/PBGSP\\_members/writ\\_synth/Simpson.pdf](http://www.beg.utexas.edu/resprog/permianbasin/PBGSP_members/writ_synth/Simpson.pdf) (accessed June 19, 2018).

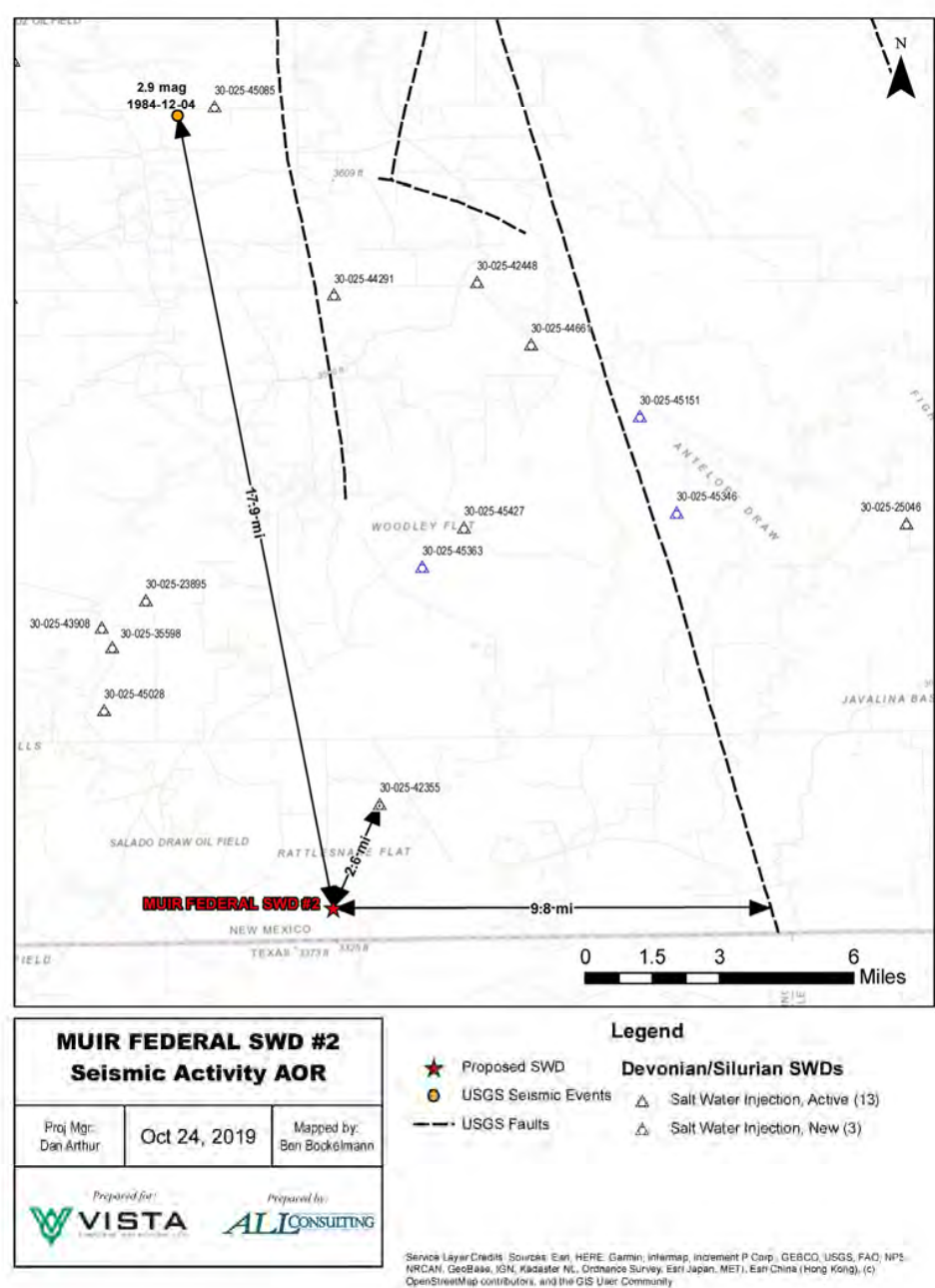
Snee, Jens-Erik Lund, and Mark D. Zoback. 2018. "State of Stress in the Permian Basin, Texas and New Mexico: Implications for Induced Seismicity." *The Leading Edge* 37, no. 2 (February 2018): 127-34.

U.S. Geological Survey (USGS). No date. Earthquakes Hazard Program: Earthquake Catalog. <https://earthquake.usgs.gov/earthquakes/search/> (accessed June 14, 2018).

Induced Seismicity Potential Statement for the Muir Federal SWD #2  
November 7, 2019

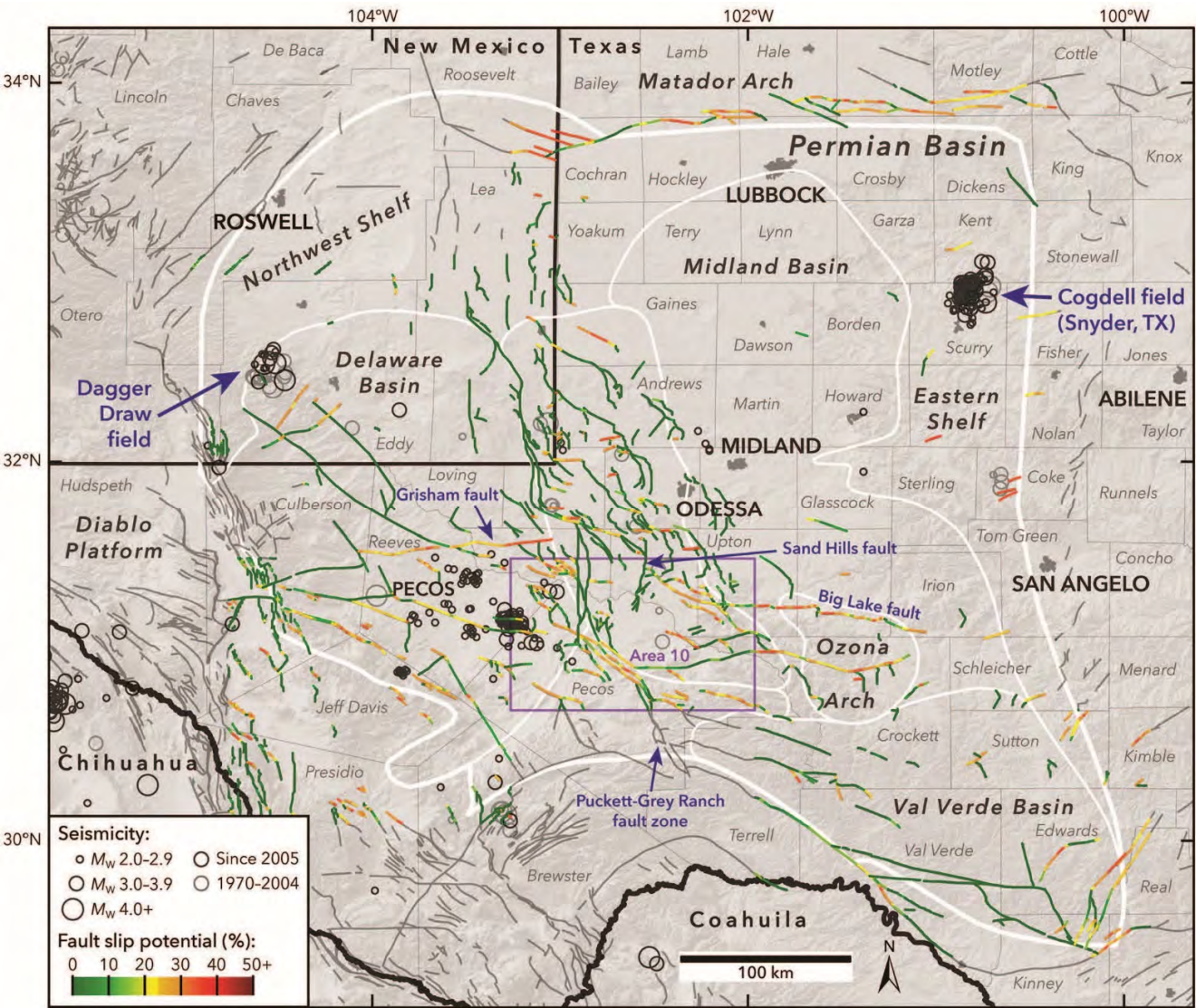
## **Exhibits**

Induced Seismicity Potential Statement for the Muir Federal SWD #2  
November 7, 2019



**Exhibit 1. Map Showing the Distances from Known and Inferred Faults, Seismic Event, and Closest Deep Injection Well**

Induced Seismicity Potential Statement for the Muir Federal SWD #2  
November 7, 2019



**Exhibit 2. Results of the Snee and Zoback (2018) Probabilistic FSP Analysis Across the Permian Basin**

Induced Seismicity Potential Statement for the Muir Federal SWD #2  
November 7, 2019

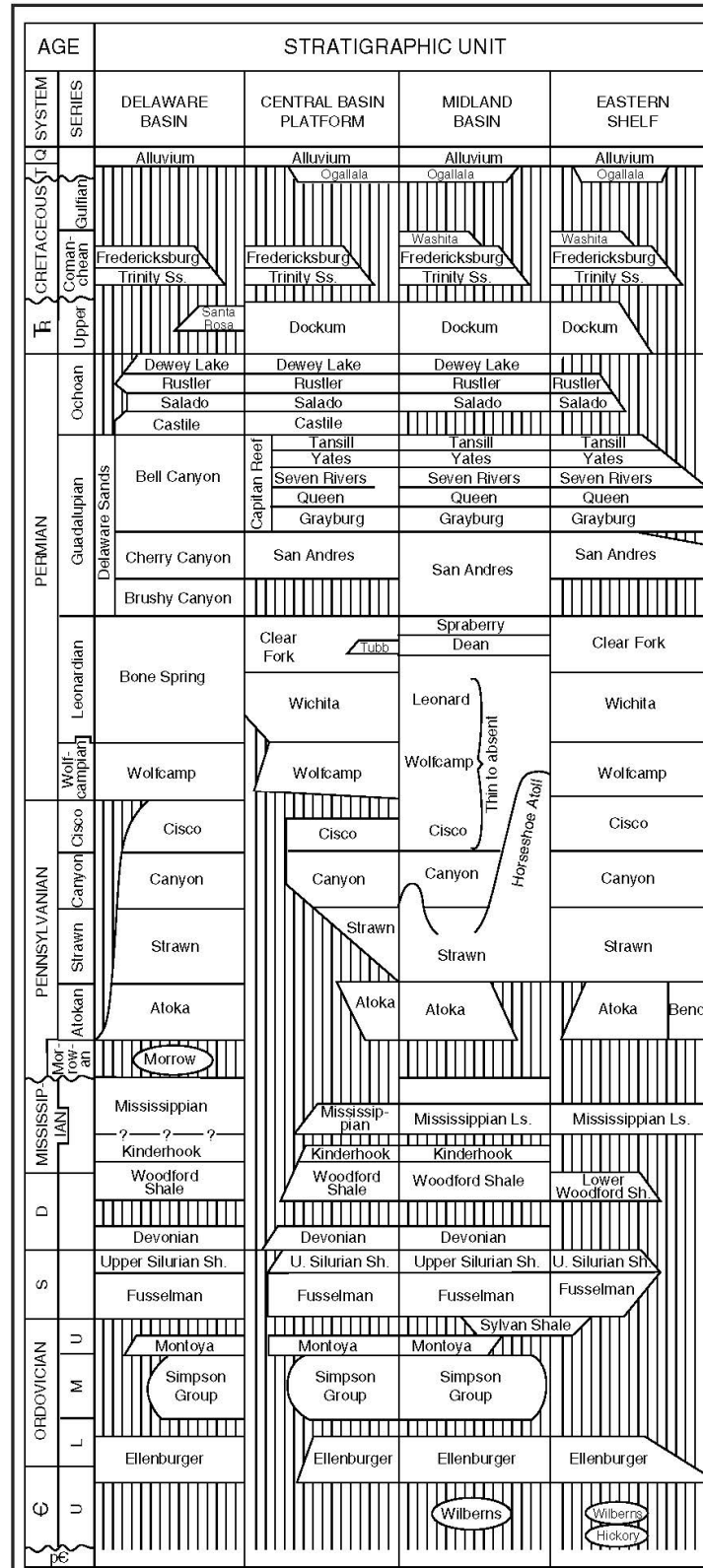


Exhibit 3. Delaware Basin Stratigraphic Chart (Ball 1995)



**Attachment 7**

Public Notice Affidavit and Notice of Application Confirmations

**APPLICATION FOR AUTHORIZATION TO INJECT**

NOTICE IS HEREBY GIVEN: That Vista Disposal Solutions, LLC, 12444 NW 10<sup>th</sup> St., Building G, Suite 202-512, Yukon, OK 73099, 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: Muir Federal SWD #2

Located 19.5 miles southwest of Jal, NM

SE ¼ SE ¼, Section 30, Township 26S, Range 34E

1245' FSL & 200' FEL

Lea County, NM

NAME AND DEPTH OF DISPOSAL ZONE: Devonian – Silurian (17,500' – 18,780')

EXPECTED MAXIMUM INJECTION RATE: 40,000 Bbls/day

EXPECTED MAXIMUM INJECTION PRESSURE: 3,500 psi (surface)

Objections or requests for hearing must be filed with the New Mexico Oil Conservation Division within fifteen (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 Nate Alleman at 918-382-7581.



# Affidavit of Publication

STATE OF NEW MEXICO  
COUNTY OF LEA

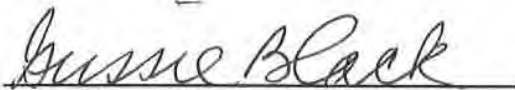
I, Daniel Russell, Publisher of the Hobbs News-Sun, a newspaper published at Hobbs, New Mexico, solemnly swear that the clipping attached hereto was published in the regular and entire issue of said newspaper, and not a supplement thereof for a period of 1 issue(s).

Beginning with the issue dated  
November 02, 2019  
and ending with the issue dated  
November 02, 2019.



Publisher

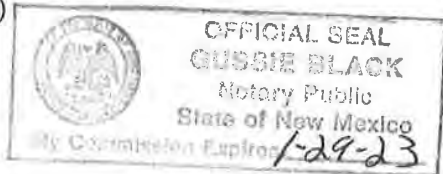
Sworn and subscribed to before me this  
2nd day of November 2019.



Business Manager

My commission expires  
January 29, 2023

(Seal)



This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937 and payment of fees for said

**LEGAL NOTICE**  
**NOVEMBER 2, 2019**

**APPLICATION FOR AUTHORIZATION TO INJECT**

NOTICE IS HEREBY GIVEN: That Vista Disposal Solutions, LLC, 12444 NW 10th St., Building G, Suite 202-512, Yukon, OK 73099, 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: Muir Federal SWD #2  
Located 19.5 miles southwest of Jal, NM  
SE 1/4 SE 1/4, Section 30, Township 26S, Range 34E  
1245' FSL & 200' FEL  
Lea County, NM

NAME AND DEPTH OF DISPOSAL ZONE: Devonian - Silurian (17,500' - 18,780')

EXPECTED MAXIMUM INJECTION RATE: 40,000 Bbls/day

EXPECTED MAXIMUM INJECTION PRESSURE: 3,500 psi (surface)

Objections or requests for hearing must be filed with the New Mexico Oil Conservation Division within fifteen (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 Nate Alleman at 918-382-7581.  
#34834

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DANIEL ARTHUR  
ALL CONSULTING  
1718 S. CHEYENNE AVE.  
TULSA, OK 74119

| Muir Federal SWD #2 - Notice of Application Recipients  |                        |          |       |          |
|---|------------------------|----------|-------|----------|
| Entity  | Address                | City     | State | Zip Code |
| Landowner & Mineral Owner   |                        |          |       |          |
| New Mexico BLM  | 620 E Greene St.       | Carlsbad | NM    | 88220    |
| OCD District  |                        |          |       |          |
| NMOCD District 1  | 1625 N. French Drive   | Hobbs    | NM    | 88240    |
| Leasehold Operators   |                        |          |       |          |
| Chevron USA Inc. (CHEVRON USA INC)  | 6301 Deauville         | Midland  | TX    | 79706    |
| Commision of Public Lands - State Land Office   | 310 Old Santa Fe Trail | Santa Fe | NM    | 87501    |
| Devon Energy Production Company, LP<br>(DEVON ENERGY PROD CO LP)<br>(DEVON ENERGY PRODUCTION CO.)   | 6488 Seven Rivers Hwy. | Artesia  | NM    | 88210    |
| ECHO Production, Inc. (ECHO PROD INC)   | P.O. Box 1210          | Graham   | TX    | 76450    |
| EOG Resources, Inc. (EOG RESOURCES INC)   | 104 S. 4th Street      | Artesia  | NM    | 88210    |
| Railroad Commission of Texas<br>Technical Permitting Section - UIC Program<br>(TEXAS)   | P.O. Box 12967         | Austin   | TX    | 78711    |
| <b>Notes:</b> The table above shows the Entities who were identified as parties of interest requiring notification on either the 1-mile well detail list (Attachment 2) or on the 2-mile Mineral Lease Map (Attachment 2). The names listed above in parenthesis, are the abbreviated entity names used on either the 1-mile well detail list (Attachment 2) or on the 2-mile Mineral Lease Map (Attachment 2). |                        |          |       |          |

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Chevron USA Inc.  
6301 Deauville  
Midland TX 79706-2964

Devon Energy Production Company, LP  
6488 Seven Rivers Hwy.  
Artesia NM 88210-9134

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ECHO Production, Inc.  
P.O. Box 1210  
Graham TX 76450-1210

EOG Resources, Inc.  
104 S. 4th Street  
Artesia NM 88210-2123

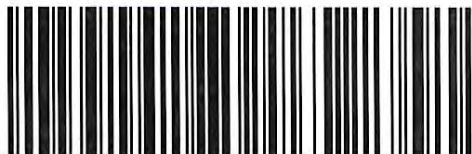


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New Mexico BLM  
620 E. Greene St.  
Carlsbad NM 88220-6292

NMOCD District 1  
1625 N. French Drive  
Hobbs NM 88240-9273

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Technical Permitting Section - UIC Program  
Railroad Commission of Texas  
P.O. Box 12967  
Austin TX 78711-2967

Commission of Public Lands  
State Land Office  
310 Old Santa Fe Trail  
Santa Fe NM 87501-2708