

**STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION**

**APPLICATION OF AWR DISPOSAL, LLC
TO APPROVE SALT WATER
DISPOSAL WELL IN LEA
COUNTY, NEW MEXICO.**

**CASE NO. 21031
(MULEDOM)**

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**STATE OF NEW MEXICO
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**APPLICATION OF AWR DISPOSAL, LLC
TO APPROVE SALT WATER
DISPOSAL WELL IN LEA
COUNTY, NEW MEXICO.**

CASE NO. _____

APPLICATION

AWR Disposal, LLC ("AWR"), OGRID No. 328805, through its undersigned attorneys, hereby makes this application to the Oil Conservation Division pursuant to the provisions of N.M. Stat. Ann. § 70-2-12, for an order approving drilling of a salt water disposal well in Lea County, New Mexico. In support of this application, AWR states as follows:

(1) AWR proposes to drill the Muledome SWD #1 well at a surface location 1389 feet from the North line and 356 feet from the West line of Section 30, Township 22 South, Range 33 East, NMPM, Lea County, New Mexico for the purpose of operating a salt water disposal well.

(2) AWR seeks authority to inject salt water into the Devonian-Silurian formation at a depth of 16,083' -17,701'.

(3) AWR intends to use 7 inch tubing inside the surface and intermediate casings and 5 ½ inch tubing inside the liner and requests that the Division approve a maximum daily injection rate for the well of 50,000 bbls per day.

(4) AWR anticipates using an average pressure of 2,400 psi for this well, and it requests that a maximum pressure of 3,216 psi be approved for the well.

(5) A proposed C-108 for the subject well is attached hereto in Attachment A.



(6) The granting of this application will avoid the drilling of unnecessary wells, will prevent waste, and will protect correlative rights.

WHEREFORE, AWR requests that this application be set for hearing before an Examiner of the Oil Conservation Division on February 6, 2020; and that after notice and hearing, the Division enter its order approving this application.

Respectfully submitted,

MODRALL, SPERLING, ROEHL, HARRIS
& SISK, P.A.

By: Deana H. Bennett
Deana Bennett
Post Office Box 2168
500 Fourth Street NW, Suite 1000
Albuquerque, New Mexico 87103-2168
Telephone: 505.848.1800
Attorneys for Applicant

CASE NO. _____: Application of AWR Disposal, LLC for approval of salt water disposal well in Lea County, New Mexico. Applicant seeks an order approving the Muledome SWD #1 well at a surface location 1389 feet from the North line and 356 feet from the West line of Section 30, Township 22 South, Range 33 East, NMPM, Lea County, New Mexico for the purpose of operating a salt water disposal well. Applicant requests authorization to inject salt water into the Devonian-Silurian formation at a depth of 16,083'-17,701'. Applicant requests that the Division approve a maximum daily injection rate for the well of 50,000 bbls per day. Said location is approximately 27.3 miles west of Eunice, New Mexico.

RECEIVED:	REVIEWER:	TYPE:	APP NO:
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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: AWR DISPOSAL LLC **OGRID Number:** 328805
Well Name: MULEDOVE SWD #1 **API:** TBD
Pool: SWD; DEVONIAN-SILURIAN **Pool Code:** 97869

**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

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.

CHRIS WEYAND

Print or Type Name


Signature

12/3/2019
 Date
512.600.1764

Phone Number

CHRIS@LONQUIST.COM
 e-mail Address


APPLICATION FOR AUTHORIZATION TO INJECT

- I. PURPOSE: Secondary Recovery Pressure Maintenance ☒ Disposal Storage
Application qualifies for administrative approval? ☒ Yes No
- II. OPERATOR: AWR DISPOSAL, LLC
ADDRESS: 3300 N. A Street, Ste 220, Midland, Texas 79705
CONTACT PARTY: Chris Weyand (Agent) PHONE: 512-600-1764
- 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 ☒ 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: Christopher B. Weyand TITLE: Consulting Engineer
SIGNATURE:  DATE: 12/3/2019
E-MAIL ADDRESS: chris@lonquist.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: _____

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

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.

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.

Side 1

INJECTION WELL DATA SHEET

OPERATOR: AWR DISPOSAL, LLC

WELL NAME & NUMBER: MULEDOME SWD #1

WELL LOCATION: 1389' FNL & 356' FWL E 30 22S 33E
FOOTAGE LOCATION UNIT LETTER SECTION TOWNSHIP RANGE

WELLBORE SCHEMATIC

WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 24.000"

Casing Size: 20.000"

Cemented with: 1336 sx.

or _____ ft³

Top of Cement: Surface

Method Determined: Circulation

1" Intermediate Casing

Hole Size: 17.500"

Casing Size: 13.375"

Cemented with: 4,026 sx.

or _____ ft³

Top of Cement: Surface

Method Determined: Circulation

2" Intermediate Casing

Hole Size: 12.250"

Casing Size: 9.625"

Cemented with: 3,433 sx.

or _____ ft³

Top of Cement: Surface

Method Determined: Circulation

Production Liner

Hole Size: 8.500"

Casing Size: 7.625"

Cemented with: 202 sx.

or _____ ft³

Top of Cement: 11,750'

Method Determined: Logged

Total Depth: 17,701'

Injection Interval

16,083 feet to 17,701 feet

(Open Hole)

INJECTION WELL DATA SHEET

Tubing Size: 7", 26 lb/ft. P-110, TCPC from 0' - 11,650' and 5.500", 17 lb/ft. P-110 TCPC from 11,650' - 15,983'

Lining Material: Duoline

Type of Packer: 7-5/8" x 5-1/2" TCPC Permanent Packer with High Temp Elastomer and Full Inconel 925 trim

Packer Setting Depth: 15,983'

Other Type of Tubing/Casing Seal (if applicable): _____

Additional Data

1. Is this a new well drilled for injection? X Yes No

If no, for what purpose was the well originally drilled? N/A

2. Name of the Injection Formation: Devonian, Silurian, Fusselman and Montova (Top 100')

3. Name of Field or Pool (if applicable): SWD; Devonian-Silurian

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used. No, new drill.

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area:

Delaware: 4,959'

Bone Spring: 8,764'

Wolfcamp: 12,182'

Strawn: 13,687'

Atoka: 13,850'

Morrow: 14,333'

AWR Disposal, LLC

Muledome SWD No. 1

FORM C-108 Supplemental Information

III. Well Data

A. Wellbore Information

1.

Well information	
Lease Name	Muledome SWD
Well No.	1
Location	S-30 T-22S R-33E
Footage Location	1389' FNL & 356' FWL

2.

a. Wellbore Description

Casing Information				
Type	Surface	Intermediate 1	Intermediate 2	Production Liner
OD	20"	13.375"	9.625"	7.625"
WT	0.500"	0.455"	0.545"	0.500"
ID	19.000"	12.415"	8.535"	6.625"
Drift ID	18.812"	12.259"	8.535"	6.500"
COD	21.00"	14.375"	10.625"	7.625"
Weight	106.5 lb/ft	68 lb/ft	53.5 lb/ft	39 lb/ft
Grade	J-55	HCL-80	P-110	HCP-110
Hole Size	24"	17.5"	12.25"	8.5"
Depth Set	1,250'	5,100'	12,250'	11,750' – 16,083'

b. Cementing Program

Cement Information				
Casing String	Surface	Intermediate 1	Intermediate 2	Liner
Cement Type	Lead: Extendacem Tail: Halcem	Halcem	Halcem	Neocem
Cement Volume	Lead: 714 sx Tail: 622 sx	4,026 sx	Stage 1: 1,441 sx Stage 2: 933 sx Stage 3: 1,059 sx	202
Cement Excess	75%	100%	50%	50%
TOC	Surface	Surface	Surface	11,750'
Method	Circulate to Surface	Circulate to Surface	Circulate to Surface	Logged

3. Tubing Description

Tubing Information		
OD	7"	5.5"
WT	0.362"	0.304"
ID	6.276"	4.892"
Drift ID	7.875"	6.050"
COD	6.151"	4.653"
Weight	26 lb/ft	17 lb/ft
Grade	P-110 TCPC	P-110 TCPC
Depth Set	0'-11,650'	11,650' -15,983'

Tubing will be lined with Duoline.

4. Packer Description

7-5/8" x 5-1/2" TCPC Permanent Packer with High Temp Elastomer and Full Inconel 925 trim

B. Completion Information

1. Injection Formation: Devonian, Silurian, Fusselman, Montoya (Top 100')
2. Gross Injection Interval: 16,083' – 17,701'

Completion Type: Open Hole

3. Drilled for injection.
4. See the attached wellbore schematic.
5. Oil and Gas Bearing Zones within area of well:

Formation	Depth
Delaware	4,959'
Bone Spring	8,764'
Wolfcamp	12,182'
Strawn	13,687'
Atoka	13,850'
Morrow	14,333'

VI. Area of Review

No wells within the area of review penetrate the proposed injection zone.

VII. Proposed Operation Data

1. Proposed Daily Rate of Fluids to be Injection:

Average Volume: 40,000 BPD

Maximum Volume: 50,000 BPD

2. Closed System

3. Anticipated Injection Pressure:

Average Injection Pressure: 2,400 PSI (surface pressure)

Maximum Injection Pressure: 3,216 PSI (surface pressure)

4. The injection fluid is to be locally produced water. It is expected that the source water will predominantly be from the Bone Spring and Wolfcamp formations. Attached are produced water sample analyses taken from the closest wells that feature samples from the Delaware, Bone Spring, Wolfcamp, Strawn, Atoka, and Morrow formations.
5. The disposal interval is non-productive. No water samples are available from the surrounding area.

VIII. Geological Data

The Devonian formation is a dolomitic ramp carbonate that occurs below the Woodford shale and above the Fusselman formation. Strata found in the Devonian formation include two major groups, the Wristen Buildups and the Thirtyone Deepwater Chert, with the Wristen being more abundant. The Wristen Groups is composed of mixed limestone and dolomites with mudstone to grainstone and boundstone textures. Porosity in the Wristen group is a result of both primary and secondary development. Present are moldic, vugular, karstic (including collapse breccia) features that allow for higher porosities and permeabilities. The Thirtyone Formation contains two end-member reservoir facies, skeletal packstones/grainstones and spiculitic chert, with most of the porosity and permeability found in the coarsely crystalline cherty dolomite. These particular characteristics allow for this formation to be a tremendous Salt Water Disposal horizon.

A. Injection Zone: Siluro-Devonian Formation

Formation	Depth
Rustler Anhydrite	1,101'
Castile	3,404'
Lamar	4,910'
Delaware	4,959'
Bone Spring	8,764'
Wolfcamp	12,182'
Strawn	13,687'
Atoka	13,850'
Morrow	14,333'
Mississippian	15,543'
Woodford	15,774'
Devonian	16,033'
Fusselman	17,033'
Montoya	17,601'

B. Underground Sources of Drinking Water

No water wells exist within one mile of the proposed well location. Water wells in the surrounding area have an average total depth of 320 ft and an average depth to water of 184 ft generally producing from the Santa Rosa. The upper Rustler may also be another USDW and will be protected.

IX. Proposed Stimulation Program

Stimulate with up to 50,000 gallons of acid.

X. Logging and Test Data on the Well

There are no logs or test data on the well. During the process of drilling and completion resistivity, gamma ray, and density logs will be run.

XI. Chemical Analysis of Fresh Water Wells

No water wells exist within one mile of the proposed well location.

XII. Affirmative Statement of Examination of Geologic and Engineering Data

Based on the available engineering and geologic data we find no evidence of open faults or any other hydrologic connection between the disposal zone (in the proposed Muledome SWD #1) and any underground sources of drinking water.

NAME: Herb Wacker

TITLE: Geologist

SIGNATURE: Herb Wacker

DATE: Nov. 1, 2019

TBAG# 4517

AWR DISPOSAL LLC		Muledome SWD #1		Location - Sec 30 T22S R33E		TD 17,701		Directions to Site - From Jal, NM - Travel 35.2 miles West on NM-128. Turn right (N) onto Red Road and travel 22 miles to location.	
Vertical Injection - Devonian, Silurian, Fusselman		Lea County NM		GL/XB		3738' / 3768'		Lat/Long: 32.3662781/-103.6184143	
Geologic Tops (MD ft)	Section	Problems	Bit/BHA	Mud	Casing	Logging	Cement (HOLD)	Injection String	
Rustler Anhydrite - 1101 Surface TD - 1250	Surface Drill 24" 0' - 1250' Set and Cement 20" Casing	Loss Circulation Hole Cleaning Wellbore stability in the Red Beds Anhydrite in the Rustler	24" Tricone 9-5/8" x 8" MM 9 jts: 8" DC 21 jts: 5" HWDP 5" DP to surface	Spud Mud MW< 9.0	1250' of 20" 106.5# J55 BTC Centralizers - bottom 2 joints and every 3rd jt thereafter, Cement basket 5th jt from surface	No Logs	Lead: 714 sx 13.7 ppg EXTENDACEM, 1.694 ft3/sk (800') 75% excess Tail: 622sx 14.8 ppg HALCEM, 1.342 ft3/sk (200') 75% excess Cement to Surface	11650' of 7" P110 26# TCPC 4333' of 5-1/2" P110 17# TCPC Duoline Internally Coated Injection Tubing	
Top Salt - 3404 Base Salt (Lamar top) - 4910 1st Int TD - 5100	1st Intermediate Drill 3850' of 17-1/2" Hole 1250' - 5100' Set and Cement 13-3/8" Casing	Seepage Losses Possible H2S Anhydrite Salt Sections	17-1/2" PDC 9-5/8" x 8" MM 9 jts: 8" DC 21 jts: 5" HWDP 5" DP to surface	Brine Water <11ppg	SM A Section Casing Bowl 5100' of 13-3/8" 68# HCL80 BTC. Externally coated 1100 - 5100' Centralizers - bottom jt, every 3rd joint in open hole and 2 jt inside the surface casing	Mudlogger on site by 1250'	4026sx of 13.7ppg Halcem (100% XS in OH) with 5% Miccobond. Cement to surface		
9-5/8" ECP DV Tool - 5150 Bell Canyon - 4959 Cherry Canyon - 5812 Brushy Canyon - 7182 DV Tool - 8500 Bone Spring - 8764 3rd Int Liner Top - 11,750 Wolfcamp - 12182 2nd Int TD - 12,250	2nd Intermediate Drill 7150' of 12-1/4" Hole 5100' - 12250' Set 9-5/8" Intermediate Casing and Cement in 3 Stages	Hard Drilling in the Brushy Canyon Seepage to Complete Loss Water Flows Some Anhydrite H2S possible Production in the Bone Spring and Wolfcamp Ballooning is possible in Cherry Canyon and Brushy if Broken Down	12-1/4" PDC 8" MM 9jts: 8" DC 8" Drilling Jars 21 jts: 5" HWDP 5" DP to Surface	WBM with Produced FW until Loss of circulation	10M B Section 12250' of 9-5/8" 53.5# P110 BTC Special Drift to 8.535" Externally Coat Between DV Tools DV tool at at 8500' ECP DV Tool at 5150' Centralizers - bottom jt, 100' aside of DV tool, every 3rd joint in open hole and 5 within the surface casing	MWD GR Triple combo + CBL of 13-3/8" Casing	Stage 3: 1059 sx 13.7 ppg HalCem™ C 10% XS 1000psi CSD after 10 hrs Cement to Surface Stage 2: 933 sx of 13.7 ppg HalCem™ C 50% XS 1000psi CSD after 10 hrs Cement to Surface Stage 1: 1441 sx 15.6 ppg HalCem™ 50% XS 1000psi CSD after 10 hrs Cement to Surface		
Strawn - 13687 Morrow - 14333 Miss Lst - 15543 Woodford - 15774 Perm Packer - 15,983 3rd Int TD - 16,083	3rd Intermediate Drill 3833' of 8-1/2" Hole 12250' - 16083' Set 7-5/8" Liner and Cement in Single Stage	High Pressure (up to 15ppg) and wellbore instability (fracturing) expected in the Wolfcamp Production in the Wolfcamp Atoka and Morrow Hard Drilling in the Morrow Clastic	8-1/2" PDC 6-3/4" MM 9 jts: 6" DC 21 jts: 5" HWDP 5" DP to Surface	12.5 ppg OBM UBD/MPD using ADA (HOLD)	4333' of 7-5/8" 39# HCP110 USS Flush VersaFlex Packer Hanger Centralizers on and 1 jt above shoe jt and then every 2nd jt.	MWD GR Triple combo, CBL of 9-5/8" Casing	202sx of 13.2 ppg NeoCem™ PT2 8hr TT Silica Flour 50% Excess 1000psi CSD after 10hrs	7-5/8" x 5-1/2" TCPC Permanent Packer with High Temp Elastomer and full Inconel 925	
Devonian - 16,033 Fusselman - 17033 Montoya - 17,601' TD - 17,701'	Injection Interval Drill 1618' of 6-1/2" hole 16083' - 17701'	Chert is possible Loss of Circulation is expected H2S encountered on the Striker 3 well BHT estimated at 280F	6-1/2" PDC 4-3/4" MM 9 jts: 4-3/4" DC 4-3/4" Drilling Jars 18 jts: 4" FH HWDP 4" FH DP to Surface	Cut brine - low grav for possible flows	Openhole completion	MWD GR Triple Combo with FMI, CBL of 7-5/8"	Displace with 3% KCl (or heavier brine if necessary)		

District I
1625 N. French Dr., Hobbs, NM 88340
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 Bravos 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

¹ API Number	² Pool Code 97869	³ Pool Name SWD; DEVONIAN-SILURIAN
⁴ Property Code	⁵ Property Name MULEDOM SWD	⁶ Well Number 1
⁷ OGRID No. 328805	⁸ Operator Name AWR DISPOSAL, LLC	⁹ Elevation 3737'

¹⁰Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	30	22-S	33-E	-	1389'	NORTH	356'	WEST	LEA

¹¹Bottom 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

¹² Dedicated Acres	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ 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.

X=761655.72
Y=499107.81

X=764166.30
Y=499120.50

X=764804.72
Y=499134.77

X=761673.35
Y=493826.81

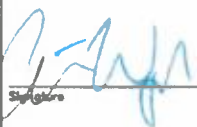
X=764203.19
Y=493844.12

X=766844.19
Y=493865.10

SURFACE LOCATION
NEW MEXICO EAST
NAD 1983
X=762001
Y=497721
LAT.: N 32.3862787
LONG.: W 103.6186392

¹⁷OPERATOR CERTIFICATION

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 undivided 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 is a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

 12/3/2019

Chris Weyand
Printed Name
chris@lonquist.com
E-mail Address

¹⁸SURVEYOR CERTIFICATION

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 to the best of my belief.

04/16/2019

Date of Survey
Signature and Seal of Professional Surveyor

Certificate Number

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) 748-1281 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 and Natural Resources
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-101
Revised July 18, 2013

☐ AMENDED REPORT

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

¹ Operator Name and Address AWR DISPOSAL, LLC 3300 N. A Street, Ste 220 Midland Texas 79705		¹⁷ GRID Number 328805
		¹⁸ API Number TBD
² Property Code	²⁰ Property Name Muledome SWD	¹⁹ Well No. 1

³ Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
E	30	22S	33E	N/A	1389'	NORTH	356'	WEST	LEA

⁴ Proposed Bottom Hole Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
-	-	-	-	-	-	-	-	-	-

⁵ Pool Information

⁶ Pool Name SWD: DEVONIAN-SILURIAN	⁷ Pool Code 97869
--	---------------------------------

Additional Well Information

¹¹ Work Type N	¹² Well Type SWD	¹³ Cable/Rotary R	¹⁴ Lease Type Private	¹⁵ Ground Level Elevation 3,737'
¹⁶ Multiple N	¹⁷ Proposed Depth 17,701'	¹⁸ Formation Devonian-Silurian	¹⁹ Contractor TBD	²⁰ Spud Date ASAP
Depth to Ground water 148'		Distance from nearest fresh water well > 1 mile		Distance to nearest surface water > 1 mile

☐ We will be using a closed-loop system in lieu of lined pits

²¹ Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/lb	Setting Depth	Sacks of Cement	Estimated TOC
Surface	24"	20"	106.5 lb/ft	1,250'	1,336	Surface
Intermediate 1	17.5"	13.375"	68 lb/ft	5,100'	4,026	Surface
Intermediate 2	12.25"	9.625"	53.5 lb/ft	12,250'	3,433	Surface
Prod. Liner	8.5"	7.625"	39 lb/ft	11,750' - 16,083'	202	11,750'

Casing/Cement Program: Additional Comments

See attached schematic.

²² Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Double Hydraulic Blinds, Pipe	10,000 psi	8,000 psi	TBD - Schaffer/Cameron

²³ I hereby certify that the information given above is true and complete to the best of my knowledge and belief.
I further certify that I have complied with 19.15.14.9 (A) NMAC ☐ and/or 19.15.14.9 (B) NMAC ☒ if applicable.
Signature: 

Printed name: Christopher B. Wayand

Title: Consulting Engineer

E-mail Address: chris@longquist.com

Date: 2/3/2019

Phone: (512) 600-1764

OIL CONSERVATION DIVISION

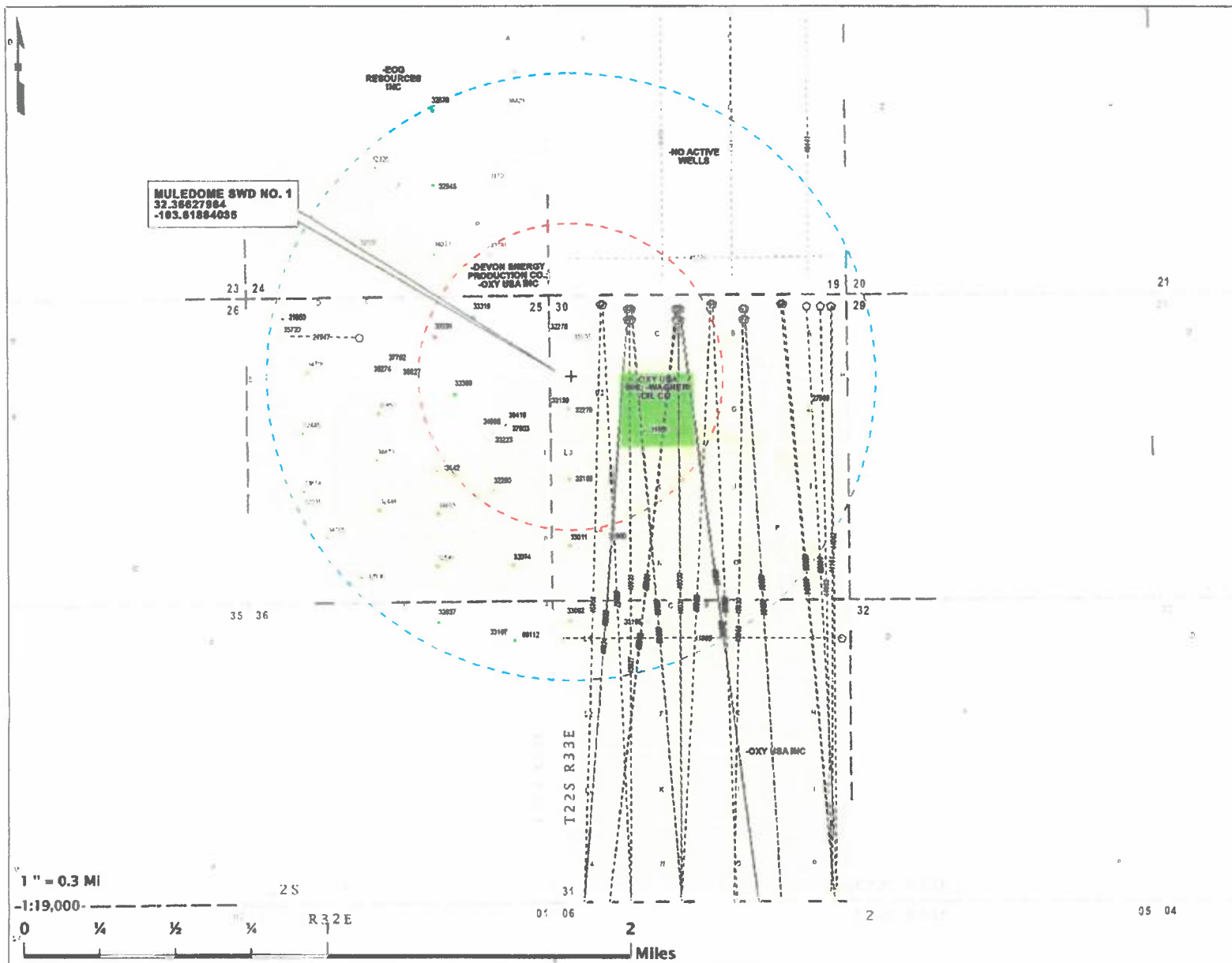
Approved By:

Title:

Approved Date:

Expiration Date:

Conditions of Approval Attached



Muledome SWD No. 1
Offset Operators
1-Mile Area of Review
NGL Water Solutions Permian, LLC
Lea Co., NM

PCS: NAD 1983 NM-E FIPS 3001 (US Ft.)

Drawn by: ELR Date: 12/9/2019 Approved by: CW

LONGUIST & CO. LLC

PROFESSIONAL ENGINEER
JULIAN - HOSPITAL
CHIEF - 201101 STATION

+ Muledome SWD No. 1 SHL

1/2-Mile Radius

1-Mile Radius

2-Mile Radius

QQ Section (NM PLSS-2019)

Section (NM PLSS-2019)

Township (NM PLSS-2019)

Lateral (32)

API (30-025-J) SHL Status-Type (Count)

Horizontal Surface Location (32)

Active - Oil (22)

Cancelled APD - Oil (16)

Expired TA - Oil (1)

Plugged/Not Released - Oil (1)

Permitted - Oil (1)

Plugged/Not Released - Oil (7)

API (30-025-J) SHL Status-Type (Count)

Active - Oil (4)

Cancelled - Oil (4)

Plugged/Not Released - Oil (1)

Permitted - Oil (22)

Plugged/Not Released - Oil (1)

Offset Operator(s)

DEVON ENERGY PRODUCTION CO., - OXY USA INC.

DEVON ENERGY PRODUCTION COMPANY, LP

EDG RESOURCES INC.

OXY USA INC.

OXY USA INC. - WAGNER OIL CO.

NO ACTIVE WELLS

*** Note: All coordinates shown are in NAD 83 GCS (DO). ***

Date: Source:

Well Location: NM OCO (2019)

Well Status: NM OCO (2019)

Map Extent

LEA

EDDY

NEW MEXICO

LOVING

WILSON

GAINES

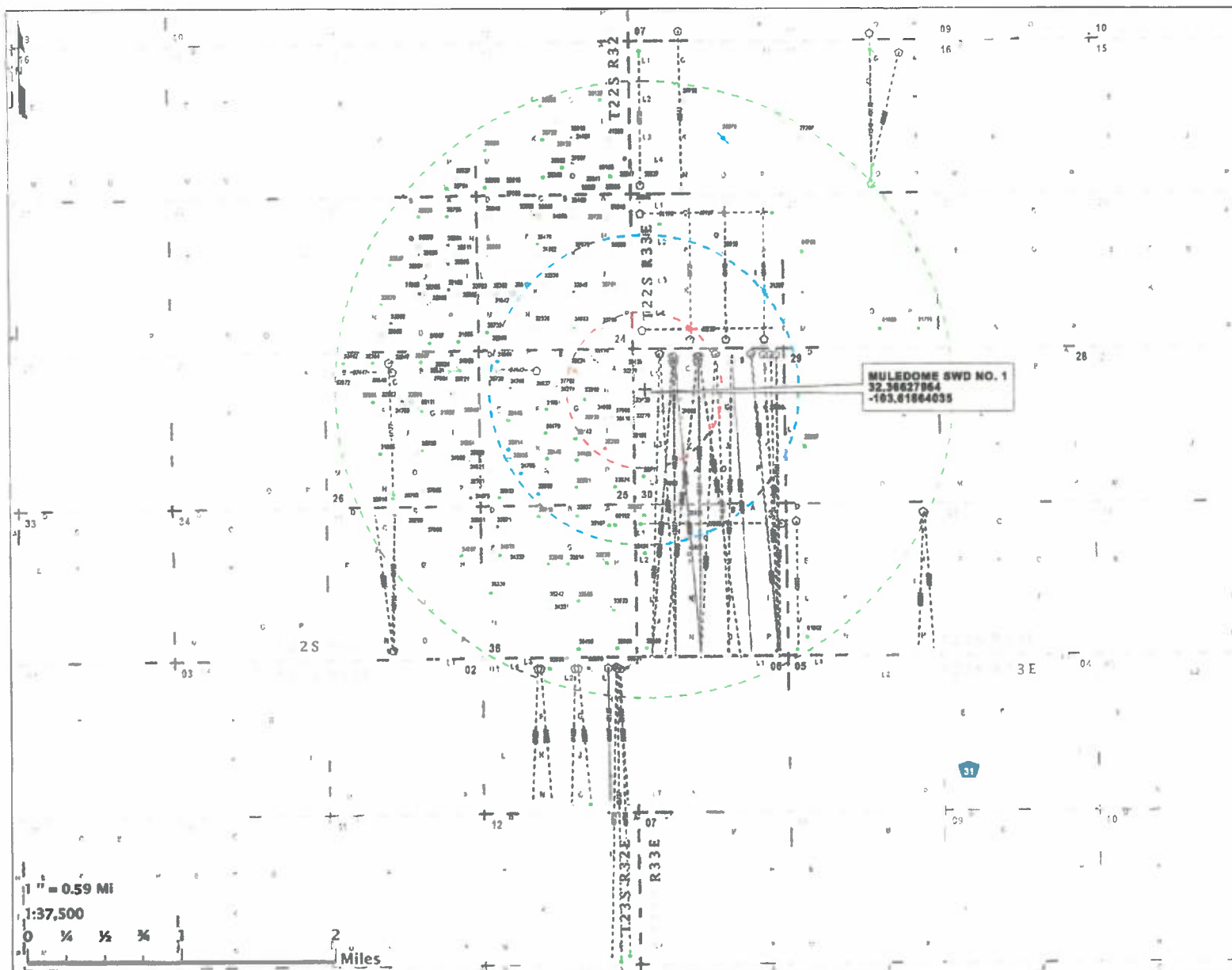
**Muledome SWD No. 1
1-Mile Area of Review List**

API (30-025-...)	WELL NAME	WELL TYPE	STATUS	OPERATOR	TVD (FT.)	LATITUDE (NAD83 DD)	LONGITUDE (NAD83 DD)	DATE DRILLED	FIELD
08132	PRE-ONSARD WELL #001	D	P	PRE-ONSARD WELL OPERATOR	5061	32.15364490	-109.82297130	1/11/1900	
24947	COVINGTON A FEDERAL #001	O	P	OXY USA INC	35150	32.36818310	-109.63059890	2/7/1975	[51681] RED TANK, BONE SPRING; [51682] RED TANK, DELAWARE, WEST
27504	RED TANK 30 STATE #003	D	E	OXY USA INC	5312	32.36458590	-109.60528220	10/24/1981	[6930] BOOTLEG RIDGE, DELAWARE
31850	COVINGTON A FEDERAL #002	O	A	OXY USA INC	10120	32.36907580	-109.63481900	11/7/1993	[51683] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST
31851	COVINGTON A FEDERAL #004	D	A	OXY USA INC	10104	32.36455920	-109.62946320	8/4/1995	[51683] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST
31959	BIGHORN 30 STATE #002	D	A	WAGNER OIL CO	10491	32.36368560	-109.61450200	12/31/9999	[51687] RED TANK, BONE SPRING, EAST
31960	BIGHORN 30 STATE #003	D	C	DEVON ENERGY OPERATING COMPANY LP	9999	32.35828079	-109.61659005	12/31/9999	
32095	COVINGTON A FEDERAL #007L	D	C	POGO PRODUCING CO	9999	32.35999990	-109.63372051	12/31/9999	
32036	COVINGTON A FEDERAL #009	D	A	OXY USA INC	10100	32.35679630	-109.63052370	9/23/1991	[51685] RED TANK, DELAWARE, WEST; [94249] RED TANK, DELAWARE, CO ABANDONED
32278	BIGHORN 30 STATE #005	D	C	DEVON ENERGY OPERATING COMPANY LP	99999	32.36822218	-109.61878092	12/31/9999	
32279	BIGHORN 30 STATE #004	D	C	DEVON ENERGY OPERATING COMPANY LP	99999	32.36459174	-109.61877495	12/31/9999	
32290	COVINGTON A FEDERAL #008	D	A	OXY USA INC	9010	32.36095050	-109.62304690	1/12/1996	[51683] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST
32320	RED TANK 24 FEDERAL #002	D	A	OXY USA INC	10164	32.37615420	-109.62948610	8/24/1995	[51683] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST
32326	RED TANK 24 FEDERAL #001	D	A	OXY USA INC	10160	32.37236400	-109.63054660	12/31/1994	[51683] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST
32445	COVINGTON A FEDERAL #003	D	A	OXY USA INC	8950	32.36143600	-109.61374130	3/4/1998	[51683] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST
32446	COVINGTON A FEDERAL #005	D	A	OXY USA INC	8900	32.36089270	-109.62948320	4/8/1996	[51683] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST
32581	COVINGTON A FEDERAL #010	D	A	OXY USA INC	8990	32.35770740	-109.62825120	5/19/1995	[51683] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST
32837	MULE DEER 36 STATE #001	D	P	EOG RESOURCES INC	9018	32.35458760	-109.62421460	4/7/1995	[51683] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST
32878	JACKALOPE 24 FEDERAL #001	D	P	EOG RESOURCES INC	9014	32.37909320	-109.62828940	11/30/1996	[51683] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST
32945	CHECKERS 24 FEDERAL #001	D	A	DEVON ENERGY PRODUCTION COMPANY, LP	9025	32.37545780	-109.62628170	8/20/1997	[51681] RED TANK, BONE SPRING
33031	RED TANK 30 STATE #003	D	A	OXY USA INC	9020	32.35824200	-109.61876680	7/19/1995	[51687] RED TANK, BONE SPRING, EAST; [51689] RED TANK, DELAWARE, WEST
33074	COVINGTON A FEDERAL #011	D	A	OXY USA INC	9010	32.35732690	-109.62159730	10/28/1995	[51685] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST
33082	RED TANK 31 STATE #001	D	H	OXY USA INC	9010	32.35461040	-109.62876480	9/21/1995	[51687] RED TANK, BONE SPRING, EAST; [51689] RED TANK, DELAWARE, WEST
33107	MULE DEER 36 STATE #004	D	A	EOG RESOURCES INC	9007	32.35499490	-109.62262100	10/10/1995	[51683] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST
33109	RED TANK 30 STATE #002	D	A	OXY USA INC	9010	32.36141590	-109.61877440	4/23/2000	[51687] RED TANK, BONE SPRING, EAST; [51689] RED TANK, DELAWARE, WEST
33130	CALMON 30 STATE #001	D	A	OXY USA INC	9000	32.36473080	-109.61878200	11/27/1995	[51687] RED TANK, BONE SPRING, EAST; [51689] RED TANK, DELAWARE, WEST
33135	CALMON 30 STATE #002	D	C	POGO PRODUCING CO	0	32.36822218	-109.61878032	12/31/9999	
33142	COVINGTON A FEDERAL #013	D	A	OXY USA INC	9000	32.36384690	-109.62625890	12/27/1995	[51683] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST
33196	RED TANK 31 STATE #003	D	C	POGO PRODUCING CO	0	32.35480956	-109.61446915	12/31/9999	
33223	COVINGTON A FEDERAL #012	D	C	POGO PRODUCING CO	0	32.36367545	-109.62306850	12/31/9999	
33234	COVINGTON A FEDERAL #016	D	P	OXY USA INC	8980	32.36820220	-109.62624650	7/23/1996	[51683] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST
33319	COVINGTON A FEDERAL #015	D	P	OXY USA INC	9010	32.36911770	-109.62406920	7/31/1997	[51683] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST
33399	COVINGTON A FEDERAL #014	D	P	OXY USA INC	8966	32.36548230	-109.62519070	4/27/1996	[51683] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST
33614	COVINGTON A FEDERAL #007	D	A	OXY USA INC	8930	32.36090850	-109.62372570	11/15/1996	[51689] RED TANK, DELAWARE, WEST
33701	CHECKERS 24 FEDERAL #008	D	C	DEVON ENERGY PRODUCTION CO.	0	32.37546782	-109.62308814	12/31/9999	
33798	CHECKERS 24 FEDERAL #002	D	C	DEVON ENERGY PRODUCTION CO.	0	32.37231428	-109.62308288	12/31/9999	
34023	CHECKERS 24 FEDERAL #007	D	P	DEVON ENERGY PRODUCTION COMPANY, LP	9066	32.37230460	-109.62627410	4/9/1998	[51683] RED TANK, BONE SPRING
34029	JACKALOPE 24 FEDERAL #004	D	C	BURLINGTON RESOURCES OIL & GAS CO	0	32.37910592	-109.62202022	12/31/9999	
34455	COVINGTON A FEDERAL #037	D	A	OXY USA INC	8940	32.35982510	-109.62615970	11/4/1999	[51683] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST
34479	COVINGTON A FEDERAL #036	D	A	OXY USA INC	8950	32.36235430	-109.62957780	8/6/1998	[51683] RED TANK, BONE SPRING; [51689] RED TANK, DELAWARE, WEST

Muledome SWD No. 1
1-Mile Area of Review List
NM-OCd (2019)

Muledome SWD No. 1
1-Mile Area of Review List

34705	COVINGTON A FEDERAL #034	O	A	OXY USA INC	8975	32.35869890	-103.63240810	10/10/1999	[51689] RED TANK, DELAWARE, WEST
34706	COVINGTON A FEDERAL #035	O	A	OXY USA INC	8950	32.36655040	-103.63740850	10/11/1999	[51689] RED TANK, DELAWARE, WEST
34998	COVINGTON A FEDERAL #012	O	C	POGO PRODUCING CO	0	32.36403566	-103.62228855	12/31/9999	
35720	COVINGTON A FEDERAL #040	O	C	POGO PRODUCING CO	0	32.36816770	-103.63450695	12/31/9999	
36274	COVINGTON A FEDERAL #043C	O	C	POGO PRODUCING CO	0	32.36678931	-103.62842647	12/31/9999	
36416	COVINGTON A FEDERAL #012H	O	C	POGO PRODUCING CO	0	32.36403566	-103.62228855	12/31/9999	
36627	COVINGTON A FEDERAL #045	O	C	POGO PRODUCING CO	0	32.36678931	-103.62842647	12/31/9999	
37003	COVINGTON A FEDERAL #012	O	H	OXY USA INC	0	32.36403660	-103.62227630	12/31/9999	
37282	COVINGTON A FEDERAL #045	O	C	POGO PRODUCING COMPANY LLC	0	32.36678931	-103.62842647	12/31/9999	
40724	MERCHANT LIVESTOCK 19 22 33 STATE COM #002C	O	C	CIMAREX ENERGY CO.	0	32.37185060	-103.61878608	12/31/9999	[51687] RED TANK, BONE SPRING, EAST
40839	MERCHANT LIVESTOCK 19 22 33 STATE COM #002C	O	C	CIMAREX ENERGY CO.	0	32.37094320	-103.61744150	12/31/9999	[51687] RED TANK, BONE SPRING, EAST
40840	MERCHANT LIVESTOCK 19 22 33 STATE COM #003C	O	C	CIMAREX ENERGY CO.	0	32.37093730	-103.60951250	12/31/9999	[51687] RED TANK, BONE SPRING, EAST
40841	MERCHANT LIVESTOCK 19 22 33 STATE COM #004C	O	C	CIMAREX ENERGY CO.	0	32.37093350	-103.60523990	12/31/9999	[51687] RED TANK, BONE SPRING, EAST
41885	RED TANK 31 STATE #005H	O	A	OXY USA INC	10,756	32.35369870	-103.60356140	7/7/2014	[51687] RED TANK, BONE SPRING, EAST
44062	RED TANK 30 31 STATE COM #024	O	H	OXY USA INC	1,090	32.36952830	-103.60399450	10/19/2017	[51687] RED TANK, BONE SPRING, EAST
44063	RED TANK 30 31 STATE COM #034H	O	A	OXY USA INC	11,950	32.36952830	-103.60457750	11/5/2017	[51687] RED TANK, BONE SPRING, EAST
44161	RED TANK 30 31 STATE COM #024Y	O	A	OXY USA INC	10,863	32.36952830	-103.60399450	11/11/2017	[51687] RED TANK, BONE SPRING, EAST
44193	RED TANK 30 31 STATE COM #034H	O	H	OXY USA INC	9,407	32.36952830	-103.60354890	8/3/2018	[51687] RED TANK, BONE SPRING, EAST
45923	AVOGATO 30 31 STATE COM #008H	O	H	OXY USA INC	0	32.36964700	-103.60668300	12/31/9999	[51687] RED TANK, BONE SPRING, EAST
45924	AVOGATO 30 31 STATE COM #021H	O	N	OXY USA INC	0	32.36893600	-103.61542150	7/13/2019	[51687] RED TANK, BONE SPRING, EAST
45925	AVOGATO 30 31 STATE COM #022H	O	N	OXY USA INC	0	32.36893600	-103.61530800	7/10/2019	[51687] RED TANK, BONE SPRING, EAST
45926	AVOGATO 30 31 STATE COM #023H	O	H	OXY USA INC	0	32.36893600	-103.61519500	7/8/2019	[51687] RED TANK, BONE SPRING, EAST
45927	AVOGATO 30 31 STATE COM #032H	O	H	OXY USA INC	0	32.36943100	-103.61530800	6/30/2019	[51687] RED TANK, BONE SPRING, EAST
45928	AVOGATO 30 31 STATE COM #033H	O	N	OXY USA INC	0	32.36943100	-103.61519500	6/24/2019	[51687] RED TANK, BONE SPRING, EAST
45929	AVOGATO 30 31 STATE COM #031H	O	N	OXY USA INC	0	32.36943100	-103.61542200	7/3/2019	[51687] RED TANK, BONE SPRING, EAST
45930	AVOGATO 30 31 STATE COM #034H	O	H	OXY USA INC	0	32.36943100	-103.60856000	6/20/2019	[51687] RED TANK, BONE SPRING, EAST
45931	AVOGATO 30 31 STATE COM #035H	O	N	OXY USA INC	0	32.36943100	-103.60883600	6/22/2019	[51687] RED TANK, BONE SPRING, EAST
45954	AVOGATO 30 31 STATE COM #001H	O	N	OXY USA INC	0	32.36893300	-103.61268500	12/31/9999	[51687] RED TANK, BONE SPRING, EAST
45955	AVOGATO 30 31 STATE COM #004H	O	N	OXY USA INC	0	32.36893300	-103.61243900	12/31/9999	[51687] RED TANK, BONE SPRING, EAST
45956	AVOGATO 30 31 STATE COM #011H	O	H	OXY USA INC	0	32.36964700	-103.61697800	12/31/9999	[51687] RED TANK, BONE SPRING, EAST
45957	AVOGATO 30 31 STATE COM #012H	O	H	OXY USA INC	0	32.36964700	-103.61681400	12/31/9999	[51687] RED TANK, BONE SPRING, EAST
45958	AVOGATO 30 31 STATE COM #013H	O	N	OXY USA INC	0	32.36964700	-103.61074800	12/31/9999	[51687] RED TANK, BONE SPRING, EAST
45959	AVOGATO 30 31 STATE COM #014H	O	N	OXY USA INC	0	32.36954600	-103.61063400	12/31/9999	[51687] RED TANK, BONE SPRING, EAST
45960	AVOGATO 30 31 STATE COM #024H	O	N	OXY USA INC	0	32.36892500	-103.60894900	7/16/2019	[51687] RED TANK, BONE SPRING, EAST
45961	AVOGATO 30 31 STATE COM #025H	O	N	OXY USA INC	0	32.36892500	-103.60883600	7/18/2019	[51687] RED TANK, BONE SPRING, EAST
45962	AVOGATO 30 31 STATE COM #021H	O	N	OXY USA INC	0	32.36942900	-103.61268500	12/31/9999	[51687] RED TANK, BONE SPRING, EAST
45963	AVOGATO 30 31 STATE COM #023H	O	N	OXY USA INC	0	32.36942900	-103.61243900	12/31/9999	[51687] RED TANK, BONE SPRING, EAST
45964	AVOGATO 30 31 STATE COM #024H	O	N	OXY USA INC	0	32.36964700	-103.60679600	12/31/9999	[51687] RED TANK, BONE SPRING, EAST
46030	AVOGATO 30 31 STATE COM #002H	O	N	OXY USA INC	0	32.36893300	-103.61257300	12/31/9999	[51687] RED TANK, BONE SPRING, EAST
46041	AVOGATO 30 31 STATE COM #022H	O	N	OXY USA INC	0	32.36942800	-103.61257300	12/31/9999	[51687] RED TANK, BONE SPRING, EAST



Muledome SWD No. 1
Oil & Gas Well
2-Mile Area of Review
NGL Water Solutions Permian, LLC
Lea Co., NM

PCS: NAD 1983 NM-E FIPS 3001 (US Ft.)
 Drawn by: ELR Date: 11/26/2019 Approved by: CW

LONQUIST & CO. LLC
 PERMITS & REGULATORY
 AUSTIN • HOUSTON • DALLAS • RICHMOND
 SALT LAKE CITY • DENVER • SALT LAKE CITY • FORT WORTH

Muledome SWD No. 1 SHL
 1/2 Mile Radius
 1 Mile Radius
 2 Mile Radius
 OO Section (NM PLSS-2019)
 Section (NM PLSS-2019)
 Township (NM PLSS-2019)
 Lateral (57)

API (30-025) - SHL Status-Type (Count)
 Horizontal Surface Location (57)
 Active - Gas (8)
 Active - Oil (63)
 Active - SWD (1)
 Cancelled APD - Gas (2)
 Cancelled APD - Oil (37)
 Expired TA - Oil (1)
 Plugged/Not Released - Oil (4)
 Permitted - Gas (2)
 Permitted - Miscellaneous (1)
 Permitted - Oil (6)
 Permitted - SWD (1)
 Plugged/Not Released - Oil (27)

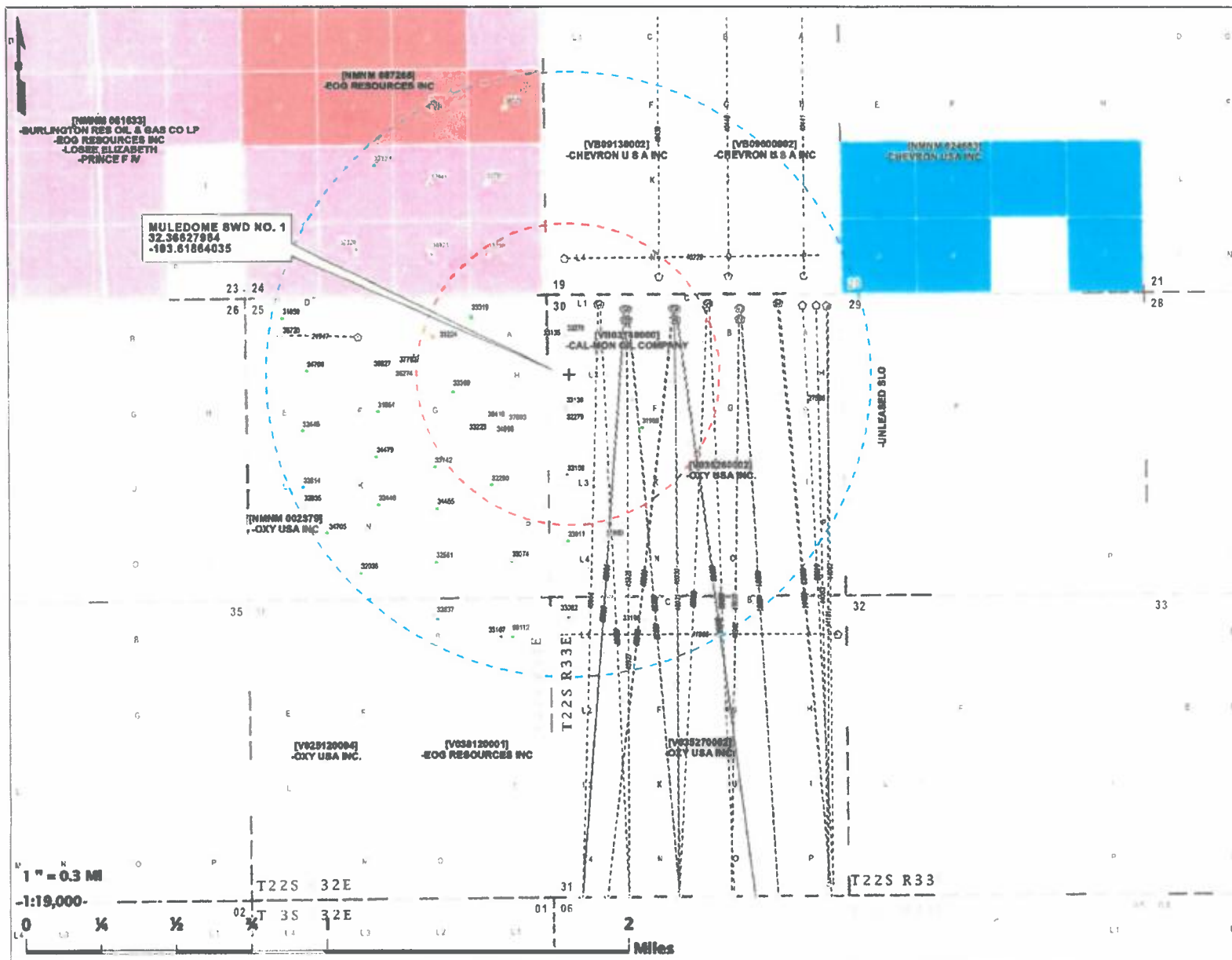
API (30-025) - SHL Status-Type (Count)
 Active - Oil (12)
 Cancelled - Oil (11)
 Plugged/Not Released - Oil (1)
 Permitted - Gas (2)
 Permitted - Oil (27)
 Plugged/Not Released - Oil (2)

* Note: All coordinates shown are in NAD 83 GCS (DD)
 Data Source:
 Well Location - NM OGD (2019)
 Well Status - NM OGD (2019)

LEA

NEW MEXICO

LOVING TEXAS WILKINSON



Muledome SWD No. 1
Offset Lessee(s)
1-Mile Area of Review
NGL Water Solutions Permian, LLC
Lea Co., NM

PCS: NAD 1983 NM-E FIPS 3001 (US F1)

Drawn by: BLR Date: 12/9/2019 Approved by: CW

LONGHORN & CO. LLC
PERMANENT EMISSIONS
AUSTIN - HOUSTON CAL SAPY - WICHITA
DENVER - CALLEJO STATION SALT LAKE - FORT WORTH

Legend:
+ Muledome SWD No. 1 S/W
1/2 mile Buffer
1 mile Buffer
2 mile Buffer
QQ Section OIM PLSS-2019
Section 20M PLSS-2019
Township 20M PLSS-2019
Letter d (32)
API 00-000-3 S/W, Section Type (Contd)
Horizontal Surface Location (32)
Active - OH (22)
Cancelled API - OH (10)
Expired TA - OH (1)
Flagged/Not Released - OH (1)
Permitted - OH (1)
Flagged/Not Released - OH (1)
Flagged/Not Released - OH (1)
API 00-000-3 S/W, Section Type (Contd)
Active - OH (1)
Cancelled - OH (1)
Flagged/Not Released - OH (1)
Permitted - OH (22)
Flagged/Not Released - OH (1)
NR S/W Fluid Mineral Lease
NR S/W Oil/Gas Lease
NR S/W Leasehold
CAL SAPY OIL COMPANY
CHEVRON U S A INC
EOG RESOURCES INC
OXY USA INC
UNRELEASED SLO
NR S/W Leasehold
BURLINGTON RES OIL & GAS CO LP - EOG RESOURCES INC - LOSER ELIZABETH - PRINCE F W
CHEVRON USA INC
EOG RESOURCES INC
OXY USA INC

Note: All coordinates shown are in NAD 83 GCS (NAD 83)
Data Source:
Well Location - NGL OGD (2019)
Well Status - NGL OGD (2019)

Map Extent:
EDDY LEA
LOVING TEXAS
ANDREWS GAINES

Meddome SWD #1: Offsetting Produced Water Analysis																		
wellname	api	section	township	range	unit	county	formation	ph	tds_mgl	sodium_mgl	calcium_mgl	iron_mgl	magnesium_mgl	manganese_mgl	chloride_mgl	bicarbonate_mgl	sulfate_mgl	co2_mgl
ANTELOPE RIDGE UNIT #002	3002520444	4	24S	34E	B	LEA	ATOKA	6.7	51475						31000	317	340	
TODD 26 G FEDERAL #001	3001520242	26	23S	31E	G	EDDY	ATOKA	6.7	202478						126000	93	540	
THYME APY FEDERAL #002	3002533529	1	23S	32E	G	LEA	BONE SPRING	6.1	172896		0	0	2025		104976	781	1150	
CORIANDER AOC STATE #002	3002533574	1	23S	32E	H	LEA	BONE SPRING	5.2			24176	0	3815		167962	61.1	165	
THISTLE UNIT #071H	3002542425	27	23S	33E	A	Lea	BONE SPRING 1ST SAND	5.6	171476.3	55363.2	9140	40.4	1023	1.1	104576.4	244	560	770
DUNDARY RAIDER 6 FEDERAL #002	3002541884	7	23S	32E	A	Lea	BONE SPRING 2ND SAND	6	117284.4	36911	5399.2	88.1	706.6	1.33	71443.9	378	17	200
ILBREY BASIN 5 STATE COM #001	3002540987	5	22S	32E	N	Lea	BONE SPRING 2ND SAND	6.3		72568	5821	42	884	0.08	124390	159	650	180
ALDABRA 26 FEDERAL #008H	3001538624	26	23S	31E	P	EDDY	BONE SPRING 3RD SAND	7.1	117079	37414.7	5610.4	22.6	690.7	1.1	71000	134	662	190
GAUCHO UNIT #011H	3002541184	17	22S	34E	O	Lea	BONE SPRING 3RD SAND	6.8		43301	5338	0	768	0	78300	122	640	120
GRAHAM AKB STATE #002	3001526876	2	22S	31E	H	EDDY	DELAWARE	6	301948		30760	19	5956		188957	54	100	
GAUCHO 21 FEDERAL #002H	3002540626	21	22S	34E	M	Lea	DELAWARE-BRUSHY CANYON	5.9	266467.8	71664.2	20660.8	50.2	3492.5	3.8	167562	366	0	400
SNAPPING 2 STATE #014H	3001542688	2	26S	31E	P	EDDY	WOLFCAMP	7.3	81366.4	26319.4	2587.4	26.1	326.7		50281.2		399.7	100
BELLOQ 2 STATE #002H	3001542895	2	23S	31E	C	EDDY	WOLFCAMP	6.8	119471.8	37359.2	5659.1	22.4	746.1		73172.5		1035.5	250
WILSON DEEP UNIT #001	3002520461	13	21S	34E	F	LEA	MORROW		11648						566	2161	5252	
HAT MESA #001	3002524403	14	21S	32E	H	LEA	MORROW	6.4	271555	74325.6	40019.2	123.136	3750.91		199015	288.896	529.248	

**STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION**

**APPLICATION OF AWR DISPOSAL, LLC
TO APPROVE SALT WATER
DISPOSAL WELL IN LEA
COUNTY, NEW MEXICO.**

**CASE NO. 21031
(MULEDOM)**

AFFIDAVIT OF SCOTT J. WILSON

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

I, Scott J. Wilson, make the following affidavit based upon my own personal knowledge.

1. I am over eighteen (18) years of age and am otherwise competent to make the statements contained herein.

2. I am the Senior Vice President for Ryder Scott Company in Denver, Colorado. My responsibilities at Ryder Scott Company include the performance of reserve appraisals, technical evaluations, and reservoir analysis.

3. I have obtained a bachelor's degree in petroleum engineering from the Colorado School of Mines, and a master's degree business from the University of Colorado. I have worked as a petroleum engineer since 1983.

4. I am familiar with the application that AWR Disposal, LLC ("AWR") has filed in this matter, and I have conducted a nodal analysis and reservoir study related to the area which is the subject matter of the application. A copy of my study is attached hereto as Exhibit A.



5. AWR seeks an order approving the Muledome SWD #1 well, which is a salt water disposal well.

6. The approved injection zone for the well is located below the base of the Woodford Shale formation and above the Ordovician formation, which consists of significant shale deposits.

7. I have reviewed step rate tests for similar disposal wells drilled within the area and conducted a nodal analysis.

8. It is my opinion that using 7" by 5 ½" tubing will reduce friction and will conserve pump horsepower, fuel, and reduce emissions.

9. My nodal analysis indicates that using 7" by 5 ½" tubing will not significantly increase reservoir pressures over a twenty-year time period. The injection zone is located within a reservoir with significant thickness which consists of high permeability rocks, which results in only very small pressure increases even when injection averages 40,000 barrels per day over a 20 year period.

10. It is my opinion that increasing the tubing size will not cause fractures in the formation. Wellhead pressures are set at a maximum that is below the formation fracture pressure and, as a result, it is impossible to get above the formation fracture pressure while honoring wellhead pressure constraints. Consequently, it is highly unlikely that increasing the tubing size in the well would result in fractures to the formation.

11. I have also studied the potential impact on pore pressures and run numerical simulations of planned injection rates that indicate the radial influence that the well would have over time. A copy of this study is included within Exhibit A to this affidavit. This simulation predicts that regional reservoir pressures will not be detrimentally impacted and that the majority of injected fluids will not travel greater than 1 mile in 20 years.

12. My studies further indicate that additional injection wells located one mile away from the subject well will not create any materially adverse conditions in the formation after 20 years of continuous injection.

13. I attest that the information provided herein is correct and complete to the best of my knowledge and belief.

[Signature page follows]

Scott Wilson
Scott J. Wilson

SUBSCRIBED AND SWORN to before me this 5th day of February, 2020 by Scott J. Wilson.

Darshae Rodriguez
Notary Public

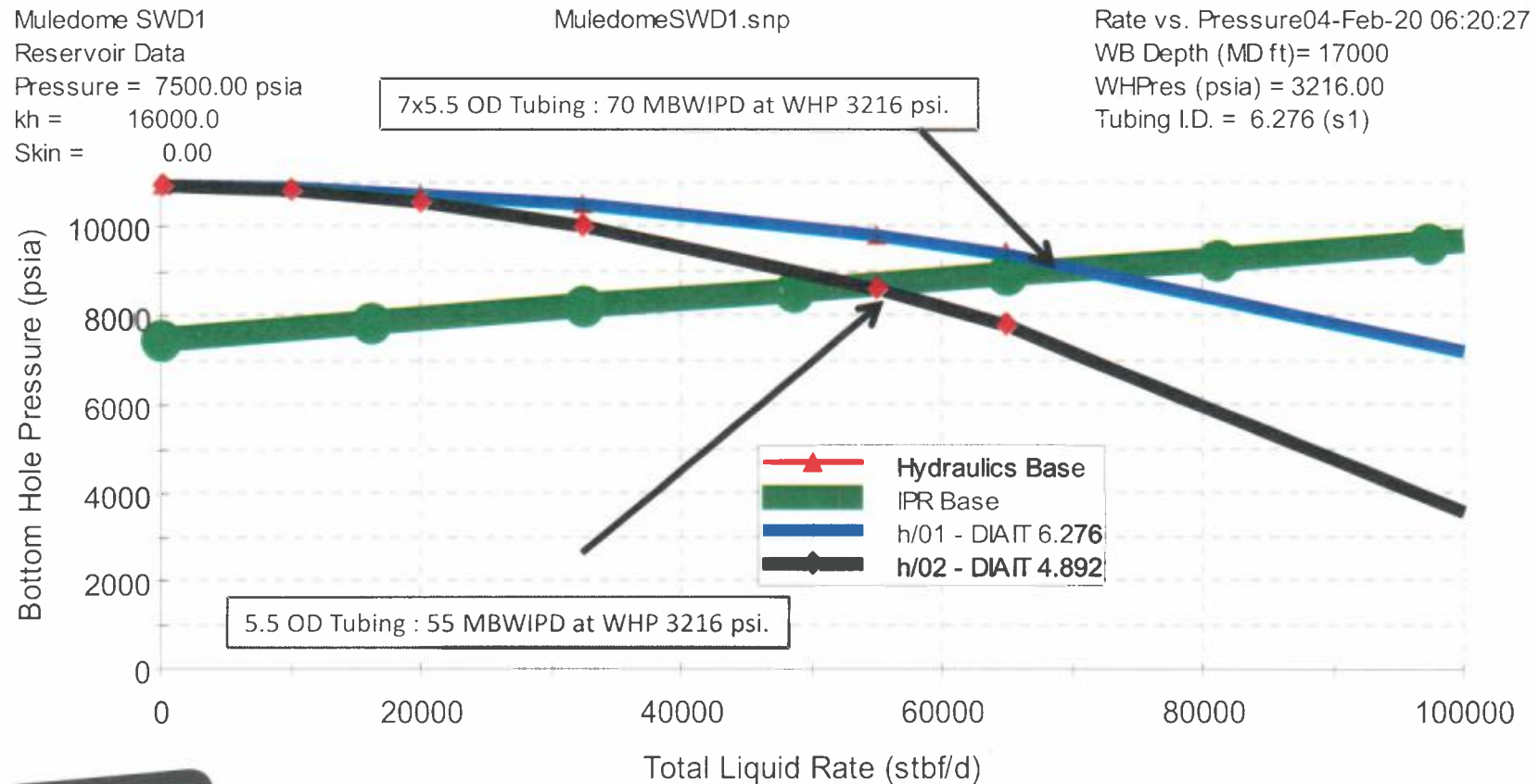
My commission expires: 8/23/21





AWR Disposal, LLC

Typical Wellbore Hydraulics Models predict a 30% increase in maximum injection rate between 5.5 tubing and 7x5.5 tubing.





AWR Disposal, LLC

Exh. A2

Increased injection rate per well equates to fewer injectors.

Muledome SWD1

MuledomeSWD1.snp

Reservoir Data

Pressure = 7500.00 psia

kh = 16000.0

Skin = 0.00

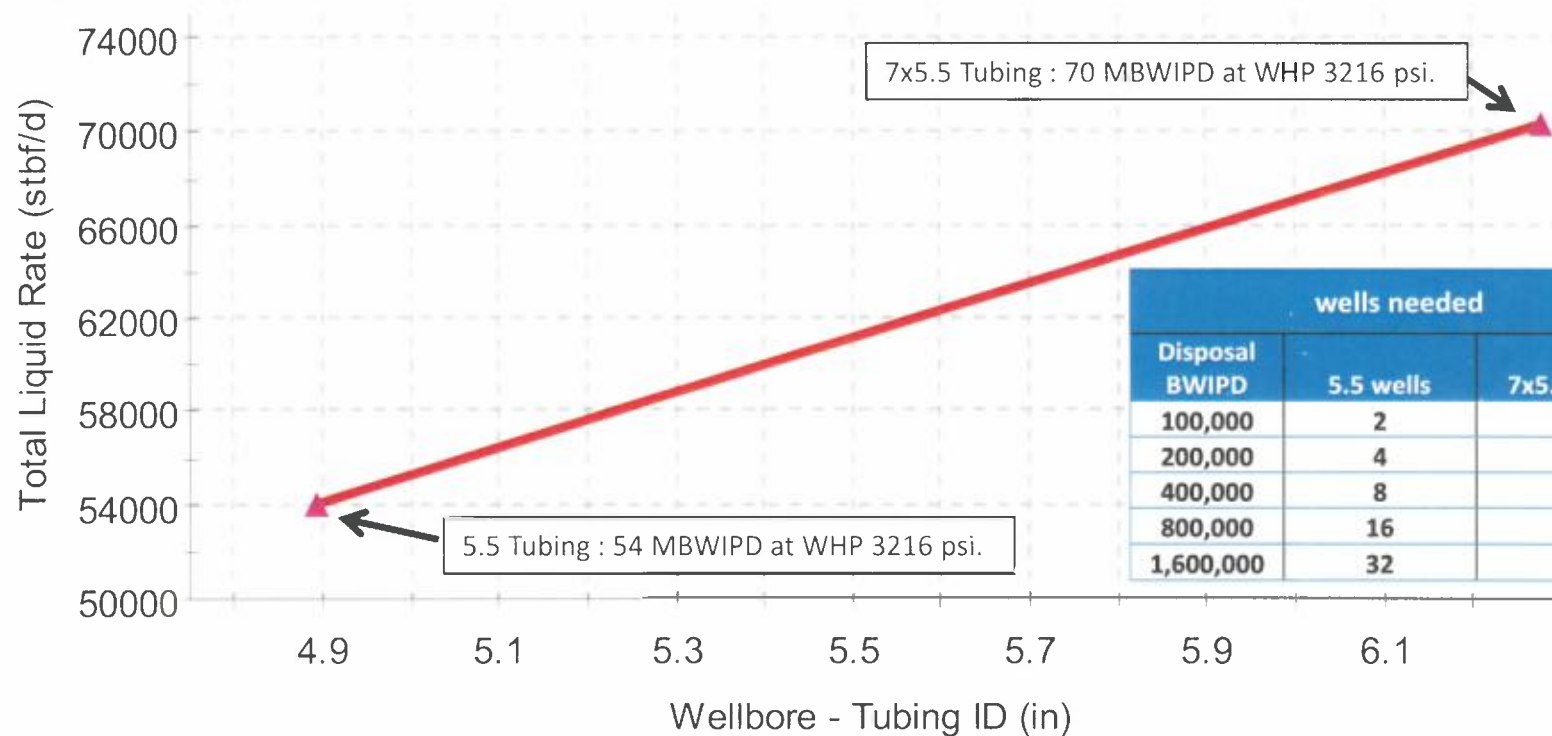
Rate vs. Wellbore - Tubing ID (in)

04-Feb-20 06:23:53

WB Depth (MD ft)= 17000

WHPres (psia) = 3216.00

Tubing I.D. = 6.276 (s1)



wells needed		
Disposal BWIPD	5.5 wells	7x5.5 wells
100,000	2	2
200,000	4	3
400,000	8	6
800,000	16	11
1,600,000	32	23

2020-02-05

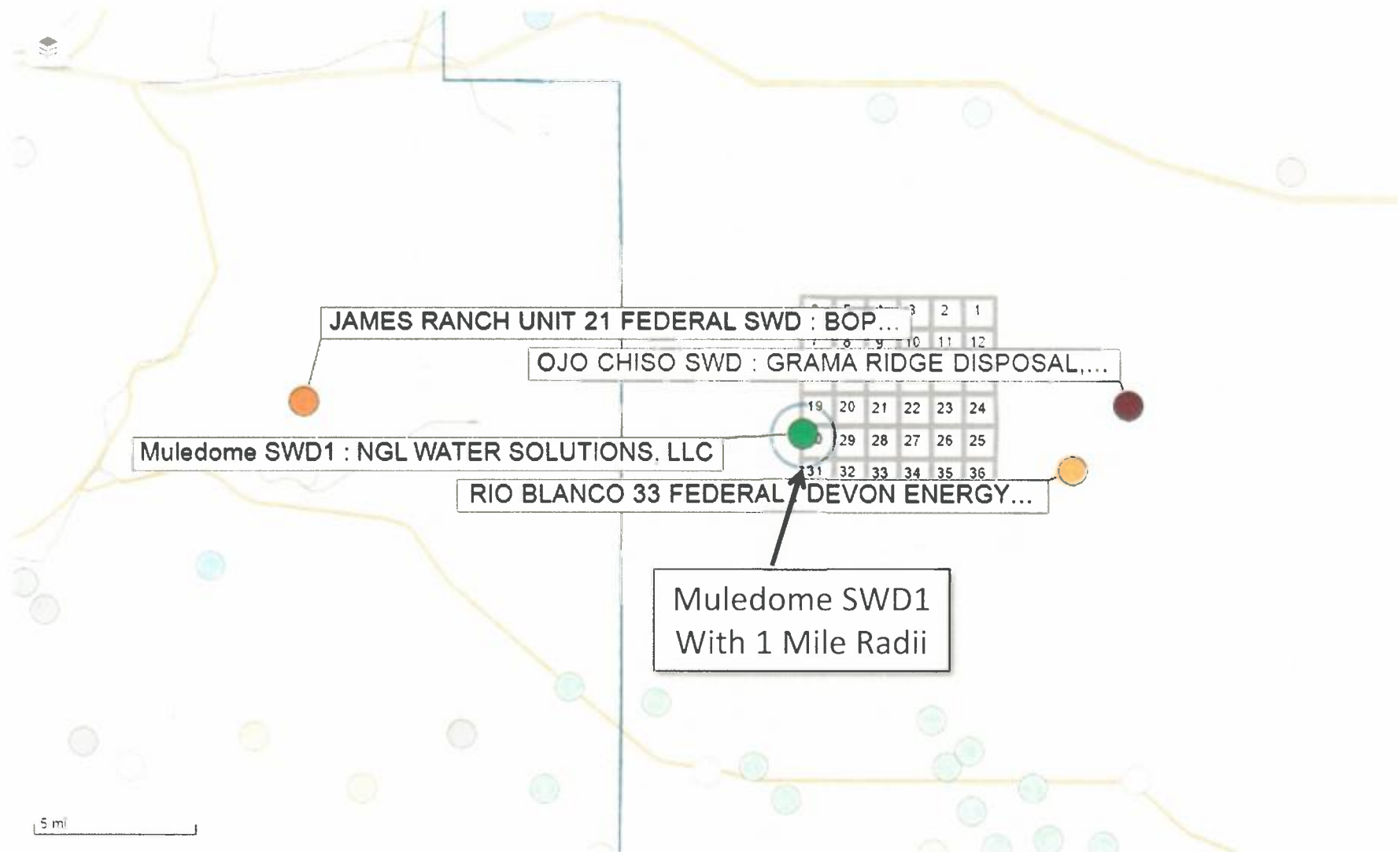


AWR Disposal, LLC

Exh. A3

Wells injecting water into the Devonian formation in the area.

Area is roughly 40 miles (E-W) by 25 miles (N-S)



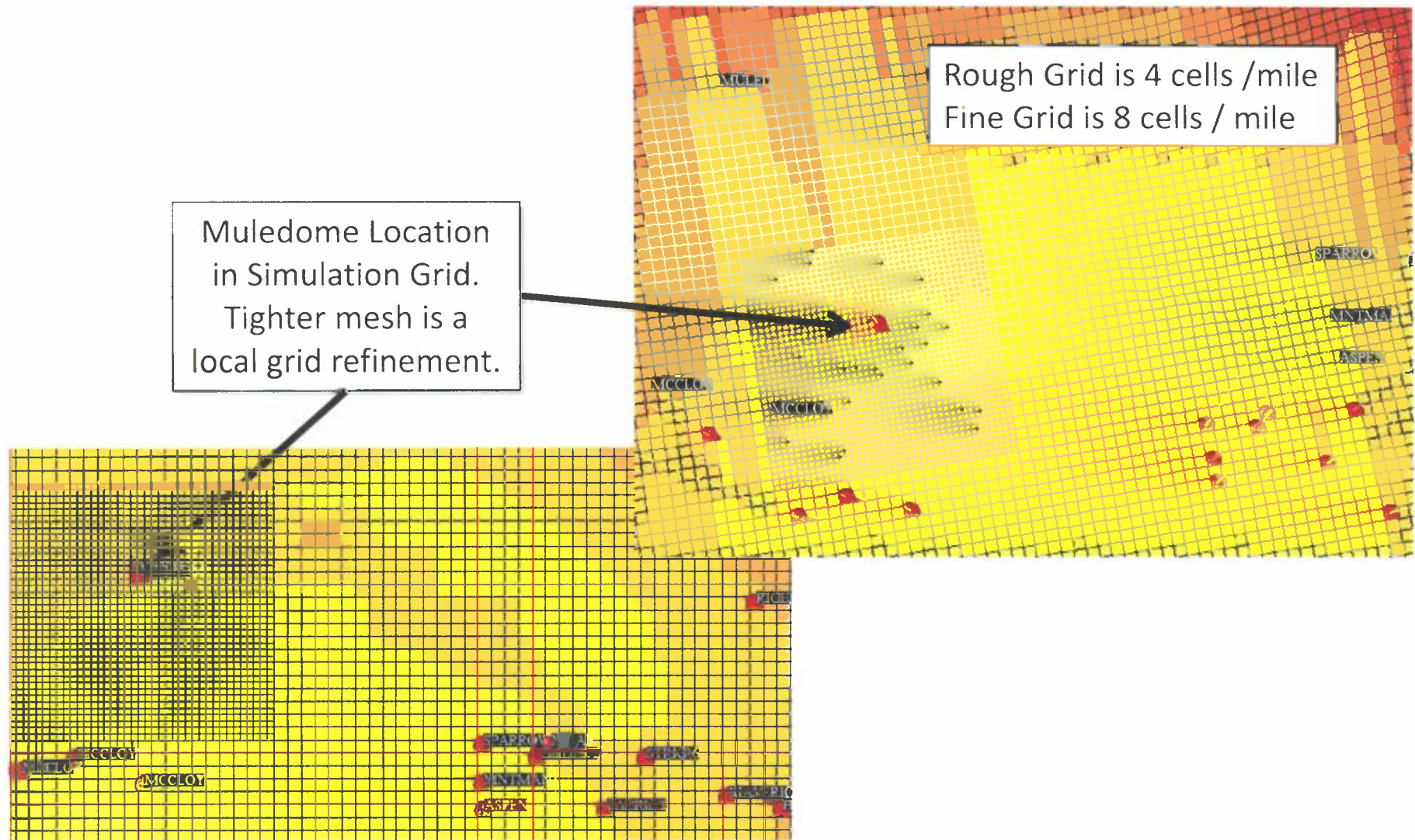


AWR Disposal, LLC

Exh. A4

Simulation Grid matches General Structure and Thickness

Reservoir Simulation grid incorporates the NGL proposed wells and the close offsets.



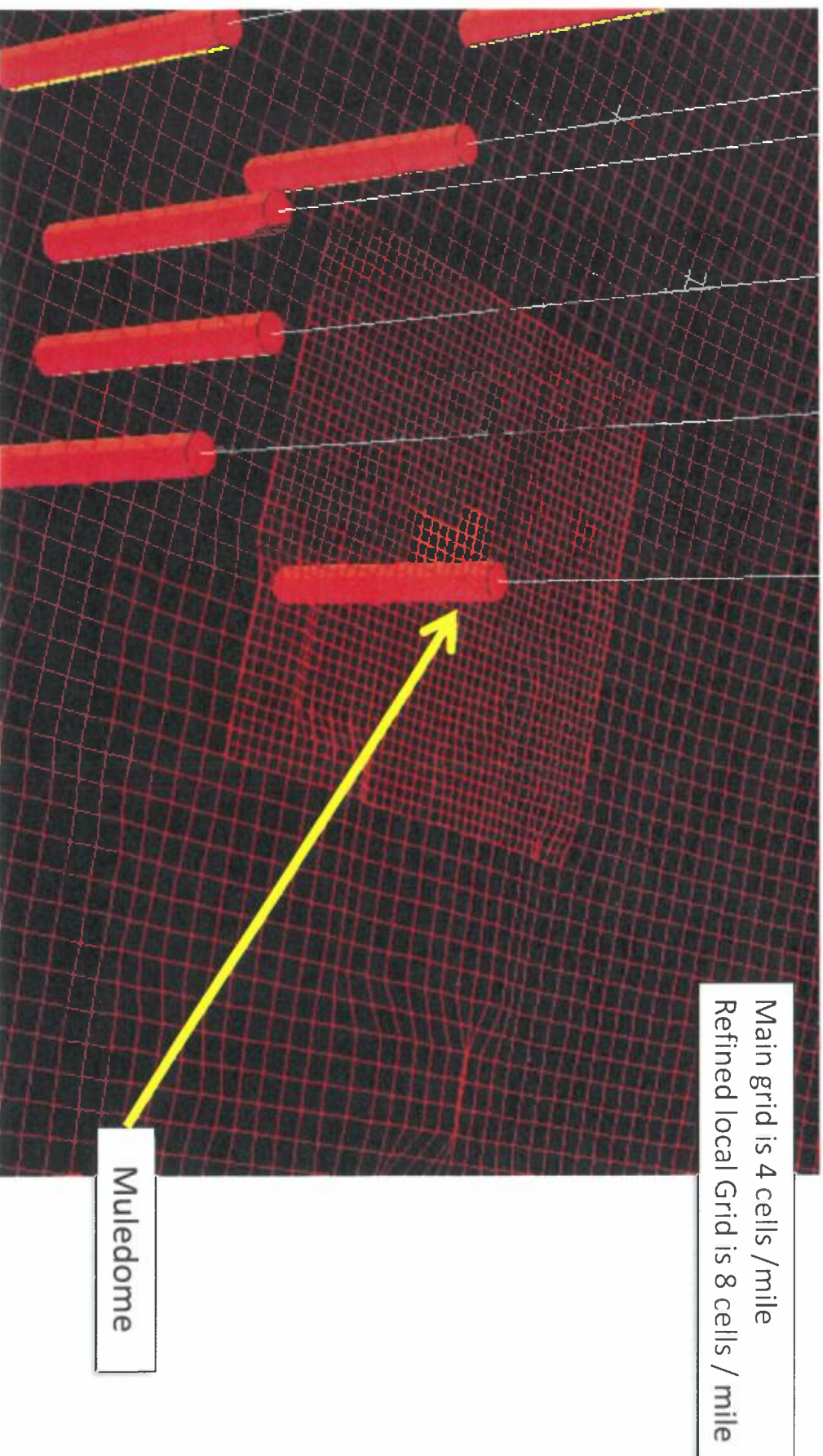


Exh. A5

AWR Disposal, LLC

3D view of grid shows Some Structural Relief.

Thickness is accurate but not easy to see at this aspect ratio.





AWR Disposal, LLC

Exh. A7

Initial pressure is equilibrated by the model based on grid cell depth, fluids(water) and capillary pressure.



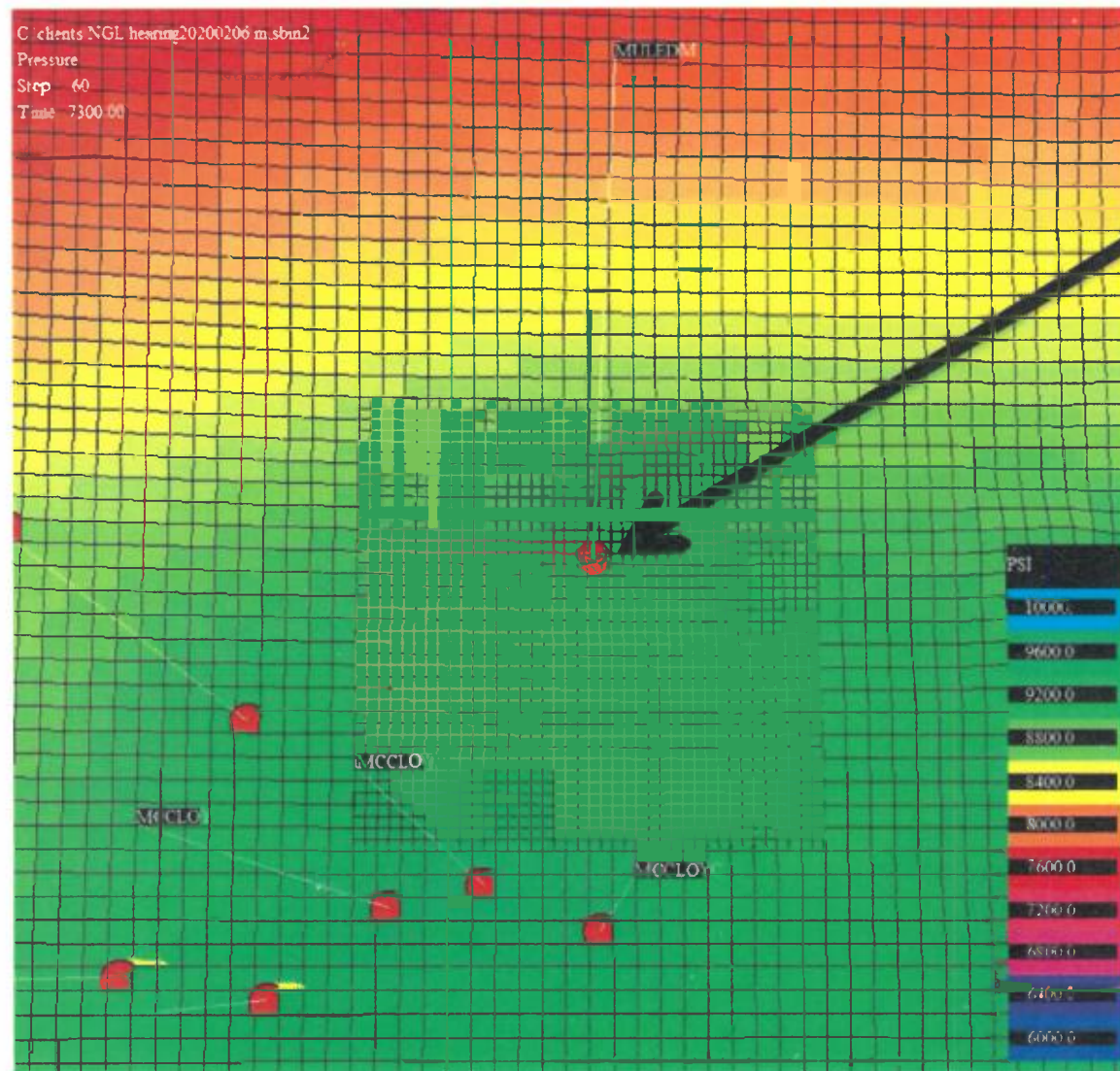
Muledome Location
in Simulation Grid
@ original Pressure



AWR Disposal, LLC

Exh. A8

Pressure at 20 years is affected by original pressure, injected volumes, and the ability of the reservoir to dissipate pressure.



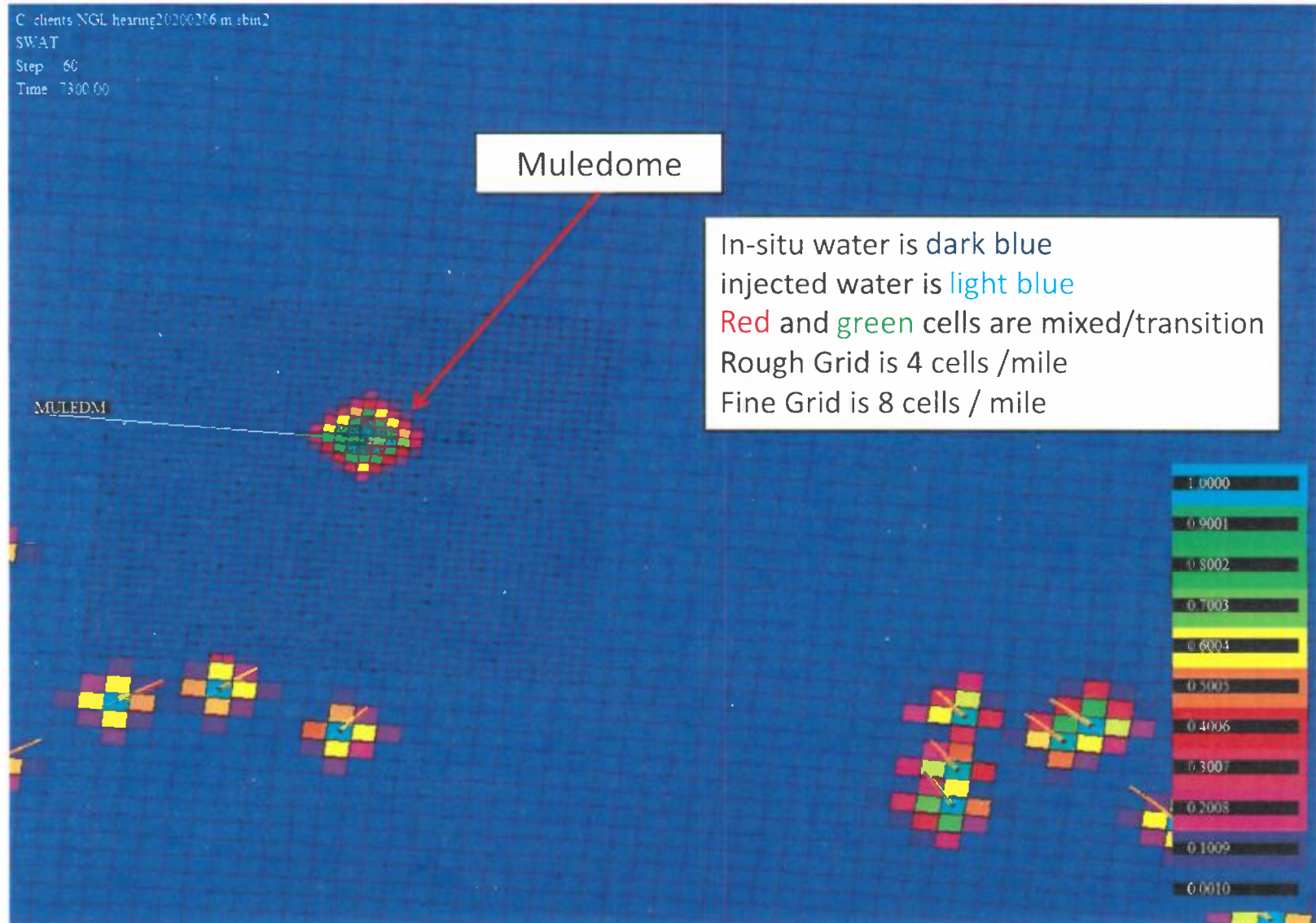
Muledome Location
in Simulation Grid
With Pressure change
after 20 years



AWR Disposal, LLC

Exh. A9

Large scale saturation profiles after 20 years of injection.

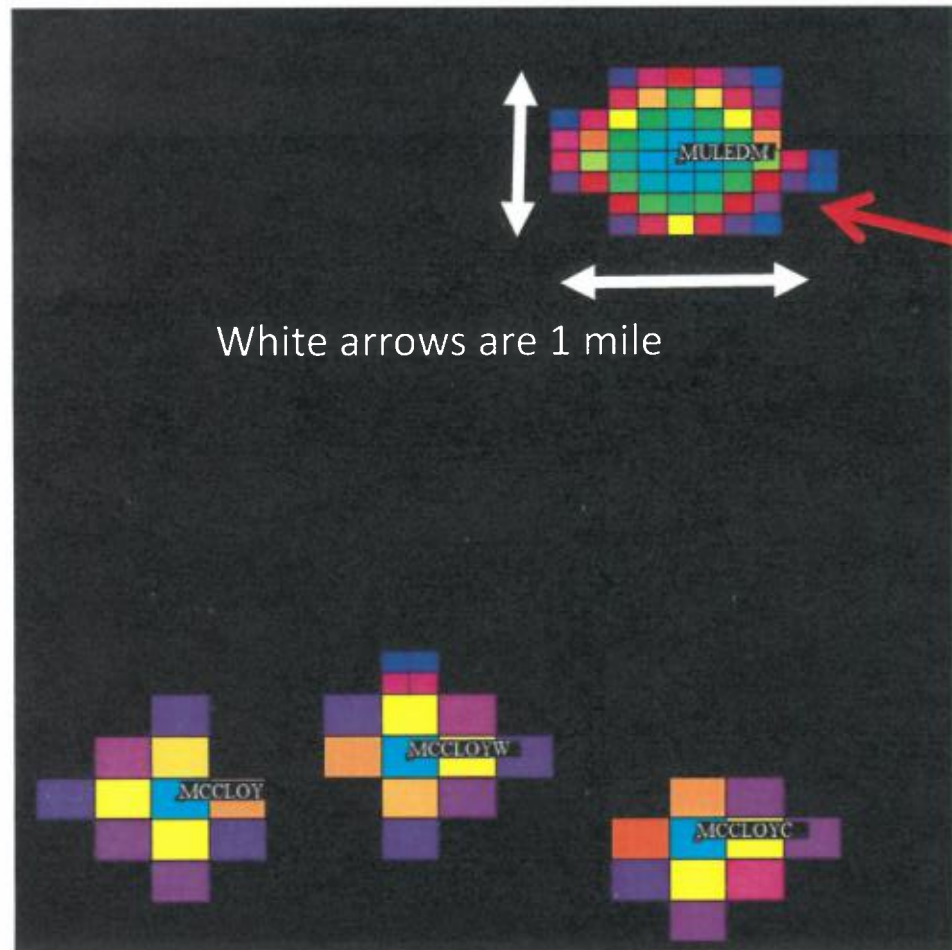




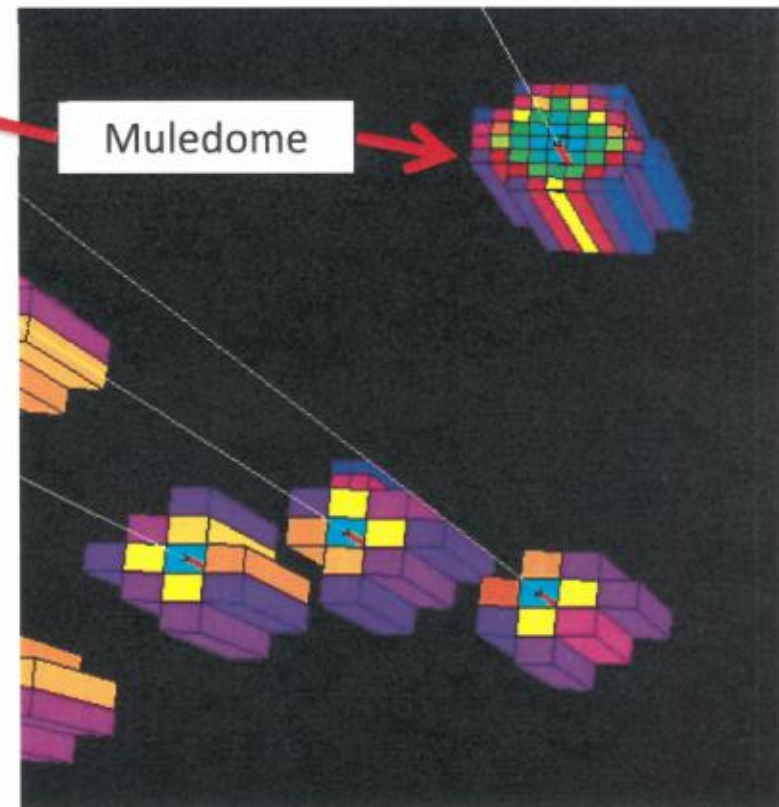
AWR Disposal, LLC

Exh. A10

Detailed saturation profiles after 20 years of injection.



In-situ water is transparent
injected water is light blue
Red and green cells are mixed/transition

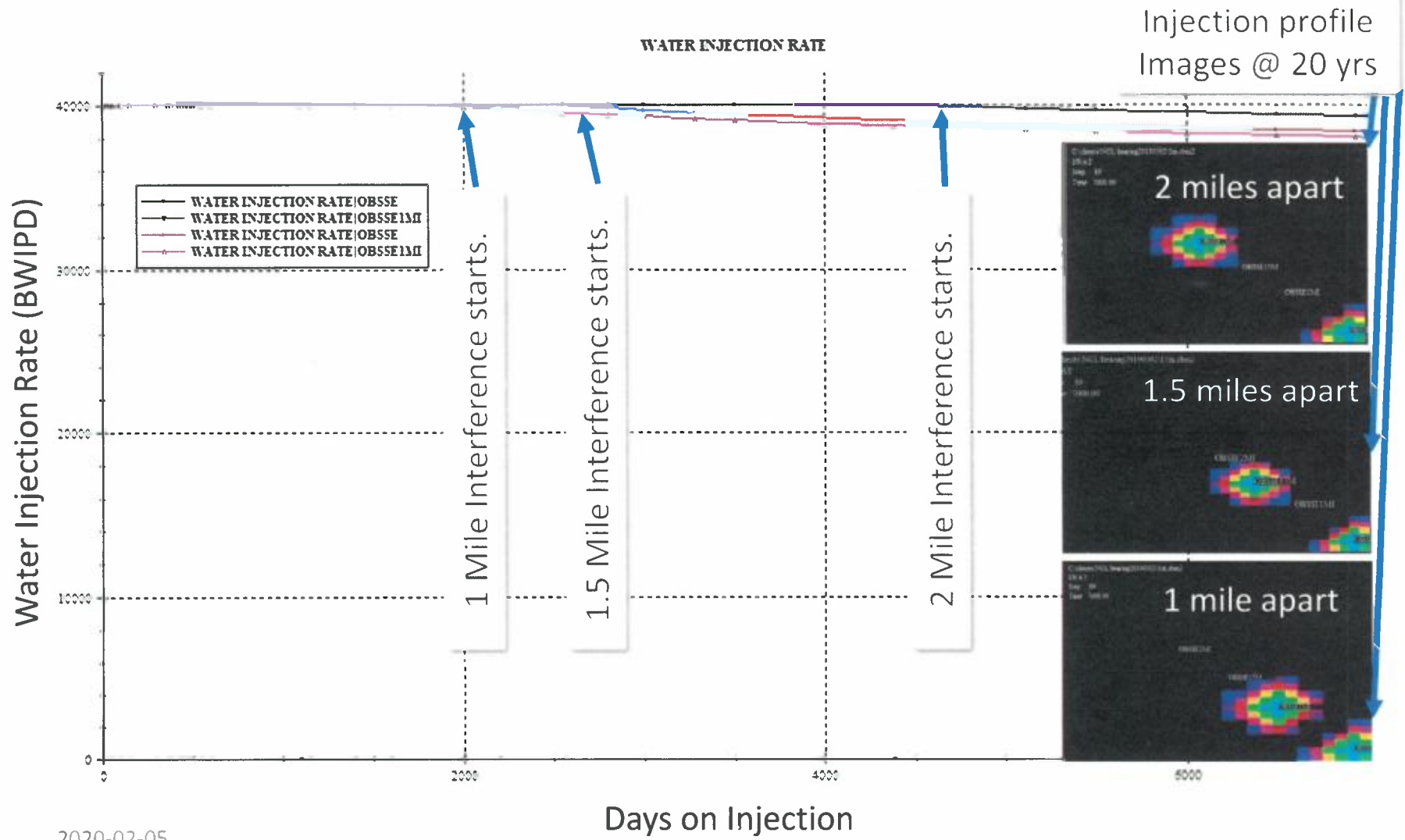




AWR Disposal, LLC

Exh. A11

Typical wells showing interference when spaced 1, 1.5, and 2 miles apart.
Closer spacing causes rates to fall, but not significantly.



2020-02-05

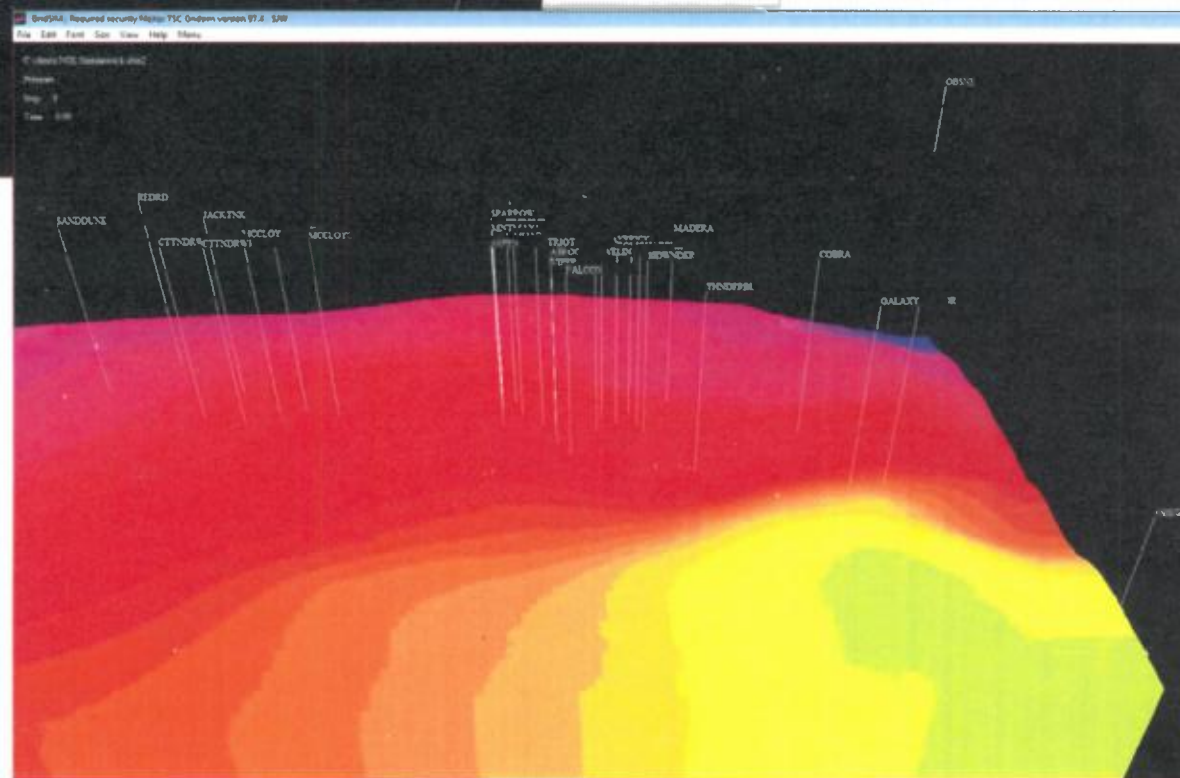
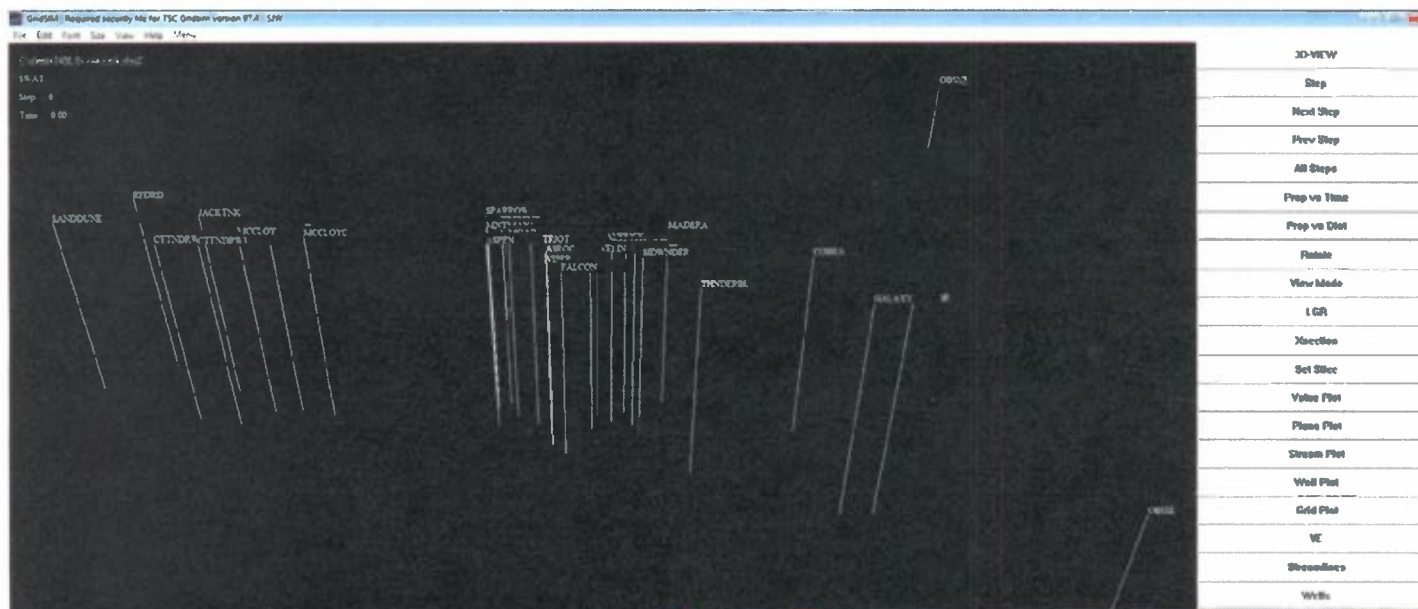
Exh. A12

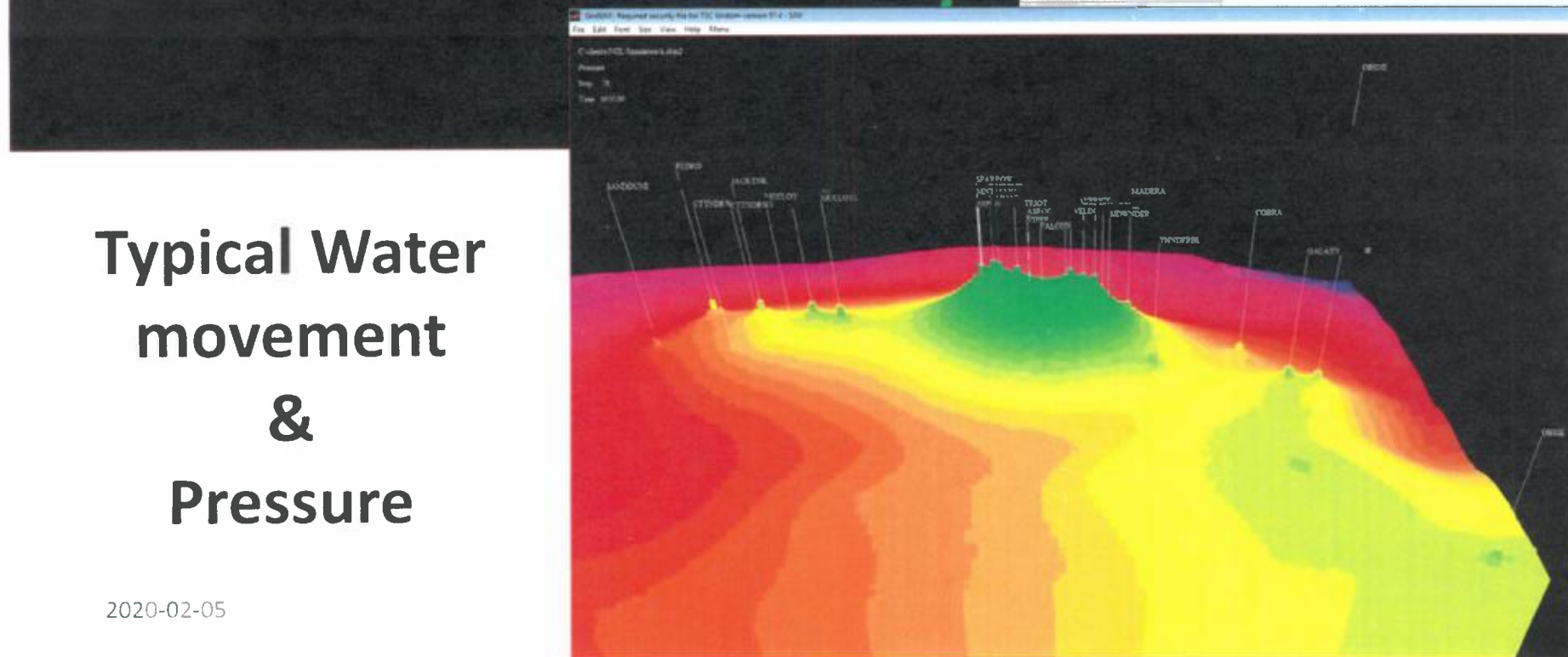
2019
(0 years)

Typical Water movement & Pressure

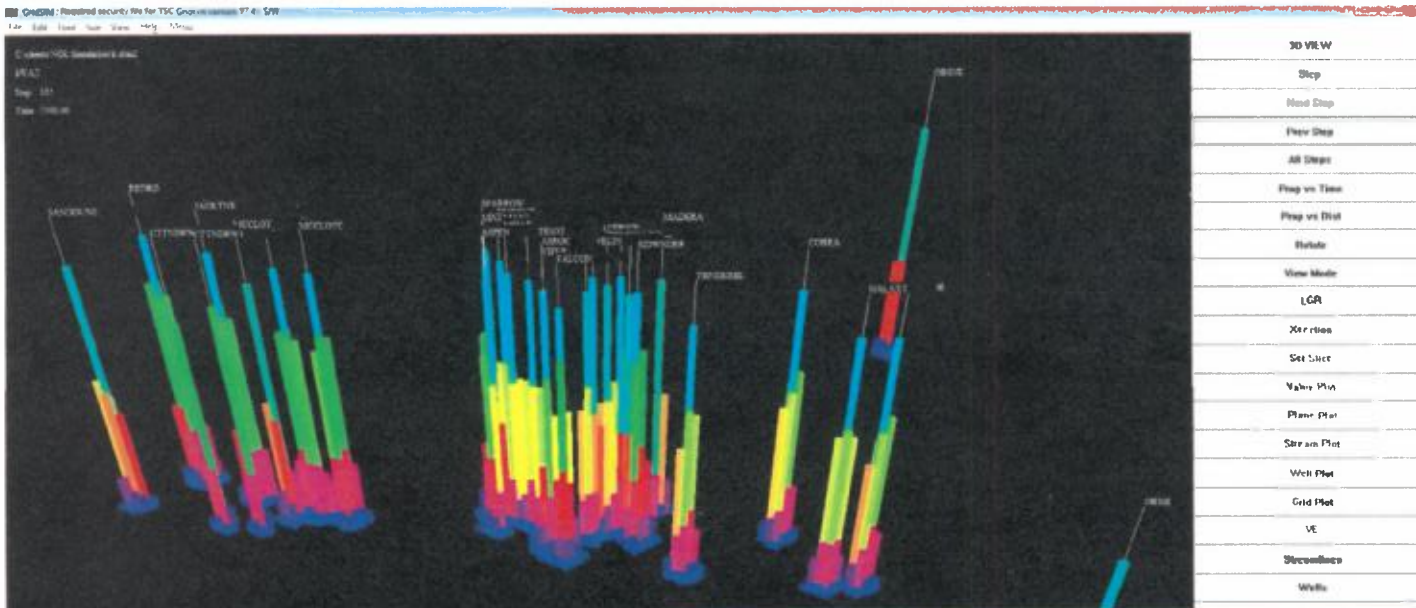
2020-02-05

24





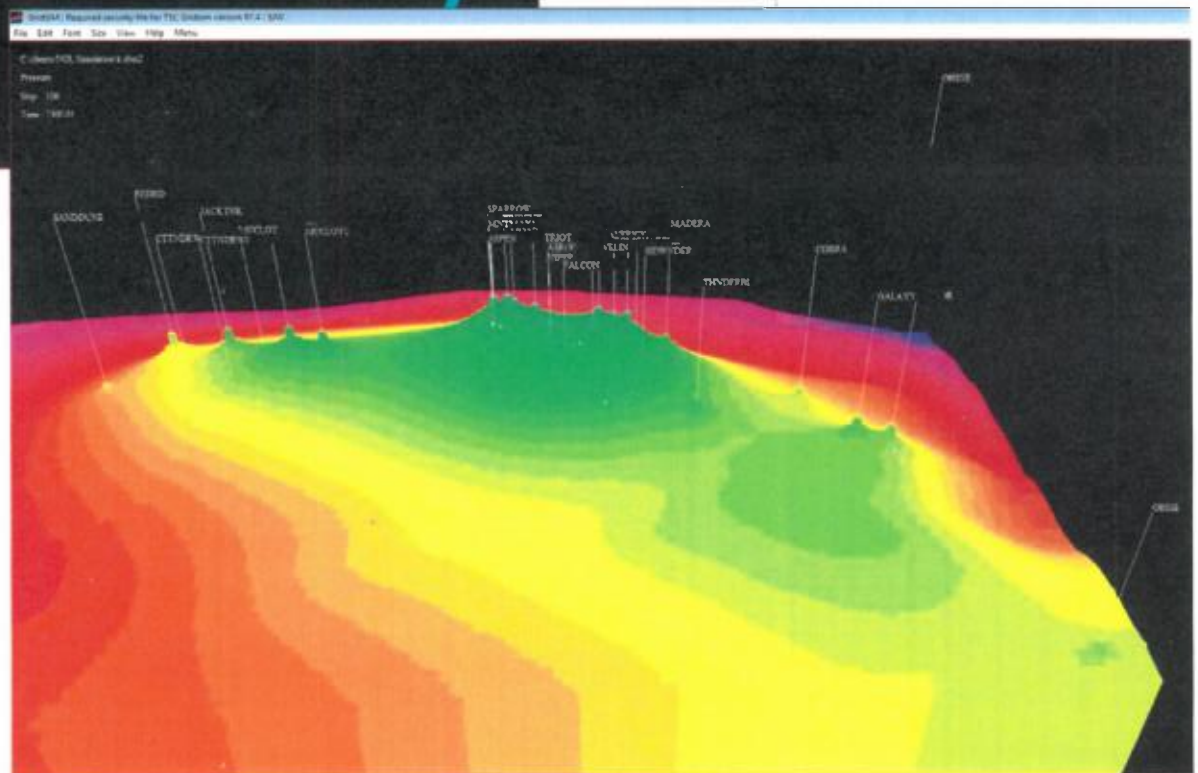
2020-02-05



Exh. A14

**2039
(20 years)**

Typical Water movement & Pressure

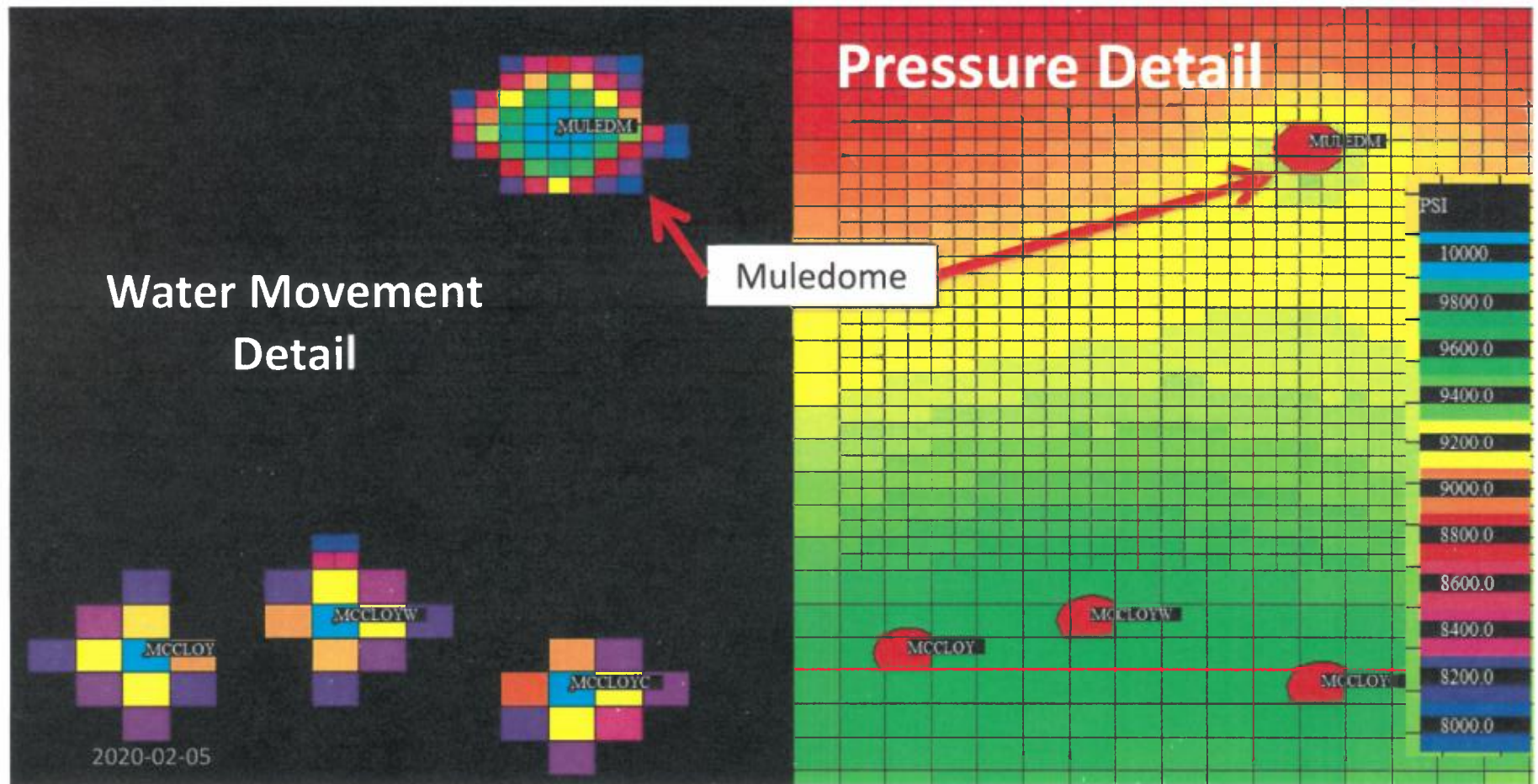


2020-02-05



Exh. A15

Detailed water saturation and pressure distribution at 2039 (20 years)

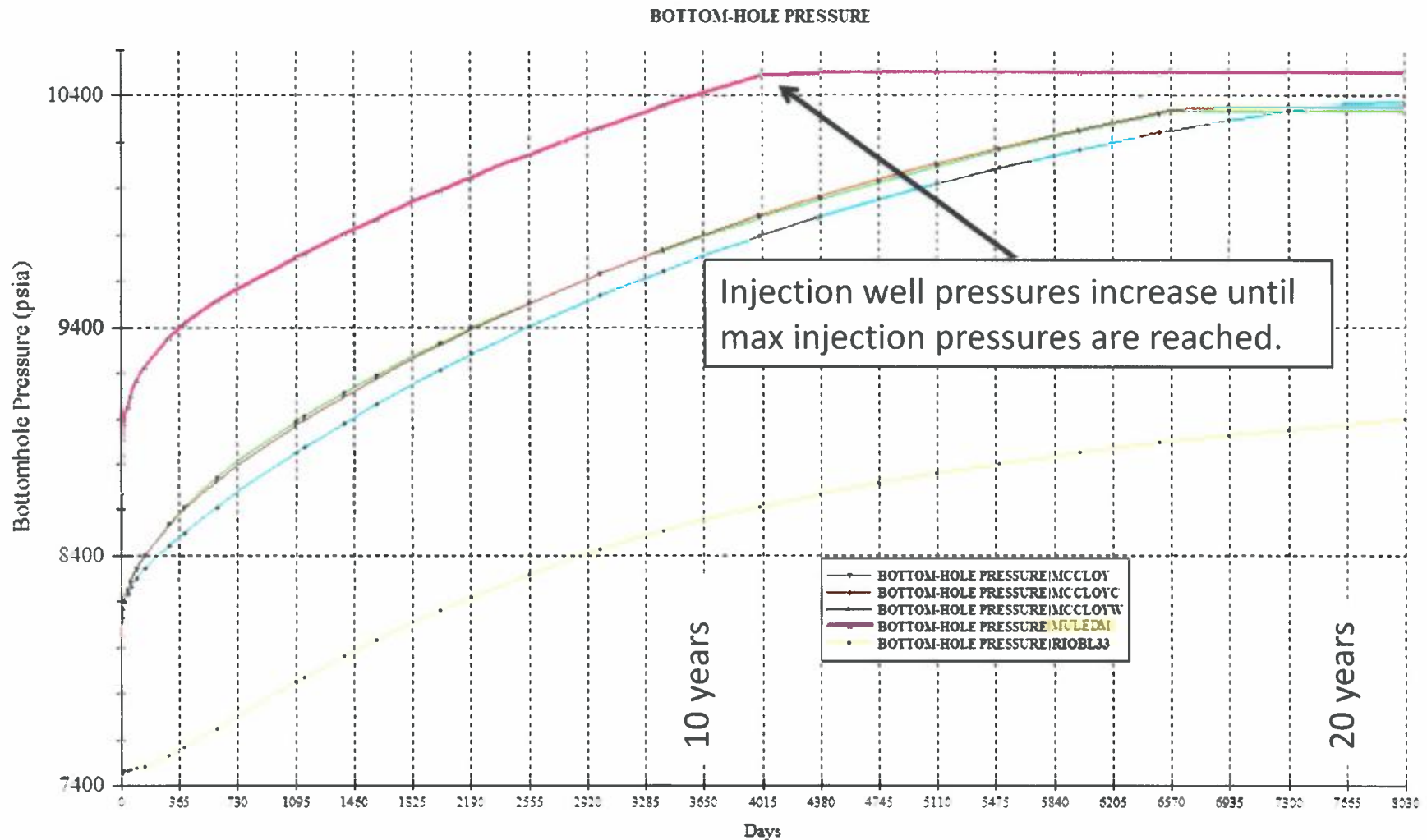




AWR Disposal, LLC

Exh. A16

Simulation BHIP predictions for wells near Muledome



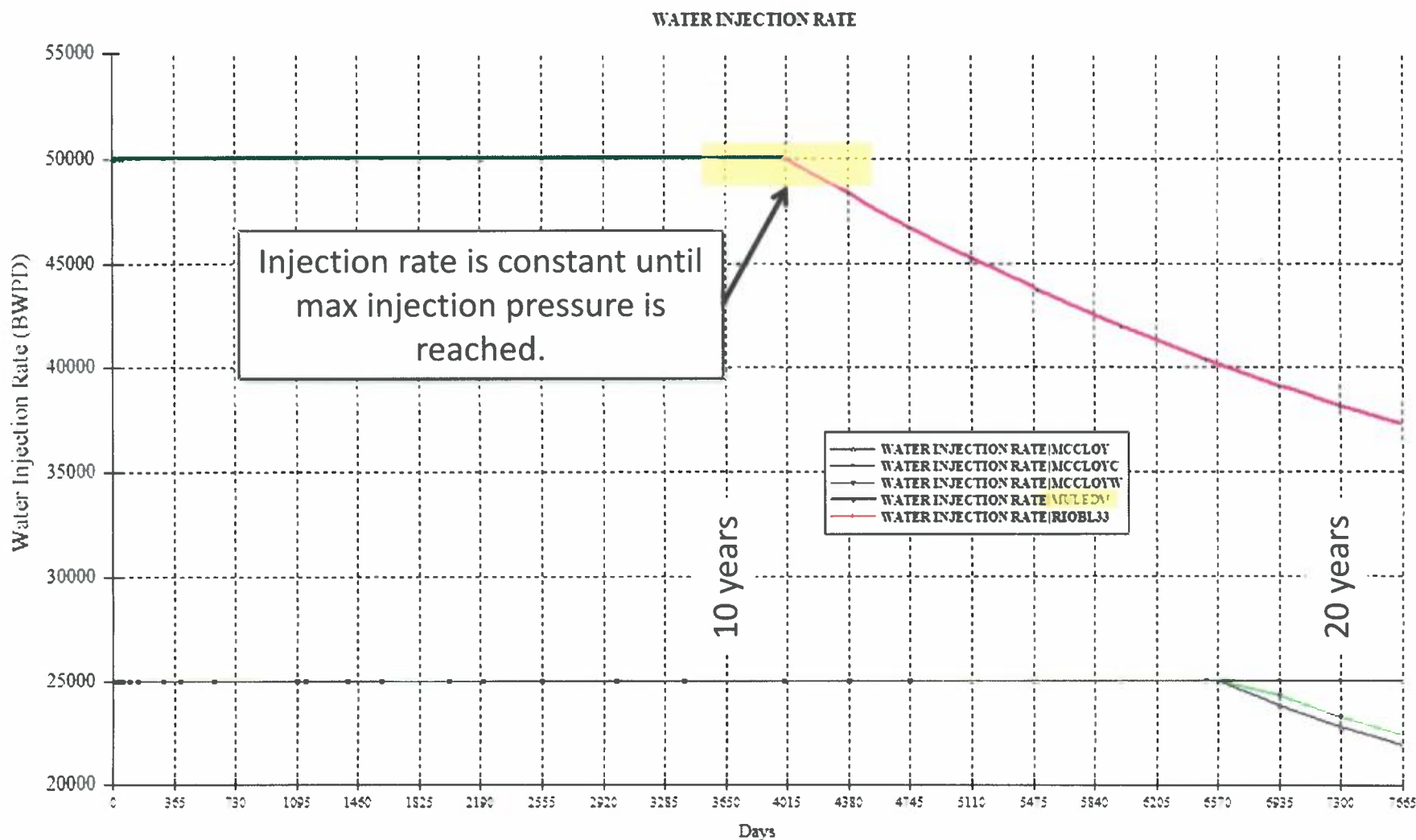
h4



AWR Disposal, LLC

Exh. A17

Simulation predictions for individual wells over 20 Years



5F

**STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION**

**APPLICATION OF AWR DISPOSAL, LLC
TO APPROVE SALT WATER
DISPOSAL WELL IN LEA
COUNTY, NEW MEXICO.**

**CASE NO. 21031
(MULEDOM)**

AFFIDAVIT OF DR. KATE ZEIGLER

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

I, Dr. Kate Zeigler, make the following affidavit based upon my own personal knowledge.

1. I am over eighteen (18) years of age and am otherwise competent to make the statements contained herein.

2. I am the senior geologist at Zeigler Geologic Consulting, and I provide a wide range of geoscience related services to companies and other entities in Southeastern New Mexico.

3. I have obtained a bachelor's degree in geology from Rice University, a master's degree in paleontology from the University of New Mexico, and a Ph.D. in stratigraphy and paleomagnetism from the University of New Mexico. Additionally, I have completed several surface geologic maps for the New Mexico Bureau of Geology and Mineral Resource's Geologic Mapping Program as well as for independent operators who are exploring prospects within the western Permian Basin. I have also conducted a prior geologic study concerning what is commonly referred to as the Devonian and Silurian formations in Southeastern New Mexico to



help determine whether the approval of 7" by 5 ½" tubing is appropriate in Devonian and Silurian salt water disposal wells approved by the New Mexico Oil Conservation Division.

4. I am familiar with the amended application that AWR Disposal, LLC ("AWR") has filed in this matter, and I have conducted a geologic study of the lands which are the subject matter of the application. A copy of my geologic study, including cross sections, a structure map and isopach are included in Attachment A to this affidavit.

5. AWR seeks an order approving the Muledome SWD #1 well, which is a salt water disposal well.

6. I have been informed that the injection intervals for the well will be isolated to the Devonian and Silurian formations (also referred to as the Wristen Group and Fusselman Formation) and the well will have four strings of casing protecting the fresh water aquifer, the salt-bearing interval, the Permian aged rocks through the Wolfcamp Formation. The deepest casing is 7 5/8", which is cemented and cement is circulated on the 7 5/8" casing.

7. The injection zone for the well is located below the Woodford Shale. The Woodford Shale is an Upper Devonian unit which has low porosity and permeability and consists predominantly of shale and mudstone with some carbonate beds. The Woodford Shale acts as a permeability boundary to prevent fluids from moving upward out of the underlying formations. The Woodford Shale formation in the area where the well is located is between 150 feet to 200 feet thick.

8. Below the injection zone for the well is the Ordovician formation, also referred to as the Simpson Group, which contains sequences of shale that make up approximately 55% of the total thickness of the formation in any given place and can likewise act as a permeability boundary which prevents fluids from migrating downwards into deeper formations and the basement rock.

In the areas where the well is located, the Ordovician formation is between 550 feet and 600 feet thick and, as a result, there is a significant thickness in this lower shale. Below the Ordovician is the Ellenburger Formation, which is up to 600 feet thick.

9. Based on my geologic study of the area, it is my opinion that the approved injection zone for the well is located below the base of the Woodford Shale formation and above the Simpson Group formation, both of which consist of significant shale deposits. Evidence indicates that shale formations located above and below the approved injection zones will likely restrict fluids from migrating beyond the approved injection zones for the well.

10. The well will primarily be injecting fluids into the Wristen Group and Fusselman Formation, with some fluids potentially being injected into the Upper Montoya Group. Each of these rock units are located within what is commonly referred to by operators and the Division as the "Devonian-Silurian" formations. These zones consist of a very thick sequence of limestone and dolostone which has significant primary and secondary porosity and permeability that is collectively between 1,300 to 1,400 feet thick.

11. It is my opinion that there is no risk to freshwater resources for injection within the Wristen Group, Fusselman, and Upper Montoya Group because of the depth of these sub-formations and the upper shale permeability boundary created by the Woodford Shale.

12. I have also studied the location of known fault lines within the area where the well is proposed to be drilled and the closest known fault line to the well is located approximately 8 miles away from where the well is proposed to be drilled.

13. There are no currently recognized production shales within the Wristen Group, Fusselman Formation, and Upper Montoya Group in this part of the western Permian Basin. While

there may be some isolated traps located within these sub-formations, it takes significant ability with imaging to be able to locate these deposits in order to properly target them.

14. I 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.

15. I attest that the information provided herein is correct and complete to the best of my knowledge and belief.

16. In my opinion, the granting of this application is in the interests of conservation and the prevention of waste.

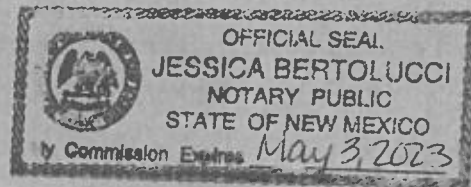
[Signature page follows]

Kate Zeigler
Dr. Kate Zeigler

SUBSCRIBED AND SWORN to before me this 3 day of February, 2020 by Dr. Kate Zeigler.

Jessica Bertolucci
Notary Public

My commission expires: May 3, 2023



Delaware Basin Stratigraphic Unit Descriptions

Lower Paleozoic

Woodford Shale (Upper Devonian)

The Woodford Shale is dominated by organic-rich mudstone interbedded with carbonate (limestone and/or dolostone) beds, chert beds and radiolarian laminae. This unit has been interpreted to include sedimentary gravity-flow deposits. Dominantly shale means lower porosity and permeability than the limestone/dolostone units above and below. The Woodford Shale is unconformable on the units below it. Locally this contact includes solution cavities and fissures down into the underlying carbonate unit(s), creating a complex boundary. It is up to 150' thick locally.

Thirtyone Formation (Lower Devonian)

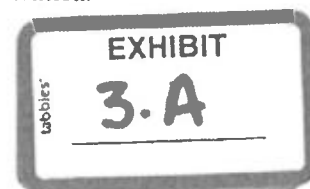
The Thirtyone Formation is part of a wedge of sedimentary rocks that thins to the north and the west where the wedge ends up truncated beneath the base of the overlying Woodford Shale. The Thirtyone Formation is only present in southeastern Lea County and consists of an upper coarsely crystalline dolostone unit and lower chert unit. This unit is not present in the area of concern.

Wristen Group (Middle-Upper Silurian)

The Wristen Group consists of interbedded limestone and dolostone that has a maximum thickness in Lea County, then thins to the north and the west. Thicknesses range from 0 to 1,400' thick. In the Delaware Basin, it occurs up to 19,000' below land surface, then rises to 10,000' to 12,000' subsurface to the north and west. It represents deposition in a shelf-margin environment and includes buildups of coral reefs, stromatoporoids and other invertebrate colonialists. The carbonate beds include boundstones, rudstones and oolitic grainstones with significant primary porosity. To the north, reservoirs targeted for production are dolomitic with vugular and fracture-related porosity.

Fusselman Formation (Late Ordovician-Lower Silurian)

The Fusselman Formation is almost entirely dolostone and can be up to 1,500' thick. As with the overlying Thirtyone Formation and Wristen Group, the Fusselman Formation thins to the north and west where it is truncated beneath the Woodford Shale to the north of where the Wristen Group pinches out. In Lea County, the Fusselman Formation can be 18,000' or more below land surface. It is primarily coarsely crystalline dolostone that is vugular, fractured and/or brecciated, with significant secondary porosity due to the fracturing and brecciation.



Montoya Group (Middle-Upper Ordovician)

The Montoya Formation includes three dolostone members overlying a sandstone unit. The three upper carbonate units include the Upham, Aleman and Cutter Members and the lower sandstone unit is the Cable Canyon Sandstone. The entire package can be up to 600' thick and depth to the top of the unit ranges from 5,500' near the northern pinchout in Chaves County to as much as 20,000' in southern Lea County. The Montoya Group was stripped from the higher parts of the Central Basin Platform by erosion in the Late Pennsylvanian and Early Permian.

Simpson Group (Middle-Upper Ordovician)

The Simpson Group is a heterogeneous unit with limestone, dolostone, sandstone and green shale horizons. Up to 1000' thick, it is dominated by the shale beds (55% of total thickness), followed by the dolostone and limestone beds (40%) and finally sandstone (5%). The shale horizons can serve as a permeability barrier between the underlying Precambrian basement rocks and overlying reservoirs where the Simpson Group is present and has sufficient thickness. Depths to the Simpson Group range from 6,700' on parts of the Central Basin Platform to up to 21,000' in the Delaware Basin.

Ellenburger Formation (Lower Ordovician)

The Ellenburger Formation is up to 1000' thick and composed of limestone and dolostone that represent cyclic deposition in waters of the inner platform with restricted circulation. Porosity in the Ellenburger Formation includes porosity in the matrix, vugs, major karst dissolution features, collapse karst breccias and fractures. Depths to the top of the unit range from 7,500' on the Central Basin Platform to up to 22,000' in the Delaware Basin.

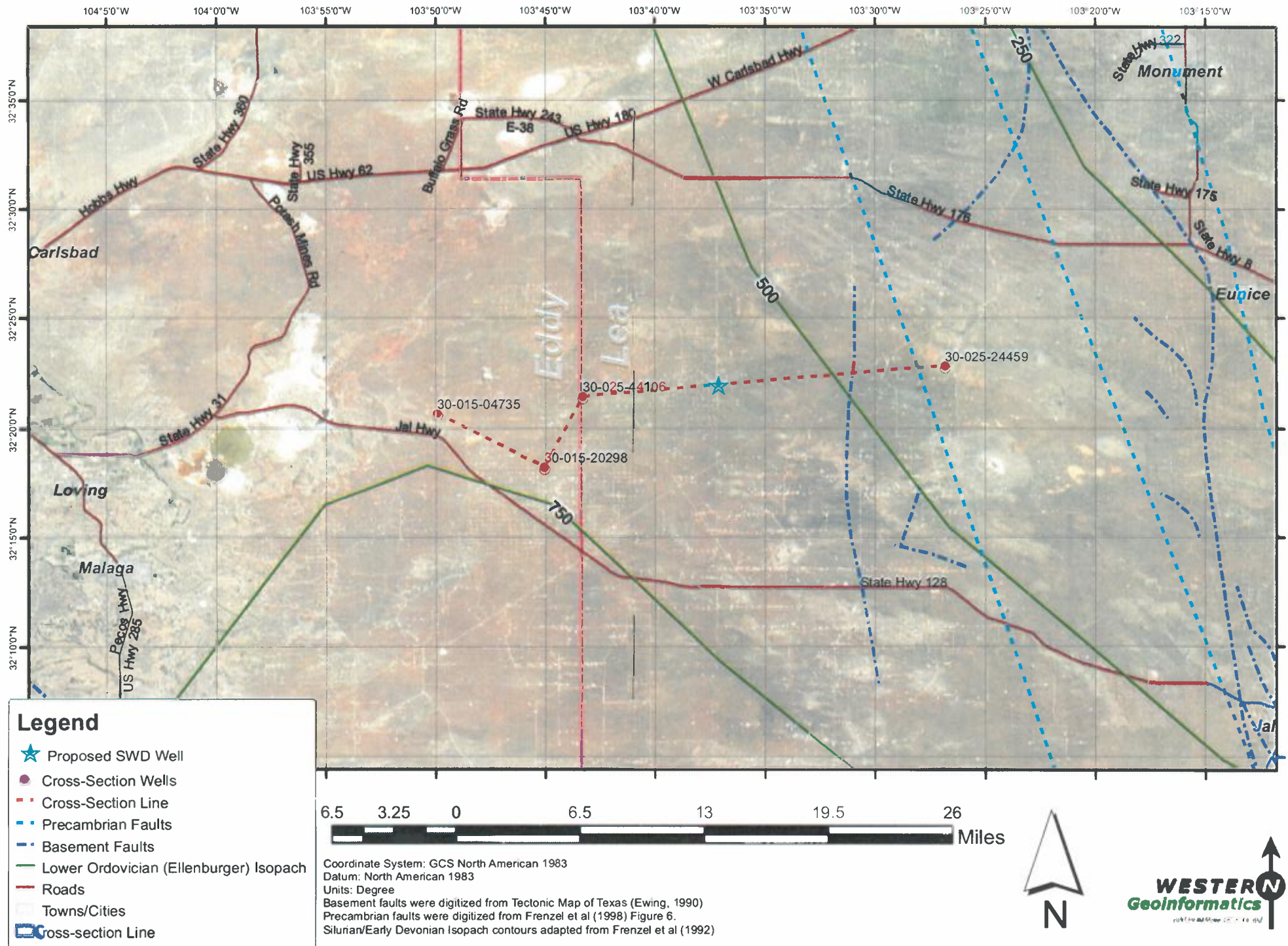
References

- Broadhead, R.F., 2017, Petroleum Geology: in V.T. McLemore, S. Timmons and M. Wilks (eds.), Energy and Mineral Resources of New Mexico, New Mexico Bureau of Geology and Mineral Resources Memoir 50, vol. A, 90 p.
- Comer, J.B., 1991, Stratigraphic analysis of the Upper Devonian Woodford Formation, Permian Basin, West Texas and southeastern New Mexico: Bureau of Economic Geology, University of Texas at Austin, Report of Investigations no. 201, 63 p.
- Hemmesch, N.T., Harris, N.B., Mnich, C.A. and Selby, D., 2014, A sequence-stratigraphic framework for the Upper Devonian Woodford Shale, Permian Basin, west Texas: American Association of Petroleum Geologists Bulletin, v. 98, no. 1, p. 23-47, doi:10.1306/05221312077
- Texas Bureau of Economic Geology, 2009, Integrated Synthesis of the Permian Basin: Data and Models for Recovering Existing and Undiscovered Oil Resources from the Largest Oil-Bearing Basin in the U.S.: Department of Energy Final Technical Report, Award No: DE-FC26-04NT15509, 964 p.

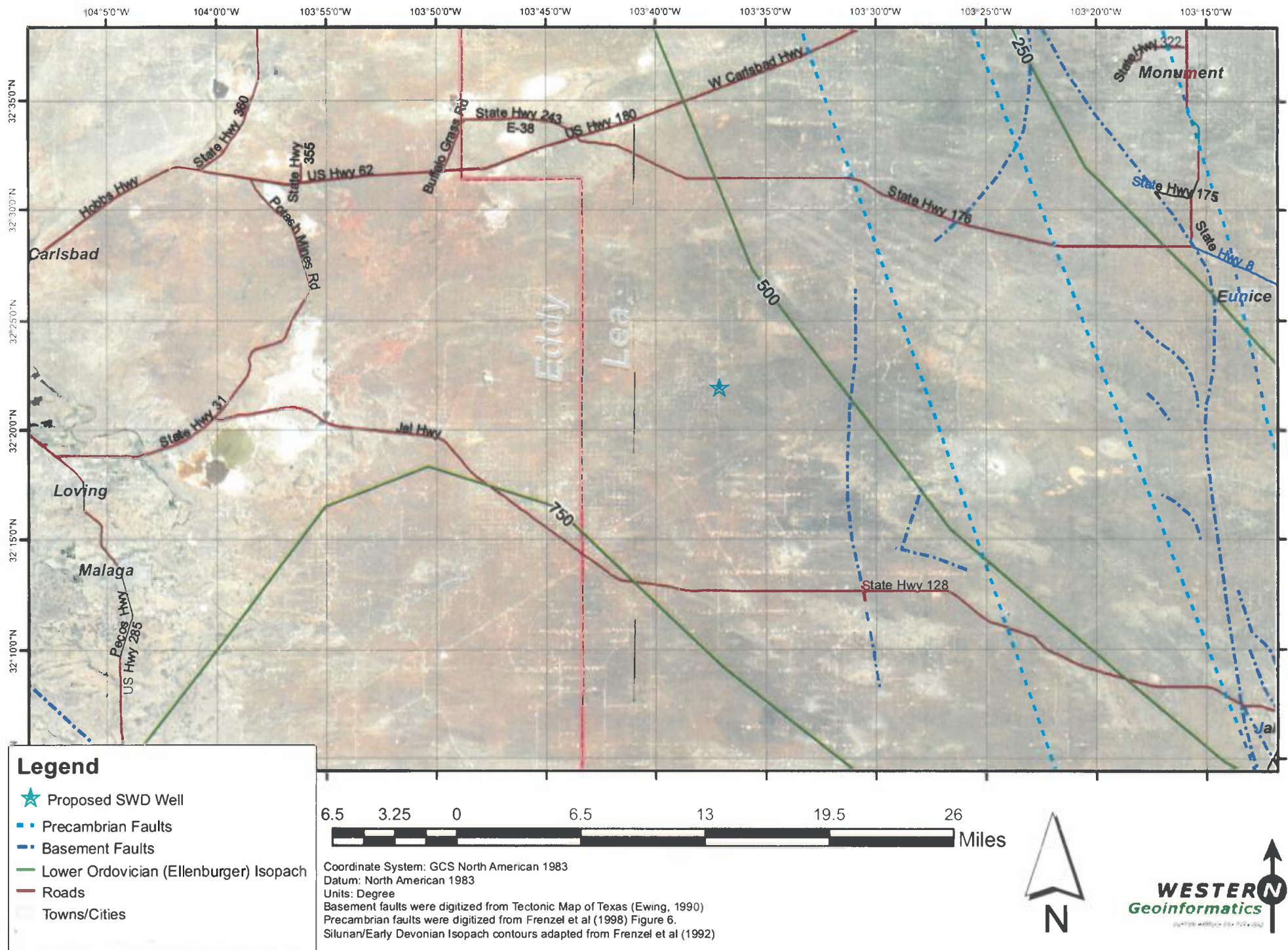
Age		Stratigraphic Unit	Key Feature	Estimated Depth Below Land Surface
Triassic		Chinle	Freshwater resources	
		Santa Rosa		
Permian	Ochoan	Dewey Lake		
		Rustler		
		Salado		
		Castile		
	Guadalupian	Bell Canyon	↑ Current petroleum zone ↓	
		Cherry Canyon		
		Brushy Canyon		
	Leonardian	Bone Spring	↑ Current petroleum zone ↓	
	Wolfcampian	Wolfcamp	↓	
Pennsylvanian	Virgilian	Cisco	↑ Current petroleum zone ↓	
	Missourian	Canyon		
	Des Moinesian	Strawn		
	Atokan	Atoka		
	Morrowan	Morrow		
Mississ.	Upper	Barnett		
	Lower	limestones		
Devon.	Upper	Woodford	Shale: permeability barrier	-16,200'
	Middle			
	Lower	Thirtyone		-16,350'
Silur.	Upper	Wristen	Target injection interval	
	Middle			
	Lower	Fusselman		-17,200'
Ordov.	Upper	Montoya		~17,650'
	Middle	Simpson	Shale: permeability barrier	-18,000'
	Lower	Ellenburger		-18,550'
Cambrian		Bliss		
Precambrian		basement		

Stratigraphic chart for the Delaware Basin from Broadhead (2017).
 * Based on data from 30-025-44106 Deep Purple SWD #1 (30-22S-32E).

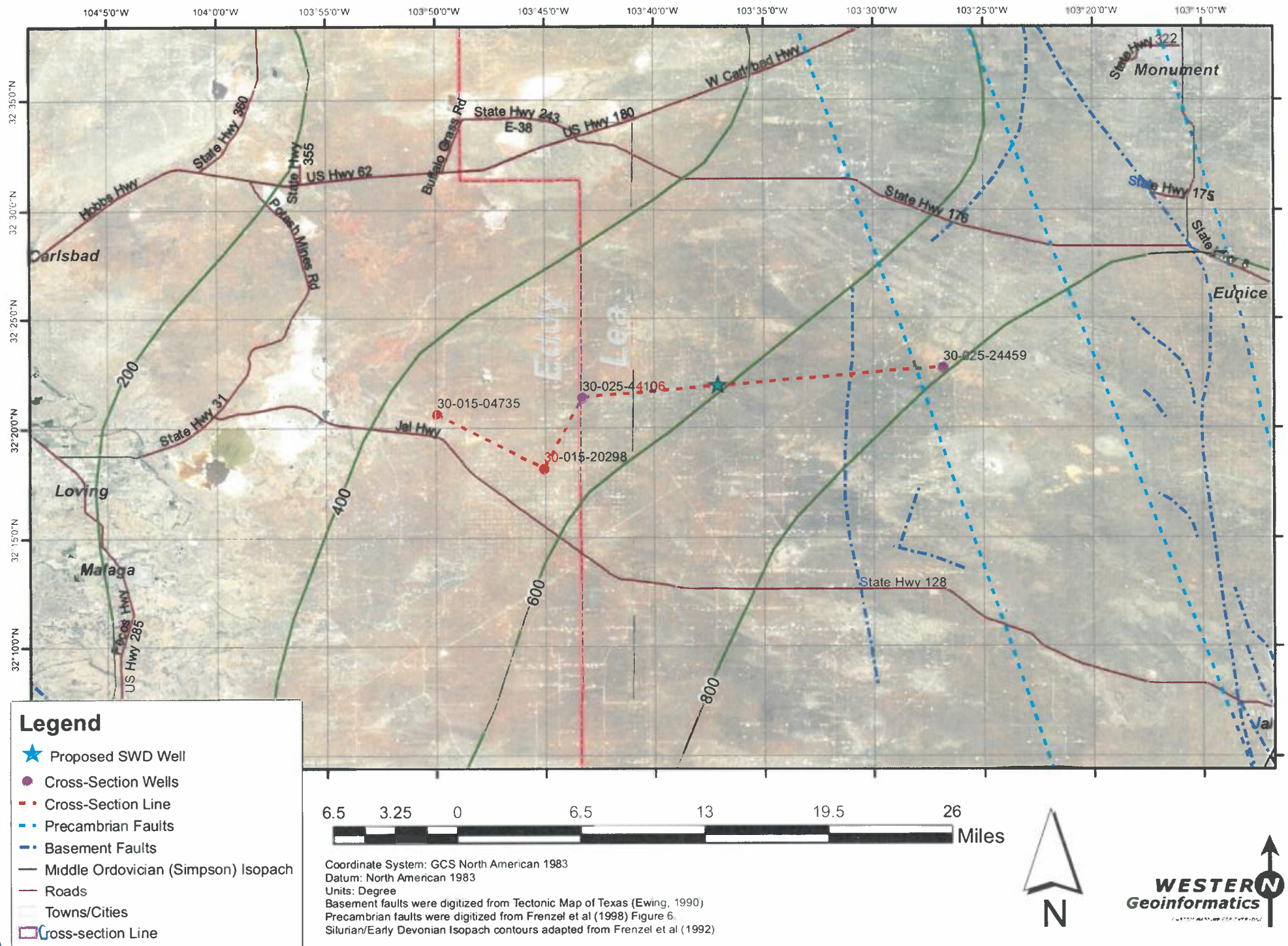
Ellenburger Isopach, Faults, Well Locations



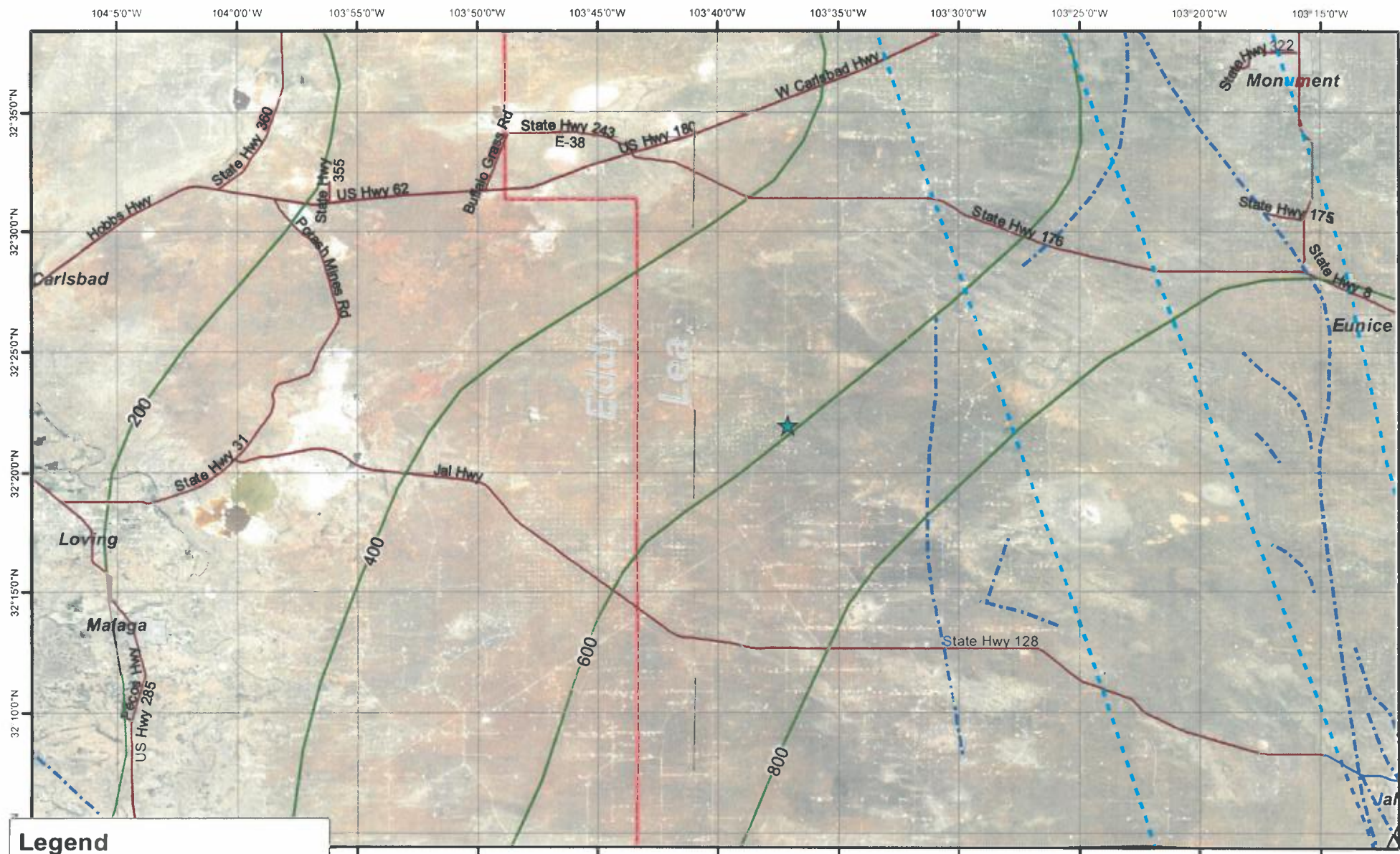
Ellenburger Isopach, Faults, Well Locations



Simpson Isopach, Faults, Well Locations



Simpson Isopach, Faults, Well Locations



Legend

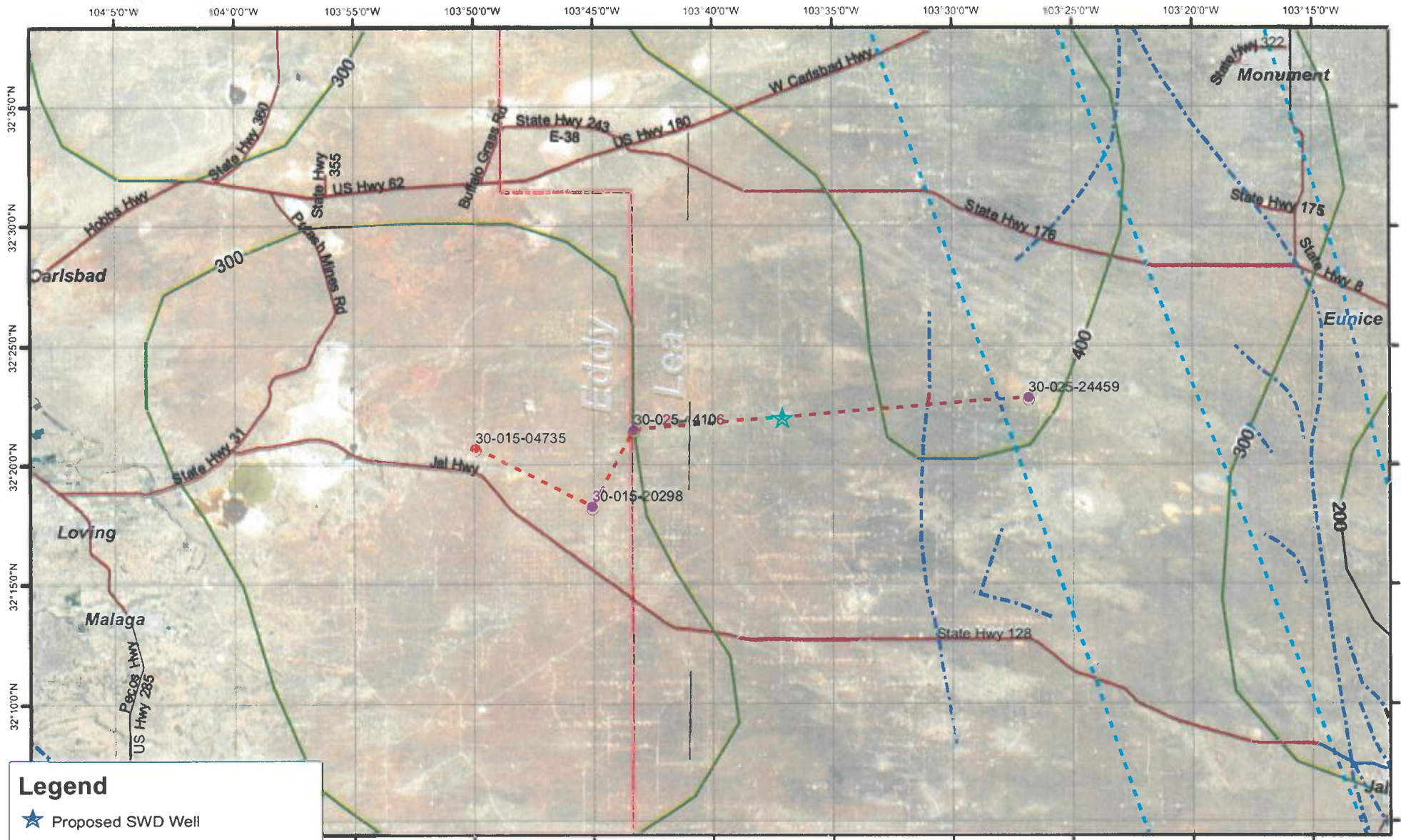
- ★ Proposed SLD Well
- Precambrian Faults
- · - Basement Faults
- Middle Ordovician (Simpson) Isopach
- Roads
- Towns/Cities



Coordinate System: GCS North American 1983
 Datum: North American 1983
 Units: Degree
 Basement faults were digitized from Tectonic Map of Texas (Ewing, 1990)
 Precambrian faults were digitized from Frenzel et al (1998) Figure 6.
 Silurian/Early Devonian Isopach contours adapted from Frenzel et al (1992)



Montoya Isopach, Faults, Well Locations



Legend

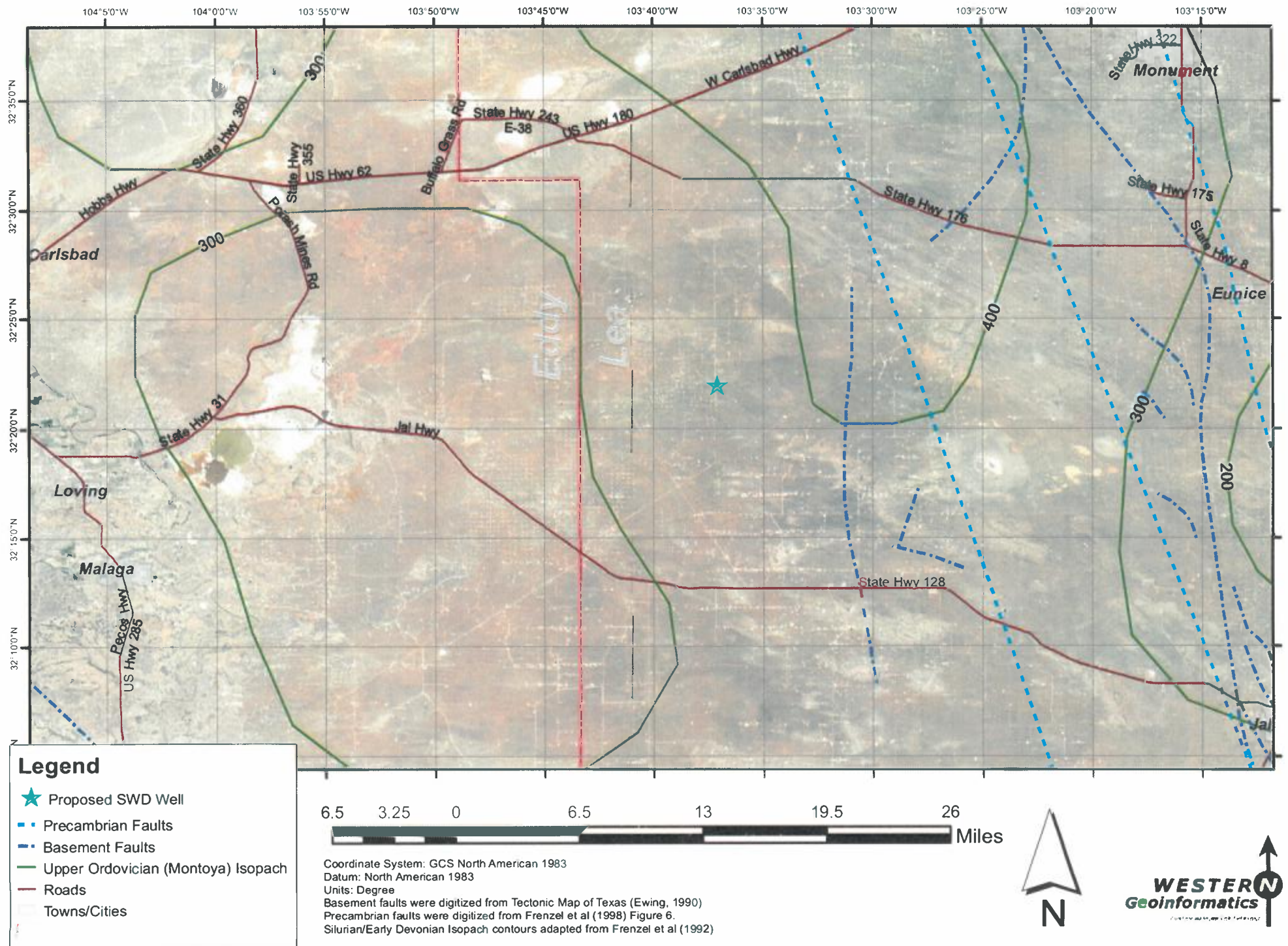
- ★ Proposed SWD Well
- Cross-Section Wells
- - - Cross-Section Line
- - - Precambrian Faults
- - - Basement Faults
- - - Upper Ordovician (Montoya) Isopach
- - - Roads
- - - Towns/Cities
- - - Cross-section Line



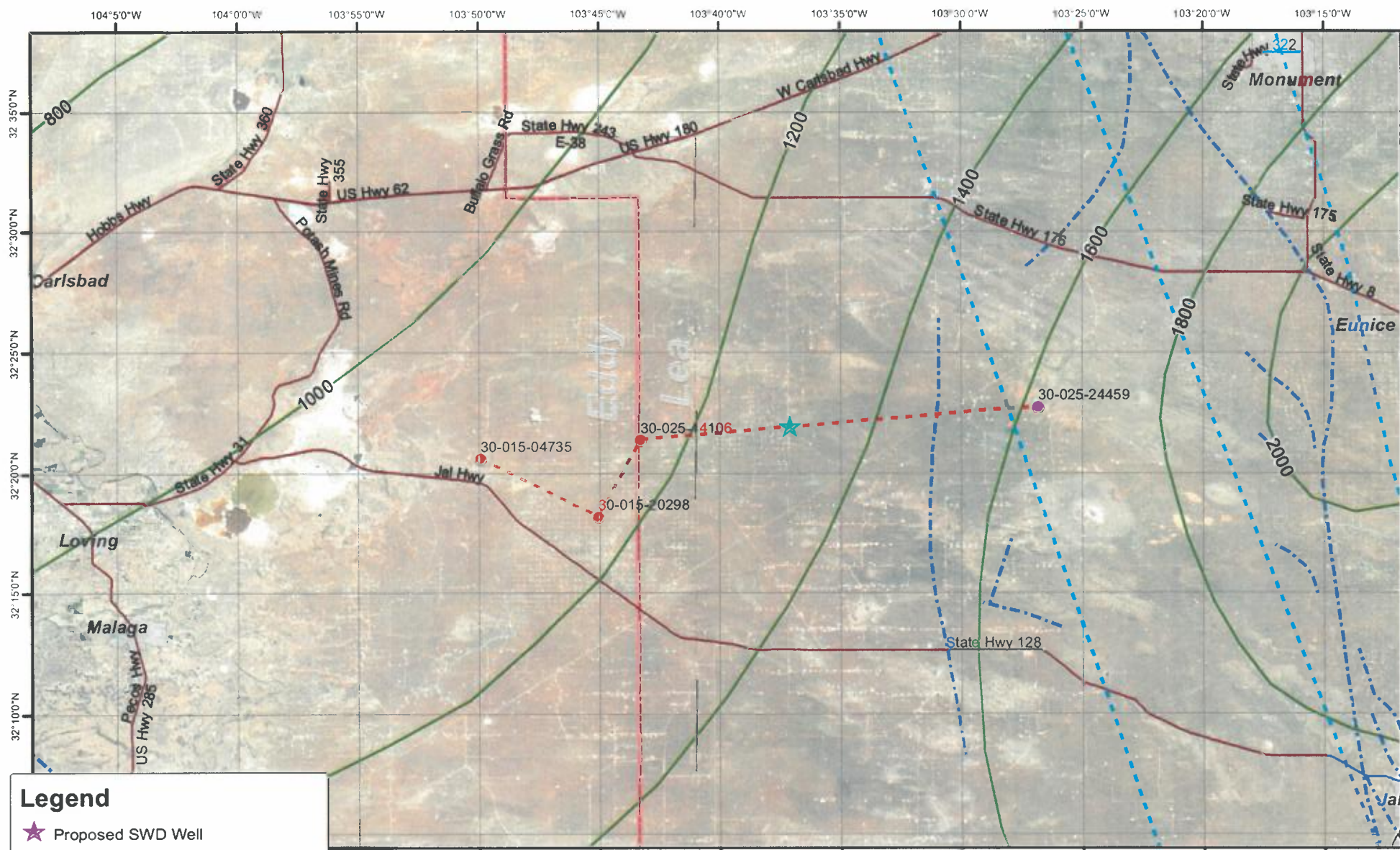
Coordinate System: GCS North American 1983
 Datum: North American 1983
 Units: Degree
 Basement faults were digitized from Tectonic Map of Texas (Ewing, 1990)
 Precambrian faults were digitized from Frenzel et al (1998) Figure 6.
 Silurian/Early Devonian Isopach contours adapted from Frenzel et al (1992)



Montoya Isopach, Faults, Well Locations



Wristen-Fusselman Isopach, Faults, Well Locations



Legend

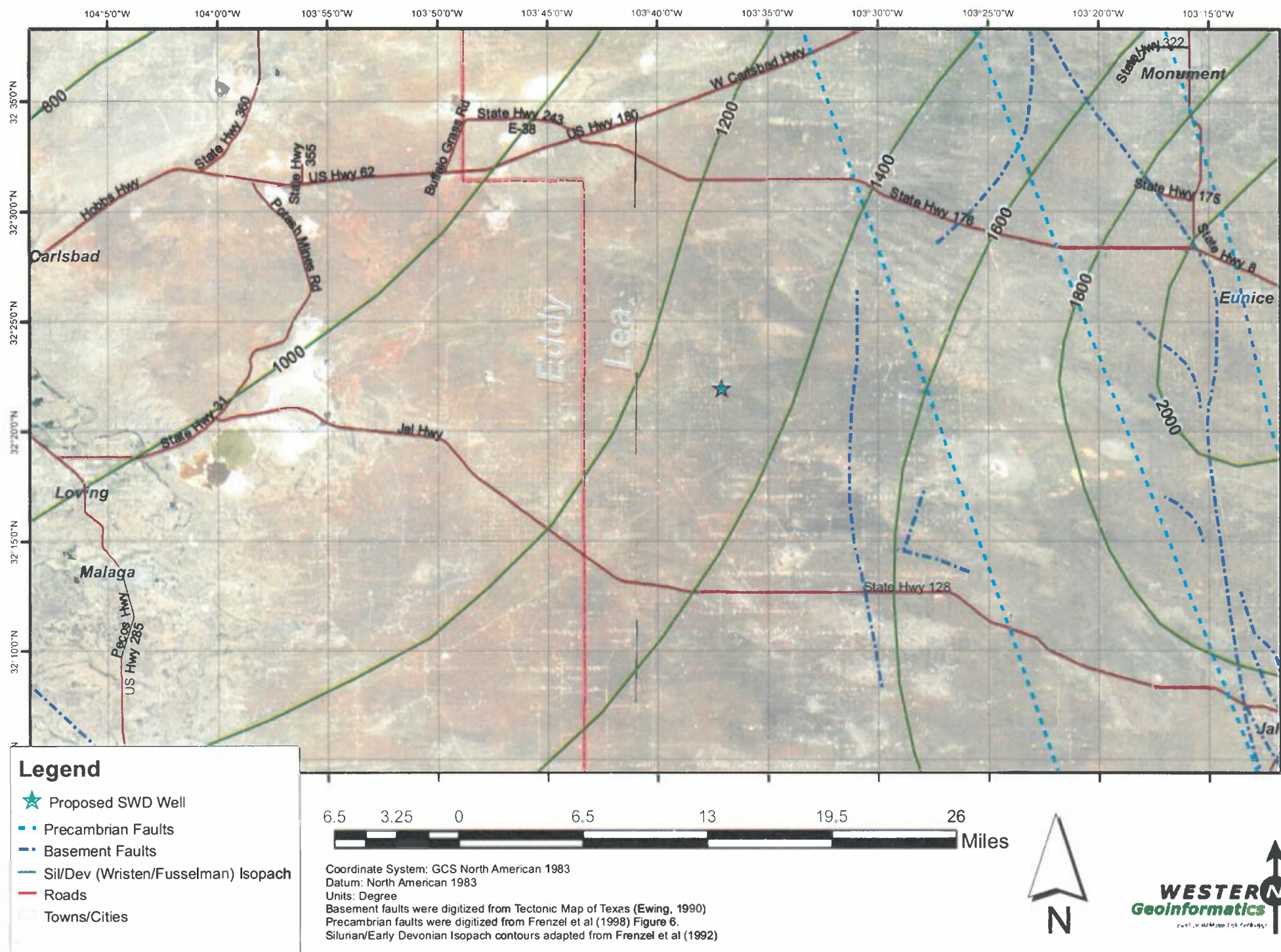
- ★ Proposed SWD Well
- Cross-Section Wells
- - - Cross-Section Line
- - - Precambrian Faults
- . - Basement Faults
- Sil/Dev (Wristen/Fusselman) Isopach
- Roads
- Towns/Cities
- - - Cross-section Line



Coordinate System: GCS North American 1983
 Datum: North American 1983
 Units: Degree
 Basement faults were digitized from Tectonic Map of Texas (Ewing, 1990)
 Precambrian faults were digitized from Frenzel et al (1998) Figure 6.
 Silurian/Early Devonian Isopach contours adapted from Frenzel et al (1992)

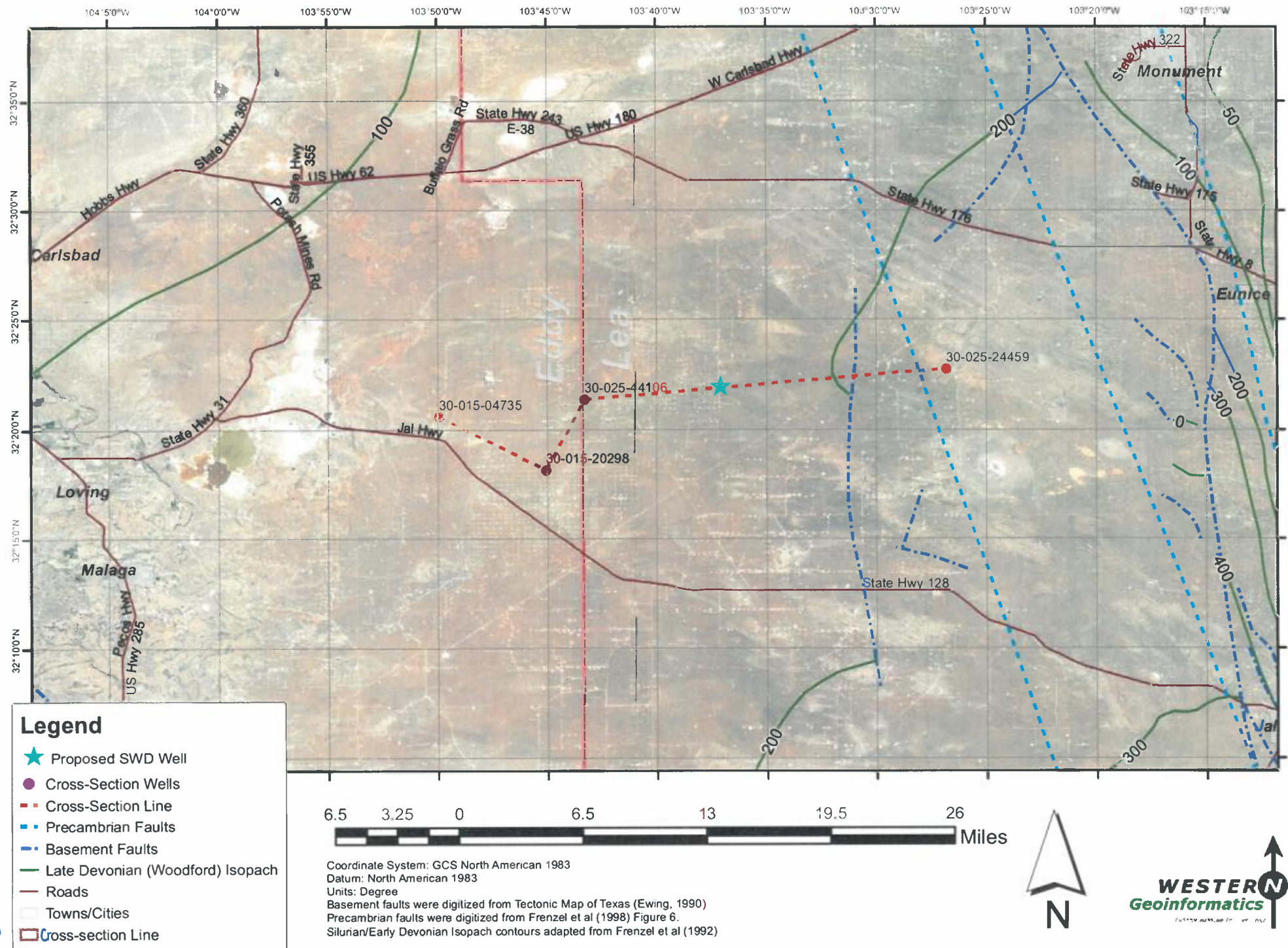


Wristen-Fusselman Isopach, Faults, Well Locations

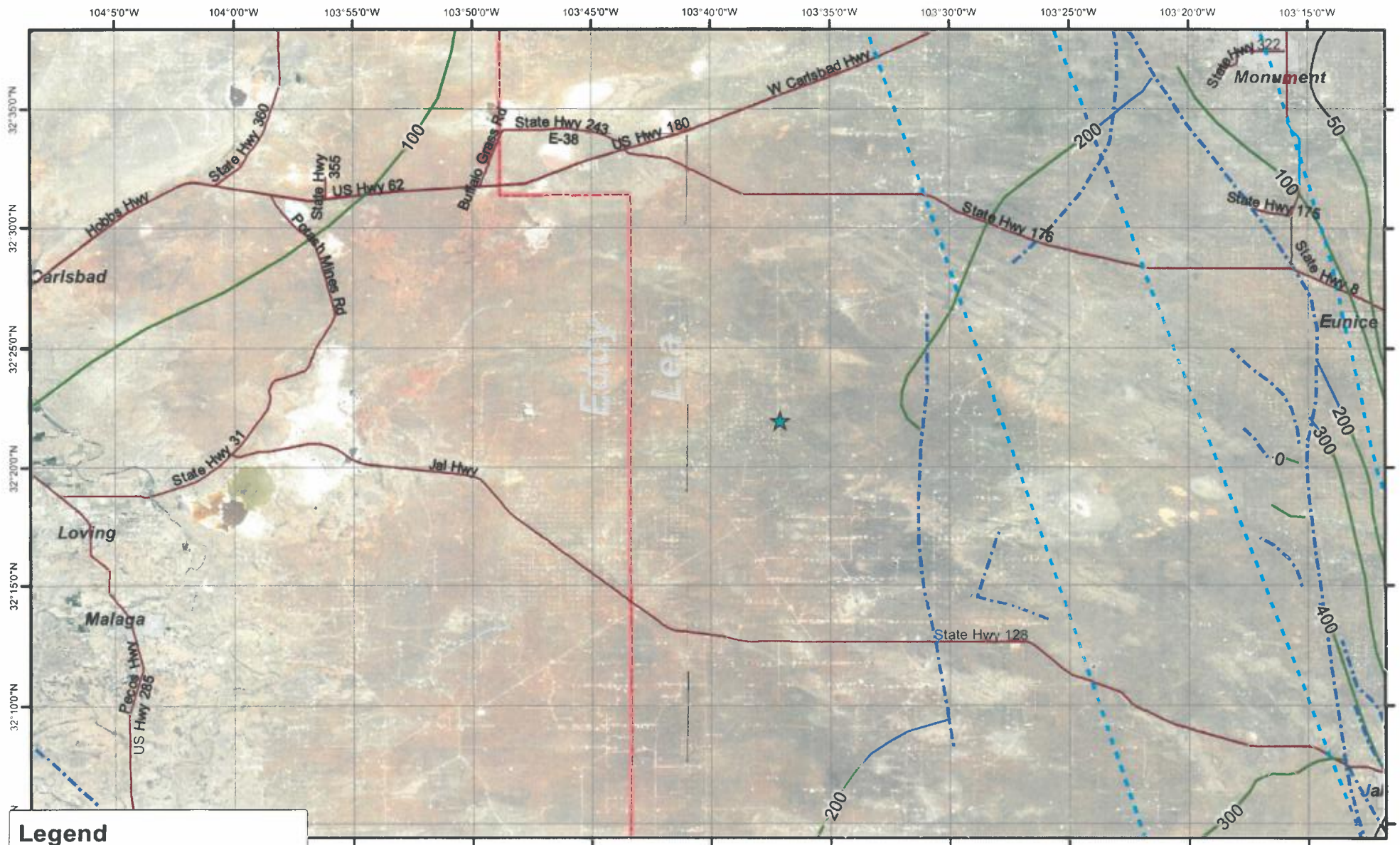


69

Woodford Isopach, Faults, Well Locations



Woodford Isopach, Faults, Well Locations



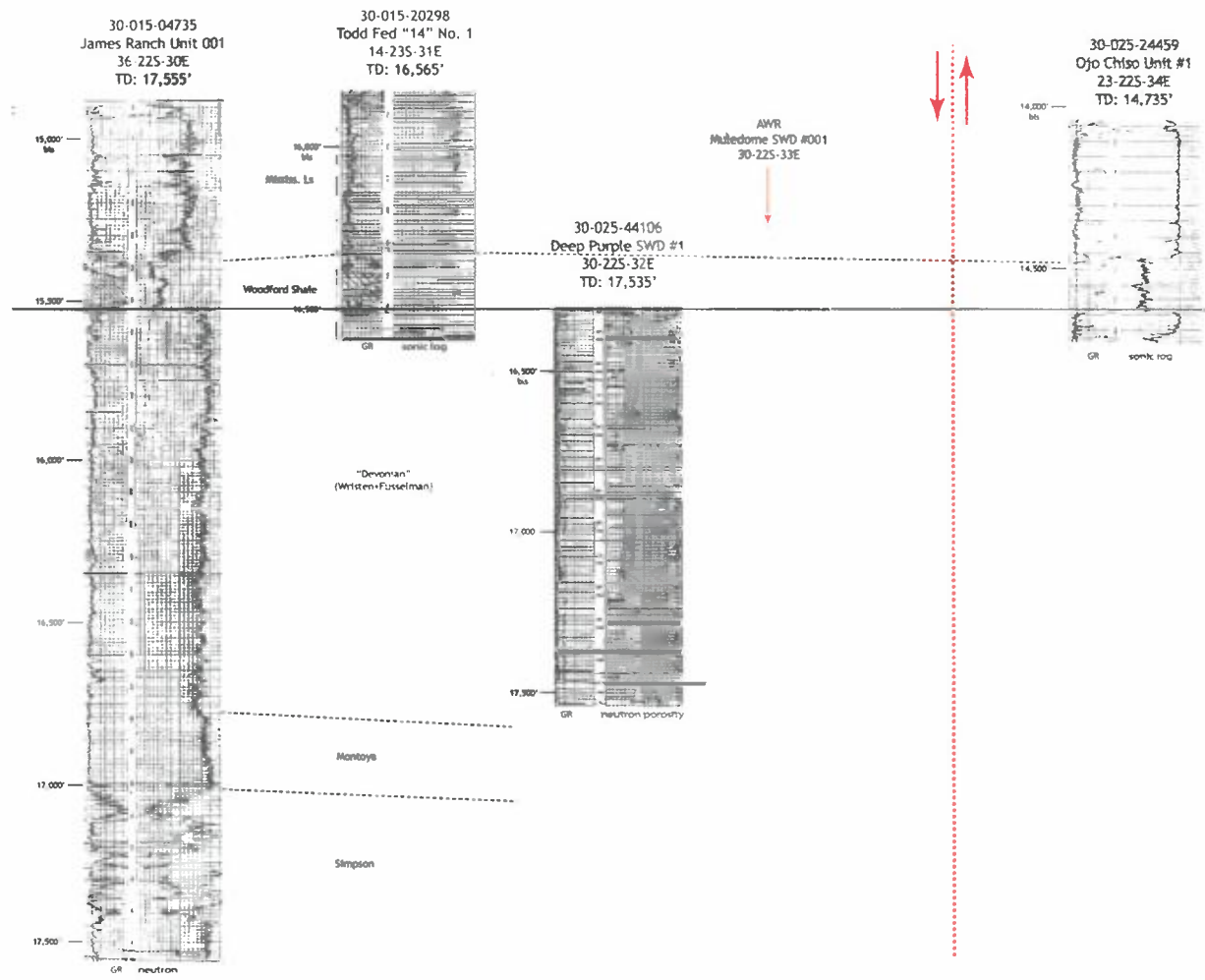
Legend

- ★ Proposed SWD Well
- - - Precambrian Faults
- - - Basement Faults
- - - Late Devonian (Woodford) Isopach
- - - Roads
- - - Towns/Cities



Coordinate System: GCS North American 1983
 Datum: North American 1983
 Units: Degree
 Basement faults were digitized from Tectonic Map of Texas (Ewing, 1990)
 Precambrian faults were digitized from Frenzel et al (1998) Figure 6.
 Silurian/Early Devonian Isopach contours adapted from Frenzel et al (1992)





**STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION**

**APPLICATION OF AWR DISPOSAL, LLC
TO APPROVE SALT WATER
DISPOSAL WELL IN LEA
COUNTY, NEW MEXICO.**

**CASE NO. 21031
(MULEDOM)**

AFFIDAVIT OF DR. STEVEN TAYLOR

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

I, Dr. Steven Taylor, make the following affidavit based upon my own personal knowledge.

1. I am over eighteen (18) years of age and am otherwise competent to make the statements contained herein.

2. I have worked at the Los Alamos National Labs from 1991 to 2006. I currently am the secretary of GeoEnergy Monitoring Systems, Inc., a company that builds and conducts seismic monitoring.

3. I have obtained a Bachelor of Science degree in geology at Ohio University (1975) and a Ph.D. in Geophysics at the Massachusetts Institute of Technology (1980).

4. I am familiar with the application that AWR Disposal, LLC ("AWR") has filed in this matter, and I have conducted a study related to the areas which is the subject matter of the application.



66

5. AWR seeks an order approving the Muledome SWD #1 well, which is a salt water disposal well.

6. The injection zone for the well is located below the base of the Woodford Shale formation and above the Ordovician formation, which consists of significant shale deposits.

7. The closest known fault line is located approximately 2 to 20 miles away from where the well is proposed to be located.

8. I have studied seismic catalogs, unpublished catalogs and USGS catalogs for the time period of 2010 – 2017 selective events within 50 km of one the Striker SWD wells. Attached as Exhibit A is a copy of my study.

9. I have also reviewed information provided by FTI Platt Sparks involving several different fault slip probability analysis conducted, using a tool created by Stanford University. These fault slip potential models showed low probability of slip or earthquakes to known mapped faults located closest to the well. A copy of the studies are attached hereto as Exhibit B.

10. I attest that the information provided herein is correct and complete to the best of my knowledge and belief.

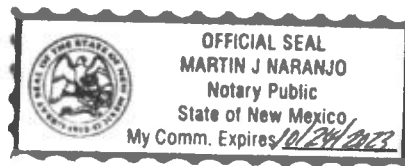
[Signature page follows]

Steven Taylor
Dr. Steven Taylor

SUBSCRIBED AND SWORN to before me this 3rd day of February, 2020 by Dr. Steven Taylor.

Martin J. Naranjo
Notary Public

My commission expires: 10/24/2023



Seismic Catalog Analysis Within 50 km of Muledome SWD #1 Well

Prepared for NGL-Permian
by
GeoEnergy Monitoring Systems
February 3, 2020

Analysis is based on NMT seismic catalogs, unpublished catalogs and USGS catalogs for the time period 2010-2017 selecting events within 50 km of the Muledome SWD well. Additionally, seismic monitoring from September 6, 2018 to date from four NGL seismic stations installed at Striker 2, Striker 3, Striker 6 and Salty Dog SWD wells.

Striker Two (STR2), Sand Dunes well, Lat/Long: 32.2072820/-103.7557370

Striker Three (STR3), Gossett well, Lat/Long: 32.2551110/-104.0868610

Striker Six (STR6), Madera well, Lat/Long: 32.2091150/-103.5359570

Salty Dog (SDOG), Salty Dog well, Lat/Long: 32.22531/-103.045212

Figure 1 shows seismic station locations with estimated detection levels for M 1.0 (green circles) and M 1.5 (red circles) along with NGL-Permian stations (yellow pushpins). **Figure 2** shows seismicity listed in Table 1 shown as red circles and additional regional stations from TexNet and NMT (green pushpins). These regional stations are used along with the 4 NGL SWD seismic stations for regional monitoring.

The USGS reports no events in the vicinity since 2010. New Mexico Tech runs a seismic network (SC) north of the wells for the DOE Waste Isolation Plant (only short-period vertical components). There are a total of seven seismic events in this time period ranging in magnitude from 1.0 to 3.1. Since the NGL seismic deployment, there have been event detections listed in Table 2 having preliminary locations using available regional data (**Figure 3**). Due to the small magnitudes, the signal-to-noise levels are low so the locations have large uncertainty and there is little constraint on depth.

A magnitude 1.2 event on August 14, 2017 occurred in the vicinity of the proposed Muledome SWD well (Figure 2).

Table 1: Seismicity Within 50 km of Striker SWD Wells 2010-2017

Date	Origin Time GMT	Latitude	Longitude	Depth (km)	Magnitude
20111227	23:10:37	32.37	-103.95	NaN	1.6
20120318	10:57:22	32.281	-103.892	5.0	3.1
20170211	14:34:27	32.29	-103.92	NaN	1.5
20170302	11:38:53	32.37	-103.88	NaN	1.7
20170325	22:46:01	32.13	-103.77	NaN	1
20170503	17:47:21	32.082	-103.023	5.0	2.6
20170814	01:09:56	32.39	-103.56	NaN	1.2



Table 2. New Mexico Area Reporting Period Seismicity (km units)

Date	Origin Time (GMT)	Lat	Long	Depth	Loc Error	M	(+/-)
09/10/18	23:35:43.942	32.1793	-103.5283	1	5.58	1.25	0.23
09/14/18	06:57:47.614	32.1540	-103.5030	1	5.58	1.11	0.41
09/15/18	16:48:21.041	32.1630	-103.5211	1	5.37	1.50	0.00
10/13/18	22:07:22.259	32.0998	-103.4560	6	5.64	1.60	0.12
11/18/18	09:04:52.707	32.2526	-103.7853	5	3.77	1.75	0.20
12/09/18	18:51:00.805	32.3634	-103.8510	1	2.09	1.44	0.08
01/03/19	09:15:48.809	32.2761	-103.6732	6	5.64	1.63	0.00
01/03/19	23:05:33.122	32.2599	-103.7654	4	5.51	1.60	0.25
01/04/19	09:45:38.943	32.2346	-103.7798	4	4.34	1.98	0.38
01/09/19	10:18:54.389	32.2255	-103.7166	5	2.80	1.47	0.41
01/27/19	07:33:47.127	32.2219	-103.7220	5	3.53	1.72	0.31
02/19/19	09:35:15.109	32.2443	-103.6898	1	4.17	1.20	0.00
02/19/19	09:35:15.109	32.2443	-103.6898	1	4.17	1.20	0.00
02/19/19	09:35:15.109	32.2443	-103.6898	1	4.17	1.20	0.00
05/23/19	06:33:40.530	32.2617	-103.7581	4	2.28	1.53	0.27
06/08/19	23:11:24.669	32.3102	-103.8510	2	0.55	1.39	0.07
07/09/19	14:43:45.683	32.2263	-103.6260	4	3.02	1.54	0.06
07/17/19	03:24:43.975	32.3326	-103.8093	6	0.91	1.56	0.07
08/10/19	16:06:35.306	32.3091	-103.7533	2	3.60	1.44	0.58
08/16/19	04:46:20.946	32.2704	-103.8383	3	0.03	1.46	0.00
08/22/19	14:39:58.164	32.2671	-103.7654	4	4.31	1.92	0.32
08/27/19	06:54:59.122	32.1473	-103.7345	1	1.35	1.66	0.22
09/03/19	20:16:04.540	32.3138	-103.8528	1	5.64	1.65	0.19
09/10/19	14:15:00.998	32.4211	-103.7478	2	0.76	2.11	0.21
09/13/19	09:41:47.001	32.2173	-103.4072	1	0.67	1.55	0.10
09/24/19	03:20:22.478	32.3247	-103.9613	7	5.64	1.46	0.07
10/12/19	05:48:24.311	32.2779	-103.7744	1	3.97	1.57	0.19
10/12/19	18:43:18.117	32.2779	-103.7581	1	2.24	1.83	0.20
10/21/19	11:58:57.072	32.2245	-103.3783	4	4.35	2.44	0.29
11/15/19	01:10:43.302	32.2581	-103.7762	2	1.79	1.72	0.37
11/30/19	04:11:34.945	32.2635	-103.7780	1	0.61	1.38	0.30
12/07/19	01:03:36.958	32.5332	-103.9069	1	4.76	1.90	0.15
12/09/19	03:17:25.761	32.4934	-103.9142	3	2.48	1.86	0.22
12/12/19	02:55:40.979	32.1864	-104.1994	3	4.41	2.20	0.10
12/15/19	02:30:13.830	32.0447	-103.7690	7	1.31	1.69	0.28
12/28/19	04:31:36.737	32.3903	-103.6786	3	0.07	1.56	0.24
12/30/19	03:01:15.030	32.0608	-103.7973	4	5.64	2.43	0.30
12/31/19	15:45:32.357	32.2508	-103.7726	2	0.38	1.36	0.31
01/27/20	06:42:28.366	32.1387	-103.8160	3	4.93	1.67	0.34
01/28/20	06:56:54.325	32.2804	-104.0982	3	1.59	1.30	0.35
01/30/20	10:43:15.102	32.4771	-103.5105	2	4.07	1.81	0.42

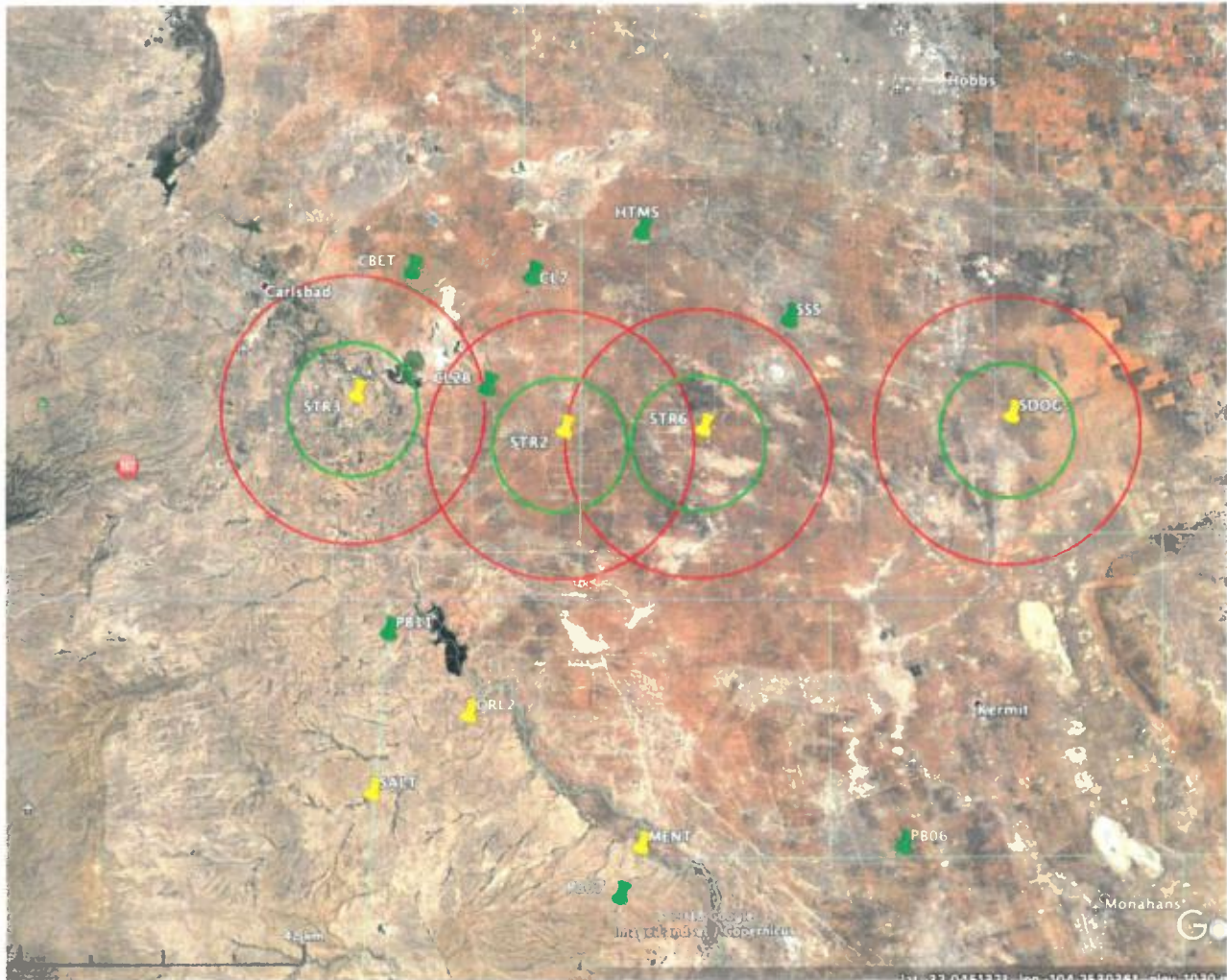


Figure 1. Striker SWD wells seismic station locations and existing NGL-Permian seismic stations (yellow pushpins). Green and red circles around stations show approximate detection levels for ML 1.0 and 1.5, respectively.

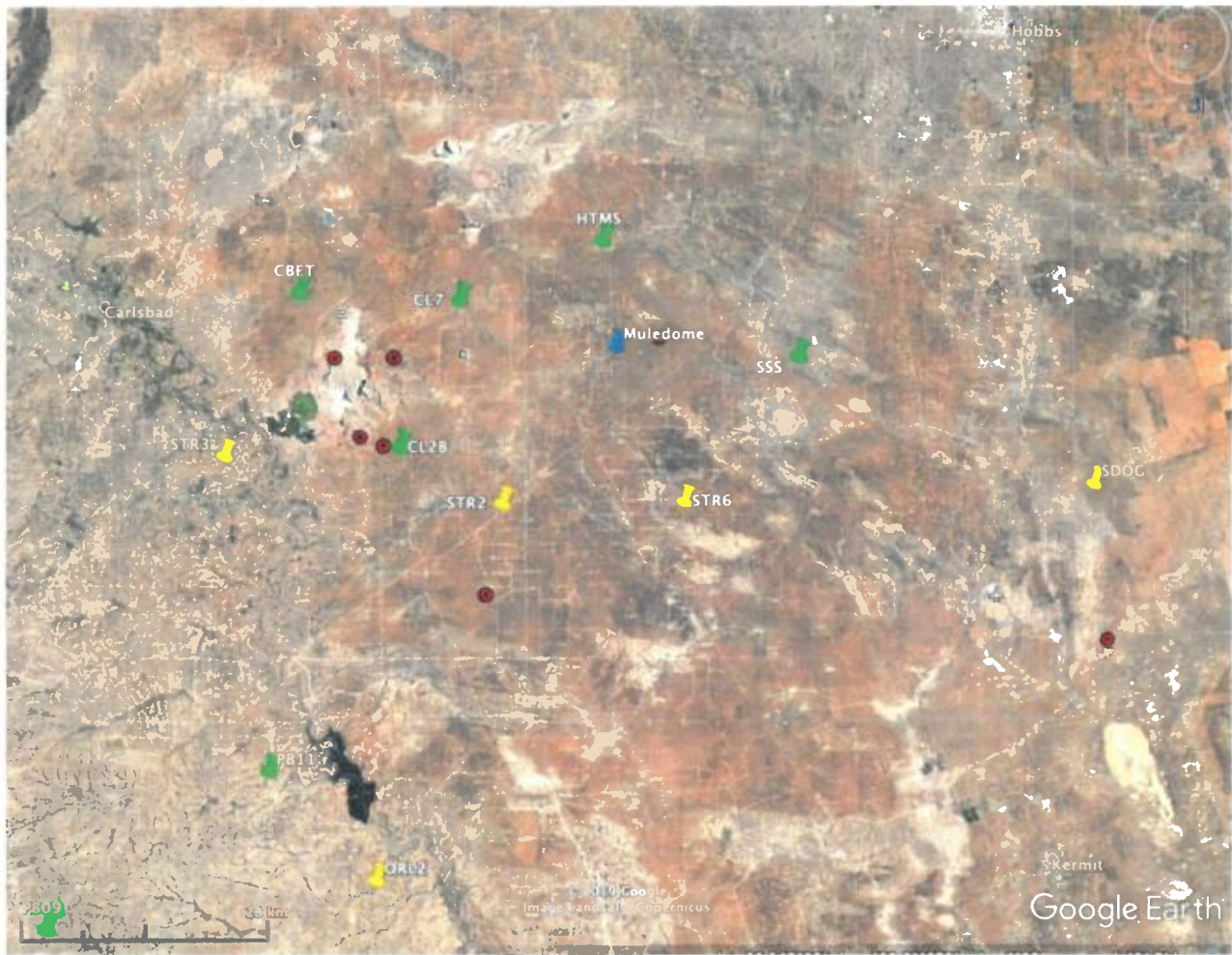


Figure 2. NGL SWD wells seismic station locations and existing NGL-Permian seismic stations (yellow pushpins). Other regional seismic stations run by TexNet and New Mexico Tech are shown as green pushpins. Historic seismicity listed in Table 1 shown as red circles. Muledome SWD well shown as blue pushpin.

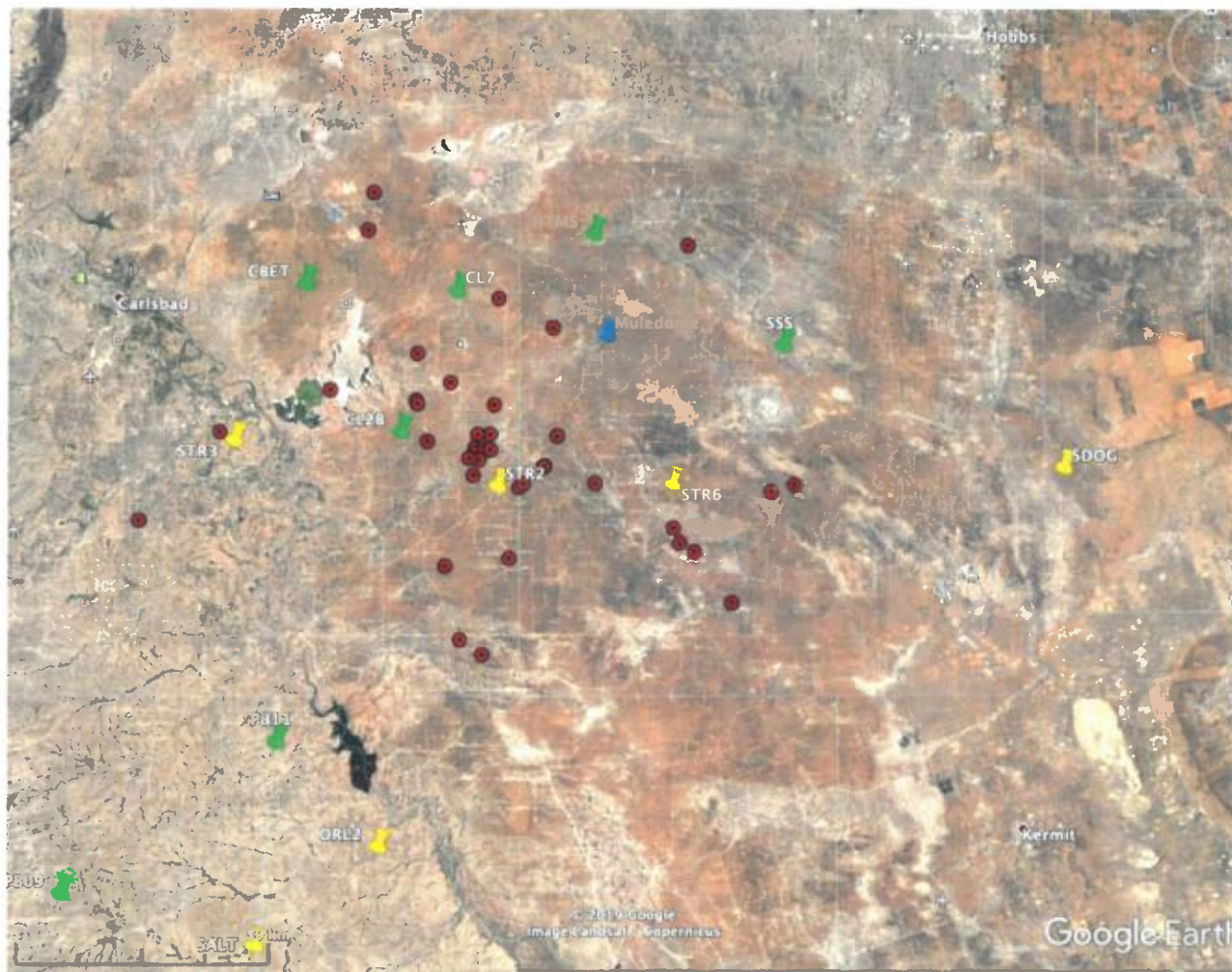


Figure 3. Seismic events from September 6, 2018 to date as red circles (Table 2). Seismic stations as yellow (NGL) or green (NMT and TexNet) pushpins. Muledome SWD well shown as blue pushpin.



Texas Registered Engineering Firm No F- 16381

February 3, 2020

RE: FSP Analysis **Muledome SWD No. 1**
Lea County, New Mexico

FSP Analysis

The FSP software used for this analysis was jointly developed by Stanford University, Exxon Mobil and XTO Energy as a tool for estimating fault slip potential resulting from fluid injection.

I have reviewed the geology, seismic activity, injection history and future proposed injection in the Subject Area and I would conclude that the **Muledome SWD No. 1** well does not pose a risk of increasing seismicity in the area. The primary risk reduction factor is that the faults are not optimally oriented to slip, and significant pressure increases would be necessary to initiate slip on the faults analyzed.

Fault slip potential (FSP) was analyzed in the area of review shown on **Exhibit No. 1**. The analysis integrates the proposed injection well and any existing injection wells in order to fully assess the pressure implications of injection in the area and the potential for slip along existing faults. Historical USGS earthquake events are denoted by the "dark blue" bulls-eye symbols, earthquake events recorded on NGL's regional seismic monitoring system are denoted by the "pink" bulls-eye symbols and earthquake events recorded on New Mexico Tech's regional seismic monitoring system are denoted by the "light blue" bulls-eye symbols.

Exhibit No. 2 shows the FSP input parameters for the local stress, average reservoir depth, pressure gradients and reservoir characteristics. Depths and reservoir characteristics were derived from nearby well logs and stress values were derived from the Lund Snee and Zoback (2018) paper related to Stress in the Permian Basin.

Exhibit No. 3 shows the location of existing wells relative to the faults documented in this area. The faults were independently mapped by FTI Platt Sparks and compared to the faults documented by the Texas Bureau of Economic Geology (BEG). The BEG faults are also the fault traces shown in the referenced Snee/Zoback paper (Figure 3 in the paper) and shown as **Exhibit No. 4** in my report. The Snee/Zoback paper only considers fault orientation relative to the stress orientation in determination of fault slip potential. Based on their limited analysis of the area they concluded the faults have low slip potential based on orientation/azimuth. My analysis



further incorporates the injection history and future injection projections and the injection reservoir characteristics to fully assess the potential for slip along these faults.

The Subject Well was input at 50,000 bbls/day and held constant for the life of the analysis (+25 years).

Wells with no historically recorded injection volumes were modelled at 25,000 bbls/day and held constant for the life of the analysis (+25 years). This volume is greater than the historical injection volumes from existing wells in the area and likely represents typical maximum injection volumes for the subject formation.

The wells with no recorded injection volumes are denoted in the model as follows: **(Exhibit No. 3)**

2 – 3002544000
4 – 3002544144
7 – 3002545341
8 – 3002545605
9 – 3002545815
10 – 3002546473

Existing wells were incorporated into the analysis using their injection volume histories and holding them constant into the future at their last reported monthly injection volume. The existing SWD injection wells are as follows: **(Exhibit No. 3)**

1 – 3002508109
3 – 3002544106
5 – 3002544273
6 – 3002545029

Exhibit No. 5 illustrates the geomechanical properties of the fault segments in the area of review. It should be noted that the FSP software only calculates a single pressure change along a fault (at the fault mid-point) so it is critical that faults are broken into multiple segments to get a true evaluation of the pressure increases associated with injection. **Exhibit No. 5** also shows the direction of max hor. stress as denoted by the grey arrows outside the circle on the stereonet in the lower right portion of this exhibit. Faults that align parallel or closer to this orientation will have the highest potential for slip or lowest ΔP to slip. All fault segments (Faults 1-6) have very low potential for slip.

Exhibit No. 6 shows that the input stress and fault values were varied by +/-10% to allow for uncertainty in the input parameters. Even considering the variability of the inputs the model results show low probability for slip on the faults in the area of review. An increase of 2,375 psi at Fault 4 still only results in a 10% probability of fault slip.

Exhibit No. 7 takes a closer look at Fault 4. The sensitivity analysis is highlighted in the lower right portion of this exhibit and shows that without any variability of inputs the ΔP needed to slip is 4,950 psi along this fault. A 10% decrease in the fault strike or SH max azimuth could lower ΔP needed to slip to 2,605 psi.

The following exhibits will track the pressure changes at the faults moving forward in time based upon the anticipated injection in the future from the proposed well and the existing wells in the Subject Area.

Exhibit No. 8 illustrates the ΔP pressure in a “heat map” and shows ΔP pressure increases at the faults as of 1/1/2020. This map indicates ΔP pressure increases of 0 psi along all fault segments.

Exhibit No. 9 illustrates the ΔP pressure in a “heat map” and shows ΔP pressure increases at the faults as of 1/1/2025. This map indicates ΔP pressure increases of 0-3 psi along the fault segments.

Exhibit No. 10 illustrates the ΔP pressure in a “heat map” and shows ΔP pressure increases at the faults as of 1/1/2030. This map indicates ΔP pressure increases of 5-18 psi along the fault segments.

Exhibit No. 11 illustrates the ΔP pressure in a “heat map” and shows ΔP pressure increases at the faults as of 1/1/2035. This map indicates ΔP pressure increases of 19-43 psi along the fault segments.

Exhibit No. 12 illustrates the ΔP pressure in a “heat map” and shows ΔP pressure increases at the faults as of 1/1/2040. This map indicates ΔP pressure increases of 41-73 psi along the fault segments.

Exhibit No. 13 illustrates the ΔP pressure in a “heat map” and shows ΔP pressure increases at the faults as of 1/1/2045. This map indicates ΔP pressure increases of 66-105 psi along the fault segments.

The pressure analysis over time shows that pressure is expected to increase along the faults however pressures remain well below critical levels. The table below shows the ΔP pressure increases needed to imitate fault slip along each fault segment and the corresponding ΔP pressure increases as of 2045:

Fault Segment	<u>ΔP to slip (fixed inputs)</u>	<u>ΔP to slip (10% varied inputs)</u>	<u>ΔP at 2045</u>
F1	5,641	3,150	105
F2	5,802	3,270	103
F3	4,965	2,615	98
F4	4,950	2,605	91
F5	5,096	2,710	79
F6	5,567	3,080	66

This analysis demonstrates that there is a low likelihood of injection induced seismicity in the Subject Area. The pressures as of 1/1/2045 remain well below the 10% modified inputs.

Recently recorded Seismicity

NGL has recorded and located 1 event within the 100 sq. mi. area of review on its local seismology network:
12/28/i9 – 1.56 mag

New Mexico Tech has recorded and located 1 event within the 100 sq. mi. area of review on its local seismology network:
8/14/17 – 1.2 mag

All of these events are below the magnitude of “felt” events and are so small that they are not detected on the USGS network.

The seismicity is likely a poroelastic stress response due to the pressure reduction associated with recent production at Wolfcamp depths and also short-term increases in pressure associated with Frac-stimulations at these same depths. TexNet data, in the Texas portion of the Delaware Basin, appears to confirm that the seismicity is primarily focused within the overpressured section with some deeper responses in the basement and there are numerous examples of the recent seismicity being spatially and temporally correlated to Hydraulic Frac-stimulations (HF) in Wolfcamp wells. This is evidenced by a lack of seismicity prior to the HF operations, a cluster of seismicity during the HF operations and no seismicity since the HF operations. This has been the opinion of FTI Platt Sparks for almost 2 years and recently the Bureau of Economic geology, Lomax et al., published a paper that concludes HF activity is more likely than SWD to be causing seismicity in the Delaware Basin study area (See research paper titled; “Improving absolute earthquake location in West Texas using probabilistic, proxy ground-truth station corrections”)

Conclusion

The faults and fault trends in this area of review are not optimally oriented to slip. The orientation of the faults requires significant pressure changes (ΔP +4,950 psi) based on the fixed input parameters and the ΔP increases remain below 105 psi by 2045 along all fault segments. This model assumes constant injection rates over the next +25 years which is not a typical scenario as SWD wells tend to decrease injection volumes over time as the well ages and disposal demand decreases in the area. If injection volumes are lower over time than the model represents, then the risk for fault slip is lowered also.

Should you have any questions, please do not hesitate to call me at (512) 327-6930 or email me at todd.reynolds@ftiplattsparks.com

Regards,

Todd W. Reynolds – Geologist/Geophysicist

Managing Director, Economics/FTI Platt Sparks

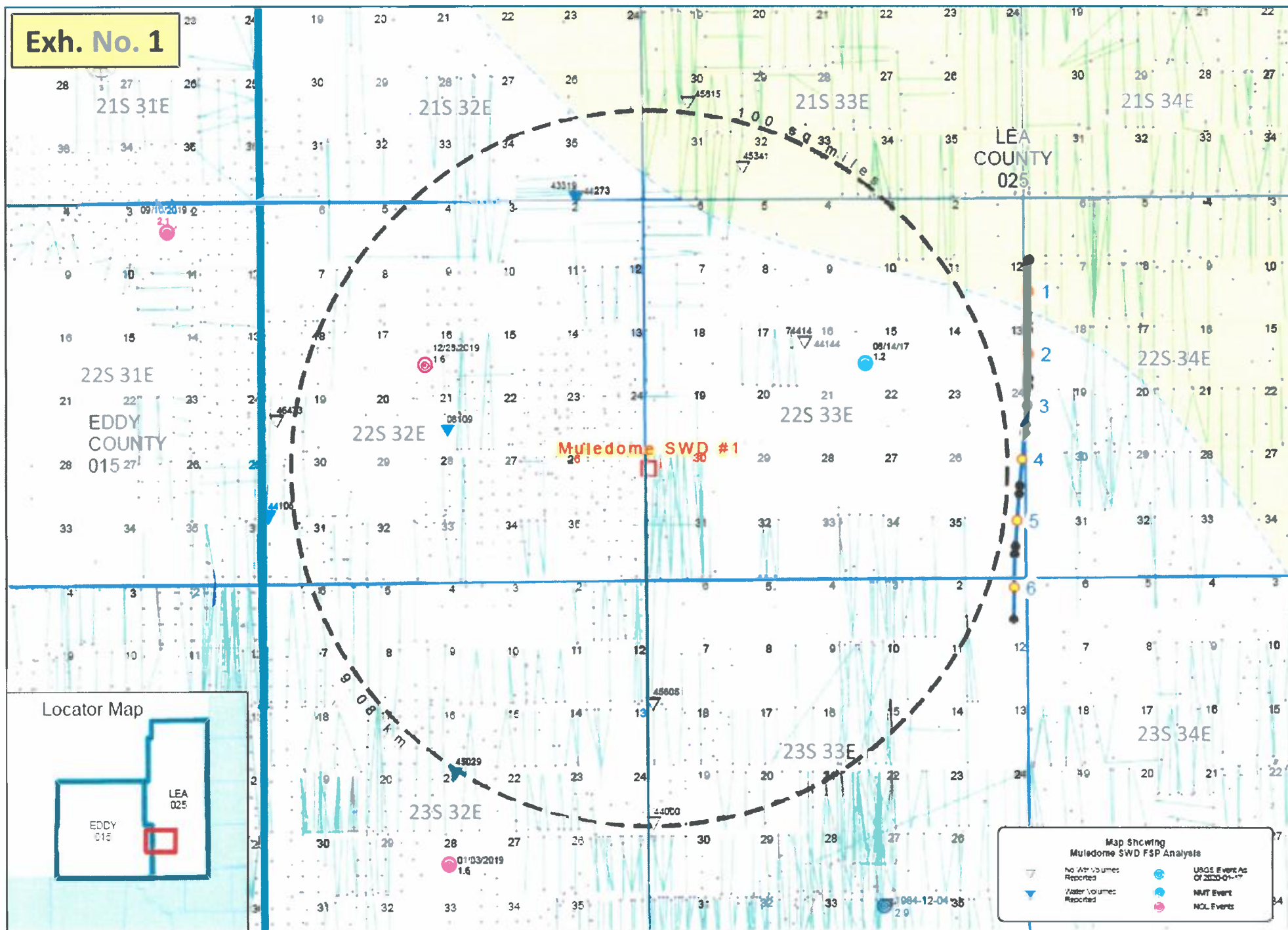


Todd W. Reynolds

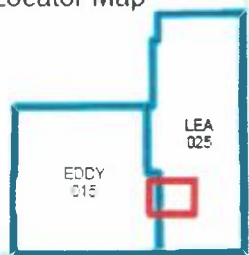
FTI Platt Sparks

512.327.6930 office

Exh. No. 1



Locator Map



Map Showing
Mule Dome SWD FSP Analysts

▽ No Water Volumes Reported	● USGS Event As Of 2020-01-17
▲ Water Volumes Reported	● NMT Event
	● NCL Events



Exh. No. 2

FSP INPUT PARAMETERS

Stress Data

☐ Specify All Three Stress Gradients...

☒ Use A-Phi Model

Vertical Stress Gradient [psi/ft]

A-Phi Parameter

☒ Min Horiz Stress Grad Available []

Max Hor Stress Direction [deg N CW]

Initial Res. Pressure Gradient [psi/ft]

Reference Depth for Calculations [ft]

Fault Friction Coefficient assumed – 0.6

OK

Hydrology Data

☒ Enter Hydrologic Parameters

☐ Load External Hydrologic Model

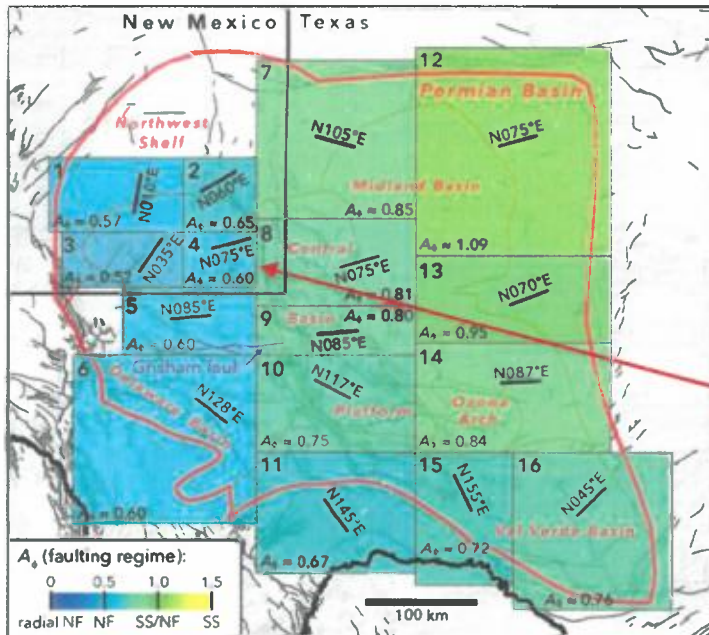
Aquifer Thickness [ft]

Porosity [%]

Permeability [mD]

Fault dips assumed – 85 deg

OK



Input Parameter Comments

Hydrologic Parameters – Derived from Striker 6 SWD #2 logs

Stress Gradients – Derived from A Phi parameter from Snee/Zoback paper (.60)

Max Hor. Stress Direction - Derived from Snee/Zoback paper (N75E)

Fault Slip Potential

MODEL INPUTS

GEOMECHANICS

PROB. GEOMECH

HYDROLOGY

PROB. HYDRO

INTEGRATED

Fault Selector:

All Faults

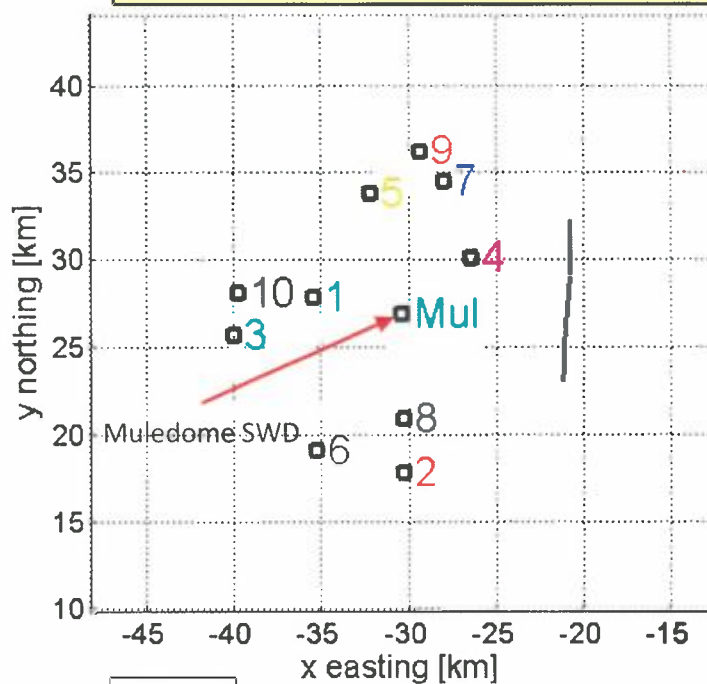
Fault #1
Fault #2
Fault #3
Fault #4
Fault #5
Fault #6

Stress Regime: Normal Faulting

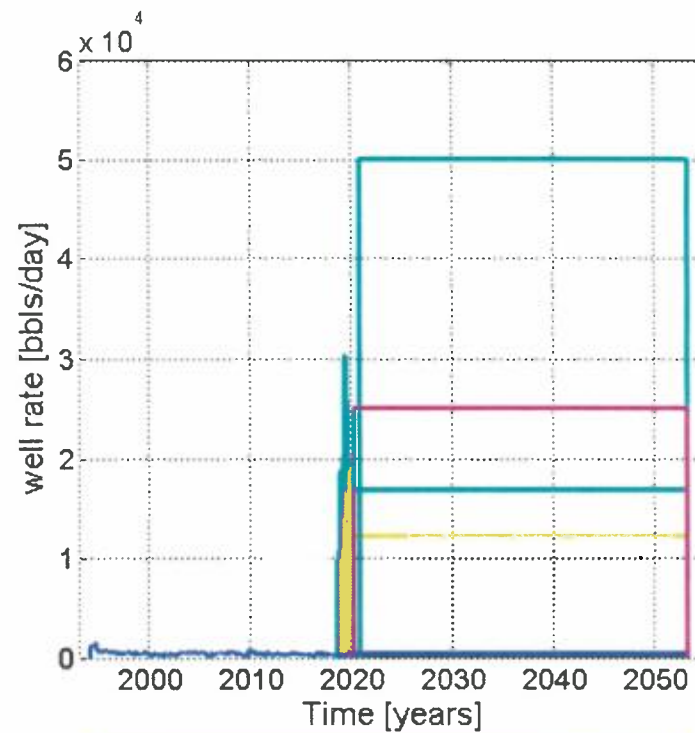
Select Well:

All

FSP INPUT Fault and well locations



Calculate



FSP INPUT Injection history and projected future injection

Exh. No. 4

Area of Review

Low slip potential based on fault orientation (green faults)

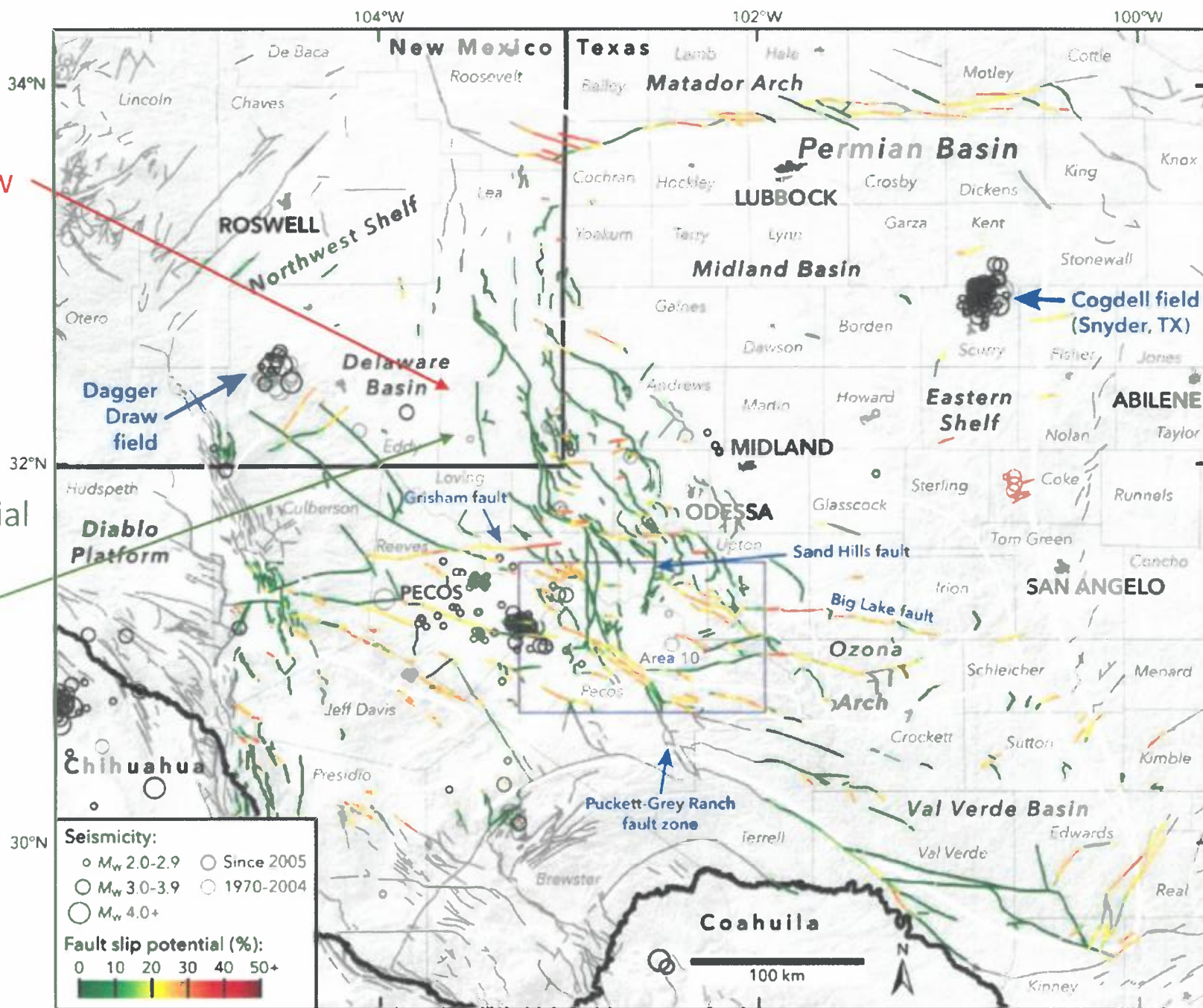


Figure 3. Results of our probabilistic FSP analysis across the Permian Basin. Data sources are as in Figures 1 and 2

From Lund Snee and Zoback (2018)

Fault Slip Potential

MODEL INPUTS

GEOMECHAN...

PROB. GEOMECH

HYDROLOGY

PROB. HYDRO

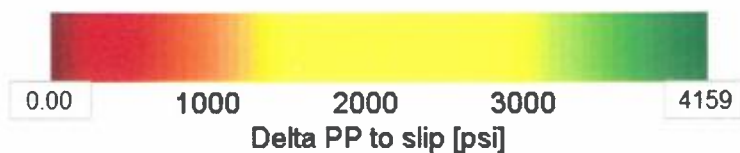
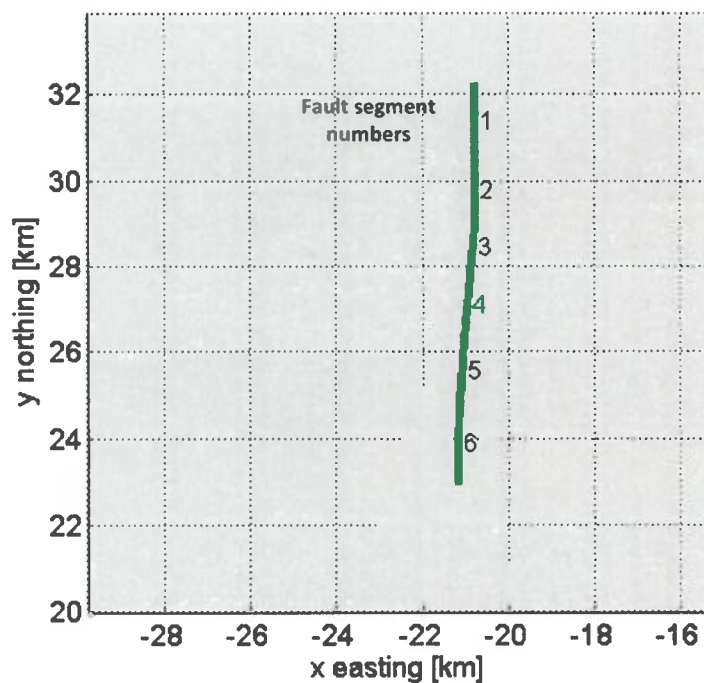
INTEGRATED

Fault Selector:

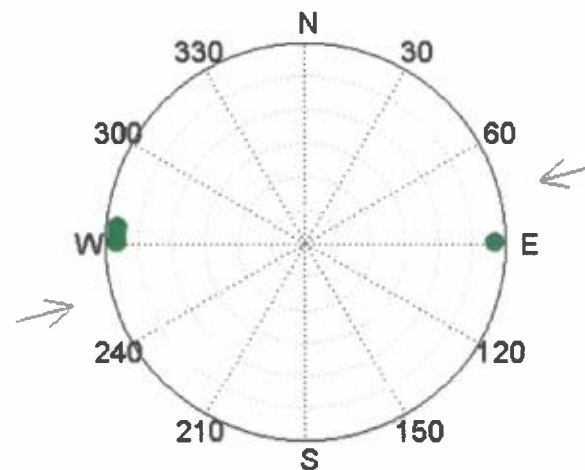
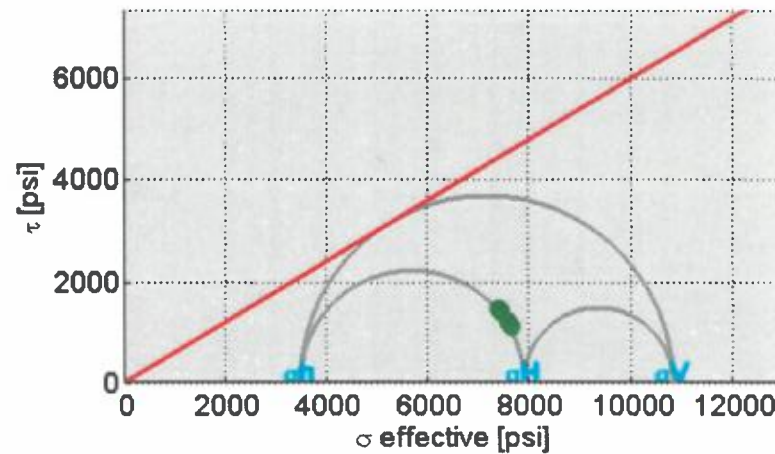
- All Faults
- Fault #1
- Fault #2
- Fault #3
- Fault #4
- Fault #5
- Fault #6

a) Fault Number

Help



Stress Regime: Normal Faulting



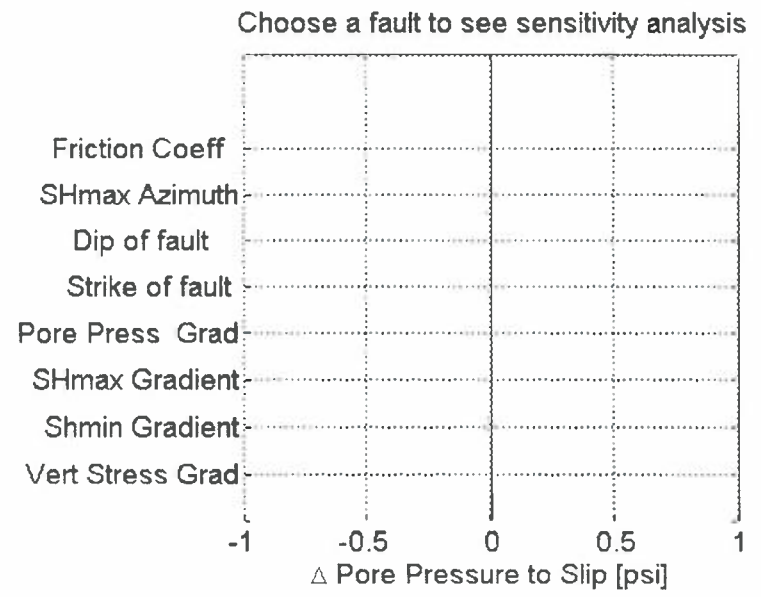
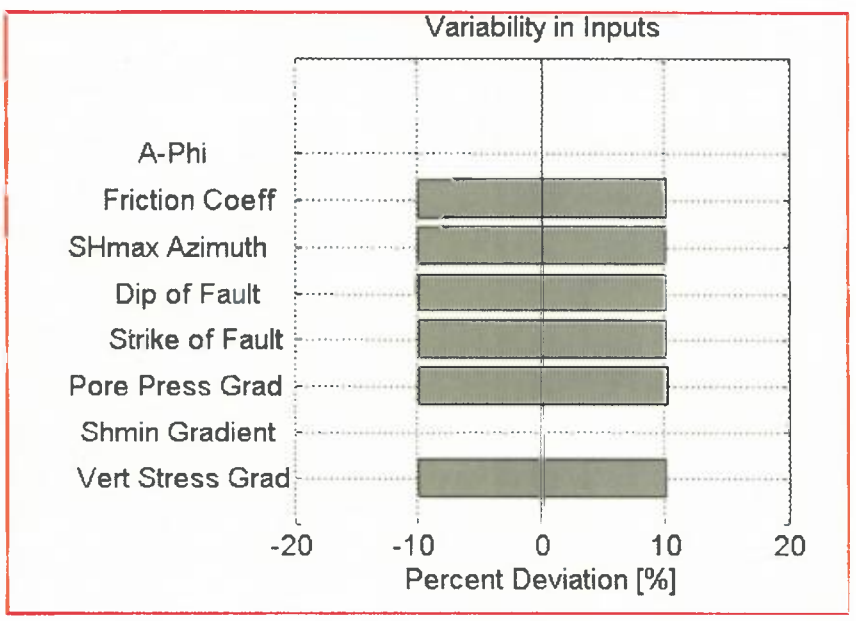
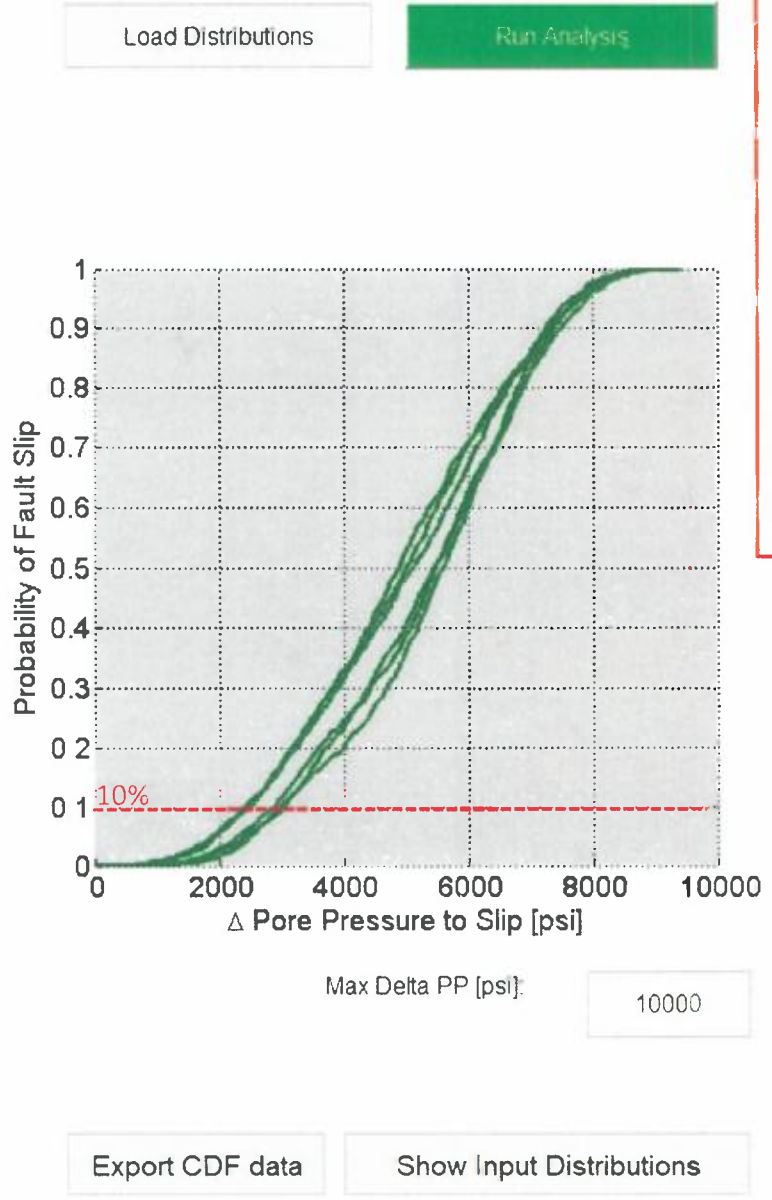
Stereonet Show: Fault Normals

Fault Slip Potential

- Fault Selector:
- All Faults
 - Fault #1
 - Fault #2
 - Fault #3
 - Fault #4
 - Fault #5
 - Fault #6

Calculate

13



Fault Slip Potential

MODEL INPUTS

GEOMECHANICS

PROB. GEOM...

HYDROLOGY

PROB. HYDRO

INTEGRATED

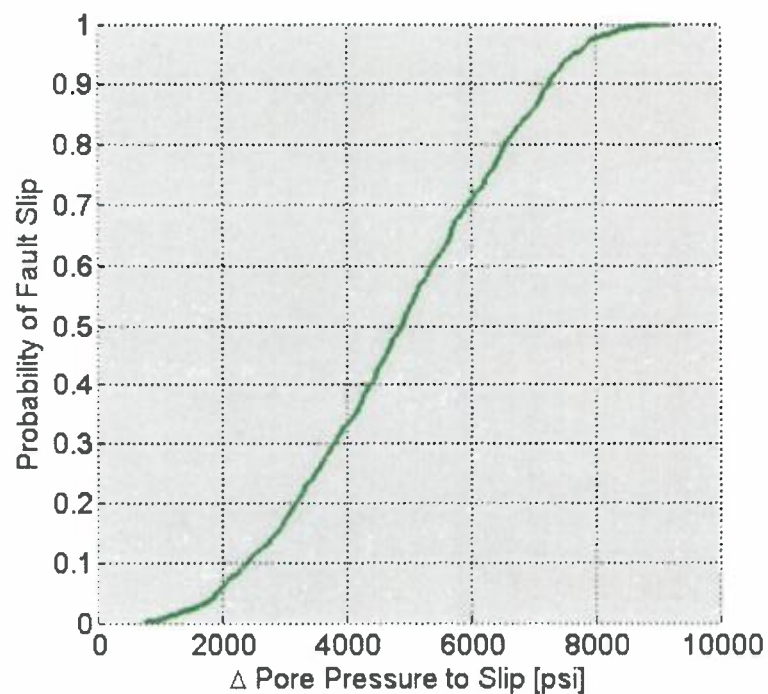
Fault Selector:

All Faults

- Fault #1
- Fault #2
- Fault #3
- Fault #4**
- Fault #5
- Fault #6

Load Distributions

Run Analysis



Max Delta PP [psi]:

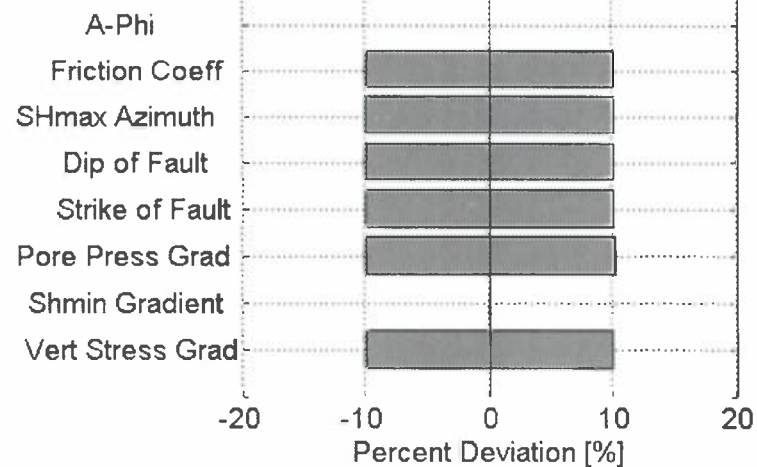
10000

Calculate

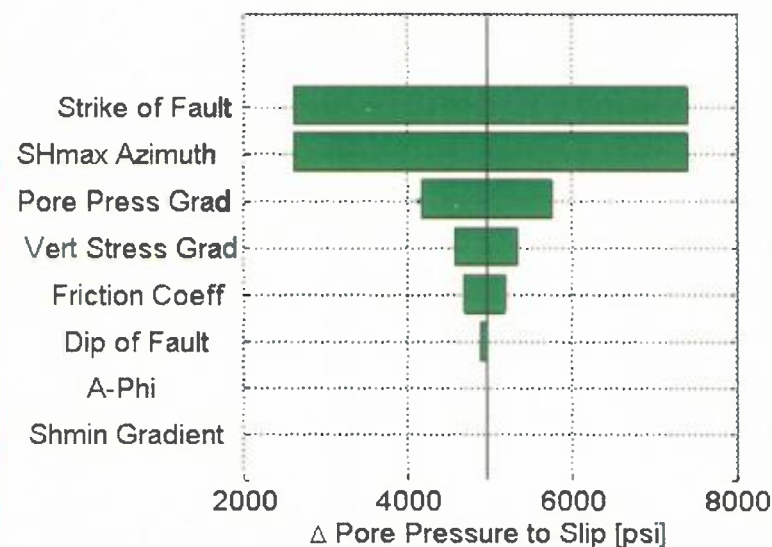
Export CDF data

Show Input Distributions

Variability in Inputs



Sensitivity Analysis for Fault #4



Fault Slip Potential

MODEL INPUTS

GEOMECHANICS

PROB. GEOMECH

HYDROLOGY

PROB. HYDRO

INTEGRATED

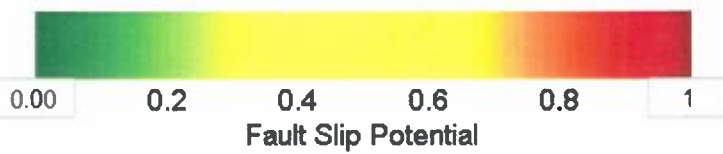
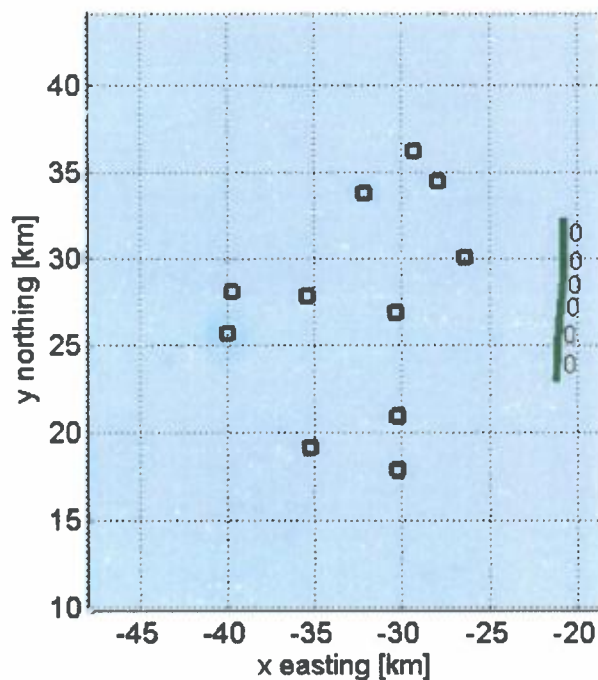
Export

Fault Selector:

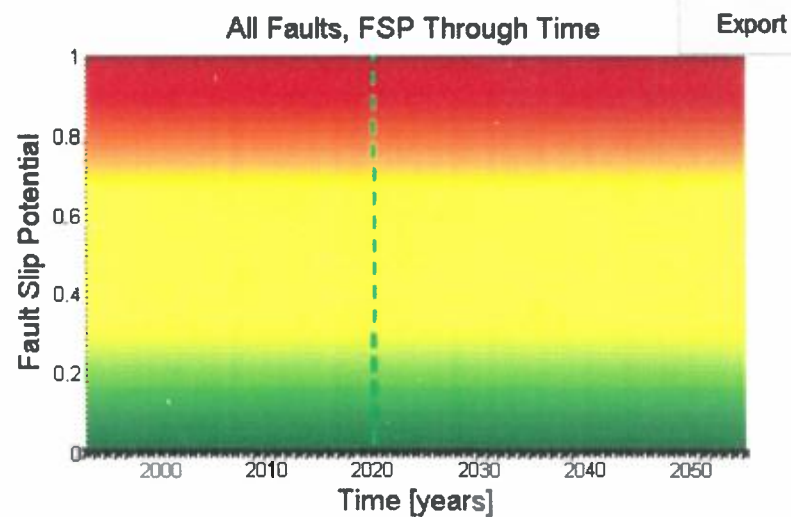
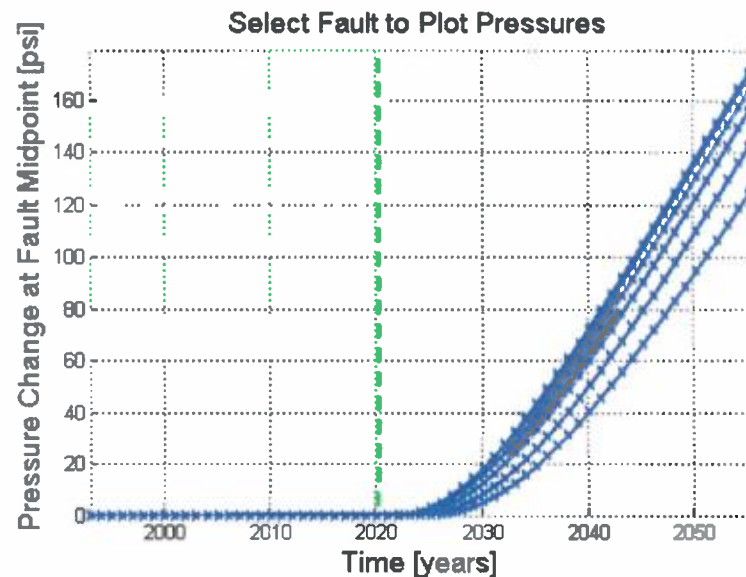
- All Faults
- Fault #1: 0.00 FSP
 - Fault #2: 0.00 FSP
 - Fault #3: 0.00 FSP
 - Fault #4: 0.00 FSP
 - Fault #5: 0.00 FSP
 - Fault #6: 0.00 FSP

b) PP Change at fault [psi]

Summary Plots



Year: 2020



Fault Slip Potential

MODEL INPUTS

GEOMECHANICS

PROB. GEOMECH

HYDROLOGY

PROB. HYDRO

INTEGRATED

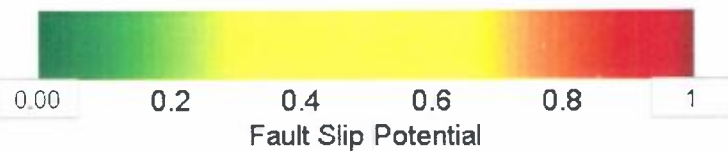
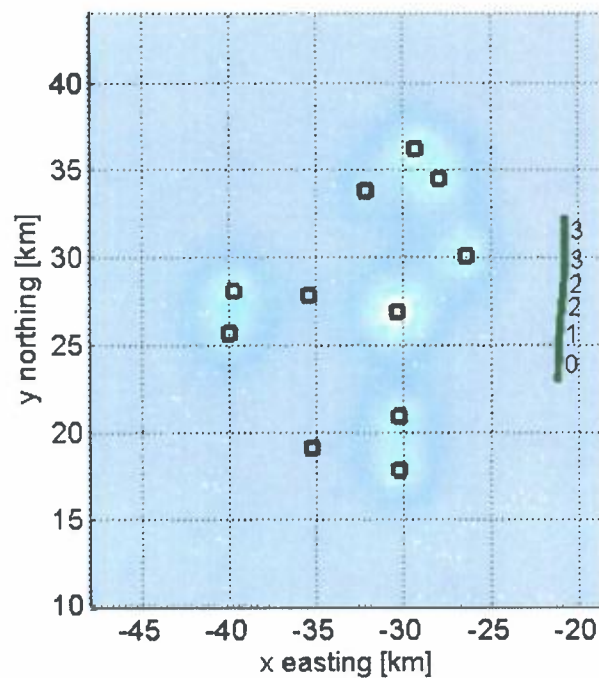
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All Faults

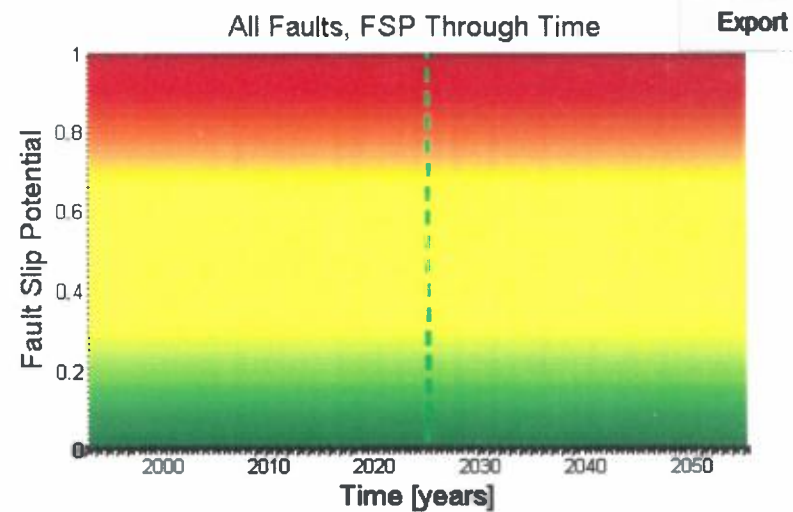
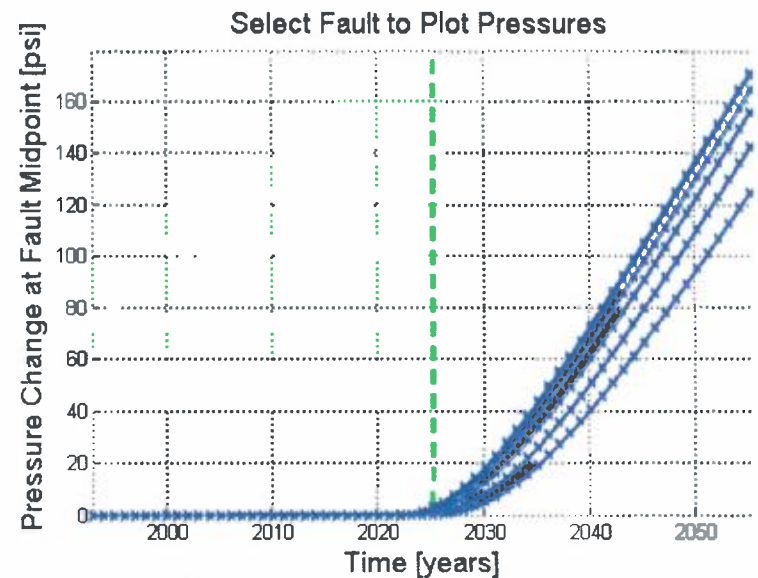
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Fault #2, 0.00 FSP
Fault #3, 0.00 FSP
Fault #4, 0.00 FSP
Fault #5, 0.00 FSP
Fault #6, 0.00 FSP

b) PP Change at fault [psi]

Summary Plots



Year: 2025



Fault Slip Potential

MODEL INPUTS

GEOMECHANICS

PROB. GEOMECH

HYDROLOGY

PROB. HYDRO

INTEGRATED

Export

Fault Selector:

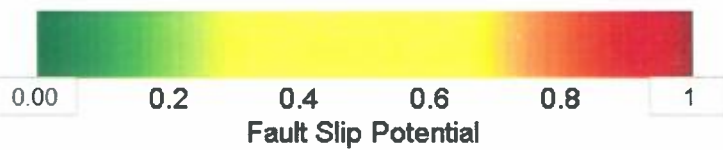
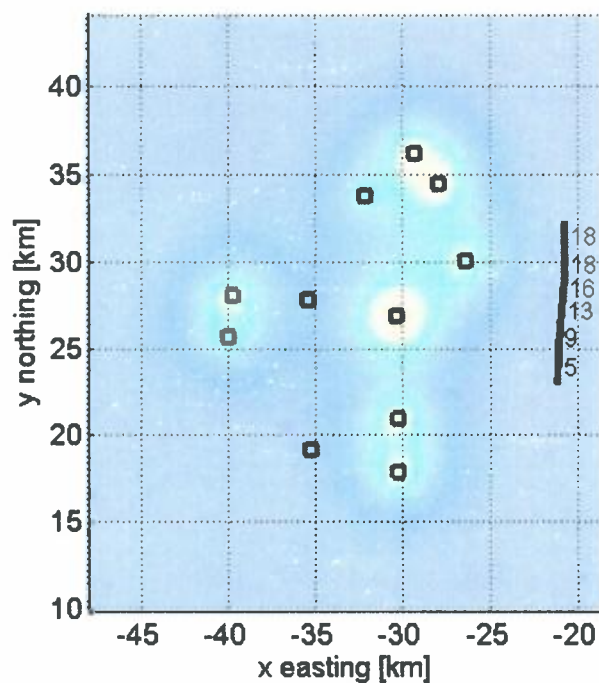
All Faults

Fault #1: 0.00 FSP
 Fault #2: 0.00 FSP
 Fault #3: 0.00 FSP
 Fault #4: 0.00 FSP
 Fault #5: 0.00 FSP
 Fault #6: 0.00 FSP

Calculate

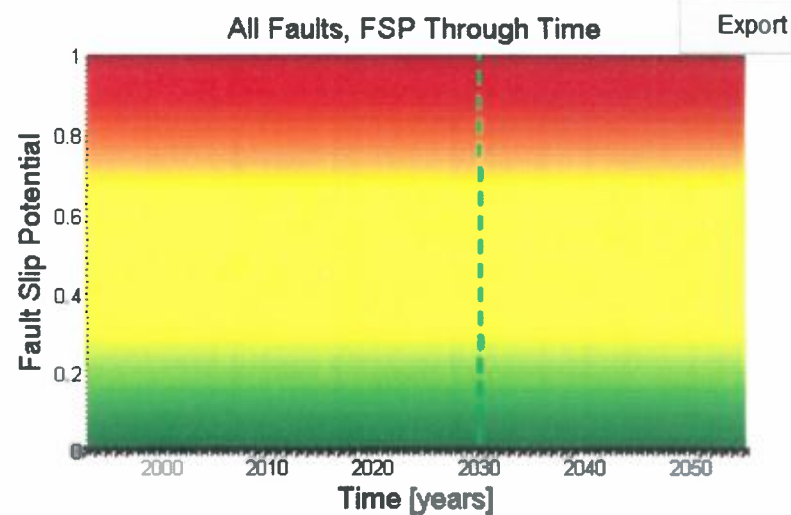
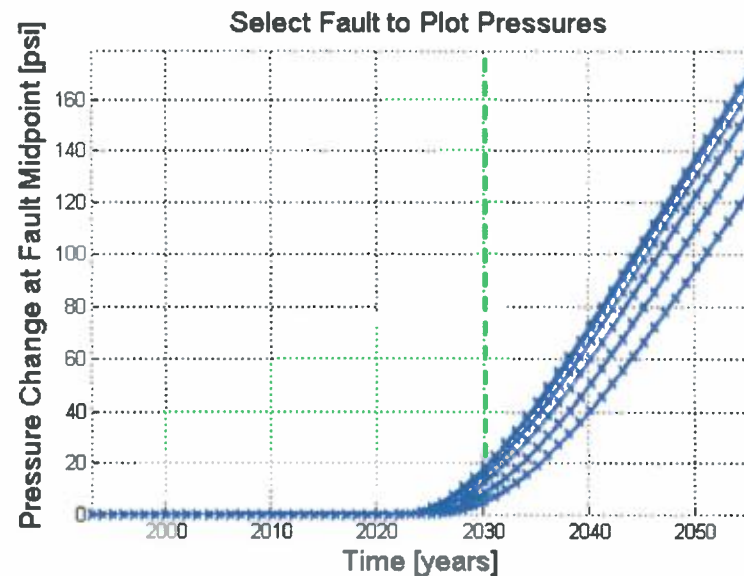
b) PP Change at fault [psi]

Summary Plots



Year:

2030



Fault Slip Potential

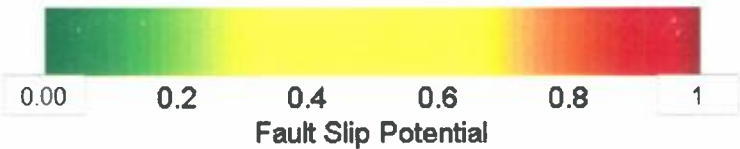
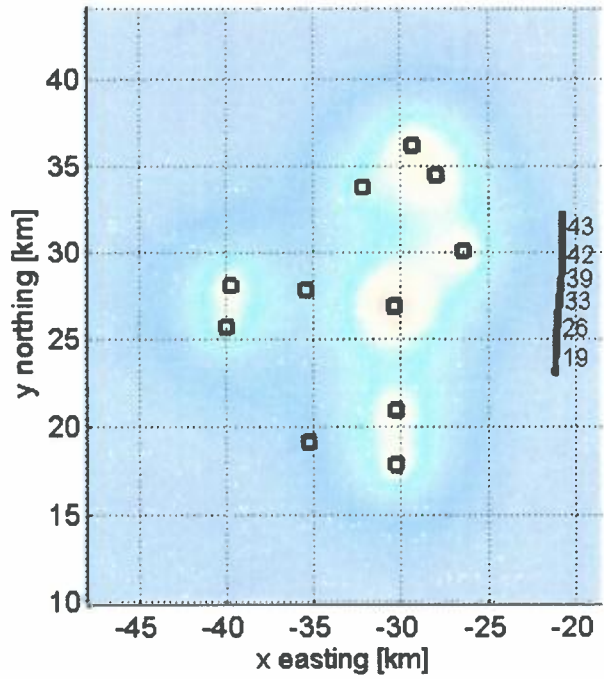
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- All Faults
- Fault #1, 0.00 FSP
 - Fault #2, 0.00 FSP
 - Fault #3, 0.00 FSP
 - Fault #4, 0.00 FSP
 - Fault #5, 0.00 FSP
 - Fault #6, 0.00 FSP

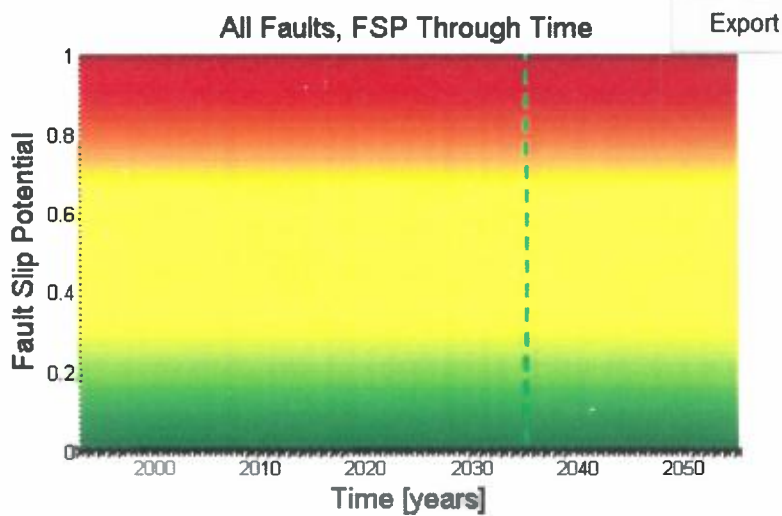
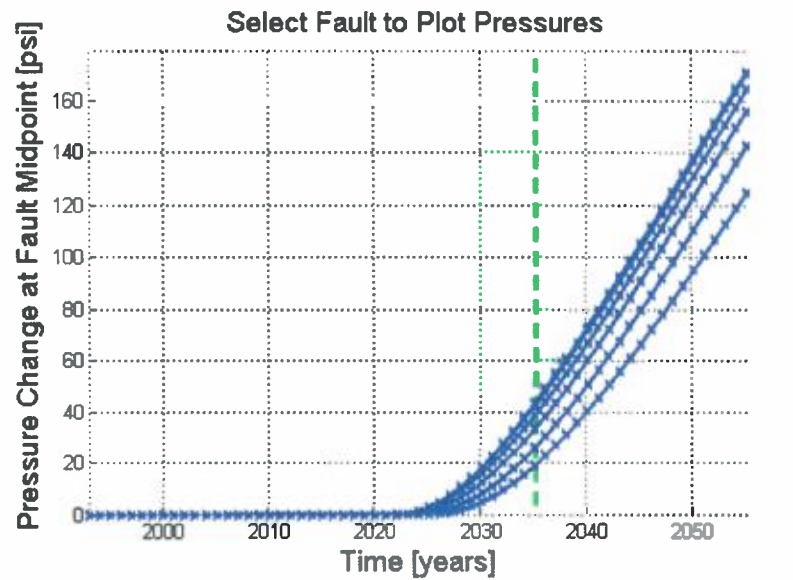
Calculate

b) PP Change at fault [psi]

Summary Plots



Year: 2035



Fault Slip Potential

MODEL INPUTS

GEOMECHANICS

PROB. GEOMECH

HYDROLOGY

PROB. HYDRO

INTEGRATED

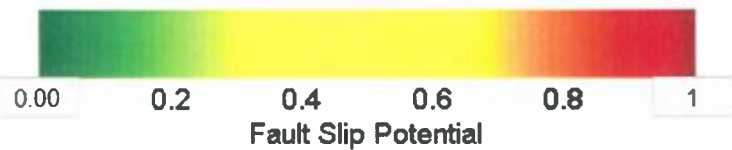
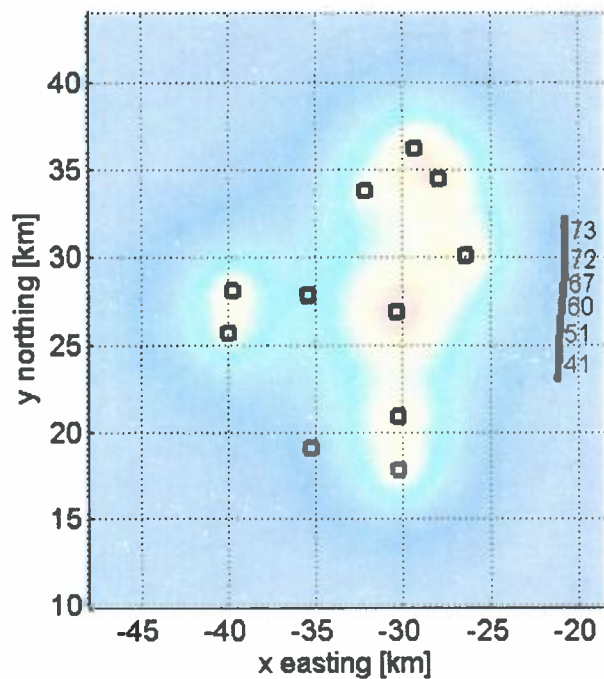
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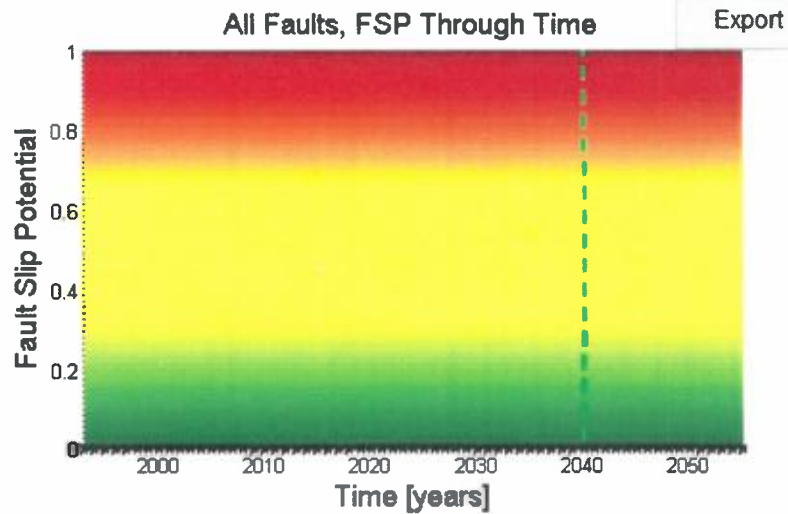
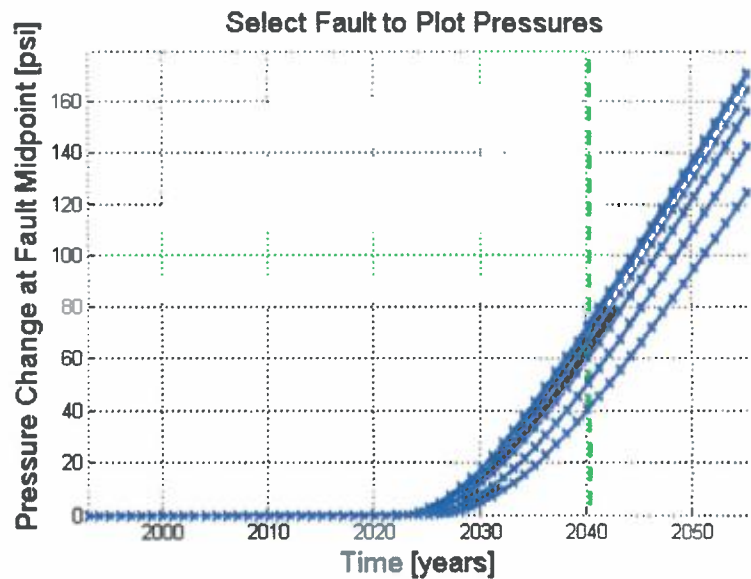
Fault #1, 0.00 FSP
Fault #2, 0.00 FSP
Fault #3, 0.00 FSP
Fault #4, 0.00 FSP
Fault #5, 0.00 FSP
Fault #6, 0.00 FSP

b) PP Change at fault [psi]

Summary Plots



Year: 2040



Fault Slip Potential

Fault Selector:

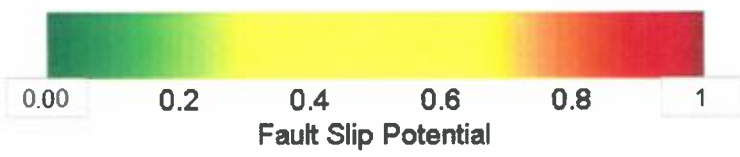
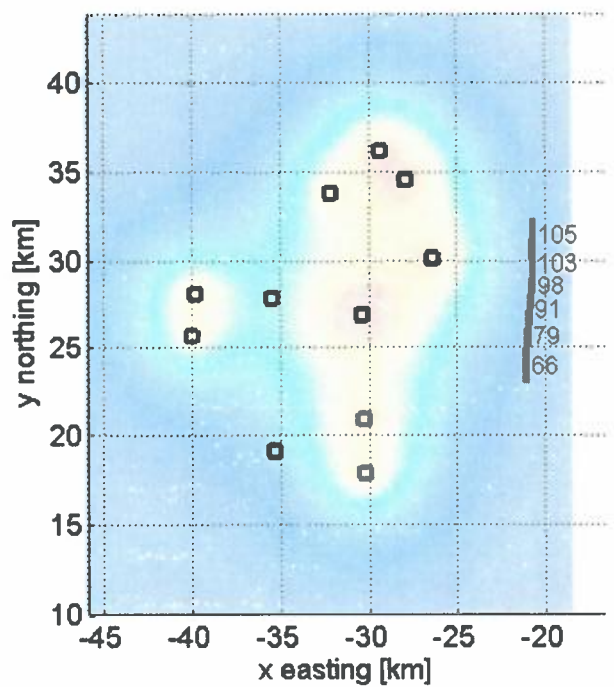
All Faults

- Fault #1, 0.00 FSP
- Fault #2, 0.00 FSP
- Fault #3, 0.00 FSP
- Fault #4, 0.00 FSP
- Fault #5, 0.00 FSP
- Fault #6, 0.00 FSP

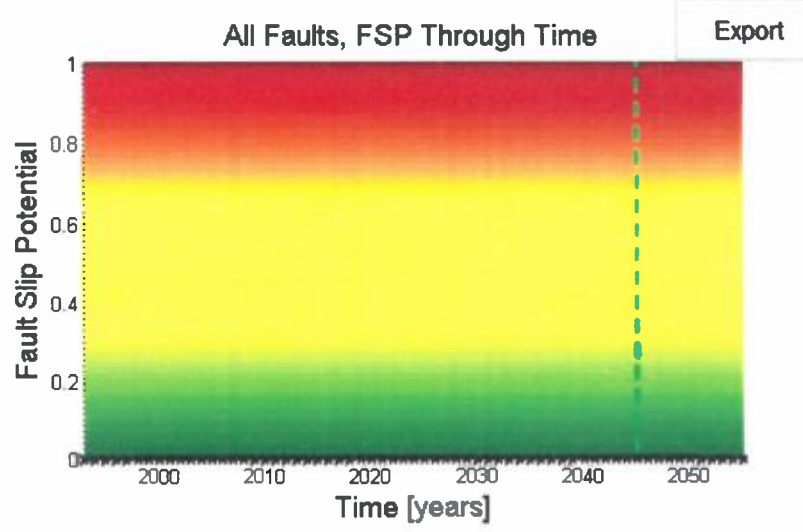
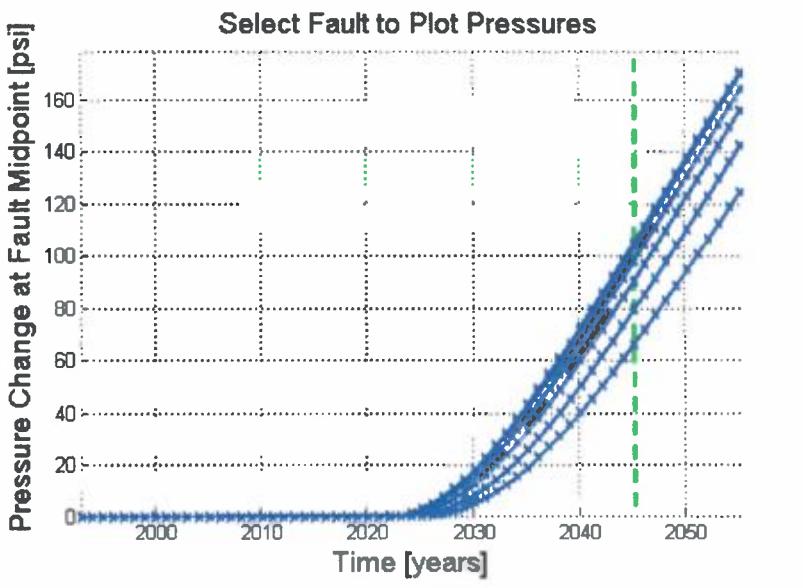
Calculate

b) PP Change at fault [psi]

Summary Plots



Year: 2045



STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

APPLICATION OF AWR DISPOSAL LLC TO APPROVE SALT WATER
DISPOSAL WELL IN LEA COUNTY, NEW MEXICO.

CASE NO. 21031
(MULEDOM)

AFFIDAVIT

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

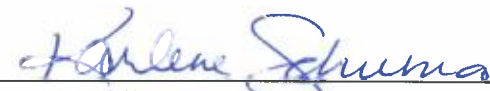
Deana M. Bennett, attorney in fact and authorized representative of AWR Disposal LLC,
the Applicant herein, being first duly sworn, upon oath, states as follows:

1. The above-referenced Application was sent under a notice letter, provided herewith, by certified mail and proof of mailing is attached hereto.
2. AWR also timely published notice of the February 6, 2020 Hearing.
3. Pursuant to Rule 19.15.4.12(B) NMAC, publication shall be made at least 10 business days before the hearing. AWR's notice was published on January 18, 2020, which is more than 10 business days before February 6, 2020. The affidavit of publication is attached hereto.



Deana M. Bennett

SUBSCRIBED AND SWORN to before me this 30th day of January, 2020 by Deana M. Bennett.



Notary Public

My commission expires: 02-27-21



STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

APPLICATION OF AWR DISPOSAL, LLC
TO APPROVE SALT WATER
DISPOSAL WELL IN LEA
COUNTY, NEW MEXICO.

CASE NO. 21031
(MULEDOME)

AFFIDAVIT OF CHRIS WEYAND

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

I, Chris Weyand, make the following affidavit based upon my own personal knowledge.

1. I am over eighteen (18) years of age and am otherwise competent to make the statements contained herein.

2. I am a Staff Engineer at Lonquist & Co., LLC. My responsibilities at Lonquist & Co., LLC include saltwater disposal well permitting efforts in New Mexico as well as other states and jurisdictions.

3. I graduated from Texas A&M University in 2010 with an engineering degree.

4. I am familiar with the application that AWR Disposal, LLC ("AWR") has filed in this matter.

5. The C-108 that is attached to the Muledome application was prepared by me or under my direction and supervision.

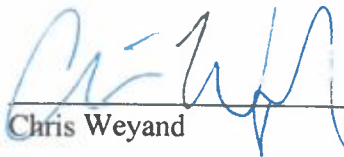
6. In this case, AWR seeks an order approving the Muledome SWD #1 well, which is a salt water disposal well.

7. As part of preparing the C-108, I compiled a list of all parties entitled to notice within a one-mile area of review. I reviewed County and Division records to determine the parties entitled to notice, including the owner of the surface (Limestone Basin Properties Ranch, LLC) and leasehold operators or other affected person. With respect to affected parties, I determined whether there was an operator, as shown in the Division records, or a designated unit operator, and if not, whether there were any working interests whose interest is evidenced by a written conveyance document either of record; and as to any tract or interest not subject to an existing oil and gas lease, whether there were mineral interest owner whose interest is evidenced by a written conveyance document either of record; and whether the United States or state of New Mexico owns the mineral estate in the spacing unit or identified tract or any part thereof, the BLM or state land office, as applicable.

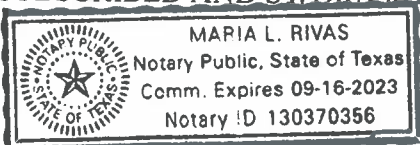
8. I provided that information to AWR's counsel who, as I understand it, sent letters to those parties giving notice of the hearing on this application.

9. I attest that the information provided herein is correct and complete to the best of my knowledge and belief.

[Signature page follows]


Chris Weyand

SUBSCRIBED AND SWORN to before me this ____ th day of February, 2020 by Chris Weyand.




Notary Public

My commission expires: 9/16/2023



MODRALL SPERLING

L A W Y E R S

January 16, 2020

Deana M. Bennett
Deana.bennett@modrall.com
505-848-1834

VIA CERTIFIED MAIL

**Re: APPLICATION OF AWR DISPOSAL, LLC
TO APPROVE SALT WATER
DISPOSAL WELL IN LEA
COUNTY, NEW MEXICO**

CASE NO. 21031

TO: AFFECTED PERSONS

This letter is to advise you that AWR Disposal, LLC ("AWR") has filed the enclosed application, which seeks an order approving the Muledome SWD #1 well at a surface location 1389 feet from the North line and 356 feet from the West line of Section 30, Township 22 South, Range 33 East, NMPM, Lea County, New Mexico for the purpose of operating a salt water disposal well. Applicant requests authorization to inject salt water into the Devonian-Silurian formation at a depth of 16,083'-17,701'. Applicant requests that the Division approve a maximum daily injection rate for the well of 50,000 bbls per day.

This case is currently set for a hearing before a Division Examiner on February 6, 2020, starting at 8:15 a.m. The hearing will be held in Porter Hall in the Oil Conservation Division's Santa Fe Office located at 1220 South Saint Francis Drive, Santa Fe, New Mexico 87505. As a party who may be affected by this application, we are notifying you of your right to appear at the hearing and participate in the case, including the right to present evidence either in support of or in opposition to the application. Failure to appear at the hearing may preclude you from any involvement in the case at a later date.

You are further notified that if you desire to appear in this case, then you are requested to file a Pre-Hearing Statement with the Division at least four business days in advance of a scheduled hearing before the Division or the Commission, but in no event later than 5:00 p.m. mountain time, on the Thursday preceding the scheduled hearing date, with a copy delivered to the undersigned.

Modrall Sperling
Roehl Harris & Sisk P.A.

500 Fourth Street NW
Suite 1000
Albuquerque,
New Mexico 87102

PO Box 2168
Albuquerque,
New Mexico 87103-2168

Tel: 505.848.1800
www.modrall.com

96

Sincerely,

Deana M. Bennett

Deana M. Bennett

Attorney for Applicant

**STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION**

**APPLICATION OF AWR DISPOSAL, LLC
TO APPROVE SALT WATER
DISPOSAL WELL IN LEA
COUNTY, NEW MEXICO.**

CASE NO. _____

APPLICATION

AWR Disposal, LLC ("AWR"), OGRID No. 328805, through its undersigned attorneys, hereby makes this application to the Oil Conservation Division pursuant to the provisions of N.M. Stat. Ann. § 70-2-12, for an order approving drilling of a salt water disposal well in Lea County, New Mexico. In support of this application, AWR states as follows:

(1) AWR proposes to drill the Muledome SWD #1 well at a surface location 1389 feet from the North line and 356 feet from the West line of Section 30, Township 22 South, Range 33 East, NMPM, Lea County, New Mexico for the purpose of operating a salt water disposal well.

(2) AWR seeks authority to inject salt water into the Devonian-Silurian formation at a depth of 16,083' -17,701'.

(3) AWR intends to use 7 inch tubing inside the surface and intermediate casings and 5 ½ inch tubing inside the liner and requests that the Division approve a maximum daily injection rate for the well of 50,000 bbls per day.

(4) AWR anticipates using an average pressure of 2,400 psi for this well, and it requests that a maximum pressure of 3,216 psi be approved for the well.

(5) A proposed C-108 for the subject well is attached hereto in Attachment A.

(6) The granting of this application will avoid the drilling of unnecessary wells, will prevent waste, and will protect correlative rights.

WHEREFORE, AWR requests that this application be set for hearing before an Examiner of the Oil Conservation Division on February 6, 2020; and that after notice and hearing, the Division enter its order approving this application.

Respectfully submitted,

MODRALL, SPERLING, ROEHL, HARRIS
& SISK, P.A.

By: Deana H. Bennett

Deana Bennett
Post Office Box 2168
500 Fourth Street NW, Suite 1000
Albuquerque, New Mexico 87103-2168
Telephone: 505.848.1800
Attorneys for Applicant

CASE NO. _____: Application of AWR Disposal, LLC for approval of salt water disposal well in Lea County, New Mexico. Applicant seeks an order approving the Muledome SWD #1 well at a surface location 1389 feet from the North line and 356 feet from the West line of Section 30, Township 22 South, Range 33 East, NMPM, Lea County, New Mexico for the purpose of operating a salt water disposal well. Applicant requests authorization to inject salt water into the Devonian-Silurian formation at a depth of 16,083'-17,701'. Applicant requests that the Division approve a maximum daily injection rate for the well of 50,000 bbls per day. Said location is approximately 27.3 miles west of Eunice, New Mexico.

Revised March 23, 2017

RECEIVED:	REVIEWER:	TYPE:	APP NO:
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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: AWR DISPOSAL LLC **OGRID Number:** 372805
Well Name: MULEDOM SWD #1 **API:** TBD
Pool: SWD, DEVONIAN-SILURIAN **Pool Code:** 97869

**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 (PRODUCTION UNIT) ☐ SD
- 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.

CHRIS WEYAND

Print or Type Name

Signature

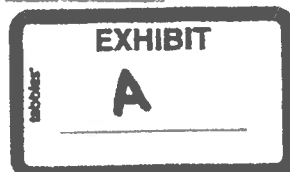
12/3/2019
 Date

512-600-1764

Phone Number

CHRIS@LONQUEST.COM

e-mail Address

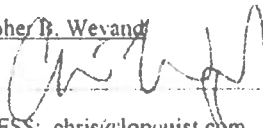


STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT

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 ☒ Disposal ☐ Storage
Application qualifies for administrative approval? ☒ Yes ☐ No
- II. OPERATOR: AWR DISPOSAL, LLC
ADDRESS: 3300 N. A Street, Ste 220, Midland, Texas 79705
CONTACT PARTY: Chris Weyand (Agent) PHONE: 512-600-1764
- 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 ☐ ☒ 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: Christopher B. Weyand TITLE: Consulting Engineer
SIGNATURE:  DATE: 12/3/2019
E-MAIL ADDRESS: chris@lonquist.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: _____

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.

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.

Side 1

INJECTION WELL DATA SHEET

OPERATOR: AWR DISPOSAL, LLC

WELL NAME & NUMBER: MULEDOM SWD #1

WELL LOCATION: 1389' FNL & 356' FWL E 30 22S 33E
 FOOTAGE LOCATION UNIT LETTER SECTION TOWNSHIP RANGE

WELLBORE SCHEMATIC

WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 24.000"

Casing Size: 20.000"

Cemented with: 1336 sx.

or _____ ft³

Top of Cement: Surface

Method Determined: Circulation

1" Intermediate Casing

Hole Size: 17.500"

Casing Size: 13.375"

Cemented with: 4,026 sx.

or _____ ft³

Top of Cement: Surface

Method Determined: Circulation

2" Intermediate Casing

Hole Size: 12.250"

Casing Size: 9.625"

Cemented with: 3,433 sx.

or _____ ft³

Top of Cement: Surface

Method Determined: Circulation

Production Liner

Hole Size: 8.500"

Casing Size: 7.625"

Cemented with: 202 sx.

or _____ ft³

Top of Cement: 11,750'

Method Determined: Logged

Total Depth: 17,701'

Injection Interval

16,083 feet to 17,701 feet

(Open Hole)

INJECTION WELL DATA SHEET

Tubing Size: 7", 26 lb/ft. P-110, TCPC from 0' - 11,650' and 5.500", 17 lb/ft, P-110 TCPC from 11,650' - 15,983'

Lining Material: Duoline

Type of Packer: 7-5/8" x 5-1/2" TCPC Permanent Packer with High Temp Elastomer and Full Inconel 925 trim

Packer Setting Depth: 15,983'

Other Type of Tubing/Casing Seal (if applicable): _____

Additional Data

1. Is this a new well drilled for injection? X Yes No

If no, for what purpose was the well originally drilled? N/A

2. Name of the Injection Formation: Devonian, Silurian, Fusselman and Montoya (Top 100')

3. Name of Field or Pool (if applicable): SWD; Devonian-Silurian

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used. No, new drill.

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area:

Delaware: 4,959'

Bonc Spring: 8,764'

Wolfcamp: 12,182'

Strawn: 13,687'

Atoka: 13,850'

Morrow: 14,333'

AWR Disposal, LLC

Muledome SWD No. 1

FORM C-108 Supplemental Information

III. Well Data

A. Wellbore Information

1.

Well Information	
Lease Name	Muledome SWD
Well No.	1
Location	S-30 T-22S R-33E
Footage Location	1389' FNL & 356' FWL

2.

a. Wellbore Description

Casing Information				
Type	Surface	Intermediate 1	Intermediate 2	Production Liner
OD	20"	13.375"	9.625"	7.625"
WT	0.500"	0.455"	0.545"	0.500"
ID	19.000"	12.415"	8.535"	6.625"
Drift ID	18.812"	12.259"	8.535"	6.500"
COD	21.00"	14.375"	10.625"	7.625"
Weight	106.5 lb/ft	68 lb/ft	53.5 lb/ft	39 lb/ft
Grade	J-55	HCL-80	P-110	HCP-110
Hole Size	24"	17.5"	12.25"	8.5"
Depth Set	1,250'	5,100'	12,250'	11,750' – 16,083'

b. Cementing Program

Cement Information				
Casing String	Surface	Intermediate 1	Intermediate 2	Liner
Cement Type	Lead: Extendacem Tail: Halcem	Halcem	Halcem	Neocem
Cement Volume	Lead: 714 sx Tail: 622 sx	4,026 sx	Stage 1: 1,441 sx Stage 2: 933 sx Stage 3: 1,059 sx	202
Cement Excess	75%	100%	50%	50%
TOC	Surface	Surface	Surface	11,750'
Method	Circulate to Surface	Circulate to Surface	Circulate to Surface	Logged

3. Tubing Description

Tubing Information		
OD	7"	5.5"
WT	0.362"	0.304"
ID	6.276"	4.892"
Drift ID	7.875"	6.050"
COD	6.151"	4.653"
Weight	26 lb/ft	17 lb/ft
Grade	P-110 TCPC	P-110 TCPC
Depth Set	0'-11,650'	11,650' -15,983'

Tubing will be lined with Duoline.

4. Packer Description

7-5/8" x 5-1/2" TCPC Permanent Packer with High Temp Elastomer and Full Inconel 925 trim

B. Completion Information

1. Injection Formation: Devonian, Silurian, Fusselman, Montoya (Top 100')
2. Gross Injection Interval: 16,083' – 17,701'

Completion Type: Open Hole

3. Drilled for injection.
4. See the attached wellbore schematic.
5. Oil and Gas Bearing Zones within area of well:

Formation	Depth
Delaware	4,959'
Bone Spring	8,764'
Wolfcamp	12,182'
Strawn	13,687'
Atoka	13,850'
Morrow	14,333'

VI. Area of Review

No wells within the area of review penetrate the proposed injection zone.

VII. Proposed Operation Data

1. Proposed Daily Rate of Fluids to be Injection:

Average Volume: 40,000 BPD

Maximum Volume: 50,000 BPD

2. Closed System

3. Anticipated Injection Pressure:

Average Injection Pressure: 2,400 PSI (surface pressure)

Maximum Injection Pressure: 3,216 PSI (surface pressure)

4. The injection fluid is to be locally produced water. It is expected that the source water will predominantly be from the Bone Spring and Wolfcamp formations. Attached are produced water sample analyses taken from the closest wells that feature samples from the Delaware, Bone Spring, Wolfcamp, Strawn, Atoka, and Morrow formations.

5. The disposal interval is non-productive. No water samples are available from the surrounding area.

VIII. Geological Data

The Devonian formation is a dolomitic ramp carbonate that occurs below the Woodford shale and above the Fusselman formation. Strata found in the Devonian formation include two major groups, the Wristen Buildups and the Thirtyone Deepwater Chert, with the Wristen being more abundant. The Wristen Groups is composed of mixed limestone and dolomites with mudstone to grainstone and boundstone textures. Porosity in the Wristen group is a result of both primary and secondary development. Present are moldic, vugular, karstic (including collapse breccia) features that allow for higher porosities and permeabilities. The Thirtyone Formation contains two end-member reservoir facies, skeletal packstones/grainstones and spiculitic chert, with most of the porosity and permeability found in the coarsely crystalline cherty dolomite. These particular characteristics allow for this formation to be a tremendous Salt Water Disposal horizon.

A. Injection Zone: Siluro-Devonian Formation

Formation	Depth
Rustler Anhydrite	1,101'
Castile	3,404'
Lamar	4,910'
Delaware	4,959'
Bone Spring	8,764'
Wolfcamp	12,182'
Strawn	13,687'
Atoka	13,850'
Morrow	14,333'
Mississippian	15,543'
Woodford	15,774'
Devonian	16,033'
Fusselman	17,033'
Montoya	17,601'

B. Underground Sources of Drinking Water

No water wells exist within one mile of the proposed well location. Water wells in the surrounding area have an average total depth of 320 ft and an average depth to water of 184 ft generally producing from the Santa Rosa. The upper Rustler may also be another USDW and will be protected.

IX. Proposed Stimulation Program

Stimulate with up to 50,000 gallons of acid.

X. Logging and Test Data on the Well

There are no logs or test data on the well. During the process of drilling and completion resistivity, gamma ray, and density logs will be run.

XI. Chemical Analysis of Fresh Water Wells

No water wells exist within one mile of the proposed well location.

XII. Affirmative Statement of Examination of Geologic and Engineering Data

Based on the available engineering and geologic data we find no evidence of open faults or any other hydrologic connection between the disposal zone (in the proposed Muledome SWD #1) and any underground sources of drinking water.

NAME: Herb Wacker

TITLE: Geologist

SIGNATURE: Herb Wacker

DATE: Nov 1, 2019

TBPS # 4517

Muledome SWD #1		Location - Sec 30 T22S R33E		TD	17,701	Directions to Site - From Jal. NM - Travel 35.2 miles West on NM-128. Turn right (N) onto Red Road and travel 22 miles to location.			
Vertical Injection - Devonian, Silurian, Fusselman		Lea County NM		GL/KB	3738' / 3768'	Lat/Long: 32.3662781/-103.6184143			
Geologic Tools (MD ft)	Section	Problems	Bit/BHA	Mud	Casing	Logging	Cement (HOLD)	Injection String	
Rustler Anhydrite - 1101 Surface TD - 1250	Surface Drill 24" 0' - 1250' Set and Cement 20" Casing	Loss Circulation Hole Cleaning Wellbore stability in the Red Beds Anhydrite in the Rustler	24" Tricone 9-5/8" x 8" MM 9 jts: 8" DC 21 jts: 5" HWDP 5" DP to surface	Spud Mud MW< 9.0	1250' of 20" 106.5# J55 BTC Centralizers - bottom 2 joints and every 3rd jt thereafter, Cement basket 5th jt from surface	No logs	Lead: 714 sx 13.7 ppg EXTENDACEM, 1.694 ft3/sk (800') 75% excess Tail: 622sx 14.8 ppg HALCEM, 1.342 ft3/sk (200') 75% excess Cement to Surface		
Top Salt - 3404 Base Salt (Lamar top) - 4910 1st Int TD - 5100 9-5/8" ECP DV Tool - 5150	1st Intermediate Drill 3850' of 17-1/2" Hole 1250' - 5100' Set and Cement 13-3/8" Casing	Seepage Losses Possible H2S Anhydrite Salt Sections	17-1/2" PDC 9-5/8" x 8" MM 9 jts: 8" DC 21 jts: 5" HWDP 5" DP to surface	Brine Water <11ppg	5M A Section Casing Bowl 5100' of 13-3/8" 68# HCL80 BTC. Externally coated 1100' - 5100' Centralizers - bottom jt, every 3rd joint in open hole and 2 jt inside the surface casing	Mudlogger on site by 1250'	4026sx of 13.7ppg Halcem (100% XS in OH) with 5% Micobond. Cement to surface	11650' of 7" P110 26# TCPC	
Bell Canyon - 4959 Cherry Canyon - 5812 Brushy Canyon - 7182 DV Tool - 8500 Bone Spring - 8764 3rd Int Liner Top - 11,750 Wolfcamp - 12182 2nd Int TD - 12,250	2nd Intermediate Drill 7150' of 12-1/4" Hole 5100' - 12250' Set 9-5/8" Intermediate Casing and Cement in 3 Stages	Hard Drilling in the Brushy Canyon Seepage to Complete Loss Water Flows Some Anhydrite H2S possible Production in the Bone Spring and Wolfcamp Ballooning is possible in Cherry Canyon and Brushy If Broken Down	12-1/4" PDC 8" MM 9jts: 8" DC 8" Drilling Jars 21 jts: 5" HWDP 5" DP to Surface	WBM with Produced FW until Loss of circulation	10M 8 Section 12250' of 9-5/8" 53.5# P110 BTC Special Drift to 8.535" Externally Coat Between DV Tools DV tool at at 8500' ECP DV Tool at 5150' Centralizers - bottom jt, 100' aside of DV tool, every 3rd joint in open hole and 5 within the surface casing	MWD GR Triple combo + CBL of 13- 3/8" Casing	Stage 3: 1059 sx 13.7 ppg HalCem™ C 10% XS 1000psi CSD after 10 hrs Cement to Surface Stage 2: 933 sx of 13.7 ppg HalCem™ C 50% XS 1000psi CSD after 10 hrs Cement to Surface Stage 1: 1441 sx 15.6 ppg HalCem™ 50% XS 1000psi CSD after 10 hrs Cement to Surface	4333' of 5-1/2" P110 17# TCPC Duoline Internally Coated Injection Tubing	
Strawn - 13687 Morrow - 14333 Miss Lst - 15543 Woodford - 15774 Perm Packer - 15,983 3rd Int TD - 16,083	3rd Intermediate Drill 3833' of 8-1/2" Hole 12250' - 16083' Set 7-5/8" Liner and Cement in Single Stage	High Pressure (up to 15ppg) and wellbore instability (fracturing) expected in the Wolfcamp Production in the Wolfcamp Atoka and Morrow Hard Drilling in the Morrow Clastic	8-1/2" PDC 6-3/4" MM 9 jts: 6" DC 21 jts: 5" HWDP 5" DP to Surface	12.5 ppg OBM UBD/MPD using ADA (HOLD)	4333' of 7-5/8" 39# HCP110 USS Flush VersaFlex Packer Hanger Centralizers on and 1 jt above shoe jt and then every 2nd jt	MWD GR Triple combo, CBL of 9-5/8" Casing	202sx of 13.2 ppg NeoCem™ PT2 8hr TT Silica Flour 50% Excess 1000psi CSD after 10hrs	7-5/8" x 5-1/2" TCPC Permanent Packer with High Temp Elastomer and full Inconel 925 trim	
Devonian - 16,033 Fusselman - 17033 Montoya - 17,691' TD - 17,701'	Injection Interval Drill 1618' of 6-1/2" hole 16083' - 17701'	Chert is possible Loss of Circulation is expected H2S encountered on the Striker 3 well BHT estimated at 280F	6-1/2" PDC 4-3/4" MM 9 jts: 4-3/4" DC 4-3/4" Drilling Jars 18 jts: 4" FH HWDP 4" FH DP to Surface	Cut brine - low grav for possible flows	Openhole completion	MWD GR Triple Combo with FMI, CBL of 7-5/8"	Displace with 3% KCl (or heavier brine if necessary)		

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) 746-1283 Fax: (575) 746-0720
District III
1000 Rio Bravo Road, Aztec, NM 87410
Phone: (505) 334-6175 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

1 API Number		2 Pool Code 97869		3 Pool Name SWD; DEVONIAN-SILURIAN	
4 Property Code		5 Property Name MULEDOM SWD			6 Well Number 1
7 OGRID No. 328805		8 Operator Name AWR DISPOSAL, LLC			9 Elevation 3737'
10 Surface Location					
UL or lot no. E	Section 30	Township 22-S	Range 33-E	Lot Idn -	Feet from the 1389'
		North/South line NORTH		Feet from the 356'	East/West line WEST
				County LEA	
11 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
12 Dedicated Acres		13 Joint or INTH		14 Consolidation Code	
				15 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.

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Y=499107.8

X=761466.36
Y=499120.55

X=766804.72
Y=499134.77

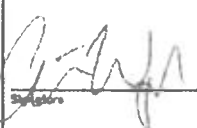
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Y=49928.81

X=764203.19
Y=493444.12

X=765644.19
Y=493655.10

17 OPERATOR CERTIFICATION

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 undivided 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 is a voluntary pooling agreement or a compulsory pooling order heretofore ordered by the division.

 12/3/2019
Signature Date

Chris Weyand
Printed Name

chris@lonquist.com
E-mail Address

18 SURVEYOR CERTIFICATION

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 to the best of my belief.

04/16/2019
Date of Survey

Signature and Seal of Professional Surveyor

Certificate Number

SURFACE LOCATION
NEW MEXICO EAST
NAD 1983
X=762001
Y=497721
LAT.: N 32.3862787
LONG.: W 103.6186392

S:\SURVEY\LOQUIST_A_CO_LLCLINE\STONEVEAL_PRODUCT\SWD_10\MULEDOM_SWD_1_REV1.DWG 11/25/2019 12:20:40 PM nmlr

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

Form C-101
Revised July 18, 2013

☐ AMENDED REPORT

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

Operator Name and Address AWR DISPOSAL, LLC 3300 N. A Street, Ste 220 Midland, Texas 79705		OGRID Number 328805
		API Number TBD
* Property Code	Property Name Muledome SWD	Well No. 1

7. Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
E	N0	22S	33E	N/A	1389'	NORTH	336'	WEST	LEA

*** Proposed Bottom Hole Location**

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County

*** Pool Information**

Pool Name SWD; DEVONIAN-SILURIAN	Pool Code 97869
-------------------------------------	--------------------

Additional Well Information

¹¹ Work Type N	¹² Well Type SWD	¹³ Cable/Rotary R	¹⁴ Lease Type Private	¹⁵ Ground Level Elevation 3,737'
¹⁶ Multiple N	¹⁷ Proposed Depth 17,701'	¹⁸ Formation Devonian-Silurian	¹⁹ Contractor TBD	²⁰ Spud Date ASAP
Depth to Ground water 148'		Distance from nearest fresh water well > 1 mile		Distance to nearest surface water > 1 mile

☐ We will be using a closed-loop system in lieu of lined pits

21. Proposed Casing and Cement Program

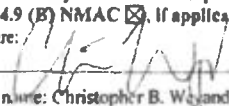
Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surface	24"	20"	106.5 lb/ft	1,250'	1,336	Surface
Intermediate 1	17.5"	13.375"	68 lb/ft	5,100'	4,026	Surface
Intermediate 2	12.25"	9.625"	53.5 lb/ft	12,250'	3,433	Surface
Prod. Liner	8.5"	7.625"	39 lb/ft	11,750' - 16,083'	202	11,750'

Casing/Cement Program: Additional Comments

See attached schematic.

22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Double Hydraulic Blinds, Pipe	10,000 psi	8,000 psi	TBD - Schaffer-Cameron

²³ I hereby certify that the information given above is true and complete to the best of my knowledge and belief.
I further certify that I have complied with 19.15.14.9 (A) NMAC ☐ and/or 19.15.14.9 (B) NMAC ☒. If applicable.
Signature: 

Printed name: Christopher B. Wayand

Title: Consulting Engineer

E-mail Address: clyng@longquist.com

Date: 12/3/2019

Phone: (512) 600-1764

OIL CONSERVATION DIVISION

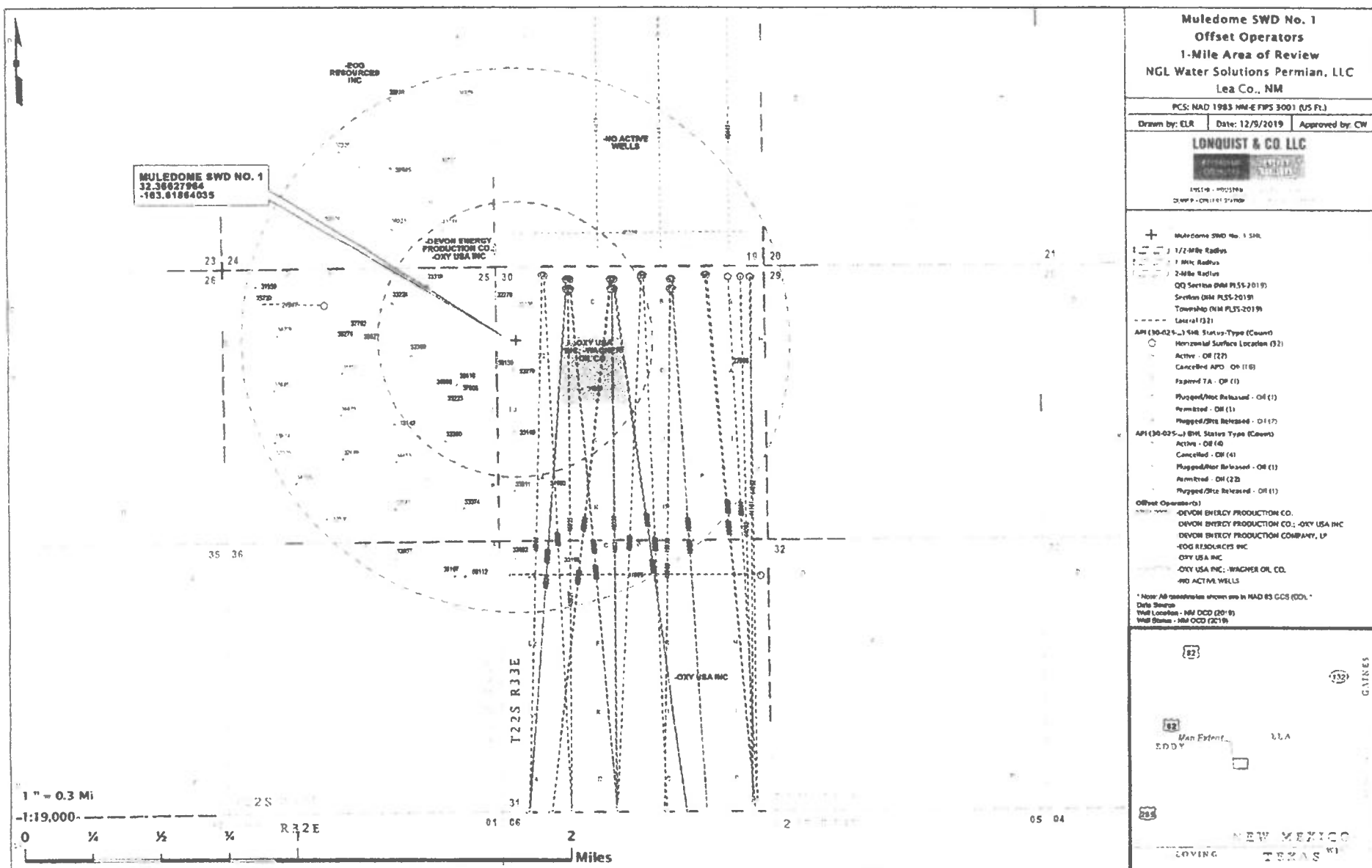
Approved By:

Title:

Approved Date:

Expiration Date:

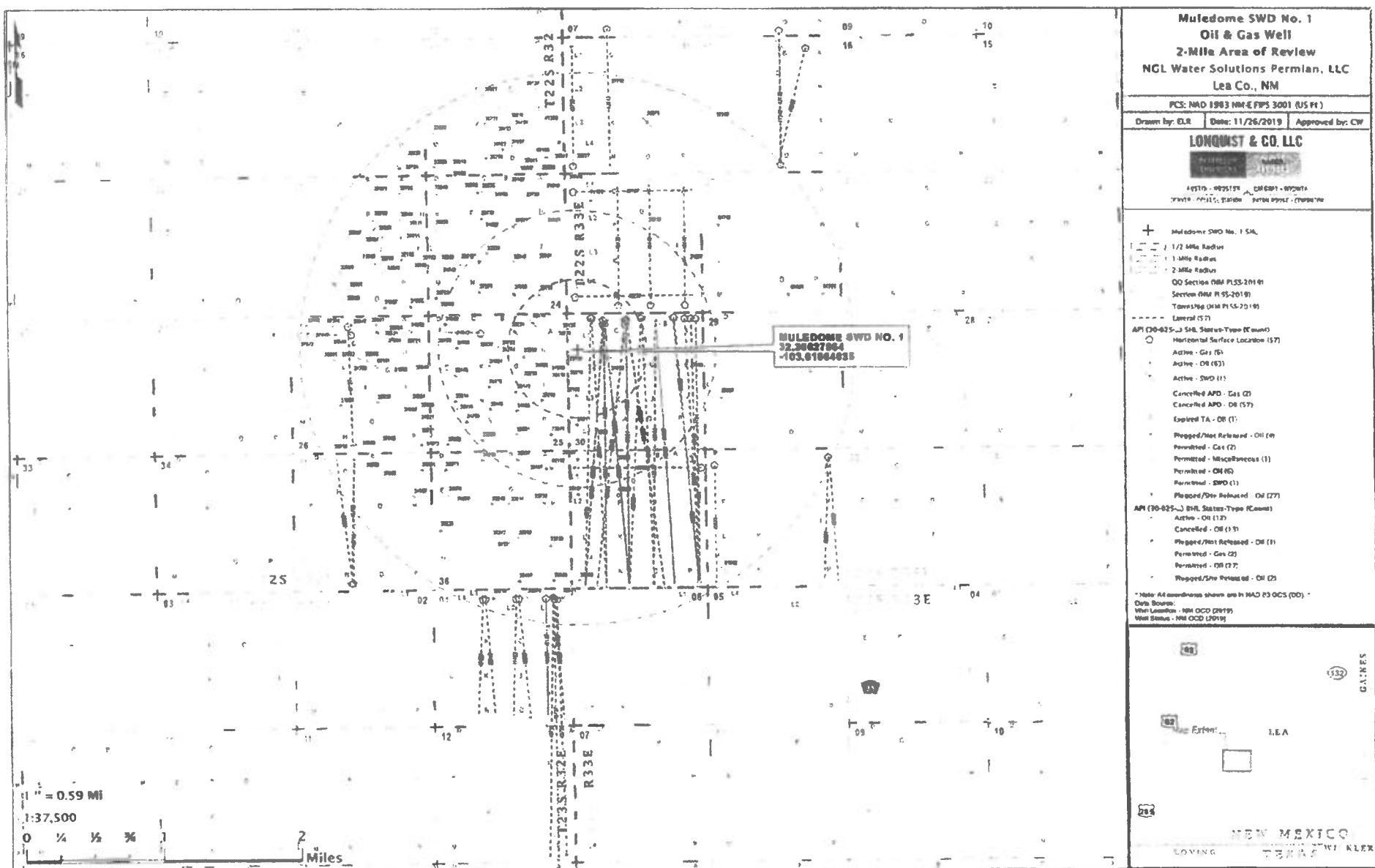
Conditions of Approval Attached

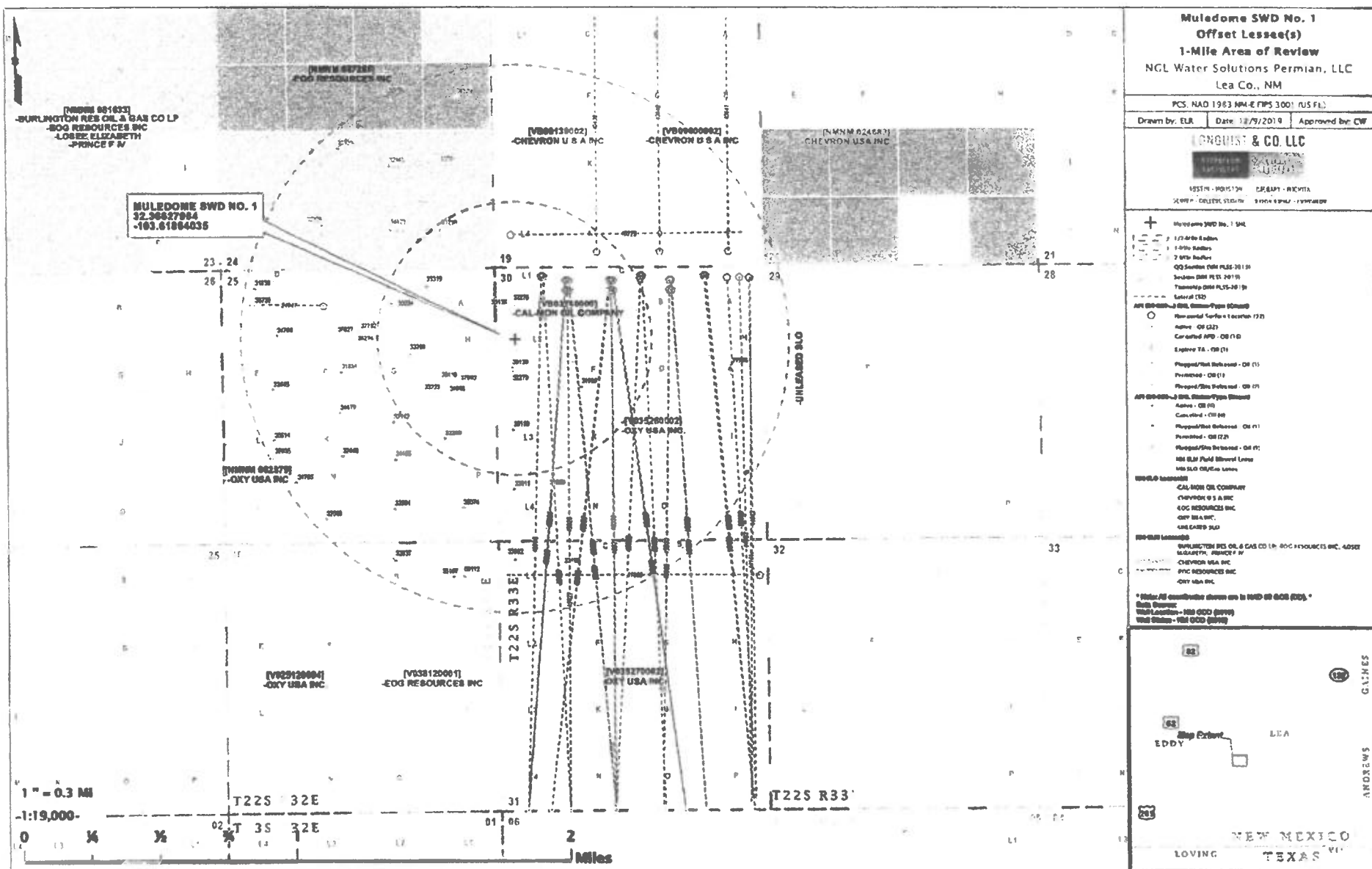


**Muledome SWD No. 1
1-Mile Area of Review List**

API (30-025-...)	WELL NAME	WELL TYPE	STATUS	OPERATOR	TVD (FT.)	LATITUDE (NAD83 DD)	LONGITUDE (NAD83 DD)	DATE DRILLED	FIELD
28112	MILGARD WELL 001	O	P	MILGARD WELL OPERATOR	5068	32.85364490	-103.62127130	3/1/1908	
28843	CONINGTON A FEDERAL 001	O	P	OXY USA INC	35550	32.36438310	-103.80583990	2/7/1975	(51681) RED TANK, BONE SPRING; (51682) RED TANK, DELAWARE, WEST
27526	RED TANK 30 STATE 001	O	B	OXY USA INC	5312	32.36438310	-103.80923320	10/24/1981	(51683) ROOTS & BRANCH, DELAWARE
31850	CONINGTON A FEDERAL 002	O	A	OXY USA INC	37320	32.36507580	-103.61481500	12/18/1993	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST
33951	CONINGTON A FEDERAL 004	O	B	OXY USA INC	10104	32.36455620	-103.62366720	8/2/1925	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST
33953	BIGHORN 30 STATE 002	O	A	WAGNER OIL CO	10491	32.36168540	-103.61402200	12/31/9999	(51687) RED TANK, BONE SPRING, EAST
33967	BIGHORN 30 STATE 003	O	B	DEVON ENERGY OPERATING COMPANY LP	9999	32.35826879	-103.61659005	12/31/9999	
33965	CONINGTON A FEDERAL 002/L	O	C	POGO PRODUCING CO	9999	32.35999950	-103.61127051	12/31/9995	
33956	CONINGTON A FEDERAL 009	O	A	OXY USA INC	10200	32.35673630	-103.61061970	9/28/1949	(51683) RED TANK, DELAWARE, WEST; (51689) RED TANK, DELAWARE, WEST; (51687) RED TANK, BONE SPRING, EAST
32378	BIGHORN 30 STATE 005	O	B	DEVON ENERGY OPERATING COMPANY LP	9999	32.36922738	-103.61978032	12/31/9999	
32379	BIGHORN 30 STATE 004	O	C	DEVON ENERGY OPERATING COMPANY LP	9999	32.36459374	-103.61877435	12/31/9999	
32390	CONINGTON A FEDERAL 004	O	A	OXY USA INC	7010	32.36281550	-103.61304500	1/12/1996	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST
32387	RED TANK 24 FEDERAL 002	O	A	OXY USA INC	10286	32.37433300	-103.62268630	8/24/1995	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST
32386	RED TANK 24 FEDERAL 003	O	A	OXY USA INC	10160	32.37236400	-103.63054660	12/31/1984	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST
32447	CONINGTON A FEDERAL 003	O	B	OXY USA INC	8950	32.36376000	-103.61376330	3/4/1998	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST
32446	CONINGTON A FEDERAL 005	O	A	OXY USA INC	8999	32.36001970	-103.62467570	4/9/1996	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST
32583	CONINGTON A FEDERAL 004	O	B	OXY USA INC	8950	32.35730740	-103.62625120	5/19/1995	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST
32817	MULE DEER 36 STATE 003	O	P	LOG RESOURCES INC	9918	32.35438780	-103.62624160	4/17/1995	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST
32878	JACKALOP 24 FEDERAL 001	O	P	LOG RESOURCES INC	7014	32.37999720	-103.62839460	11/30/1996	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST
32145	CHECKERS 24 FEDERAL 001	O	A	DEVON ENERGY PRODUCTION COMPANY, LP	3005	32.37545780	-103.62828790	8/24/1987	(51683) RED TANK, BONE SPRING
33011	RED TANK 30 STATE 005	O	A	OXY USA INC	8010	32.35424300	-103.61876880	7/19/1995	(51687) RED TANK, BONE SPRING, EAST; (51689) RED TANK, DELAWARE, WEST
33074	CONINGTON A FEDERAL 0011	O	A	OXY USA INC	8010	32.35731850	-103.62157310	10/24/1995	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST
33497	RED TANK 31 STATE 003	O	B	OXY USA INC	8010	32.35461040	-103.61876880	9/23/1995	(51683) RED TANK, BONE SPRING, EAST; (51689) RED TANK, DELAWARE, WEST
33107	MULE DEER 36 STATE 004	O	A	LOG RESOURCES INC	9007	32.35694890	-103.62763700	10/10/1995	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST
33106	RED TANK 30 STATE 002	O	A	OXY USA INC	8010	32.36141540	-103.63873440	4/7/2000	(51683) RED TANK, BONE SPRING, EAST; (51689) RED TANK, DELAWARE, WEST
33187	CALHOUN 30 STATE 001	O	A	OXY USA INC	9000	32.36479040	-103.63878200	11/27/1995	(51687) RED TANK, BONE SPRING, EAST; (51689) RED TANK, DELAWARE, WEST
33155	CALHOUN 30 STATE 002	O	C	POGO PRODUCING CO	0	32.36822218	-103.63878031	12/31/9999	
33142	CONINGTON A FEDERAL 0013	O	A	OXY USA INC	9000	32.36186990	-103.62495950	12/27/1995	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST
33196	RED TANK 31 STATE 003	O	C	POGO PRODUCING CO	0	32.35480959	-103.61488115	12/31/9999	
33223	CONINGTON A FEDERAL 0012	O	C	POGO PRODUCING CO	0	32.36167545	-103.62108950	12/31/9999	
33274	CONINGTON A FEDERAL 0016	O	P	OXY USA INC	8996	32.36302270	-103.62625560	7/23/1996	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST
33318	CONINGTON A FEDERAL 0015	O	B	OXY USA INC	8910	32.36911770	-103.62404520	7/11/1997	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST
33399	CONINGTON A FEDERAL 0014	O	P	OXY USA INC	8966	32.36548230	-103.62519070	4/27/1996	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST
33634	CONINGTON A FEDERAL 0007	O	A	OXY USA INC	8930	32.36908950	-103.62273570	11/13/1995	(51683) RED TANK, DELAWARE, WEST
33701	CHECKERS 24 FEDERAL 003	O	C	DEVON ENERGY PRODUCTION CO	0	32.37346782	-103.62799890	12/31/9999	
33718	CHECKERS 24 FEDERAL 002	O	C	DEVON ENERGY PRODUCTION CO	0	32.37211419	-103.61308789	12/31/9999	
34023	CHECKERS 24 FEDERAL 001	O	P	DEVON ENERGY PRODUCTION COMPANY, LP	8966	32.37210480	-103.62627610	4/9/2000	(51683) RED TANK, BONE SPRING
34025	JACKALOP 24 FEDERAL 004	O	C	BURINGTON RESOURCES OIL & GAS CO	0	32.37910532	-103.62202021	12/31/9999	
34854	CONINGTON A FEDERAL 0037	O	A	OXY USA INC	8960	32.35821510	-103.62631970	11/4/1999	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST
34874	CONINGTON A FEDERAL 0036	O	A	OXY USA INC	8940	32.36235490	-103.62497740	8/6/1998	(51683) RED TANK, BONE SPRING; (51689) RED TANK, DELAWARE, WEST

Muledome SWD No. 1
1-Mile Area of Review List
NM-OD (2019)





Medicine SWD #1: Offsetting Produced Water Analysis																	
wellname	api	section	township	range	unit	county	formation	ph	tds_mgl	sodium_mgl	calcium_mgl	iron_mgl	magnesium_mgl	chloride_mgl	nitrate_mgl	sulfate_mgl	co2_mgl
ANTELOPE RIDGE UNIT #002	3002520444	4	24S	34E	B	LEA	ATOKA	6.7	51475					31000	317	340	
TODD 26 G FEDERAL #001	3001320242	26	23S	31E	Q	EDDY	ATOKA	6.7	202478					128000	93	540	
TYHME APY FEDERAL #002	3002333529	1	23S	32E	G	LEA	BONE SPRING	6.3	172896			0	2025	104876	781	1150	
CORLANDER AOC STATE #002	3002333574	1	23S	32E	H	LEA	BONE SPRING	5.2			24176		3815	167962	61.1	165	
THRISTLE UNIT #071H	3002542425	27	23S	33E	A	LEA	BONE SPRING 1ST SAND	5.6	171476.3	55383.2	9140	40.4	1023	104576.4	244	500	770
JUNDARY BARREN 6 FEDERAL #002	3002541864	7	23S	32E	A	LEA	BONE SPRING 2ND SAND	6	117284.4	36911	5399.2	88.1	706.6	72443.9	378	17	200
MURREY BASIN 5 STATE COM #002	3002540887	5	22S	32E	M	LEA	BONE SPRING 2ND SAND	6.3		72548	5421	42	884	124890	159	650	180
ALDABRA 26 FEDERAL #006H	3001538624	26	23S	31E	P	EDDY	BONE SPRING 3RD SAND	7.1	1137079	37414.7	5810.4	22.6	680.7	71000	134	643	190
GAUCHO UNIT #011H	3002541184	17	22S	34E	O	LEA	BONE SPRING 3RD SAND	6.8		43301	5338	0	768	78000	122	640	120
GRAHAM AOB STATE #002	3001526876	2	22S	31E	M	EDDY	DELAWARE	6	301948		30780	19	5956	18957	54	100	
GAUCHO 21 FEDERAL #002H	3001540628	21	22S	34E	M	LEA	DELAWARE-BRUSHY CANYON	5.9	266467.8	71664.2	20640.8	90.2	3492.5	167562	366	0	400
SHAPPING 2 STATE #014H	3001542898	2	26S	31E	P	EDDY	WOLF CAMP	7.3	81386.4	28319.4	2167.4	26.1	326.7	50281.2		399.7	100
BELLOQ 2 STATE #002H	3001542895	2	23S	31E	C	EDDY	WOLF CAMP	6.8	119471.8	37359.2	5658.1	22.4	746.1	79172.5		1035.5	250
WILSON DEEP UNIT #001	3002520461	13	21S	34E	F	LEA	MORROW		11648					966	2161	5352	
HAT MESA #002	3002344408	14	21S	32E	M	LEA	MORROW	6.4	271555	74325.6	48019.2	123.136	3750.91	199015	288.886	528.248	

Karlene Schuman
Modrall Sperling Roehl Harris & Sisk P.A.
500 Fourth Street, Suite 1000
Albuquerque NM 87102

PS Form 3877

Type of Mailing: CERTIFIED MAIL
01/16/2020



Firm Mailing Book ID: 182754

Line	USPS Article Number	Name, Street, City, State, Zip	Postage	Service Fee	RR Fee	Rest.Del.Fee	Reference Contents
1	9314 8699 0430 0067 7328 01	Oil Conservation Division District IV 1220 South St. Francis Drive Santa Fe NM 87505	\$1.45	\$3.55	\$1.60	\$0.00	87806Muledome Notice
2	9314 8699 0430 0067 7328 18	Oil Conservation Division District I - Hobbs 1625 N. French Drive Hobbs NM 88240	\$1.45	\$3.55	\$1.60	\$0.00	87806Muledome Notice
3	9314 8699 0430 0067 7328 25	LIMESTONE BASIN PROP RANCH LLC 18 Desta Dr Midland TX 79705	\$1.45	\$3.55	\$1.60	\$0.00	87806Muledome Notice
4	9314 8699 0430 0067 7328 32	NEW MEXICO STATE LAND OFFICE P.O. Box 1148 Santa Fe NM 87504	\$1.45	\$3.55	\$1.60	\$0.00	87806Muledome Notice
5	9314 8699 0430 0067 7328 49	BUREAU OF LAND MGMT 301 Dinosaur Trail Santa Fe NM 87508	\$1.45	\$3.55	\$1.60	\$0.00	87806Muledome Notice
6	9314 8699 0430 0067 7328 56	OXY USA INC P.O. Box 4294 Houston TX 77210	\$1.45	\$3.55	\$1.60	\$0.00	87806Muledome Notice
7	9314 8699 0430 0067 7328 63	WAGNER OIL CO. 500 Commerce, Suite 500 Fort Worth TX 76102	\$1.45	\$3.55	\$1.60	\$0.00	87806Muledome Notice
8	9314 8699 0430 0067 7328 70	DEVON ENERGY PRODUCTION COMPANY, LP 333 West Sheridan Ave. Oklahoma City OK 73102	\$1.45	\$3.55	\$1.60	\$0.00	87806Muledome Notice
9	9314 8699 0430 0067 7328 87	EOG RESOURCES INC P.O. Box 2267 Midland TX 79702	\$1.45	\$3.55	\$1.60	\$0.00	87806Muledome Notice
10	9314 8699 0430 0067 7328 94	OXY USA INC PO BOX 27570 Houston TX 77227	\$1.45	\$3.55	\$1.60	\$0.00	87806Muledome Notice
11	9314 8699 0430 0067 7329 00	EOG RESOURCES INC PO Box 2267 Midland TX 79702	\$1.45	\$3.55	\$1.60	\$0.00	87806Muledome Notice
12	9314 8699 0430 0067 7329 17	CHEVRON USA INC 6301 DEAUVILLE Midland TX 79706	\$1.45	\$3.55	\$1.60	\$0.00	87806Muledome Notice
13	9314 8699 0430 0067 7329 24	BULLHEAD ENERGY LLC PO BOX 3445 Midland TX 79702	\$1.45	\$3.55	\$1.60	\$0.00	87806Muledome Notice
14	9314 8699 0430 0067 7329 31	ADVANCE ENERGY PARTNERS HAT MESA LLC 11490 WESTHEIMER RD STE 950 Houston TX 77077	\$1.45	\$3.55	\$1.60	\$0.00	87806Muledome Notice
15	9314 8699 0430 0067 7329 48	PIONEER EXPLORATION LTD 15603 KUYHENDAHL #219 Houston TX 77090	\$1.45	\$3.55	\$1.60	\$0.00	87806Muledome Notice



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Karlene Schuman
Modrall Sperling Roehl Harris & Sisk P.A.
500 Fourth Street, Suite 1000
Albuquerque NM 87102

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Type of Mailing: CERTIFIED MAIL
01/16/2020



Firm Mailing Book ID: 182754

Line	USPS Article Number	Name, Street, City, State, Zip	Postage	Service Fee	RR Fee	Rest.Del.Fee	Reference Contents
Totals:			\$21.75	\$53.25	\$24.00	\$0.00	
			Grand Total:		\$99.00		

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Received at Post Office

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Name of receiving employee

Dated:

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USPS Article Number	Date Created	Reference Number	Name 1	City	State	Zip	Mailing Status	Service Options	Mail Delivery Date
9314869904300067732948	2020-01-16 8:56 AM	87806Muledome	PIONEER EXPLORATION L D	Houston	TX	77090	To be Returned	Return Receipt - Electronic, Certified Mail	
9314869904300067732931	2020-01-16 8:56 AM	87806Muledome	ADVANCE ENERGY PARTNERS HAT MESA LLC	Houston	TX	77077	Delivered	Return Receipt - Electronic, Certified Mail	01-21-2020
9314869904300067732924	2020-01-16 8:56 AM	87806Muledome	BULLHEAD ENERGY LLC	Midland	TX	79702	Delivered	Return Receipt - Electronic, Certified Mail	01-27-2020
9314869904300067732917	2020-01-16 8:56 AM	87806Muledome	CHEVRON USA INC	Midland	TX	79706	Delivered	Return Receipt - Electronic, Certified Mail	01-21-2020
9314869904300067732900	2020-01-16 8:56 AM	87806Muledome	EOG RESOURCES INC	Midland	TX	79702	Delivered	Return Receipt - Electronic, Certified Mail	01-21-2020
9314869904300067732894	2020-01-16 8:56 AM	87806Muledome	OXY USA INC	Houston	TX	77227	Delivered	Return Receipt - Electronic, Certified Mail	01-20-2020
9314869904300067732887	2020-01-16 8:56 AM	87806Muledome	EOG RESOURCES INC	Midland	TX	79702	Delivered	Return Receipt - Electronic, Certified Mail	01-21-2020
9314869904300067732870	2020-01-16 8:56 AM	87806Muledome	DEVON ENERGY PRODUCTION COMPANY, LP	Oklahoma City	OK	73102	Delivered	Return Receipt - Electronic, Certified Mail	01-21-2020
9314869904300067732863	2020-01-16 8:56 AM	87806Muledome	WAGNER OIL CO.	Fort Worth	TX	76102	Delivered	Return Receipt - Electronic, Certified Mail	01-21-2020
9314869904300067732856	2020-01-16 8:56 AM	87806Muledome	OXY USA INC	Houston	TX	77210	Delivered	Return Receipt - Electronic, Certified Mail	01-23-2020
9314869904300067732849	2020-01-16 8:56 AM	87806Muledome	BUREAU OF LAND MGMT	Santa Fe	NM	87508	Delivered	Return Receipt - Electronic, Certified Mail	01-21-2020
9314869904300067732832	2020-01-16 8:56 AM	87806Muledome	NEW MEXICO STATE LAND OFFICE	Santa Fe	NM	87504	Delivered	Return Receipt - Electronic, Certified Mail	01-21-2020
9314869904300067732825	2020-01-16 8:56 AM	87806Muledome	LIMESTONE BASIN PROP RANCH LLC	Midland	TX	79705	Delivered	Return Receipt - Electronic, Certified Mail	01-21-2020
9314869904300067732818	2020-01-16 8:56 AM	87806Muledome	Oil Conservation Division District I - Hobbs	Hobbs	NM	88240	Delivered	Return Receipt - Electronic, Certified Mail	01-21-2020
9314869904300067732801	2020-01-16 8:56 AM	87806Muledome	Oil Conservation Division District IV	Santa Fe	NM	87505	Delivered	Return Receipt - Electronic, Certified Mail	01-21-2020

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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
January 18, 2020
and ending with the issue dated
January 18, 2020.



Publisher

Sworn and subscribed to before me this
18th day of January 2020.

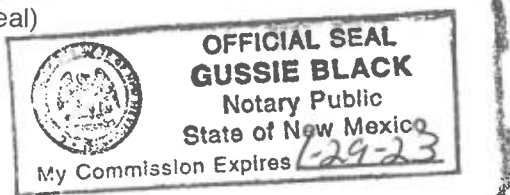


Business Manager

My commission expires

January 20, 2025

(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 JANUARY 18, 2020

CASE NO. 21031: Notice to all affected parties, as well as the heirs and devisees of: Oil Conservation Division District IV, Oil Conservation Division District 1 - Hobbs, Limestone Basin Prop Ranch LLC, New Mexico State Land Office, Bureau of Land Management, OXY USA Inc.; Wagner Oil Co.; Devon Energy Production Company LP, EOG Resources Inc., OXY USA Inc., Chevron USA Inc., Bullhead Energy LLC, Advance Energy Partners Hat Mesa LLC, Pioneer Exploration LTD of AWR Disposal LLC's application for compulsory pooling, Lea County, New Mexico. The State of New Mexico, through its Oil Conservation Division, hereby gives notice that the Division will conduct a public hearing at 8:15 a.m. on February 6, 2020, to consider this application. Applicant seeks an order approving the Muledome SWD #1 well at a surface location 1389 feet from the North line and 356 feet from the West line of Section 30, Township 22 South, Range 33 East, NMPM, Lea County, New Mexico for the purpose of operating a salt water disposal well. Applicant requests authorization to inject salt water into the Devonian-Silurian formation at a depth of 16,083'-17,701'. Applicant requests that the Division approve a maximum daily injection rate for the well of 50,000 bbls per day. Said location is approximately 27.3 miles west of Eunice, New Mexico.
#35083

01104570

00238472

DOLORES SERNA
MODRALL, SPERLING, ROEHL, HARRIS &
P. O. BOX 2168
ALBUQUERQUE, NM 87103-2168