

**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. 21090
(TWIN SISTER)**

Table of Contents

Tab 1: Application and C-108

Tab 2: Affidavit of Scott Wilson and Exhibits

Tab 3: Affidavit of Dr. Kate Ziegler and Exhibits

Tab 4: Affidavit of Dr. Steven Taylor and Exhibits

Tab 5: Notice Affidavits

Application and C-108

**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. 21090

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 Twin Sisters SWD #1 well at a surface location 2170 feet from the North line and 183 feet from the West line of Section 29, Township 23 South, Range 34 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 14,652 -16,318'.

(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 2,198 psi for this well, and it requests that a maximum pressure of 2,930 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 March 5, 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 Twin Sister SWD #1 well at a surface location 2170 feet from the North line and 183 feet from the West line of Section 29, Township 23 South, Range 34 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 14,652'-16,318'. Applicant requests that the Division approve a maximum daily injection rate for the well of 50,000 bbls per day. Said location is approximately 21.2 miles northwest of Jal, 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: 328805Well Name: TWIN SISTERS SWD #1API: TBDPool: SWD; DEVONIAN-SILURIANPool 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☐ PPR2) **NOTIFICATION REQUIRED TO:** Check those which apply.A. ☒ Offset operators or lease holdersB. ☐ Royalty, overriding royalty owners, revenue ownersC. ☒ Application requires published noticeD. ☒ Notification and/or concurrent approval by SLOE. ☒ Notification and/or concurrent approval by BLMF. ☒ Surface ownerG. ☐ 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

Date 1/27/2020512-600-1764

Phone Number

CHRIS@LONQUIST.COM

e-mail Address

Signature




STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT

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

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

- I. PURPOSE: Secondary Recovery Pressure Maintenance X Disposal Storage
Application qualifies for administrative approval? X Yes No
- II. OPERATOR: 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 X No
If yes, give the Division order number authorizing the project: _____
- V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.
- VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
- VII. Attach data on the proposed operation, including:
1. Proposed average and maximum daily rate and volume of fluids to be injected;
 2. Whether the system is open or closed;
 3. Proposed average and maximum injection pressure;
 4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
 5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).
- *VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.
- IX. Describe the proposed stimulation program, if any.
- *X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).
- *XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
- XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.
- XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.
- XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.
- NAME: Christopher B. Weyand TITLE: Consulting Engineer
SIGNATURE:  DATE: 1/7/2020
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, LLCWELL NAME & NUMBER: TWIN SISTERS SWD #1WELL LOCATION: 2170' FNL & 183' FWL
FOOTAGE LOCATIONUNIT LETTER
ESECTION
29TOWNSHIP
23SRANGE
34EWELLBORE SCHEMATICWELL CONSTRUCTION DATA
Conductor CasingHole Size: 26.000"Casing Size: 26.000"Cemented with: 71 sx.or _____ ft³Top of Cement: SurfaceMethod Determined: CirculationSurface CasingHole Size: 24.000"Casing Size: 20.000"Cemented with: 1,525 sx.or _____ ft³Top of Cement: SurfaceMethod Determined: Circulation1st Intermediate CasingHole Size: 17.500"Casing Size: 13.375"Cemented with: 4,044 sx.or _____ ft³Top of Cement: SurfaceMethod Determined: Circulation

2nd Intermediate CasingHole Size: 12.250"Casing Size: 9.625"Cemented with: 3,220 sx.or _____ ft³Top of Cement: SurfaceMethod Determined: CirculationProduction LinerHole Size: 8.500"Casing Size: 7.625"Cemented with: 273 sx.or _____ ft³Top of Cement: 11,200'Method Determined: LoggedTotal Depth: 16,518'Injection Interval14,652 feet to 16,518 feet

(Open Hole)

Side 2

INJECTION WELL DATA SHEET

Tubing Size: 7", 26 lb/ft. P-110, TCPC from 0'-11,100' and 5,500", 17 lb/ft. P-110 TCPC from 11,100' - 14,602'
 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: 14,602'

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 300')

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:

Lamar: 5,135'

Delaware: 5,235'

Bone Spring: 8,566'

Wolfcamp: 11,424'

Strawn: 12,174'

Atoka: 12,361'

Morrow: 13,004'

AWR Disposal, LLC**Twin Sisters SWD No. 1****FORM C-108 Supplemental Information****III. Well Data****A. Wellbore Information**

1.

Well information	
Lease Name	Twin Sisters SWD
Well No.	1
Location	S-29 T-23S R-34E
Footage Location	2170' FNL & 183' FWL

2.

a. Wellbore Description

Casing Information				
Type	Surface	Intermediate 1	Intermediate 2	Liner
OD	20"	13.375"	9.625"	7.625"
WT	0.595"	0.558"	0.550"	0.563"
ID	19.000"	12.415"	8.535"	6.625"
Drift ID	18.810"	12.259"	8.379"	6.500"
COD	21"	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	1,400'	5,150'	11,700'	11,200' – 14,652'

b. Cementing Program

Cement Information				
Casing String	Surface	Intermediate 1	Intermediate 2	Liner
Lead Cement	ExtendaCem	N/A	N/A	N/A
Lead Cement Volume	714 sx	N/A	N/A	N/A
Tail Cement	Halcm	Halcm	Halcm, Halcm, Halcm	Neocem
Tail Cement Volume	811 sx	4,050 sx	Stage 1: 1,193 sx Stage 2: 947 sx Stage 3: 1,080 sx	273 sx
Cement Excess	75%	100% OH	50%, 50%, 10%	50%
TOC	Surface	Surface	Surface	11,200'
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' - 11,100'	11,100' -14,602'

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: 14,652' – 16,318'

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	5,235'
Bone Spring	8,566'
Wolfcamp	11,424'
Strawn	12,174'
Atoka	12,361'
Morrow	13,004'

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: 2,198 PSI (surface pressure)

Maximum Injection Pressure: 2,930 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 Artesia, Atoka, Bone Spring, Delaware, Morrow, Pennsylvanian, Strawn, and Wolfcamp 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	1,247'
Lamar	5,135'
Bell Canyon	5,235'
Cherry Canyon	6,053'
Brushy Canyon	7,365'
Bone Spring Lm	8,566'
1st Bone Spring	9,736'
1st Bone Spring SS	10,022'
2nd Bone Spring	10,397'
3rd Bone Spring	11,227'
Wolfcamp	11,424'
Strawn	12,174'
Atoka	12,361'
Morrow	13,004'
Miss LS	13,977'
Woodford	14,388'
Devonian	14,602'
Fusselman	15,665'
Montoya	16,218'

B. Underground Sources of Drinking Water

No water wells exist within a one-mile radius of the proposed well. Water wells outside a one-mile radius in the surrounding area have an average depth of 503 feet and an average water depth of 270 feet generally producing from the Carlsbad. 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

Because there are no water wells that exist within a one-mile radius of the proposed well, chemical analysis of fresh water wells was not retrieved for the proposed well.


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 Twin Sisters SWD #1) and any underground sources of drinking water.

NAME: Herb Wacker

TITLE: Geologist

SIGNATURE:


TBP, # 4517

DATE:

Nov 1, 2019

AWR DISPOSAL LLC		Twin Sisters SWD		Location - Sec 29 T23S R34E		Yr		16,318		3619' / 3640'		Geologic Traps (Mts ft)		Section		Problems		Btu/Mft		Fluid		Casing		Logging		Cement (100 ft)		Injection String	
Vertical Injection - Devonian, Silurian, Precambrian		Rustler Anhydrite - 1247		Surface TD - 1400		Surface Drill 24" 0' - 1400' 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		1400' of 20" 106.5# J55 BTC Centralizers - bottom 2 joints and every 3rd jt thereafter		No Logs		Lead: 714 sx 13.7 ppg EXTENDACEM, 1.694 ft3/sk (800') 75% excess Tail: 811 sx 14.8 ppg HALCEM, 1.342 ft3/sk (600') 75% excess Cement to Surface		11100 of 7" P110 26# TCP									
Salt Section		1st Intermediate Drill 3750' of 17-1/2" Hole 1400' - 5150' 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 5150' 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 1400'		4050sx of 13.7ppg Halcem (100% XS in OH) with 5% Microbond. Cement to surface		3502' of 5-1/2" P110 17# TCP													
9-5/8" ECP DV Tool - 5200		2nd Intermediate Drill 6550' of 12-1/4" Hole 5150' - 11700' 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		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 11700' of 9-5/8" 53.5# P110 BTC Special Drift to 8.535" Externally Coat Between DV Tools DV tool at 8600' ECP DV Tool at 5200' Centralizers - bottom jt, 100' aside of DV tool, every 3rd joint in open hole and 5 within the surface casing		Stage 3: 1080 sx 13.7 ppg HalCem™ C 10% XS 1000psi CSD after 10 hrs Cement to Surface Stage 2: 947 sx of 13.7 ppg HalCem™ C 50% XS 1000psi CSD after 10 hrs Cement to Surface Stage 1: 1193 sx 15.6 ppg HalCem™ 50% XS 1000psi CSD after 10 hrs Cement to Surface		Duoline Internally Coated Injection Tubing															
3rd Int Liner Top - 11,200 Wolfcamp - 11424 2nd Int TD - 11,700		3rd Intermediate Drill 2952' of 8-1/2" Hole 11700' - 14652' 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 Chert is possible Loss of Circulation is expected H2S encountered on the Striker 3 well BHT estimated at 280F		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/MPO using ADA (HOLD)		3452' of 7-5/8" 39# P110 USS Flush Jt Conn 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		273sx of 13.2 ppg NeoCem™ PT2 8hr TT Silica Flour 50% Excess 1000psi CSD after 10hrs		7-5/8" x 5-1/2" TCP Permanent Packer with High Temp Elastomer and full Inconel 925 trim													
Strawn - 12174 Atoka - 12361 Morrow - 13004 Miss Let - 13977 Woodford - 14388 Perm Packer - 14,602 3rd Int TD - 14,652 Devonian - 14,602		Injection Interval Drill 1866' of 6-1/2" hole 14652' - 16518'		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		Displace with 3% KCl (or heavier brine if necessary)															
Fusselman - 15665 Montoya - 16,218' TD - 16,318'																													

District I
1625 N French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number		² Pool Code	³ Pool Name
⁴ Property Code	⁵ Property Name TWIN SISTERS SWD		⁶ Well Number 1
⁷ OGRID No. 328805	⁸ Operator Name LONQUIST & CO, LLC		⁹ Elevation 3565'

¹⁰Surface Location

UL or lot no. E	Section 29	Township 23-S	Range 34-E	Lot Ida -	Feet from the 2170'	North/South line NORTH	Feet from the 183'	East/West line WEST	County LEA
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UL or lot no. -	Section -	Township -	Range -	Lot Ida -	Feet from the -	North/South line -	Feet from the -	East/West line -	County -
¹¹ Dedicated Acres -		¹² Joint or Infill	¹³ Consolidation Code		¹⁴ Order No.				

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

<p>X=798576.73 Y=467633.37</p> <p>X=801316.73 Y=467654.38</p> <p>X=803955.36 Y=467676.43</p> <p>X=798701.08 Y=464995.73</p> <p>X=798725.42 Y=467354.09</p> <p>X=801370.07 Y=462375.43</p> <p>X=804003.61 Y=462395.34</p> <p>SURFACE LOCATION NEW MEXICO EAST NAD 1983 X=798880 Y=465465 LAT.: N 32.2768887 LONG.: W 103.5000184</p>	<p>17 OPERATOR CERTIFICATION</p> <p>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or 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 to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p><i>[Signature]</i> 1/27/20 Signature Date</p> <p><i>Chris Wagoner</i> Printed Name</p> <p><i>chris@lonquist.com</i> E-mail Address</p> <p>18 SURVEYOR CERTIFICATION</p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true to the best of my belief.</p> <p>XX/XX/XXXX</p> <p>Date of Survey</p> <p>Signature and Seal of Professional Surveyor</p> <p>Certificate Number</p>
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S:\SURVEY\Y\LOQUIST_A_CO.LLC\LIMESTONE_FINAL_PRODUCT\SILO_TWIN_SISTERS_SWD_1_REV1.DWG 12/8/2019 3:01:45 PM khaBery

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

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

District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6176 Fax: (505) 334-6170

District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3450 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 16, 2011

☐ 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, TX 79705		OGRID Number 328805
Property Code		API Number TBD
Property Name Twin Sisters SWD		Well No 1

Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N S Line	Feet From	E W Line	County
E	29	23S	34E	N-A	2170'	NORTH	183'	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

Work Type N	Well Type SWD	Cable/Rotary R	Lease Type Private	Ground Level Elevation 3,565'
Multiple N	Proposed Depth 16,318'	Formation Devonian-Silurian	Contractor TBD	Spud Date ASAP
Depth to Ground water 270'		Distance from nearest fresh water well 1.39 miles		Distance to nearest surface water ~ 1 mile

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

Proposed Casing and Cement Program

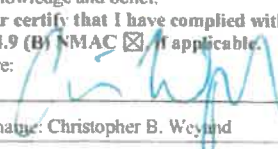
Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surface	24"	20"	106.5 lb/ft	1,400'	1,515	Surface
Intermediate 1	17.5"	13.375"	68 lb/ft	5,150'	4,050	Surface
Production	12.25"	9.625"	53.5 lb/ft	11,700'	3,220	Surface
Prod. Liner	8.5"	7.625"	39 lb/ft	11,200' - 14,652'	273	11,200'

Casing/Cement Program: Additional Comments

See attached schematic.

Proposed Blowout Prevention Program

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

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. Weyand

Title: Consulting Engineer

E-mail Address: chris@longquist.com

Date: 01/02/2020

Phone: (512) 600-1764

OIL CONSERVATION DIVISION

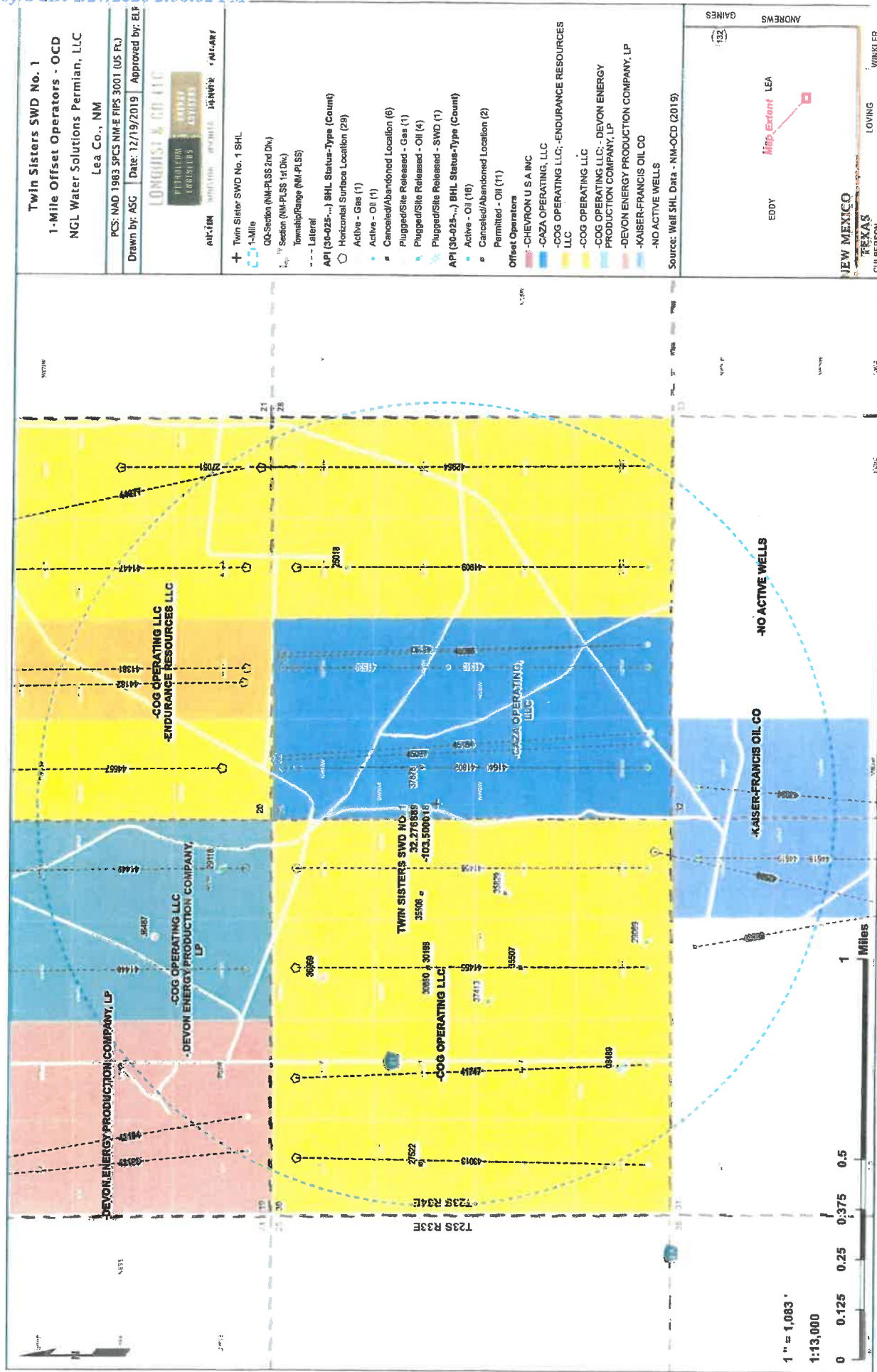
Approved By:

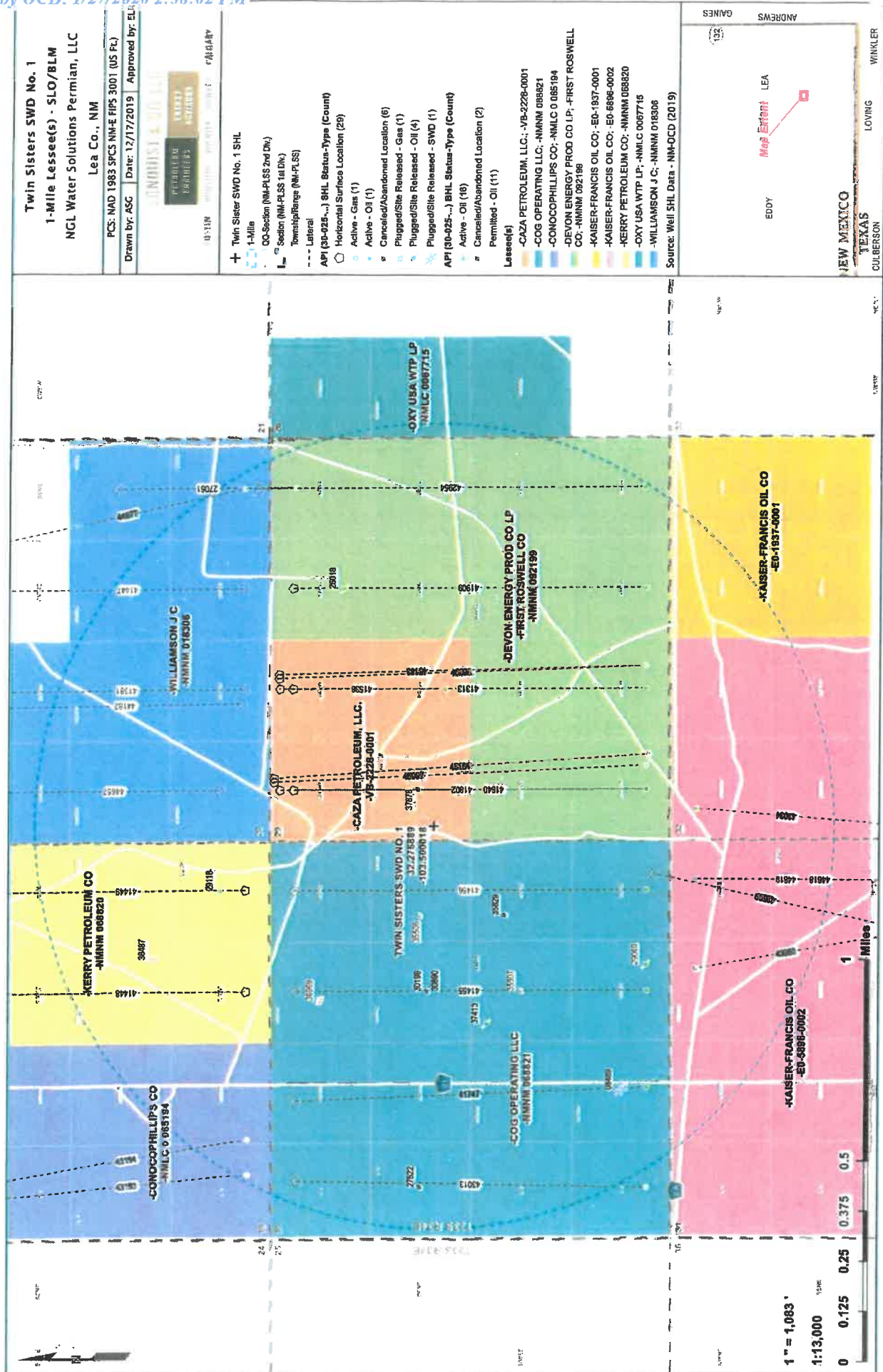
Title:

Approved Date:

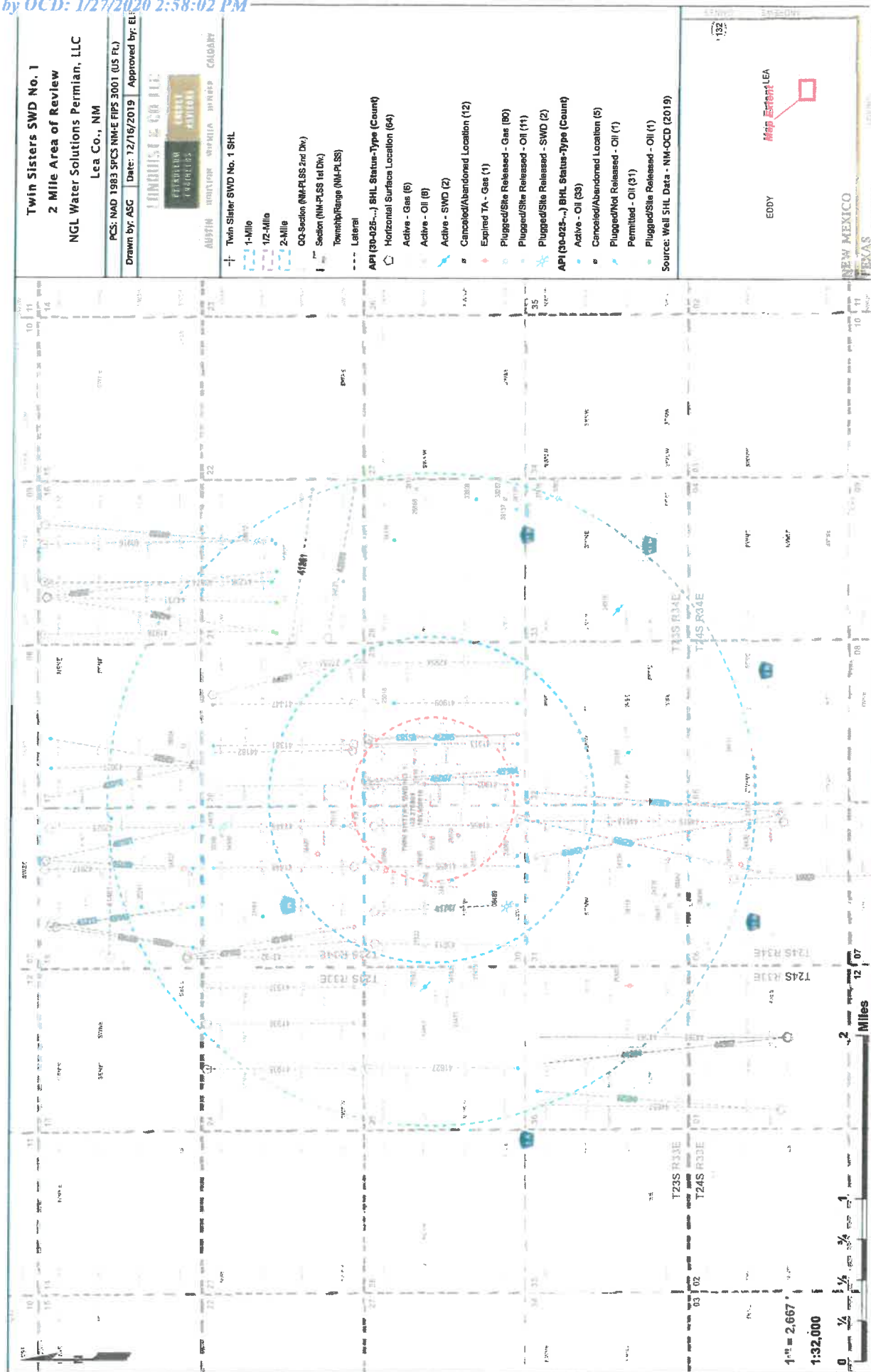
Expiration Date:

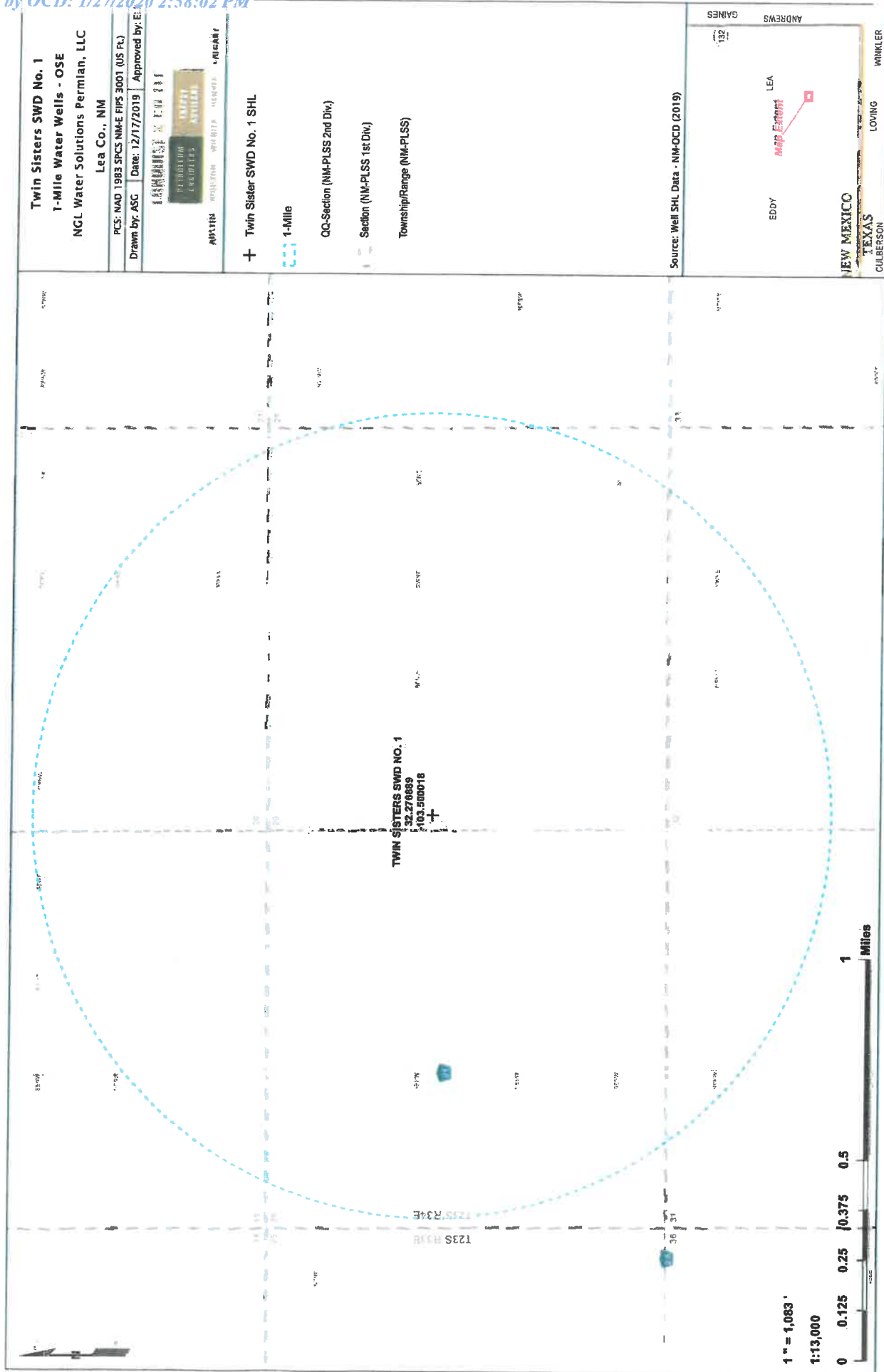
Conditions of Approval Attached





v.





Twin Sisters SWD No. 1

Unsaturation Produced Water Analysis																		
API	Well Name	Section	Township	Range	Unit	County	Field	Formation	ph	test_mg/L	calcium_mg/L	iron_mg/L	magnesium_mg/L	manganese_mg/L	chloride_mg/L	bicarbonate_mg/L	sulfate_mg/L	oz2_mg/L
3002541184	GAUCHO UNIT #031H	11/275	34E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	135614.2	48612.5	6969.8	30.2	940.9	9572.9	395	470	
3002541183	GAUCHO UNIT #031H	11/275	34E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.4	48415.9	48415.9	3712	0	146	79320	183	700	
3002541184	GAUCHO UNIT #031H	11/275	34E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	7	109808.2	17102.7	5361.4	32.4	754.2	69964.9	260.6	1000	
3002541185	GAUCHO UNIT #031H	11/275	34E	A	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	7.5	135904.6	48415.9	3712	47.2	0.21	71402.4	292.8	700	
3002541186	GAUCHO UNIT #031H	11/275	34E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	7.5	184420.1	107440.1	107440.1	47.6	1.426	13154.4	244	770	
3002541187	GAUCHO UNIT #031H	11/275	34E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.4	151771.7	57914.2	86.9	0	1.29	51000	244	0	
3002541188	GAUCHO UNIT #031H	11/275	34E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.7	48607.1	48607.1	21	0	1	76500	281	586	
3002541189	GAUCHO UNIT #031H	11/275	33E	P	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	51720	8056	84	1317	0.95	89474	183	690	
3002541190	GAUCHO UNIT #031H	11/275	33E	P	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	48607.1	48607.1	79	873	0.65	136759	183	470	
3002541191	GAUCHO UNIT #031H	11/275	33E	P	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	48607.1	48607.1	79	873	0.65	136759	183	470	
3002541192	GAUCHO UNIT #031H	11/275	33E	P	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	134372.9	27864.4	29.8	0	0.12	146896	146	480	
3002541193	GAUCHO UNIT #031H	11/275	33E	N	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	161603.2	51347.4	48.1	0	2.6	86700	244	0	
3002541194	GAUCHO UNIT #031H	11/275	33E	N	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	50929.6	18.5	0	1.12	98400	122	0	
3002541195	GAUCHO UNIT #031H	11/275	33E	P	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	158786.1	51063.6	10.6	0	1.42	96500	122	0	
3002541196	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541197	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541198	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541199	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541200	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541201	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541202	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541203	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541204	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541205	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541206	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541207	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541208	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541209	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541210	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541211	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541212	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541213	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541214	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541215	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541216	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541217	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541218	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541219	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541220	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541221	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541222	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541223	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541224	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541225	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541226	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541227	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541228	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541229	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541230	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541231	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541232	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541233	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541234	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541235	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541236	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541237	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541238	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541239	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541240	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541241	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541242	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541243	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541244	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541245	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541246	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541247	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541248	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541249	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541250	GAUCHO UNIT #031H	11/275	33E	O	Lea	Lea	CRUZ	BDNE SPRING 2ND SAND	6.5	103444.1	51063.6	10.6	0	1.42	96500	122	0	
3002541251	GAUCHO UNIT #0																	

Exhibits of Scott Wilson

**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. 21090
(TWIN SISTER)**

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 Twin Sister 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 is increased to an average rate of 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 put together a simulation of the radial influence that the well would have if larger tubing is used for a period of time. A copy of this study is included within Exhibit A to this affidavit. This study shows that it is anticipated that there will be a minimal impact on reservoir pressures and that the majority of 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 well will not create any materially adverse pressures in the formation.

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

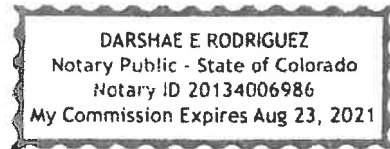
[Signature page follows]

Scott J. Wilson
Scott J. Wilson

SUBSCRIBED AND SWORN to before me this 28th day of February, 2020 by Scott J. Wilson.

Darshae Rodriguez
Notary Public

My commission expires: 8/23/21





AWR Disposal, LLC

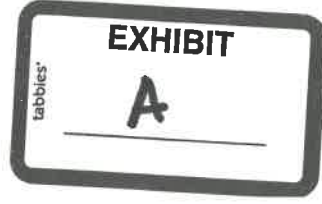
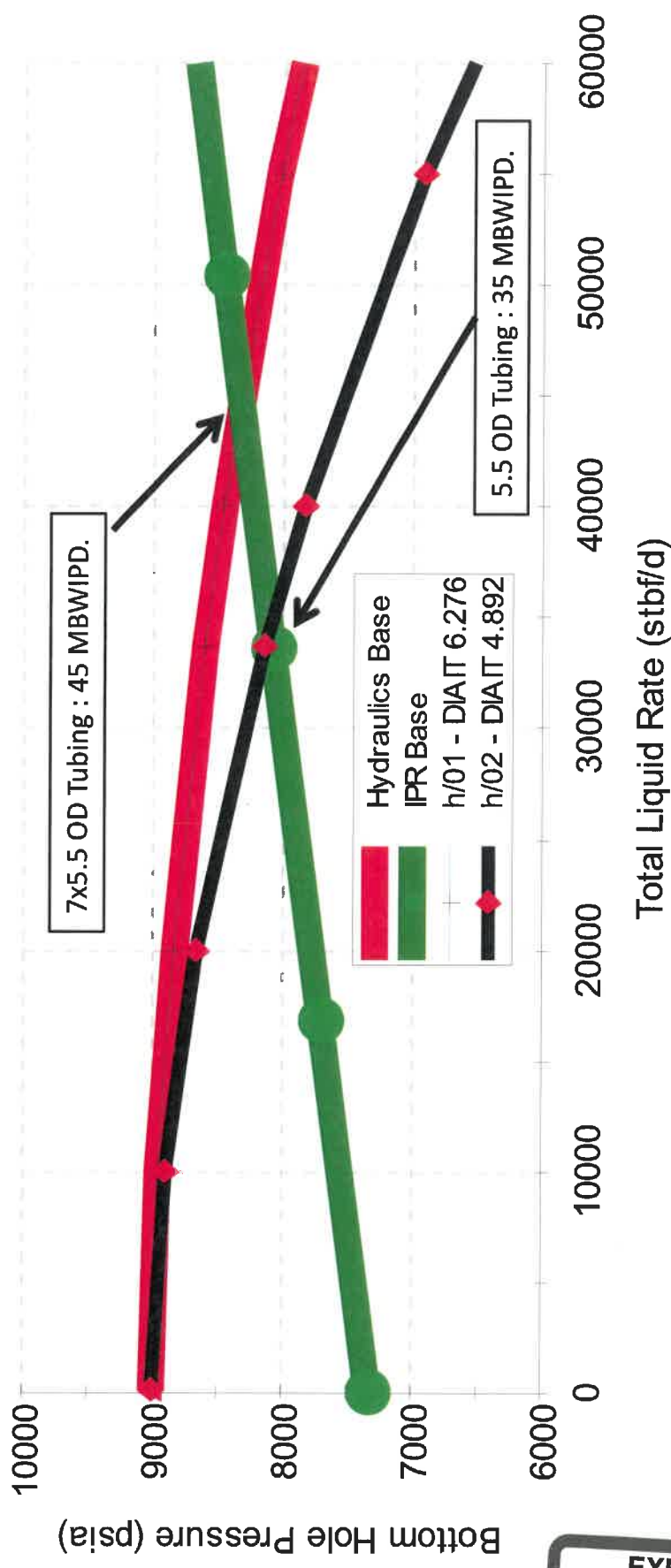
Exh. A1

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

Twin Sister SWD1
Reservoir Data
Pressure = 7342.00 psia
kh = 16000.0
Skin = 0.00

tw inSisterSWD1.snp

Rate vs. Pressure 01-Mar-20 15:42:03
WB Depth (MD ft) = 15000
WHPres (psia) = 2198.00
Tubing I.D. = 6.276 (s1)





AWR Disposal, LLC

Exh. A2

Increased injection rate per well equates to fewer injectors.

Twin Sister SWD1

Reservoir Data

Pressure = 7342.00 psia

kh = 16000.0

Skin = 0.00

tw inSisterSWD1.snp

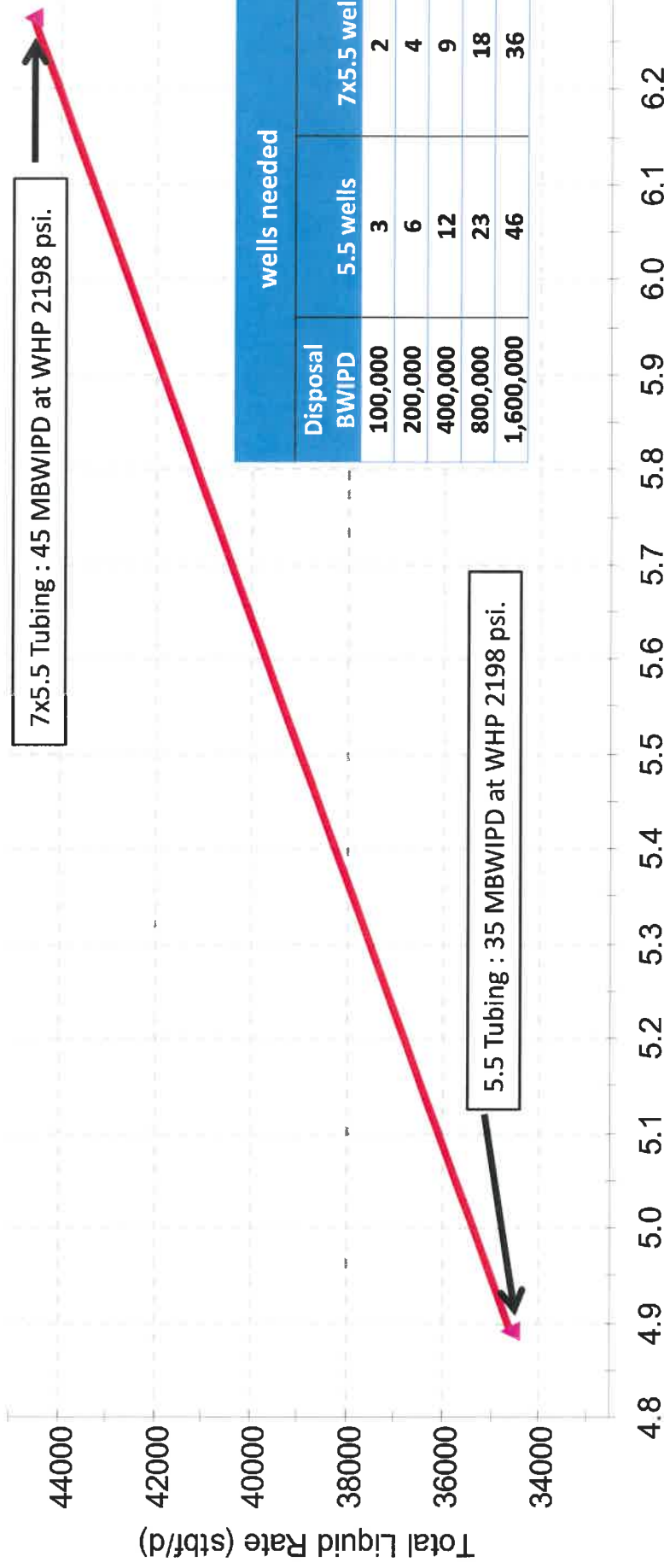
Rate vs. Wellbore - Tubing ID (in)

01-Mar-20 15:46:47

WB Depth (MD ft)= 15000

WHPres (psia) = 2198.00

Tubing I.D. = 6.276 (s1)



wells needed			
Disposal			
BWIPD	5.5 wells	7x5.5 wells	
100,000	3	2	
200,000	6	4	
400,000	12	9	
800,000	23	18	
1,600,000	46	36	

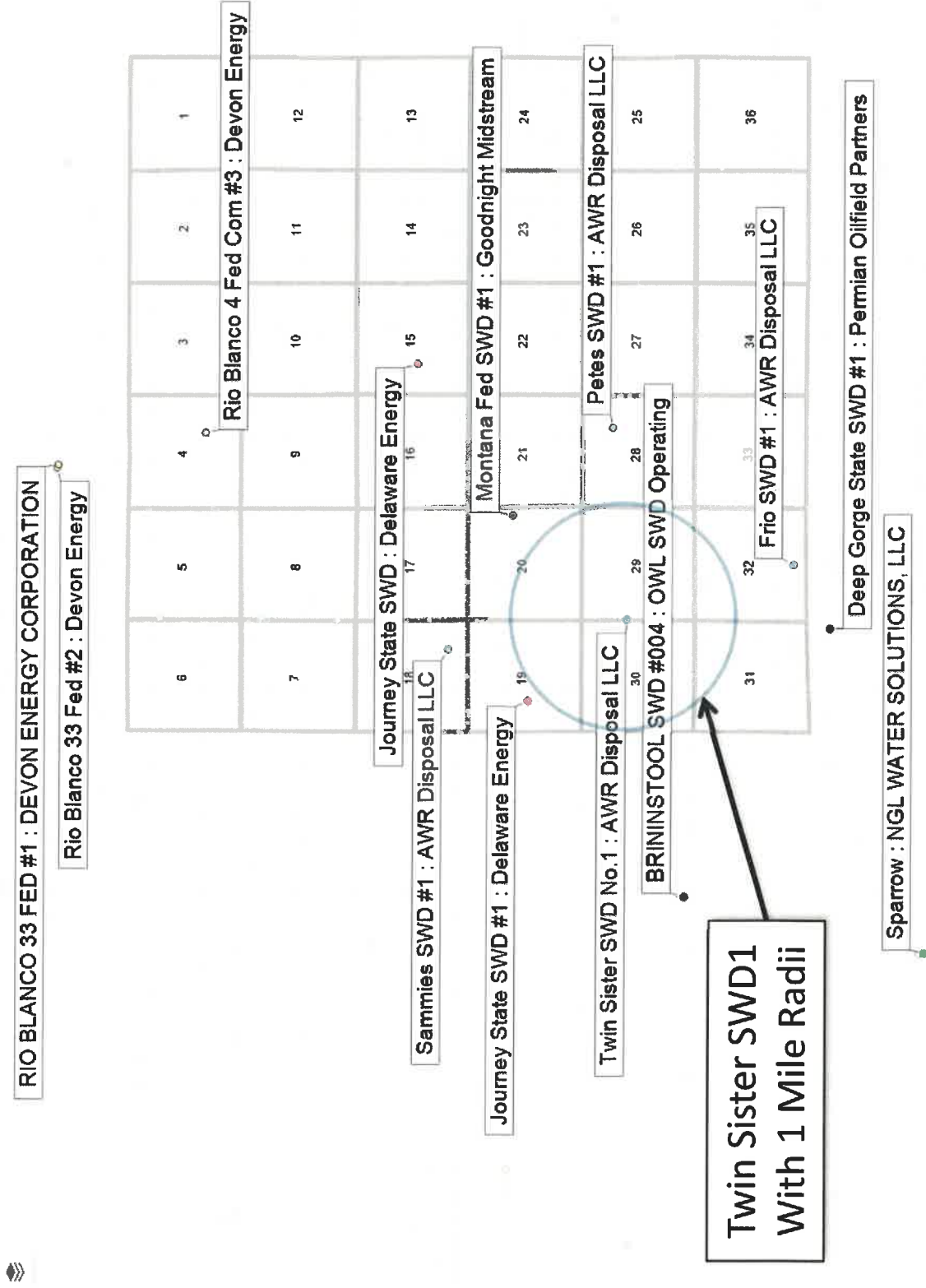
Wellbore - Tubing ID (in)



AWR Disposal, LLC

Exh. A3

Wells injecting water into the Devonian formation in the area.
Area is roughly 25 miles (E-W) by 15 miles (N-S)



31

2020-3-5



AWR Disposal, LLC

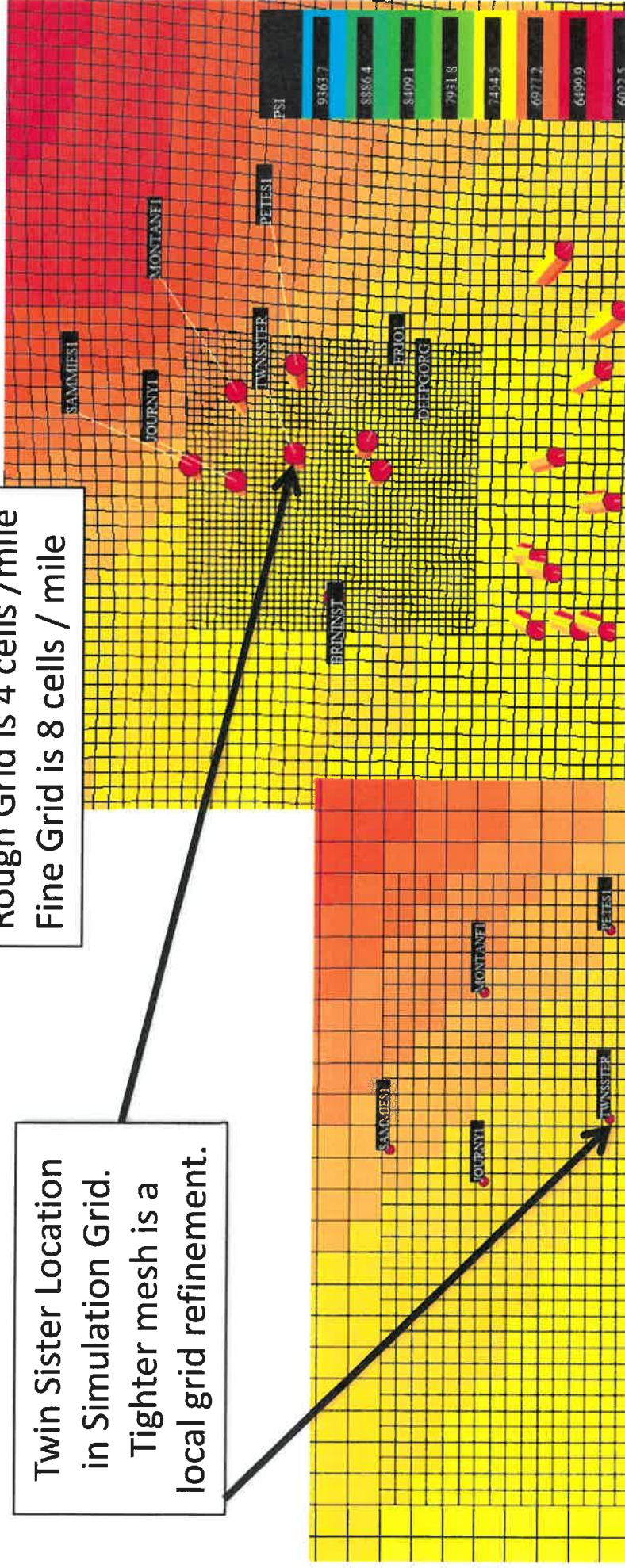
Exh. A4

Simulation Grid matches General Structure and Thickness

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

Rough Grid is 4 cells / mile
Fine Grid is 8 cells / mile

Twin Sister Location
in Simulation Grid.
Tighter mesh is a
local grid refinement.



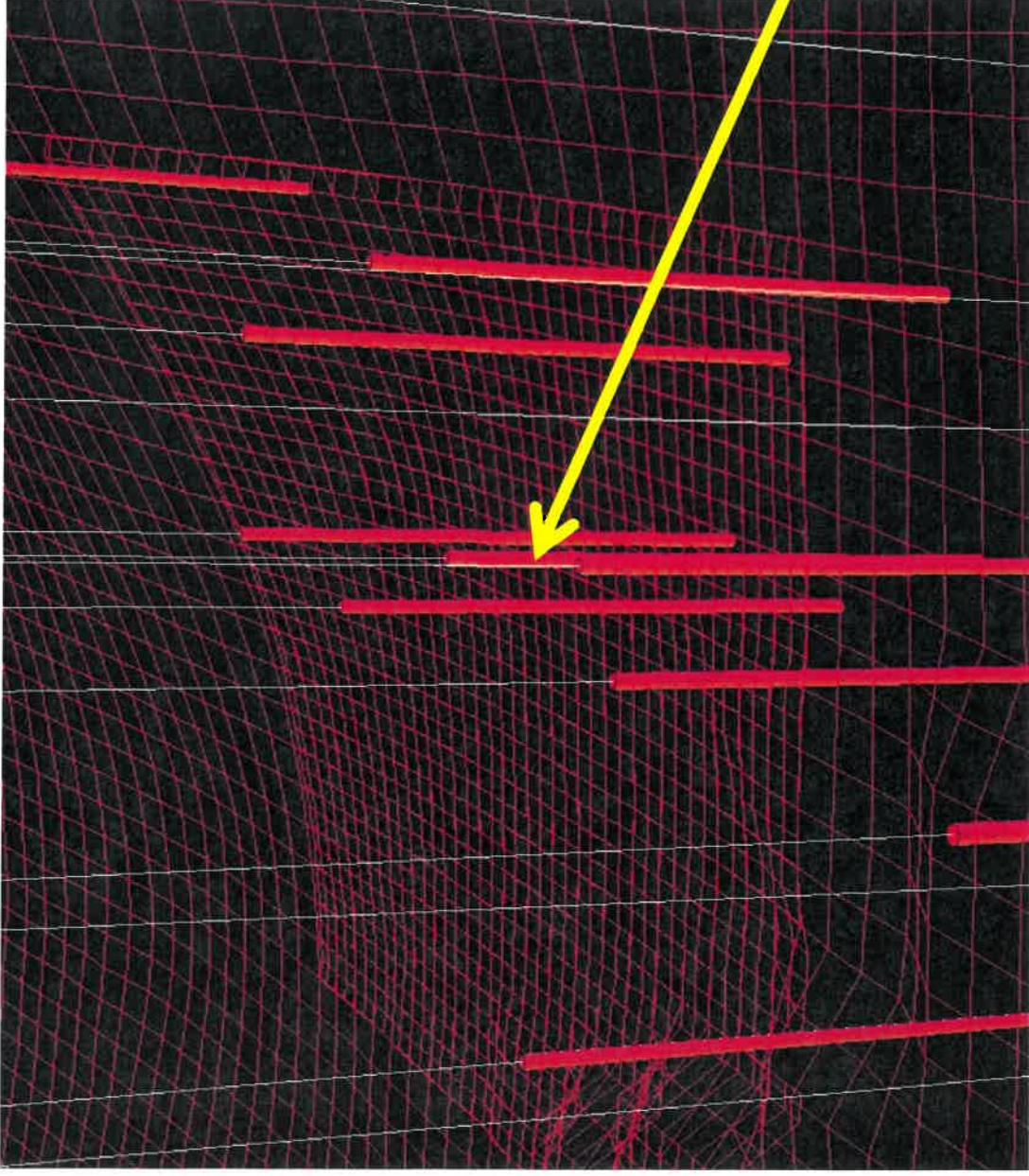


AWR Disposal, LLC

Exh. A5

3D view of grid shows Some Structural Relief.

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



Main grid is 4 cells /mile
Refined local Grid is 8 cells / mile

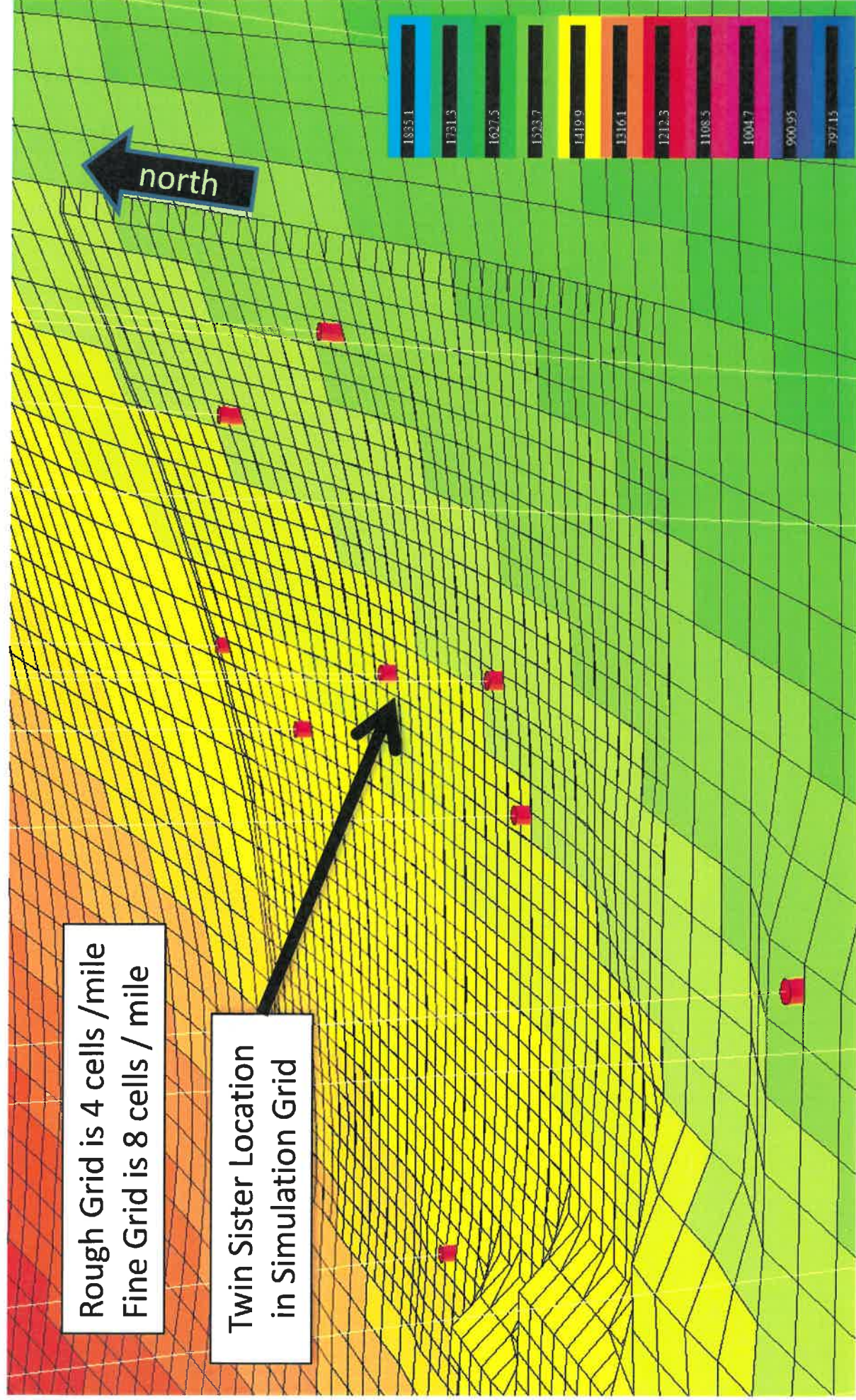
Twin Sister



AWR Disposal, LLC

Exh. A6

Orange cells to the East represent the thickest Sil/Dev.



2020-3-5

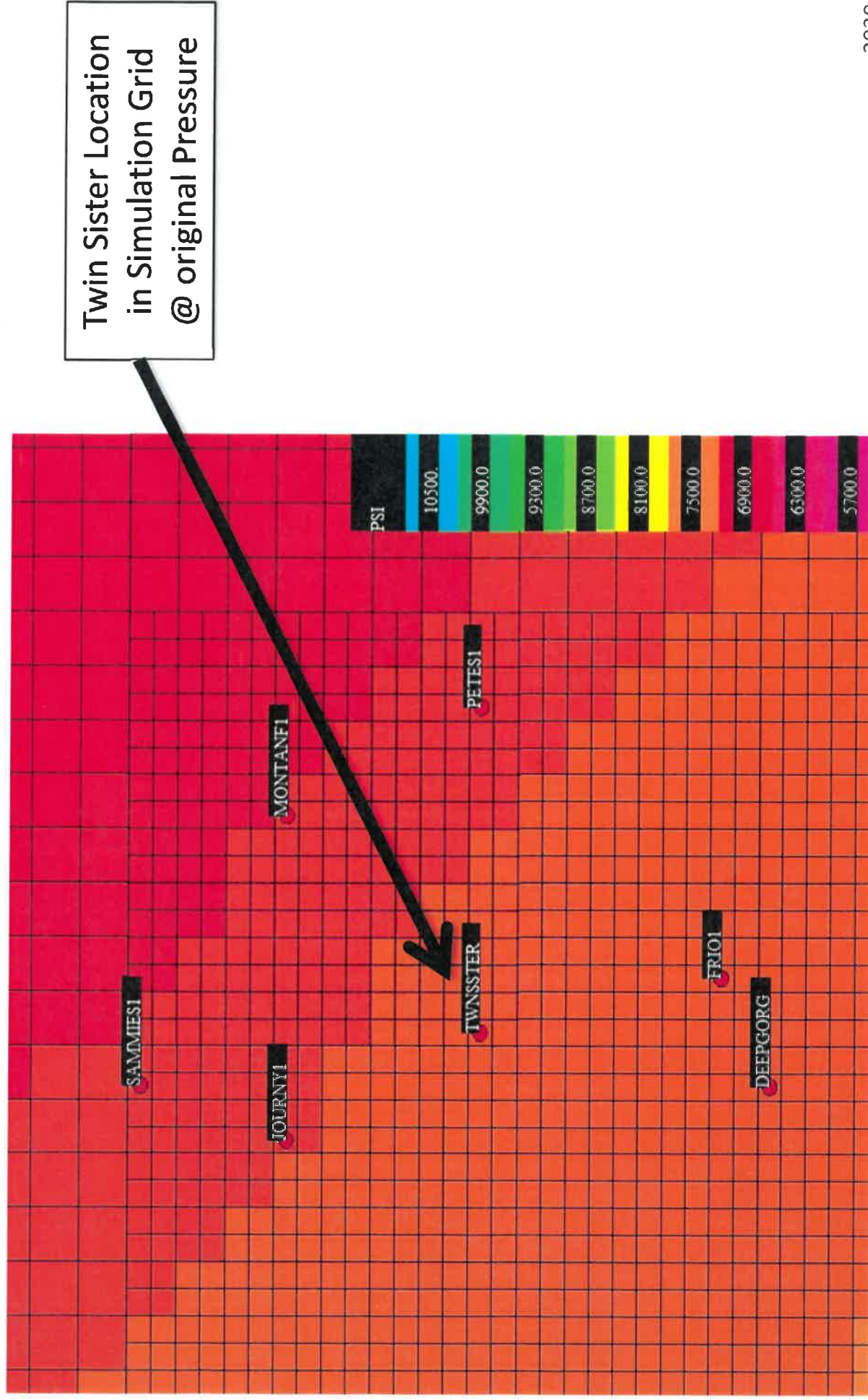
34



AWR Disposal, LLC

Exh. A7

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

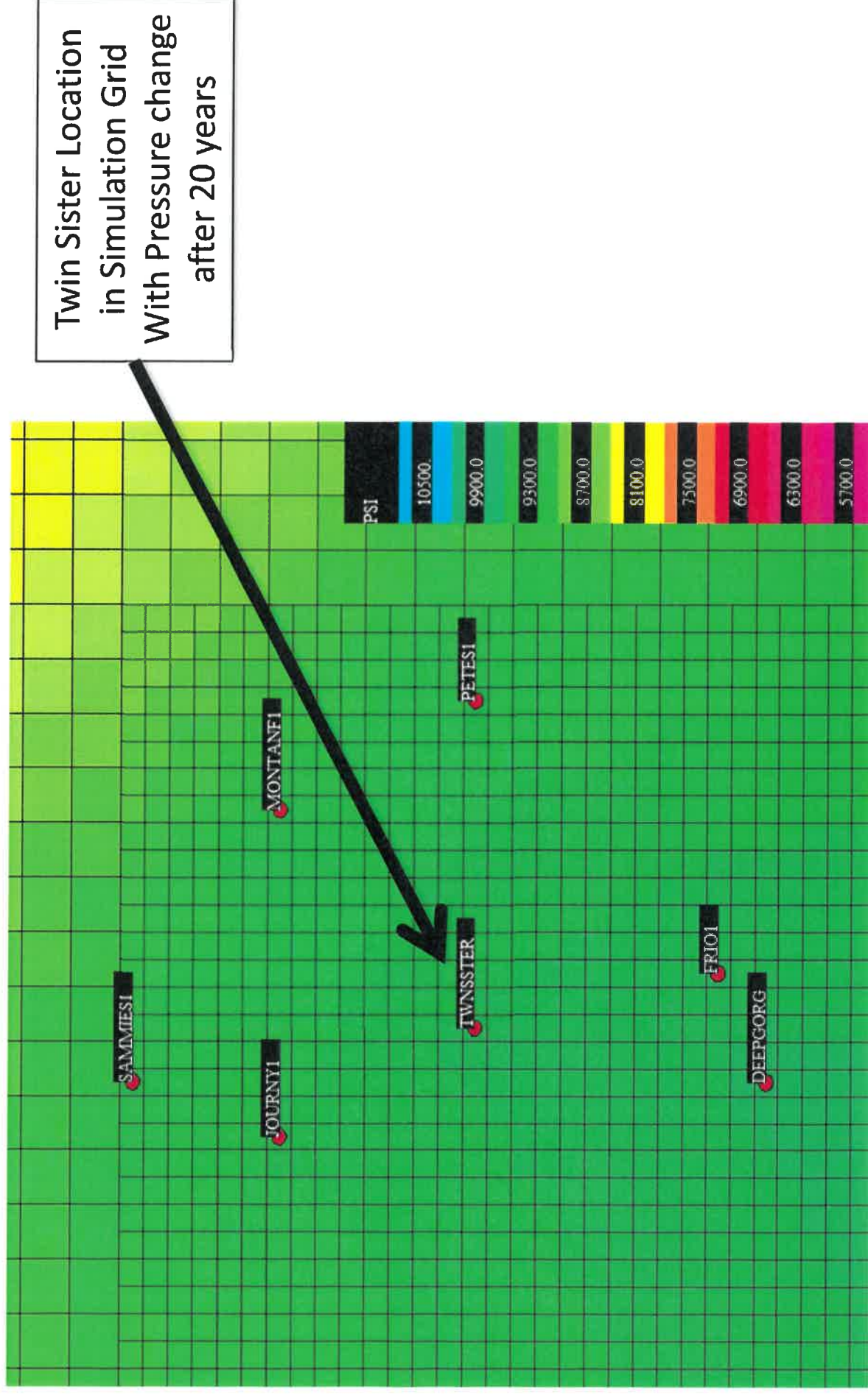




AWR Disposal, LLC

Exh. A8

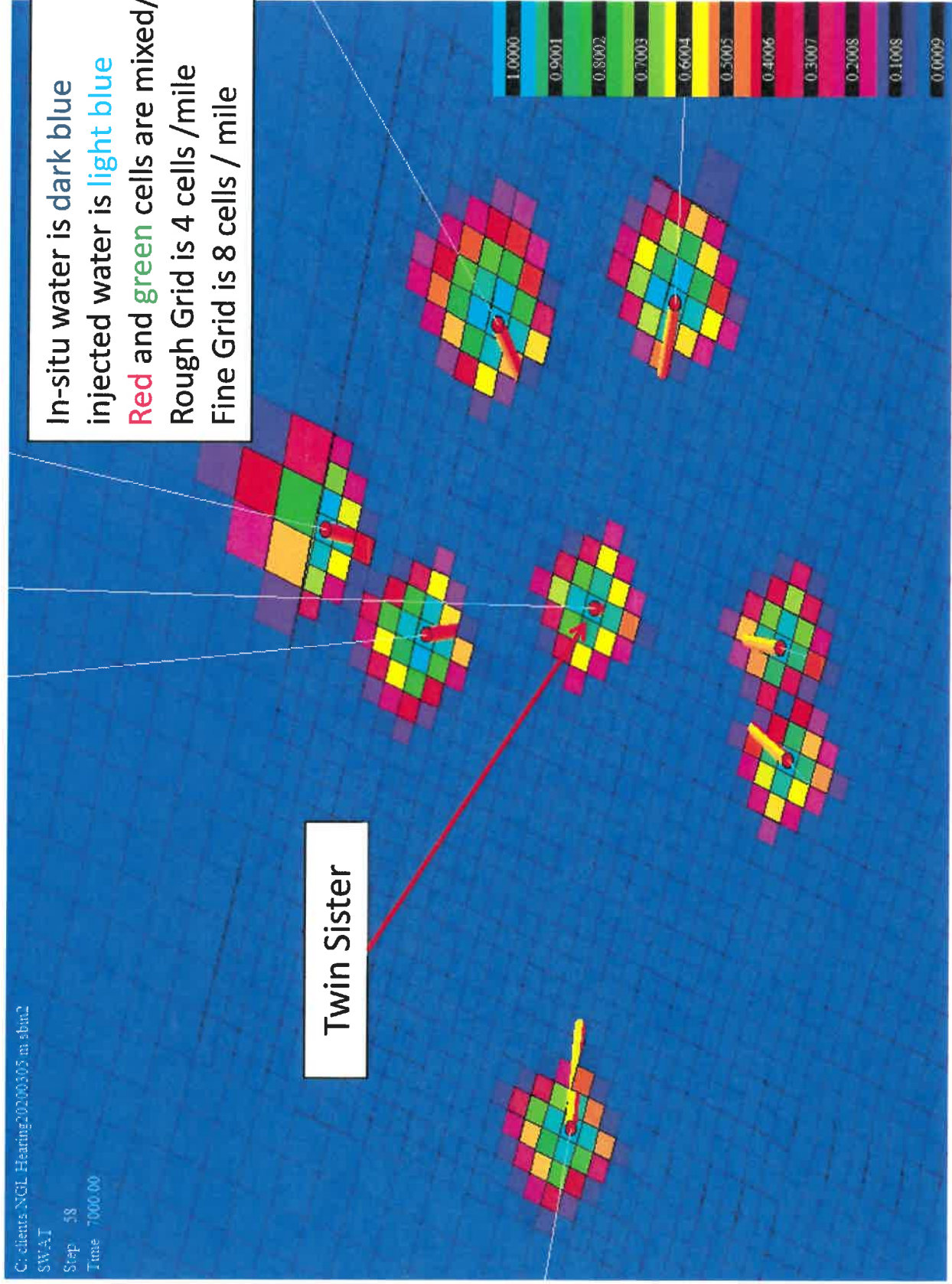
Pressure at 20 years is affected by original pressure, injected volumes, and the ability of the reservoir to dissipate pressure.



AWR Disposal, LLC

Exh. A9

Large scale saturation profiles after 20 years of injection.

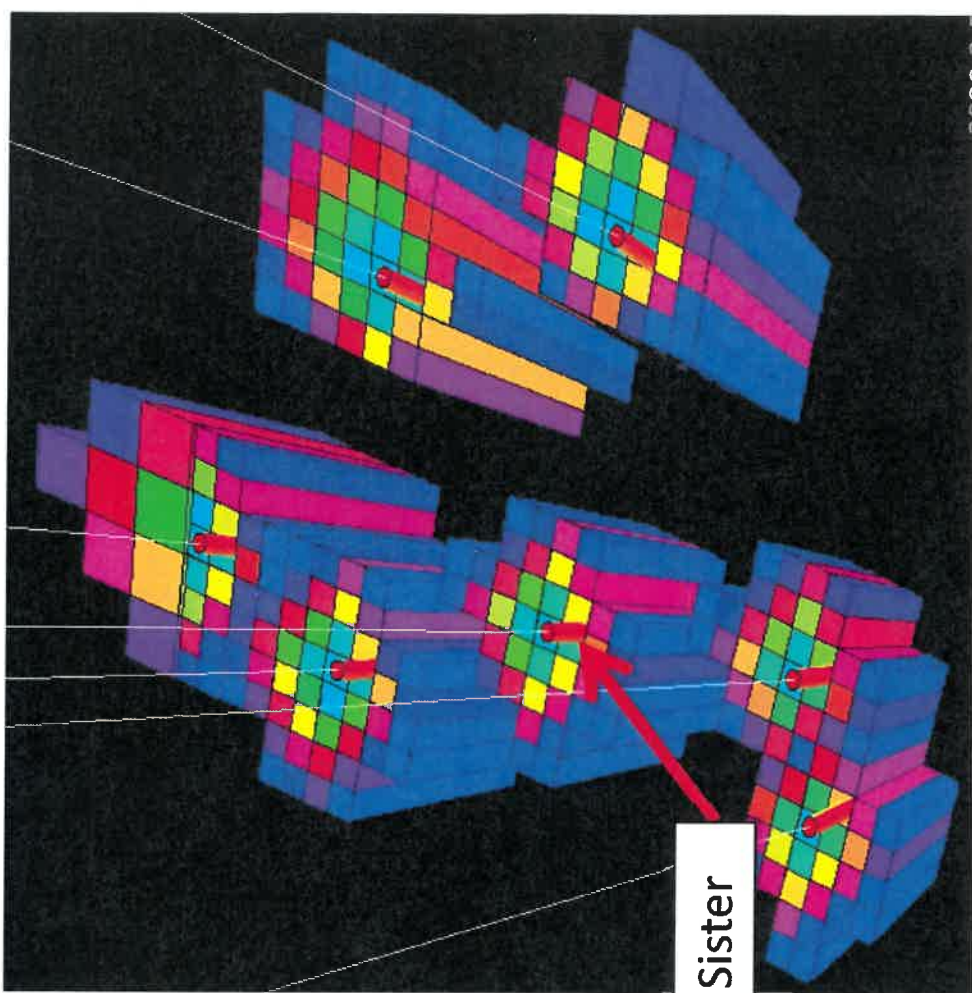
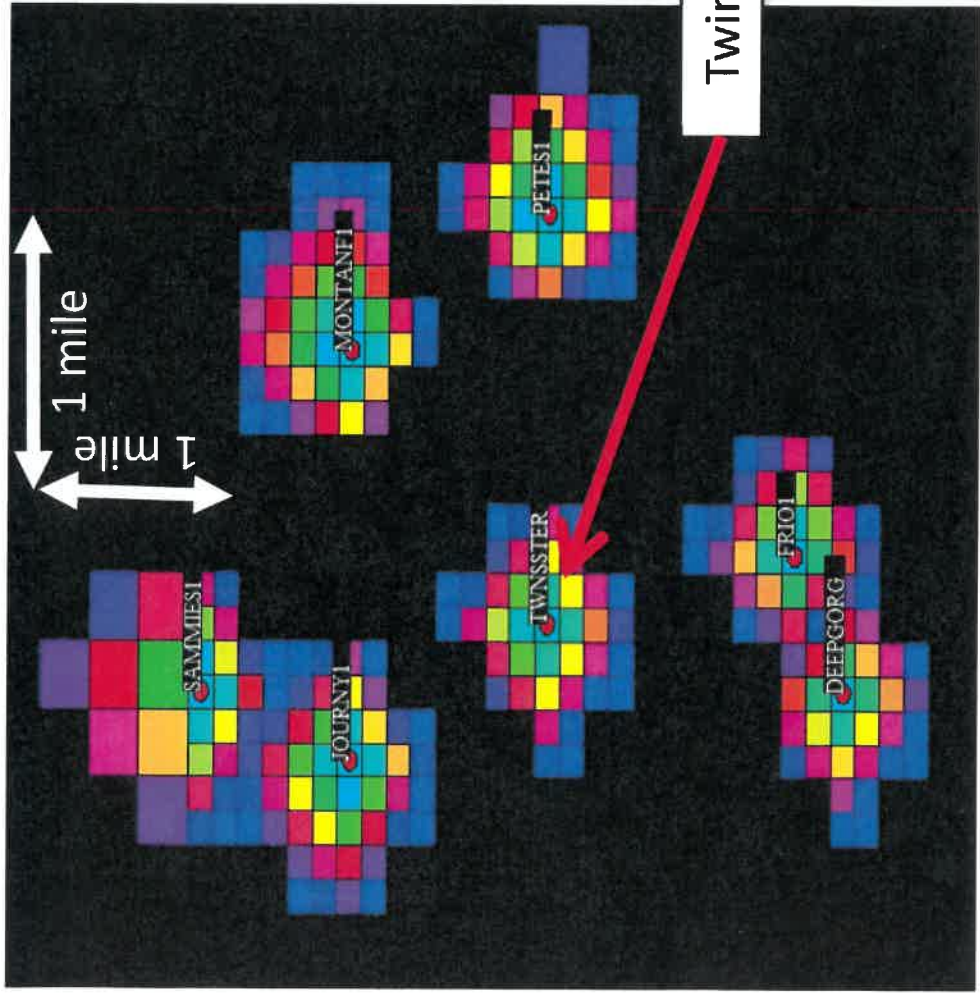


AWR Disposal, LLC

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



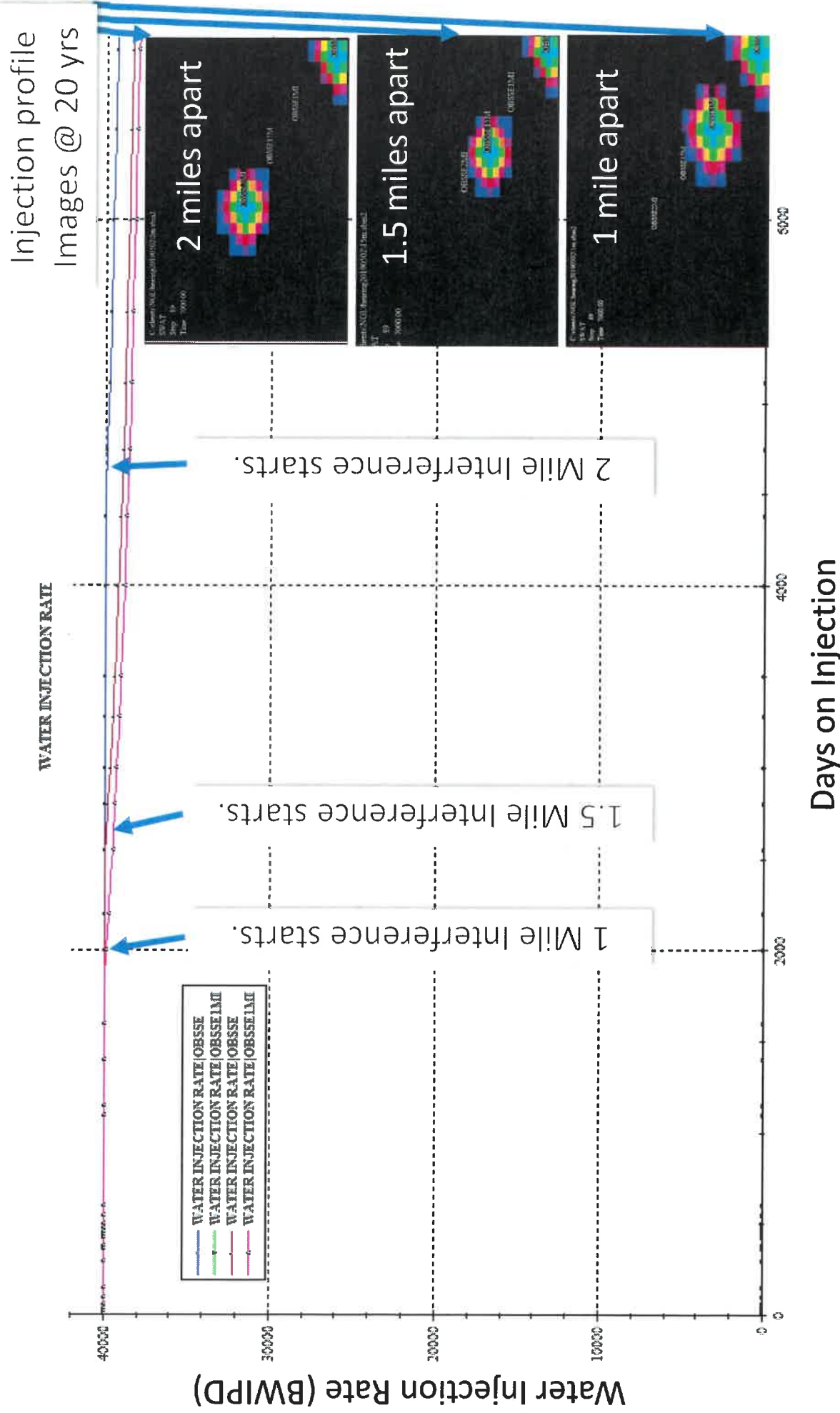


AWR Disposal, LLC

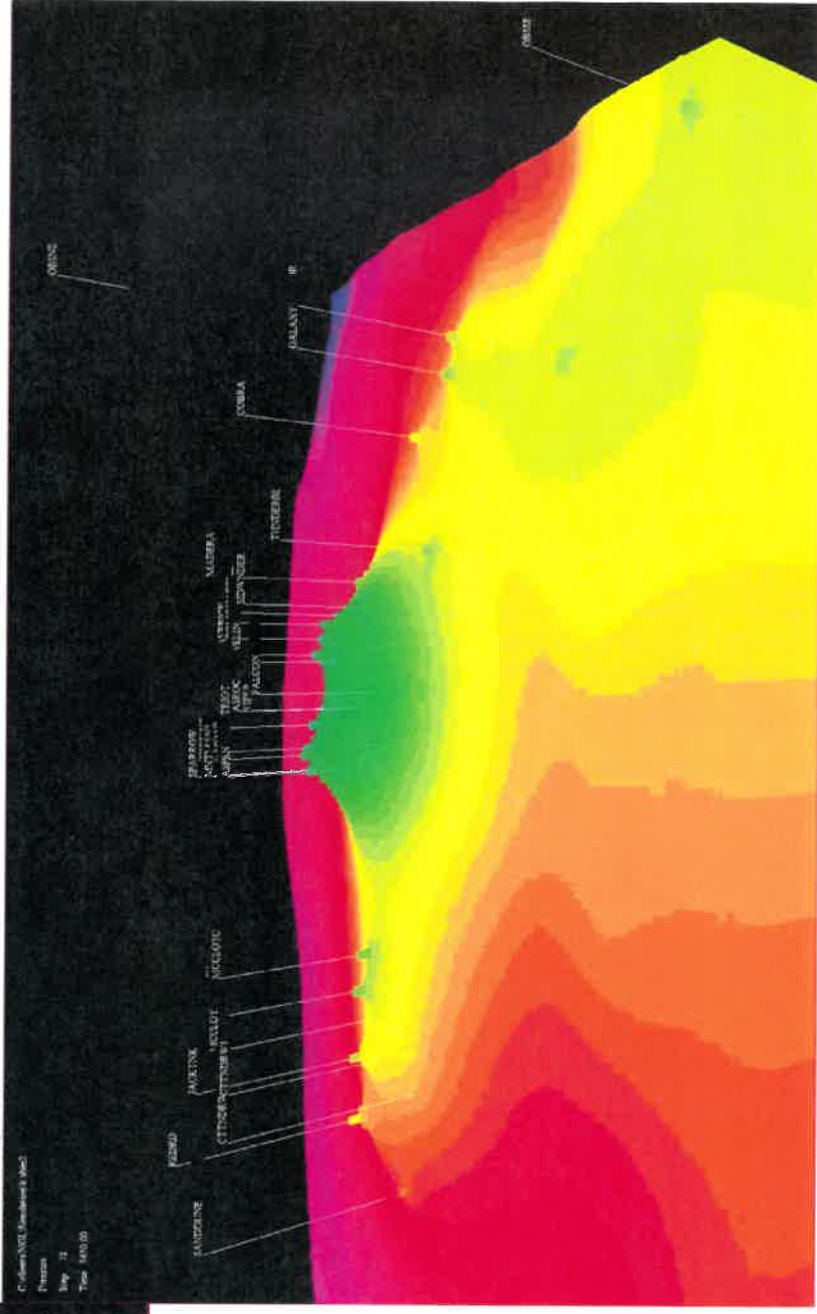
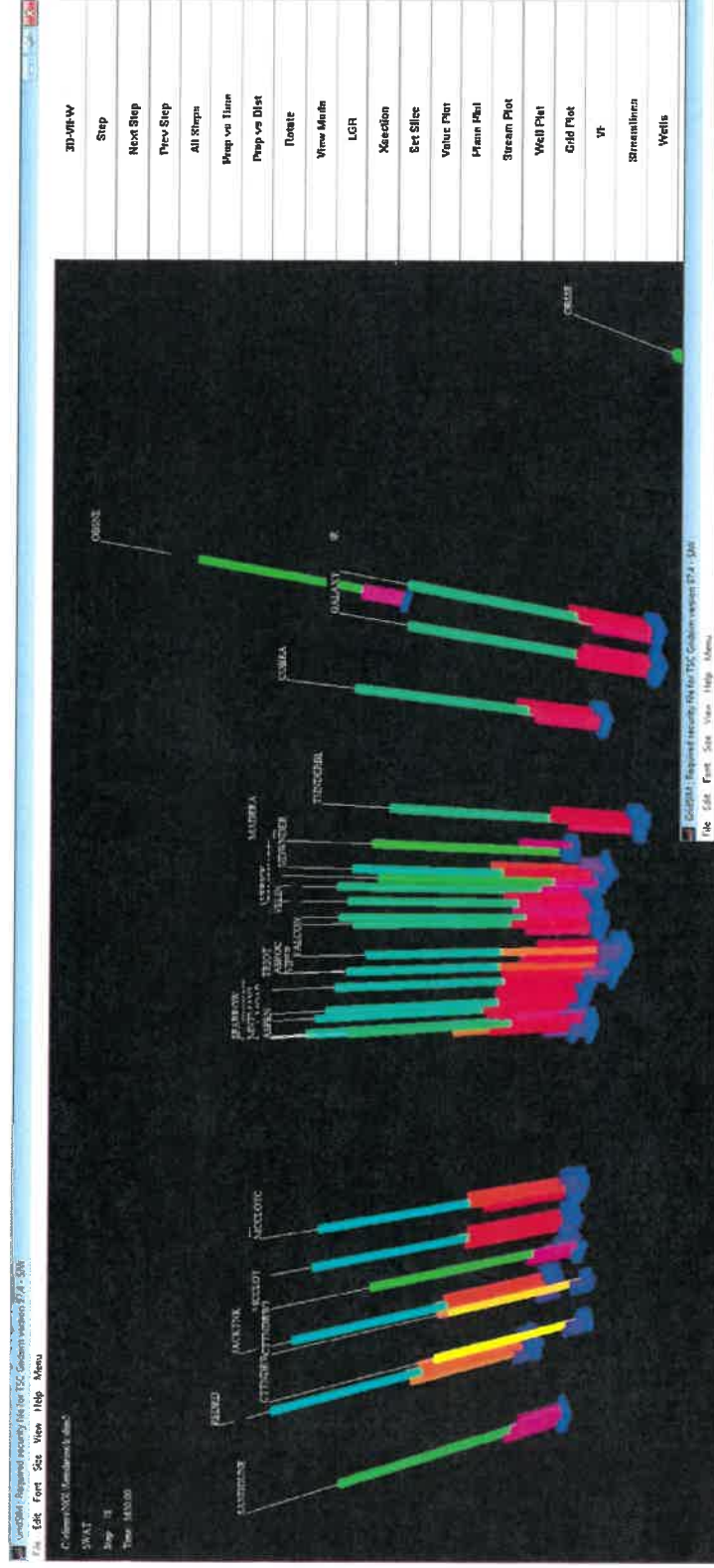
Exh. A11

Typical wells showing interference when spaced 1, 1.5, and 2 miles apart.

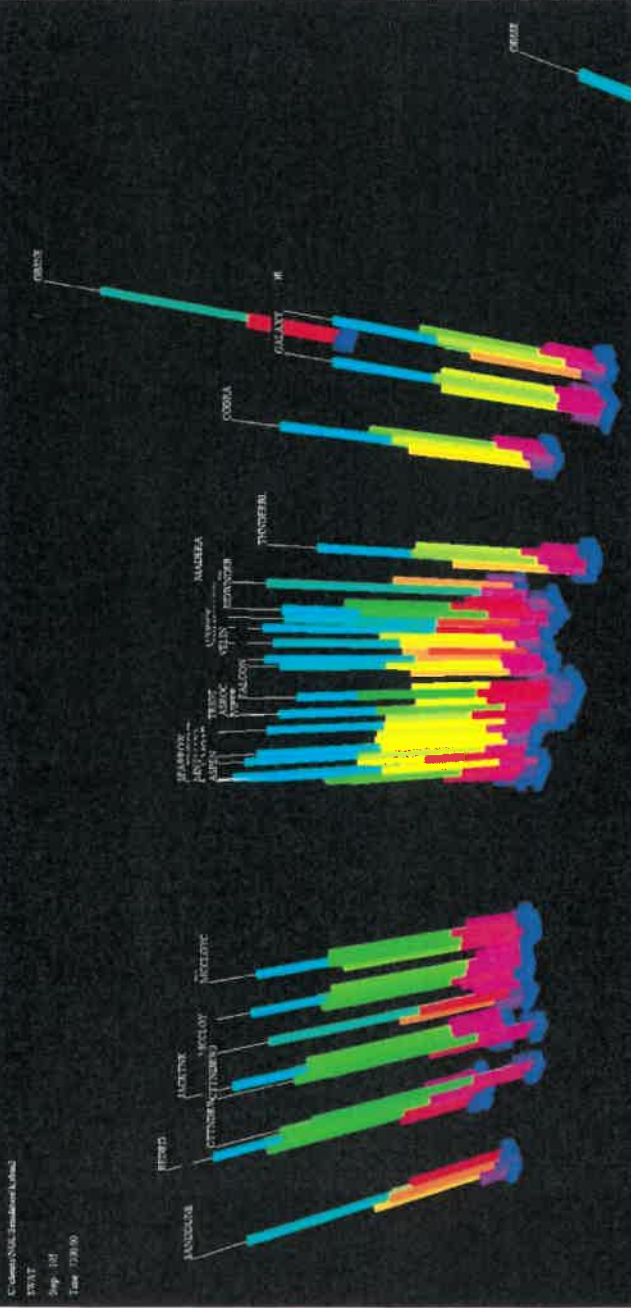
Closer spacing causes rates to fall, but not significantly.



2029
(10 years)



Typical Water movement & Pressure

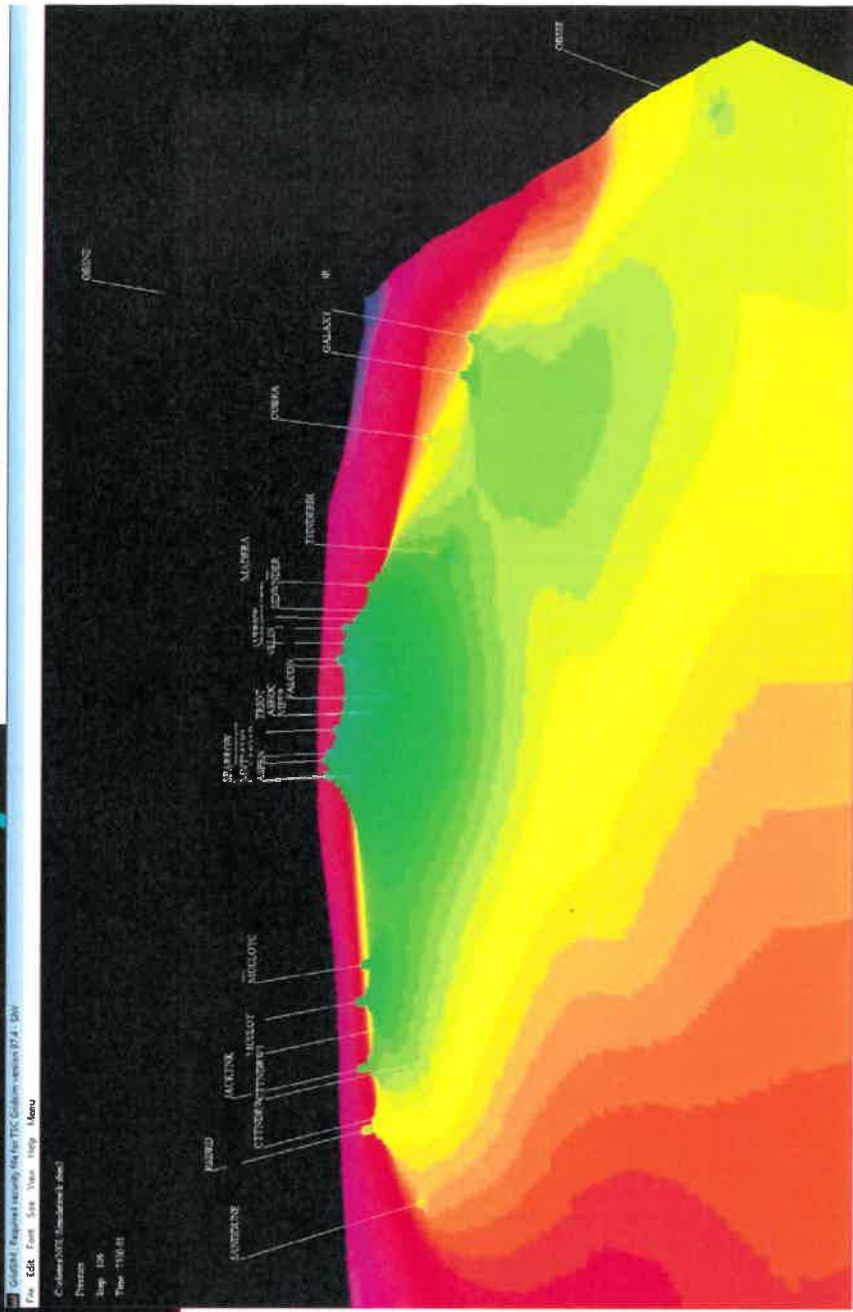


3D-VIEW
Step
Next Step
Prev Step
All Steps
Prop vs Time
Prop vs Dist
Isolate
View Mode
1 GH
X-axis
Set Slice
Value Plot
Plane Plot
Stream Plot
Well Plot
Cold Plot
VP
Streamlines
Wells

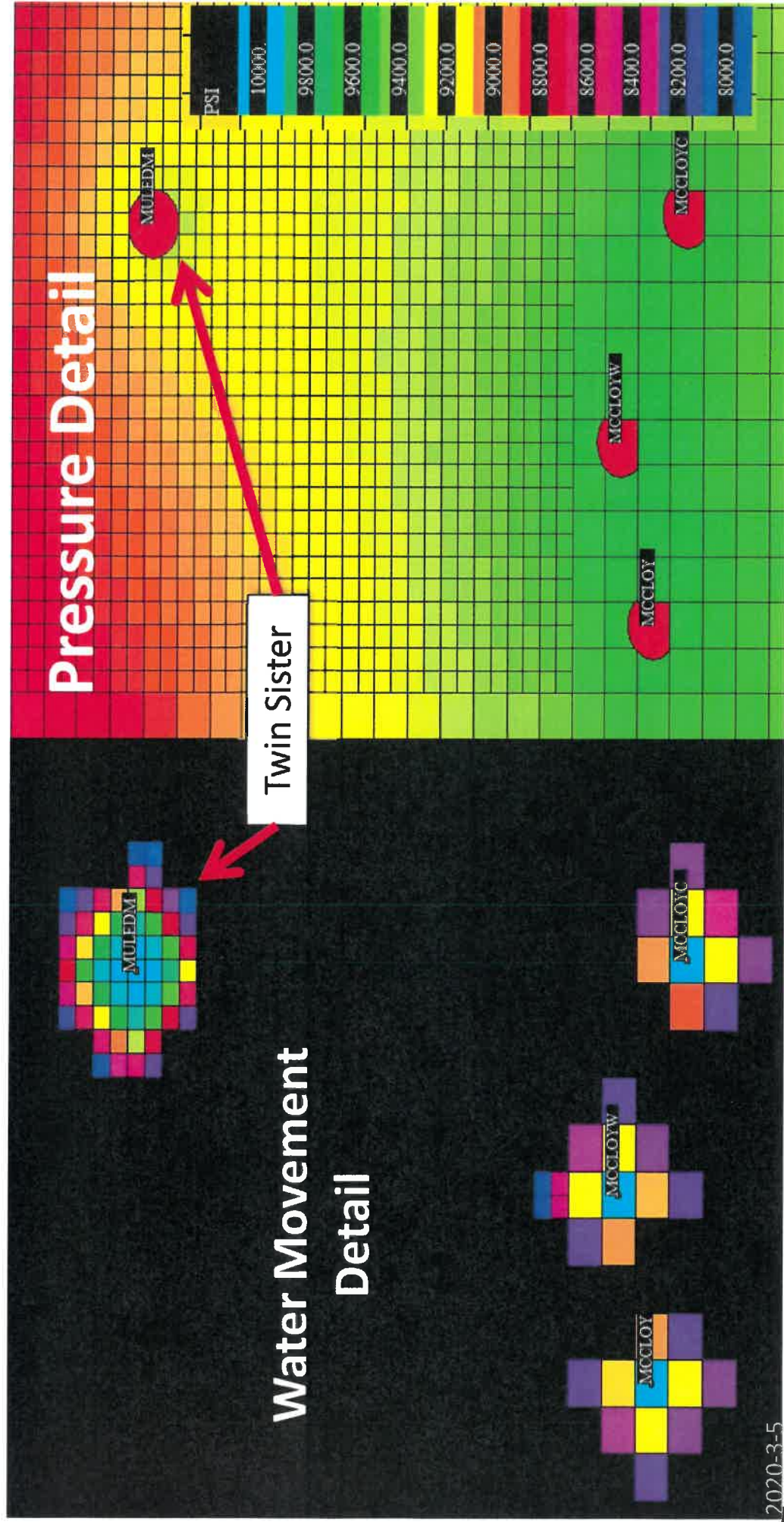
Exh. A14

2039
(20 years)

Typical Water movement & Pressure



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



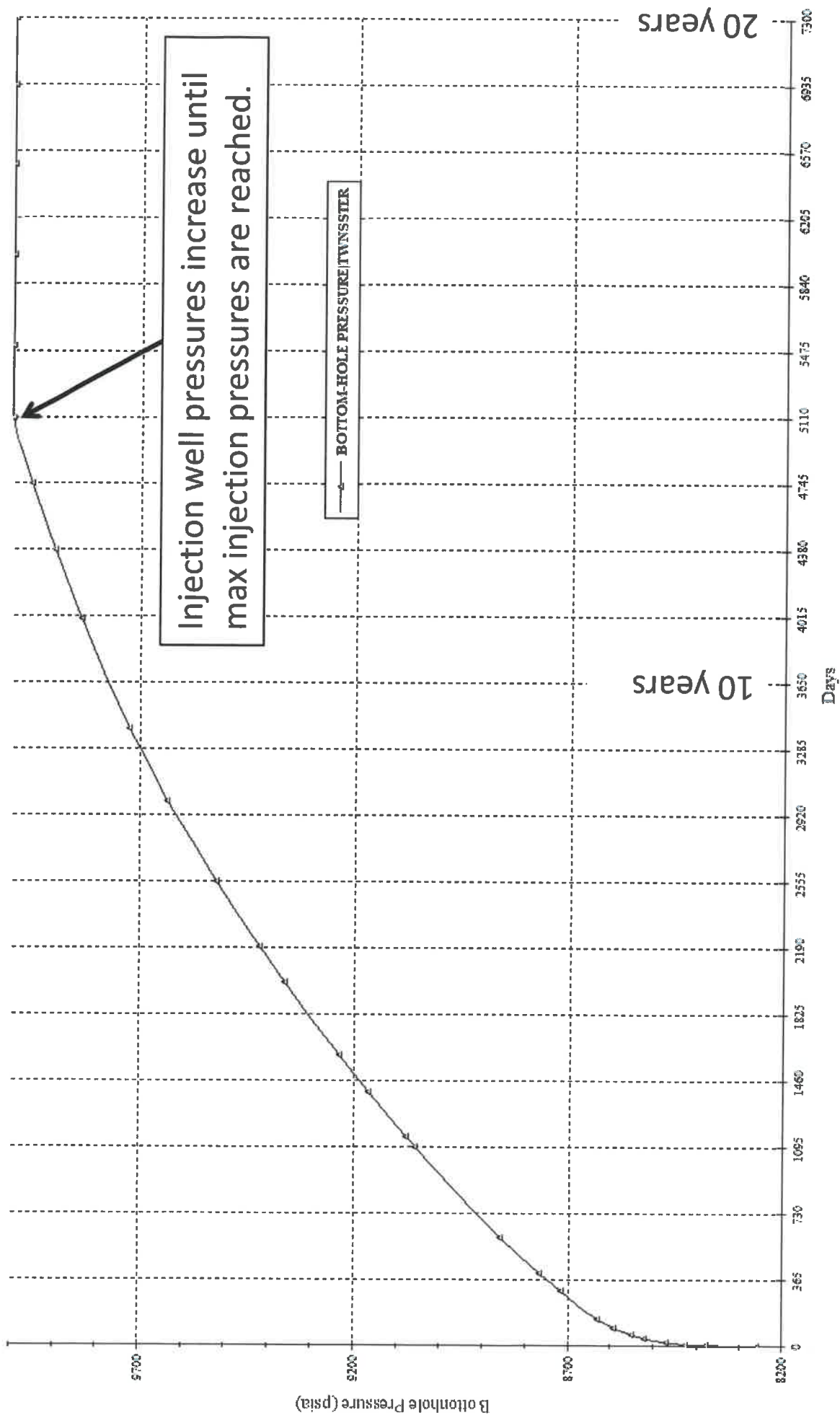


AWR Disposal, LLC

Exh. A16

Simulation BHIP predictions for Twin Sister

BOTTOM-HOLE PRESSURE

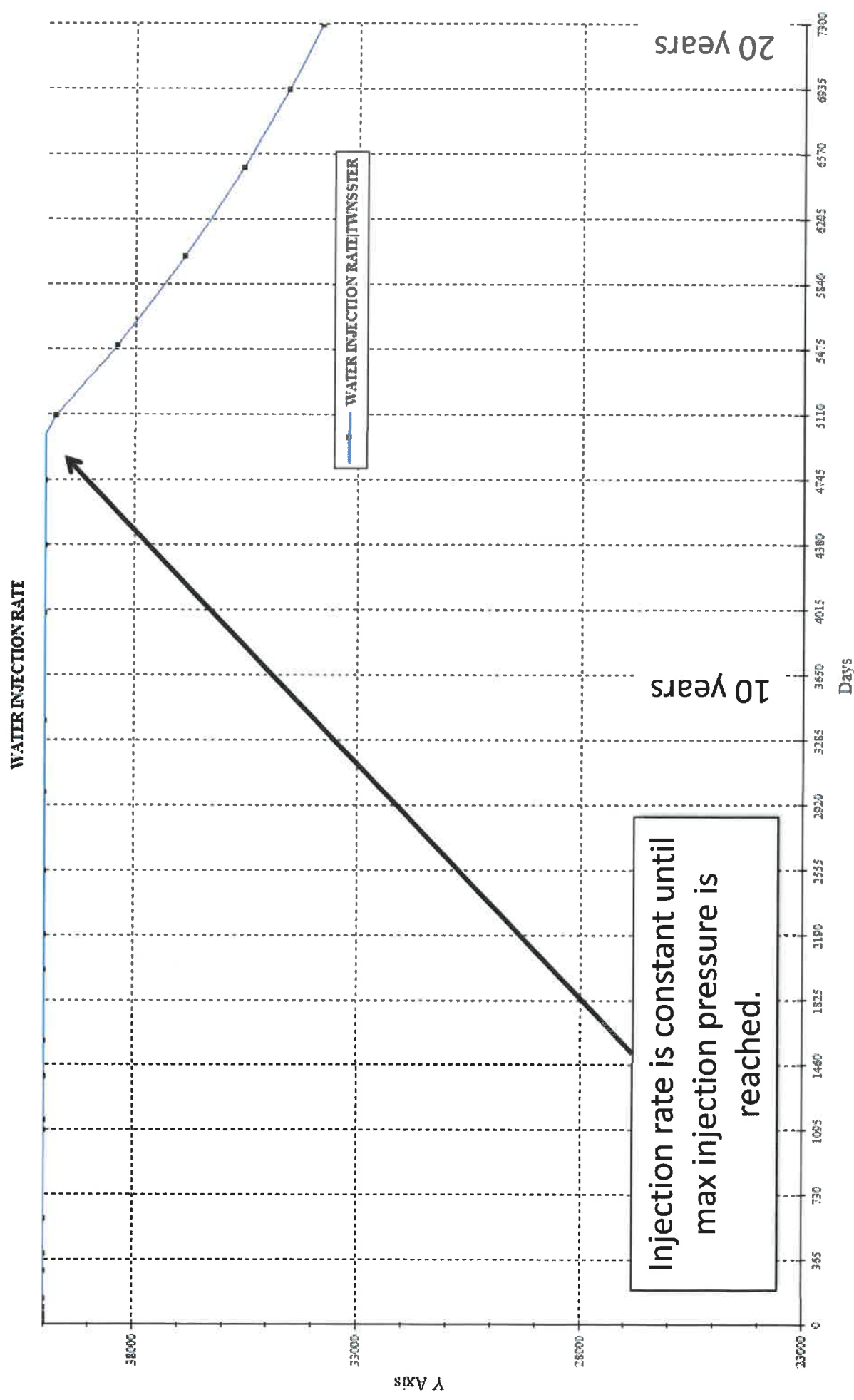




AWR Disposal, LLC

Exh. A17

Simulation predictions for individual wells over 20 Years



Exhibits of Dr. Kate Zeigler

**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. 21090
(TWIN SISTER)**

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 Twin Sister 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 areas where the well is located is between 150 feet and 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 850 feet and 900 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 1,400 to 1,600 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 1.5 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.

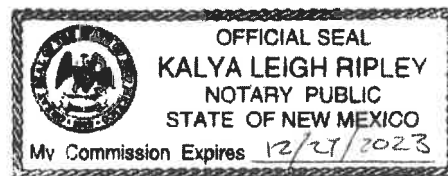
[Signature page follows]

Kate Zeigler
Dr. Kate Zeigler

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

Kalya Leigh Ripley
Notary Public

My commission expires: 12/27/2023



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)

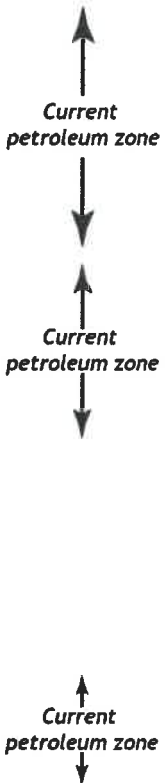
The Montoya Formation includes three dolostone members overlying a sandstone unit. The three upper carbonate units include the Upham, Aleman and Cutter Members and the lower sandstone unit is the Cable Canyon Sandstone. The entire package can be up to 600' thick and depth to the top of the unit ranges 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)

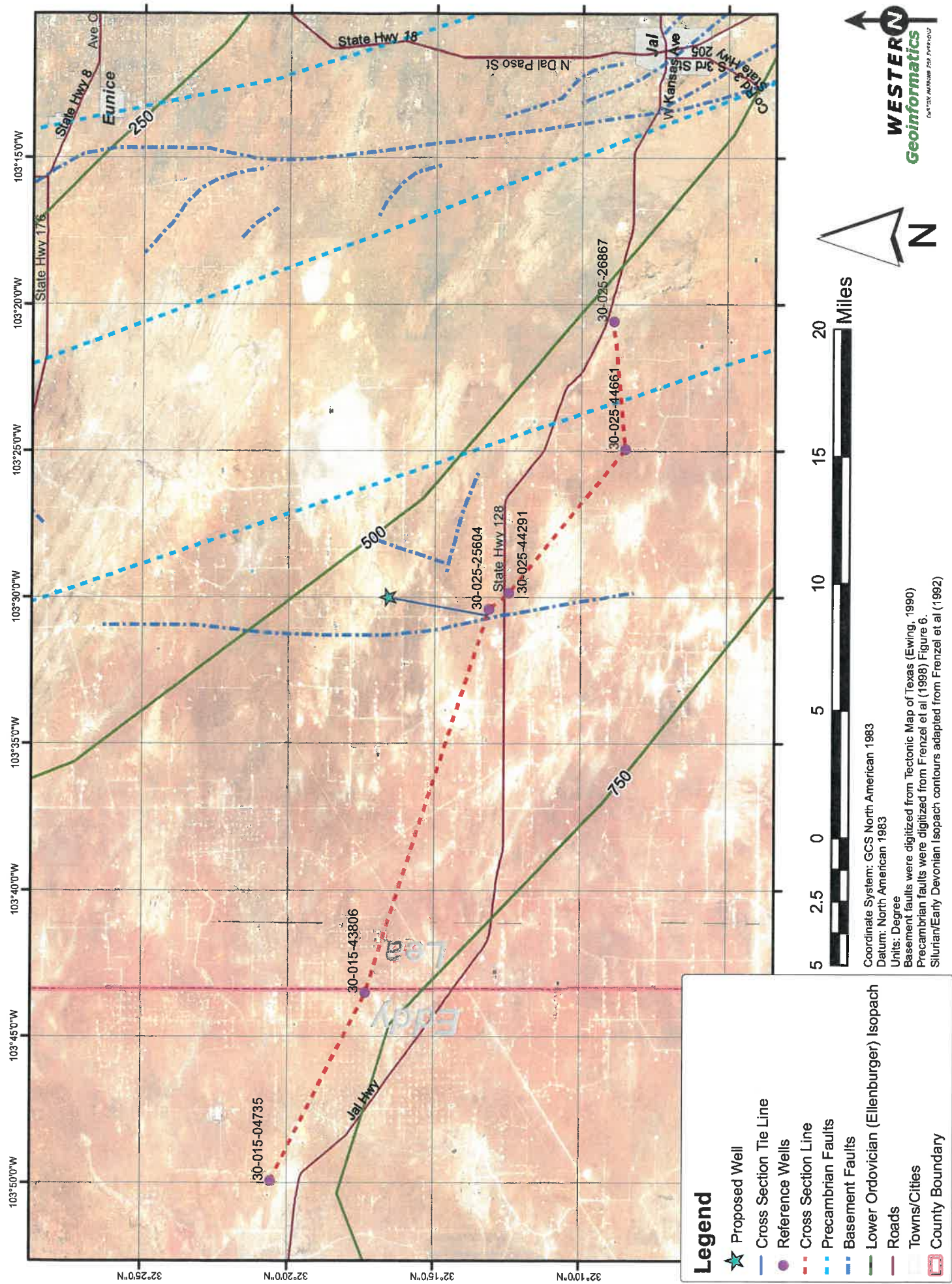
The Ellenburger Formation is up to 1000' thick and composed of limestone and dolostone that represent cyclic deposition in waters of the inner platform with restricted circulation. Porosity in the Ellenburger Formation includes porosity in the matrix, vugs, major karst dissolution features, collapse 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.

Age		Stratigraphic Unit	Key Feature	Estimated Depth Below Land Surface
Triassic		Chinle	Freshwater resources	
		Santa Rosa		
		Dewey Lake		
Permian	Ochoan	Rustler		
		Salado		
		Castile		
		Bell Canyon		
		Cherry Canyon		
	Guadalupian	Brushy Canyon		
		Bone Spring		
		Wolfcamp		
	Leonardian			
	Wolfcampian			
Pennsylvanian	Virgilian	Cisco		
	Missourian	Canyon		
	Des Moinesian	Strawn		
	Atokan	Atoka		
	Morrowan	Morrow		
Mississ.	Upper	Barnett		
	Lower	limestones		
Devon.	Upper	Woodford	Shale: permeability barrier	----- ~14,400'
	Middle			----- ~14,600'
	Lower	Thirtyone	Target injection interval	
Silur.	Upper	Wristen		
	Middle			
	Lower	Fusselman		----- ~15,650'
Ordov.	Upper	Montoya		----- ~16,200'
	Middle	Simpson	Shale: permeability barrier	----- ~16,650'
	Lower	Ellenburger		----- ~17,400'
Cambrian		Bliss		
Precambrian		basement		

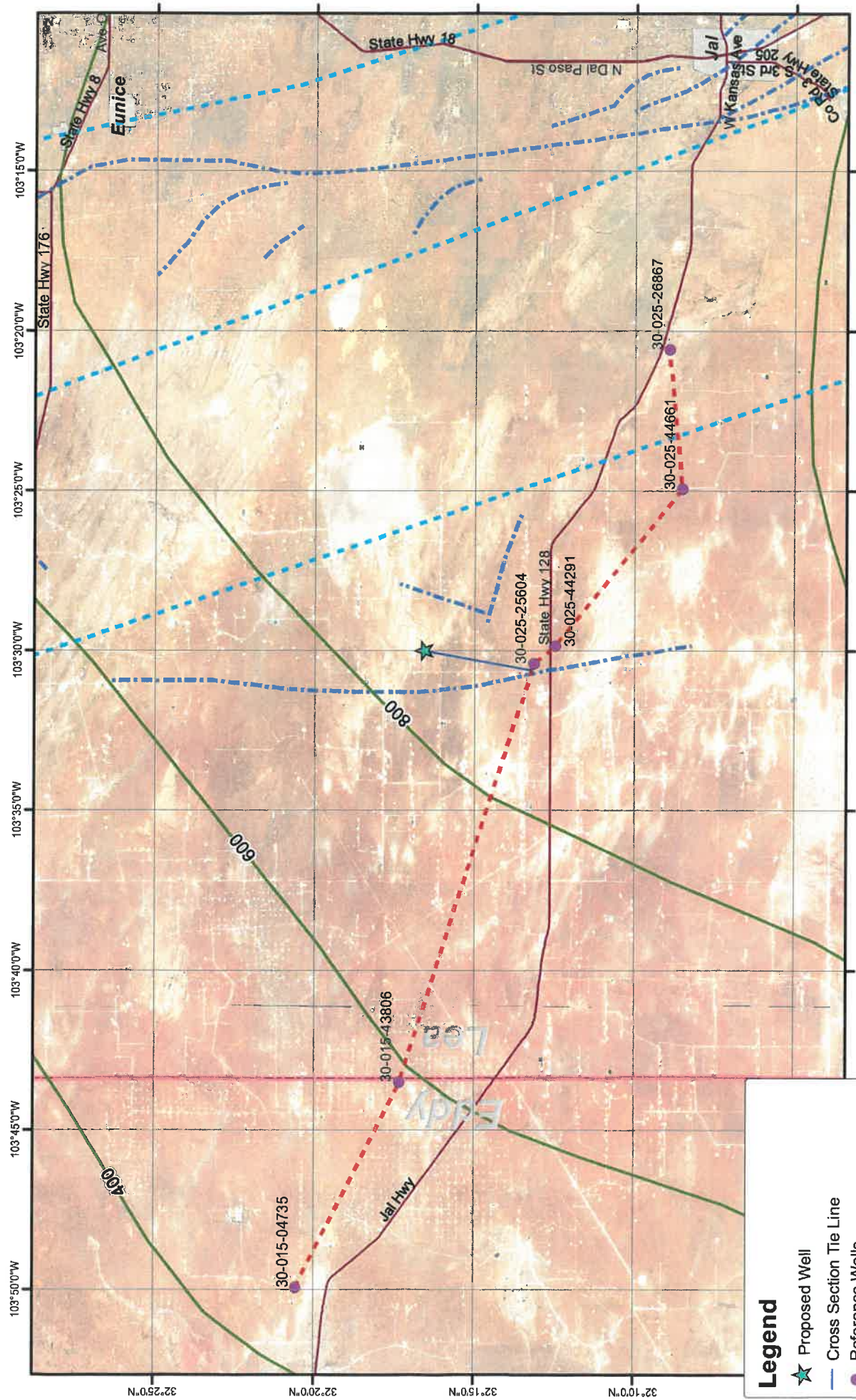
Stratigraphic chart for the Delaware Basin from Broadhead (2017).

* Based on data from 30-025-25604 Government L #1 (18-24S-34E).

Ellenburger Isopach, Faults, Well Locations



Simpson Isopach, Faults, Well Locations



Legend

- Proposed Well
- Cross Section Tie Line
- Reference Wells
- Cross Section Line
- Precambrian Faults
- Basement Faults
- Middle Ordovician (Simpson) Isopach
- Roads
- Towns/Cities
- County Boundary

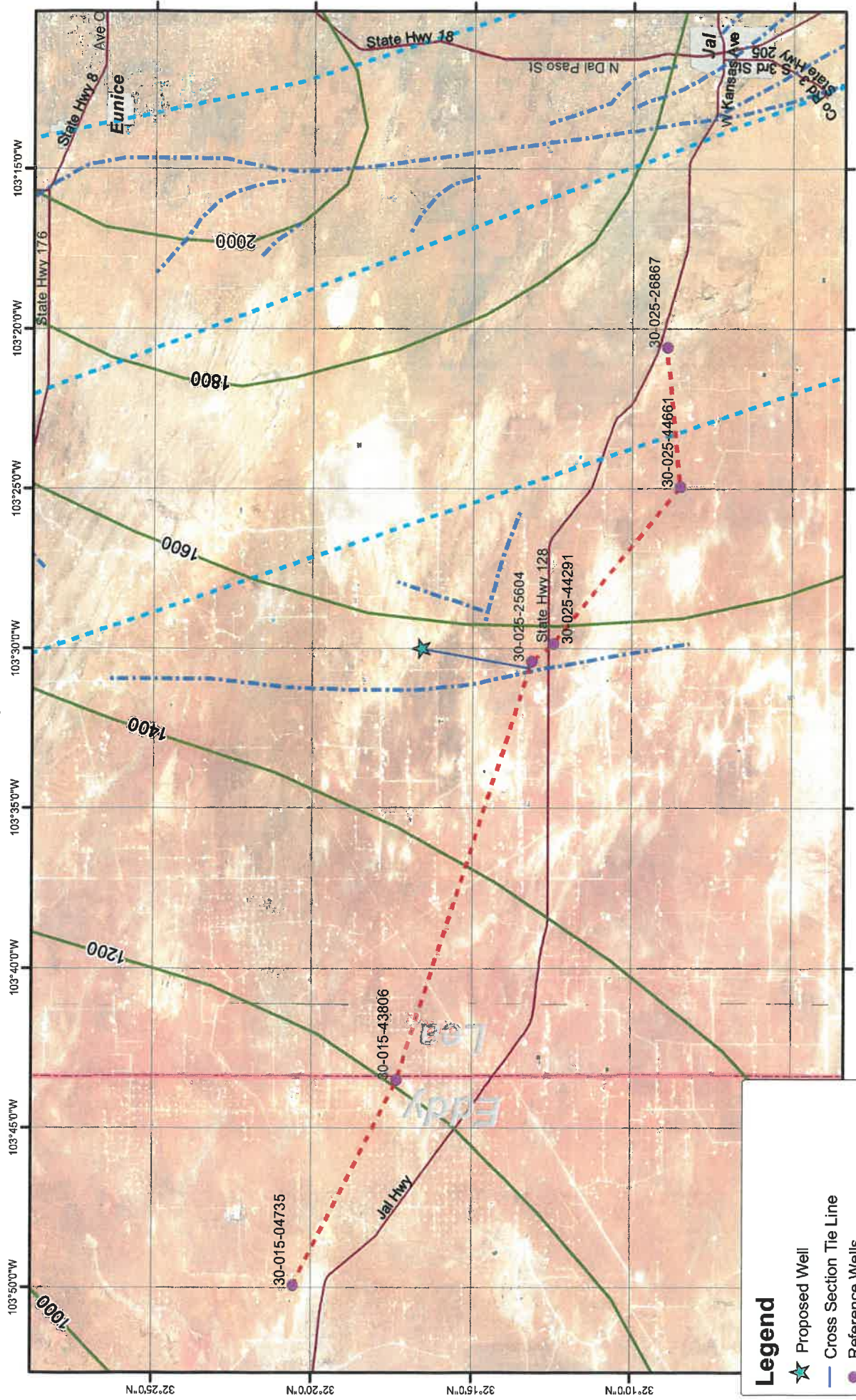


Coordinate System: GCS North American 1983
 Datum: North American 1983
 Units: Degree
 Basement faults were digitized from Tectonic Map of Texas (Ewing, 1990)
 Precambrian faults were digitized from Frenzel et al (1998) Figure 6.
 Silurian/Early Devonian Isopach contours adapted from Frenzel et al (1992)

57

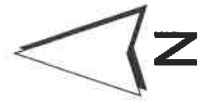


Wristen-Fusselman Isopach, Faults, Well Locations



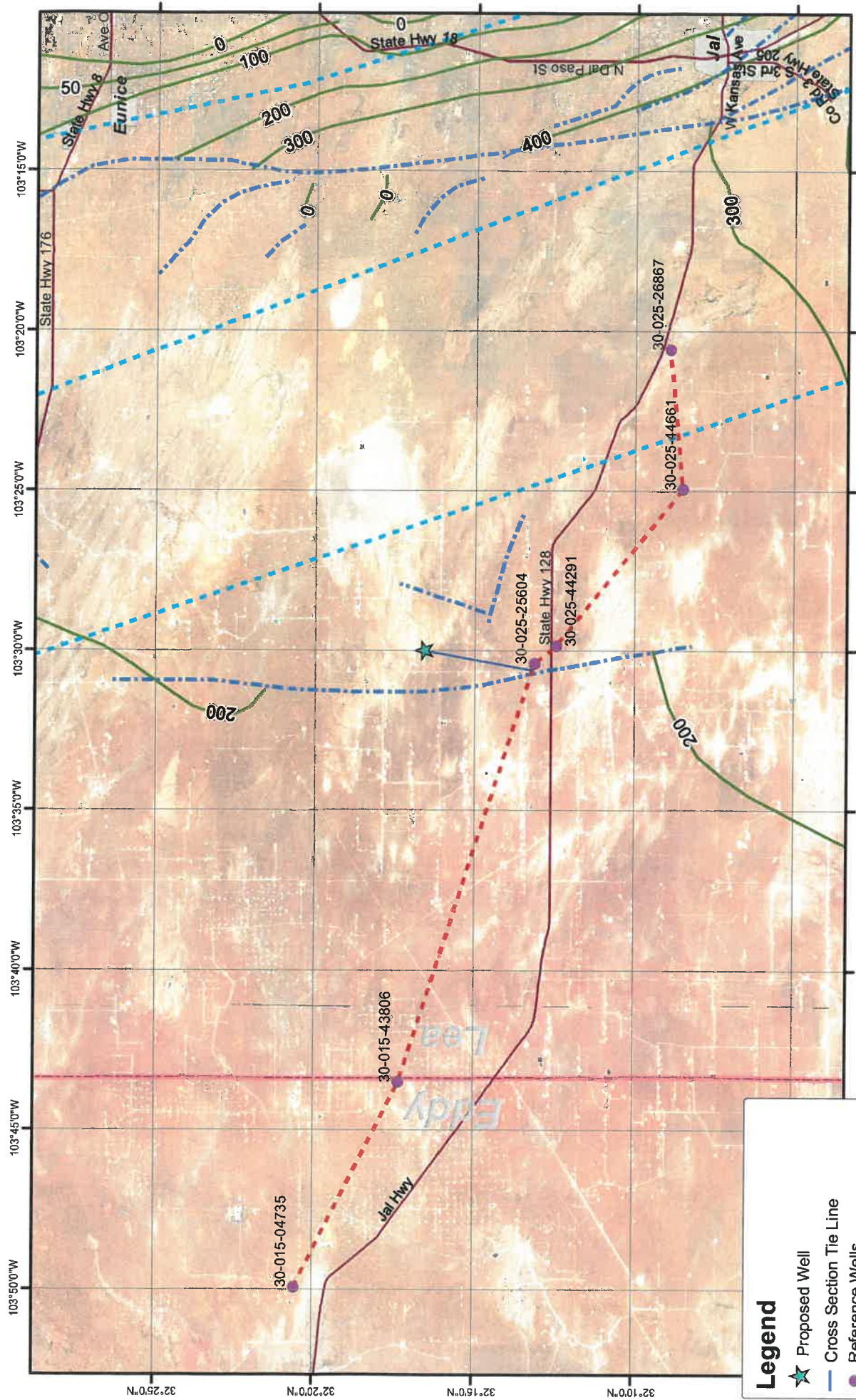
Legend

- Proposed Well
- Cross Section Tie Line
- Reference Wells
- Cross Section Line
- Precambrian Faults
- Basement Faults
- Sil/Dev (Wristen/Fusselman) Isopach
- Roads
- Towns/Cities
- County Boundary



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)

Woodford Isopach, Faults, Well Locations



Legend

- Proposed Well
- Cross Section Tie Line
- Reference Wells
- Cross Section Line
- Precambrian Faults
- Basement Faults
- Late Devonian (Woodford) Isopach
- Roads
- Towns/Cities
- County Boundary



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)

AWR Twin Sisters

29-23S-34E

Injection: 14,652'-16,318'

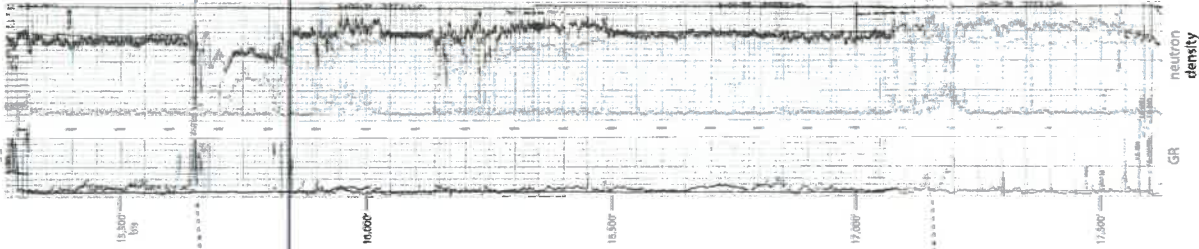


30-025-25604

Government L #1

18-24S-34E

TD: 17,620'

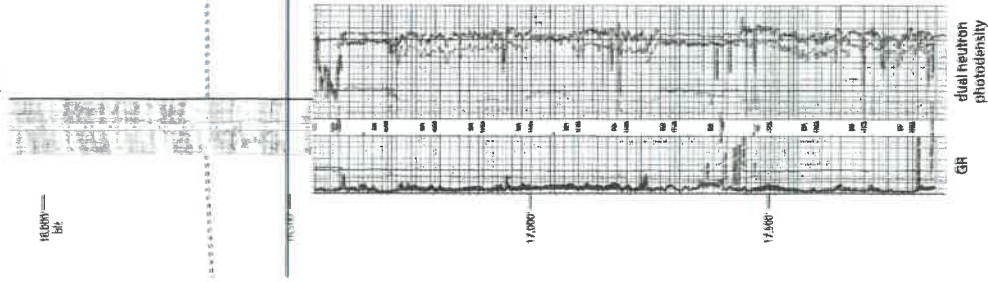


30-015-43806

Uber East SWD #001

24-23S-31E

TD: 17,905'

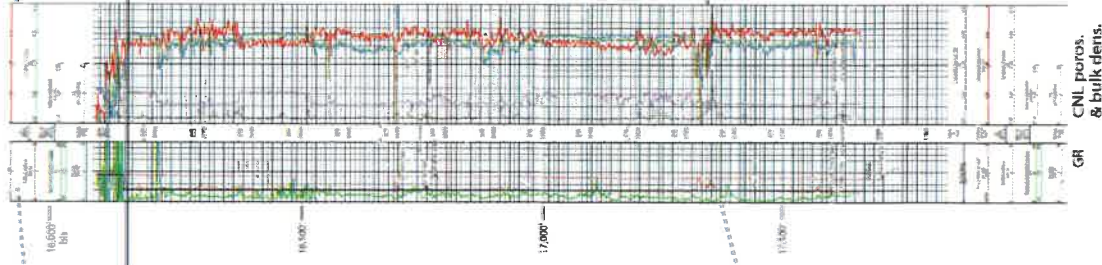


30-025-44291

Striker 6 SWD #002

20-24S-34E

TD: 17,705'

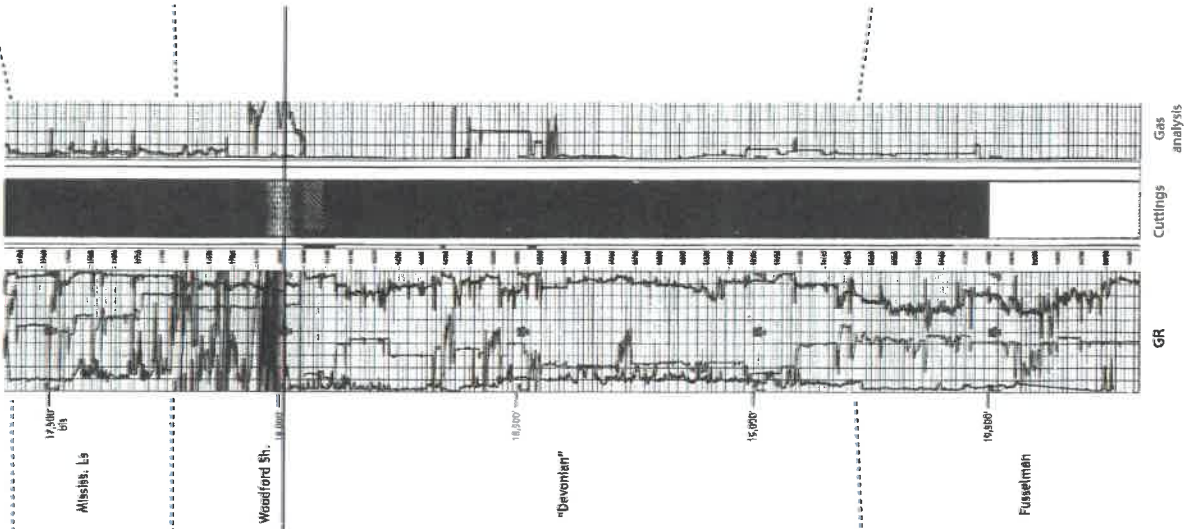


30-025-44661

Moonaw SWD #001

23-24S-34E

TD: 19,820'



Mississ. Ls

Woodford Sh.

"Devonian"

Fusulinan

100 ft.

Exhibits of Dr. Steven Taylor

**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. 21090
(TWIN SISTER)**

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.



5. AWR seeks an order approving the Twin Sister 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.

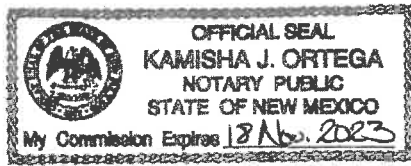
7. The closest known fault line is located approximately 2 to 20 miles away from where the well is proposed to be located.

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. In addition, New Mexico Tech recently released an updated New Mexico seismic catalogue, which includes seismic information from 2017 through February 4, 2020. I have reviewed the New Mexico Tech updated information as part of my study. My study is attached as Exhibit A.

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 2nd day of March, 2020 by Dr. Steven Taylor.

Kamisha J. Ortega
Notary Public

My commission expires: 18 Nov. 2023

Seismic Catalog Analysis in Vicinity of AWR Twin Sisters SWD #1 Well

Prepared for NGL-Permian
by
GeoEnergy Monitoring Systems
February 28, 2020

Analysis is based on NMT seismic catalogs and USGS catalogs for the time period 2010-2020 selecting events within the vicinity of the AWR Twin Sisters 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).

The USGS reports no events in the vicinity since 2010. New Mexico Tech runs a seismic network (SC) in southeastern New Mexico for the DOE Waste Isolation Plant (short-period vertical components) and posts their seismic catalogs on their website.

Figure 2 shows seismicity from GeoEMS catalogs as red circles and NMT catalogs as white circles. Events within 10 km of the well are listed in Table 1. 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.

Table 1: Events within 10 km of well

Date	Origin Time (GMT)	Latitude	Longitude	Depth (km)	Magnitude	Distance (km)
13-Sep-2018	15:50:38	32.2940	-103.4630	5.0	1.8	3.97
09-Nov-2018	20:24:15	32.2340	-103.4810	5.0	1.4	5.09
09-Jul-2019	14:43:45	32.3290	-103.5420	5.0	1.7	7.01
27-Jan-2019	00:32:19	32.3400	-103.5050	5.0	1.2	7.03
13-Oct-2018	22:07:24	32.1940	-103.5220	5.0	1.2	9.45



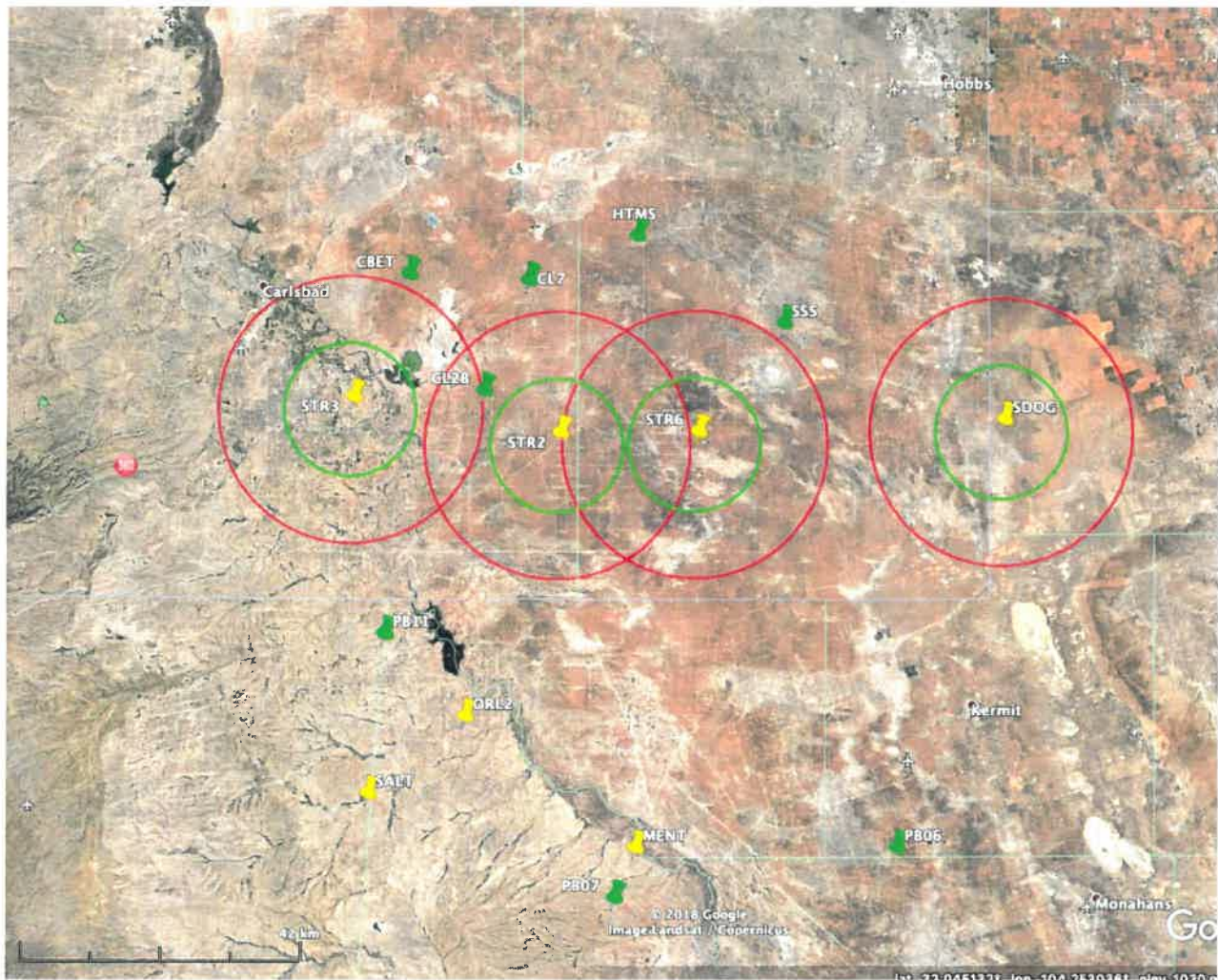


Figure 1. Striker SWD wells seismic station locations and existing NGL-Permian seismic stations (yellow pushpins). Other regional stations from NMT and TexNet seismic networks shown as green pushpins. Green and red circles around NGL stations show approximate detection levels for ML 1.0 and 1.5, respectively.

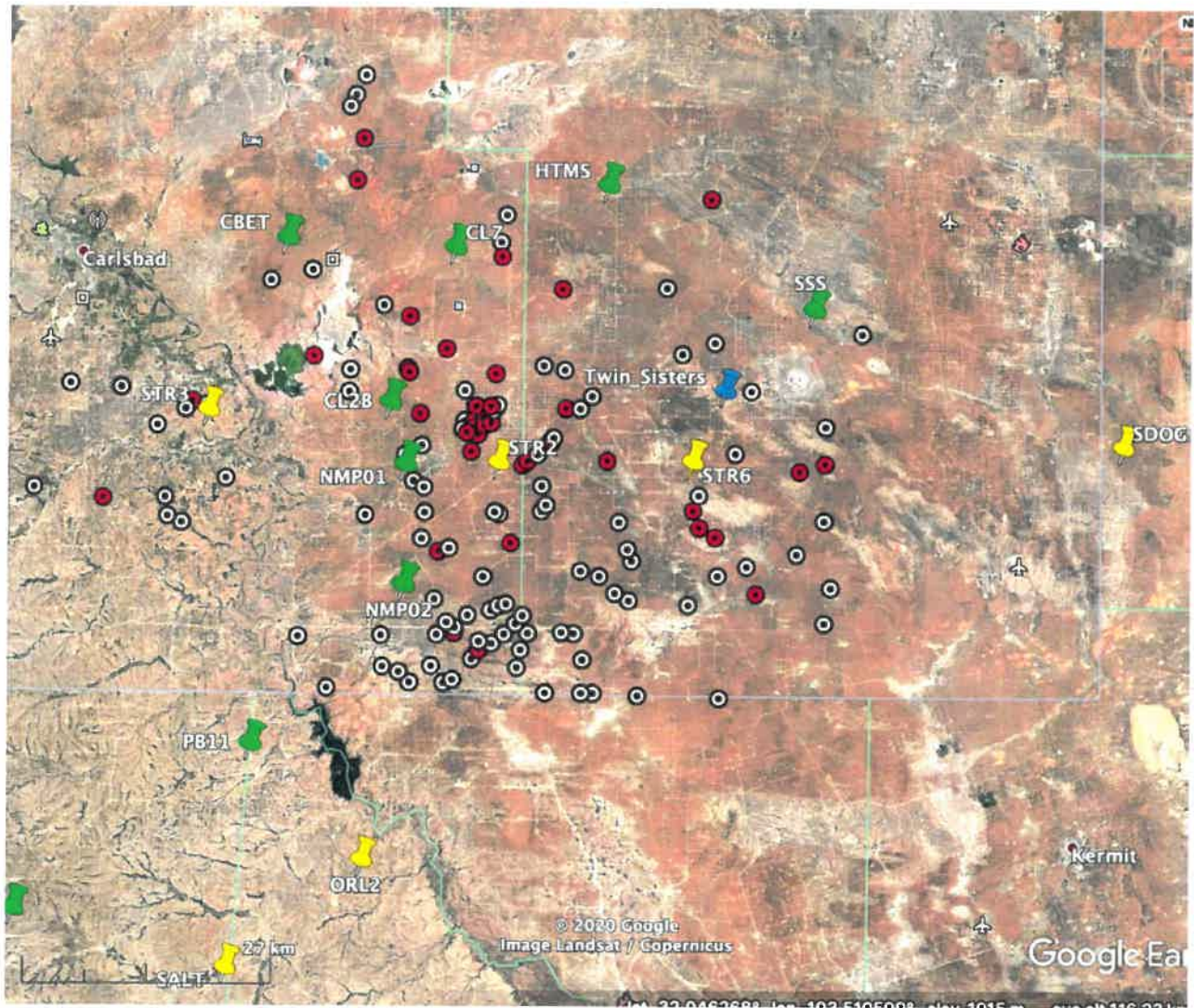


Figure 2. Seismicity in southeastern New Mexico. White circles from NMT catalog (since 2010) and red circles from GeoEMS catalog (since September 2018). AWR Twin Sisters SWD #1 shown as blue pushpin.



Texas Registered Engineering Firm No F - 16381

March 4, 2020

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

FSP Analysis

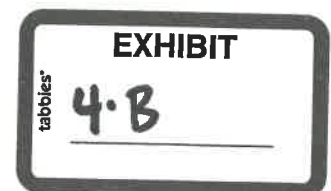
The FSP software used for this analysis was jointly developed by Stanford University, Exxon Mobil and XTO Energy as a tool for estimating fault slip potential resulting from fluid injection.

I have reviewed the geology, seismic activity, injection history and future proposed injection in the Subject Area and I would conclude that the **Twin Sisters SWD No. 1** well does not pose a risk of increasing seismicity in the area as long as the listed guidelines are considered.

Fault slip potential (FSP) was analyzed in the area of review shown on **Exhibit No. 1**. The analysis integrates all of the proposed well locations as well as 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 “blue” bulls-eye symbols and earthquake events recorded on NGL’s regional seismic monitoring system is denoted by the “pink” 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 and locations of the Proposed SWD 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



67

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 initial model run used a rate of 40,000 bbls/day for the Subject well and all other Pending/Proposed wells were run at a rate of 30,000 bbls/day and held constant for the life of the analysis (+25 years). This initial analysis resulted in high potential for fault slip along 5 fault segments (F15, 16, 17, 25, and 26). Based upon this analysis which became problematic by the year 2030, I implemented the following guidelines which were submitted in my Affidavit in NMOCD Case Nos. 20141, and 20142:

- Proposed wells within ½ mile of a fault were removed from the model
- Proposed wells within ¾ mile of a fault (greater than ½ mile) were limited to 20,000 bbls/day

These guidelines resulted in the removal of 6 Pending/Proposed wells (highlighted “red”) and a rate reduction on 1 Pending/Proposed well (highlighted “yellow”).

Injection parameters in the final model:

- The Subject well was modelled at 30,000 bbls/day and held constant for the life of the analysis (+25 years).
- Pending wells were modelled at 30,000 bbls/day and held constant for the life of the analysis (+25 years). The well highlighted “yellow” was limited to 20,000 bbls/day

The resulting model reduced the potential for fault slip on all fault segments and only Fault 15 shows a moderate potential for slip by the year 2045 (34%). By this point in time it is unlikely that many wells are injecting at the rates used in the model and the risk would be even lower.

The Pending wells are denoted in the model as follows: **(Exhibit No. 3)**

5	BRININSTOOL SWD #004
6	Czervik SWD #1
7	Spackler SWD #1
8	Anteater State SWD #1
9	Bench State SWD #1
10	Blue Hole SWD #1
11	Bronc Buster SWD #1
12	Butkus SWD #1
13	Coonskin 28 Fee SWD#1
14	Deep Gorge State SWD #1
15	Deep Thirst Federal SWD #1
16	Elbow Room SWD #1
17	Final Final SWD #1
18	Frio SWD #1
19	Guadalupe SWD #1
20	Gulper State SWD #1
21	Hasta La Vista 8 Fee SWD #1
22	Journey State SWD
23	Journey State SWD #1
24	Leonard SWD #1
25	Leviathan State SWD #001
26	LT State SWD #1
27	LTD SWD #1
28	Moab SWD #1
29	Montana Fed SWD #1
30	Mortarboard 1 Fee SWD #1
31	Mutumbo State SWD #1
32	Pappy SWD #1
33	Petes SWD #1
34	Prime Time SWD #1
35	Quest State SWD #1
36	Sammies SWD #1
37	Sand Spout State
38	Schooner SWD #1
39	Staubach Fed SWD #1
41	Unitas State SWD #1
42	Vamoose 6 Fee SWD #1
43	Voyage State SWD #1

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.

Also included in the model are existing active SWD injection wells as follows: (**Exhibit No. 3**)

- 1 - 3002536360
- 2 - 3002536425
- 3 - 3002542448
- 4 - 3002544291

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. Faults 15-17 have the highest potential for slip and Faults 2-12 and 20-24 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 1,000 psi at Fault 15 still only results in a 10% probability of fault slip.

Exhibit No. 7 takes a closer look at fault 15. 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 1,233 psi along this fault. A 10% decrease in the friction coefficient of the fault could lower ΔP needed to slip to 900 psi.

Exhibit No. 8 takes a closer look at fault 25. 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 +3,100 psi along this fault. A 10% change in the fault strike or SHmax azimuth could lower ΔP needed to slip to 1,600 psi.

Exhibit No. 9 takes a closer look at fault 7. 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 +5,300 psi along this fault. A 10% change in the fault strike or SHmax azimuth could lower ΔP needed to slip to 3,000 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 these proposed wells and the existing wells in the Subject Area.

Exhibit No. 10 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 increase of 5 psi at F15 which is the most vulnerable fault in the review area (0% calculated slip potential).

Exhibit No. 11 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 increase of 173 psi at F15 which is the most vulnerable fault in the review area (0% calculated slip potential).

Exhibit No. 12 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 increase of 449 psi at F15 which is the most vulnerable fault in the review area (0% calculated slip potential).

Exhibit No. 13 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 increase of 735 psi at F15 which is the most vulnerable fault in the review area (3% calculated slip potential).

Exhibit No. 14 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 increase of 1,014 psi at F15 which is the most vulnerable fault in the review area (12% calculated slip potential).

Exhibit No. 15 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 increase of 1,603 psi at F15 which is the most vulnerable fault in the review area (34% calculated slip potential).

The pressure analysis over time shows that pressure is expected to increase along the faults and pressures along Fault segments 15,16,17, 25 and 26 are calculated to potentially reach low to moderate levels for slip potential. 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	ΔP to slip (fixed inputs)	ΔP to slip (10% varied inputs)	ΔP at 2045
F1	3,415	1,800	1,125
F2	4,364	2,200	1,196
F3	5,117	2,900	1,319
F4	5,063	2,900	1,564
F5	5,063	2,900	1,762
F6	5,063	2,900	1,836
F7	5,332	3,000	1,828
F8	5,757	3,400	1,665
F9	4,834	2,750	1,415
F10	5,238	3,000	1,241
F11	5,238	3,000	1,333
F12	5,479	3,100	1,480
F13	3,550	1,800	1,518
F14	3,550	1,800	1,453
F15	1,233	900	1,281
F16	1,228	900	1,099
F17	1,373	800	1,100
F18	1,508	800	907
F19	2,922	1,700	1,124
F20	4,861	2,700	1,254
F21	6,777	4,600	1,412
F22	6,734	4,600	1,603
F23	4,793	2,700	1,807
F24	4,834	2,750	2,003
F25	3,105	1,700	2,127
F26	3,105	1,700	1,974

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 rates used in the model, then the risk for fault slip is lowered.

In the event significant seismicity should occur in the future, the wells closest to the faults (proposed and existing) should be the wells considered for modification or reduction of injection rates.

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

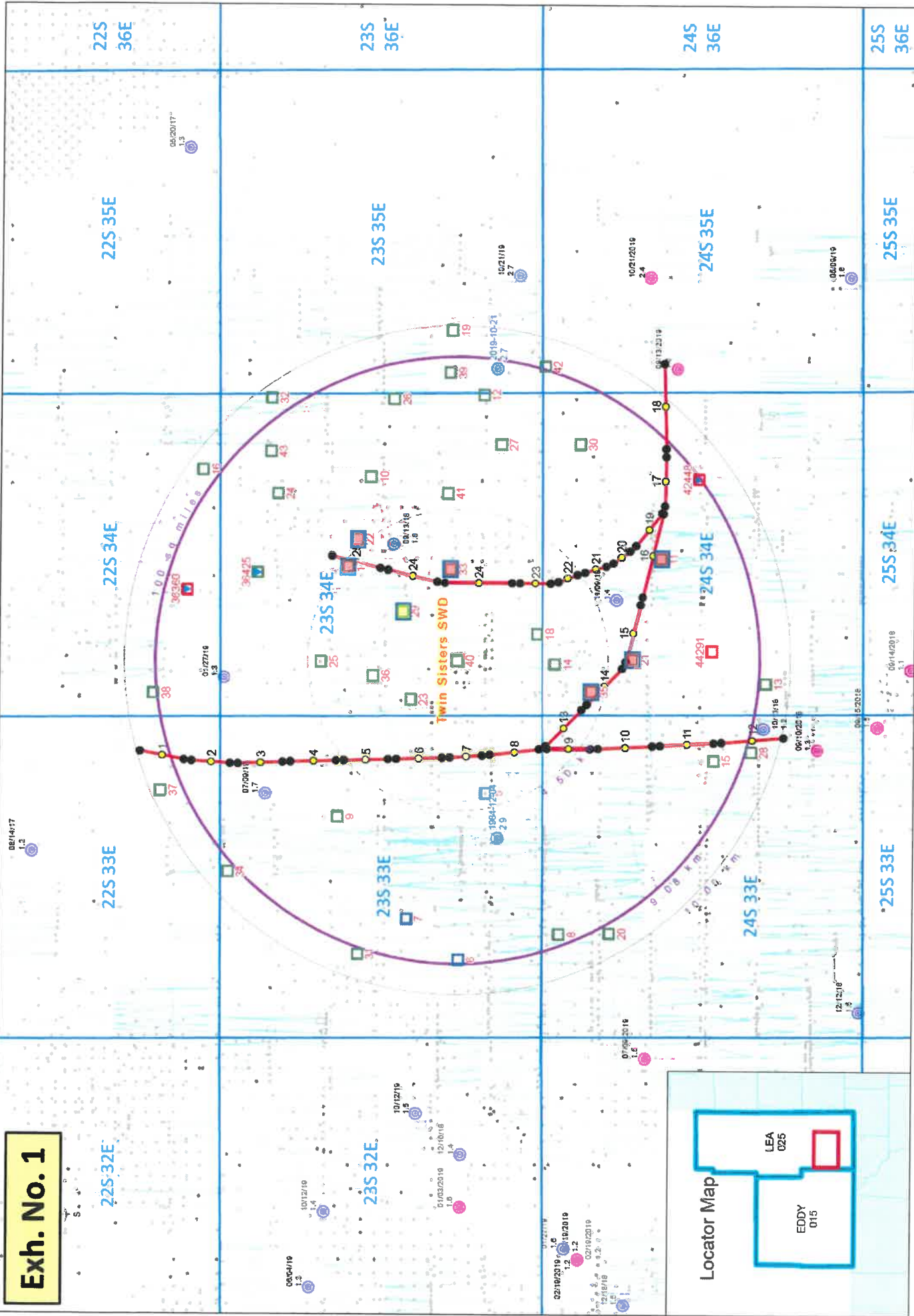


Todd W. Reynolds

FTI Platt Sparks

512.327.6930 office

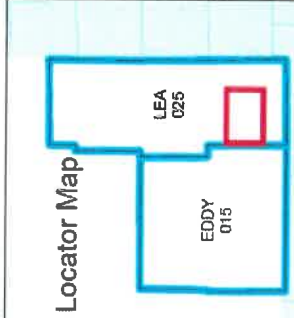
Exh. No. 1



Map Showing
Twin Sisters SWD FSP Analysis

USGS Event As of 2020-01-17
NGL Events
NMT Catalog 2017-2016 (12-31)

ACTIVE SWD
PERMITTED SWD
PENDING PERMIT



Stress Data

Vertical Stress Gradient [psi/ft] 1.1

Max Hor Stress Direction [deg N CW] 72

Reference Depth for Calculations [ft] 15485

Initial Res. Pressure Gradient [psi/ft] 0.46

Min Horiz. Stress Gradient [psi/ft] 0.86517

Max Horiz. Stress Gradient [psi/ft] 0.92607

A Phi Parameter 0.6

Reference Friction Coefficient mu 0.6

OK

Hydrology Data

☒ Enter Hydrologic Parameters

☐ Load External Hydrologic Model

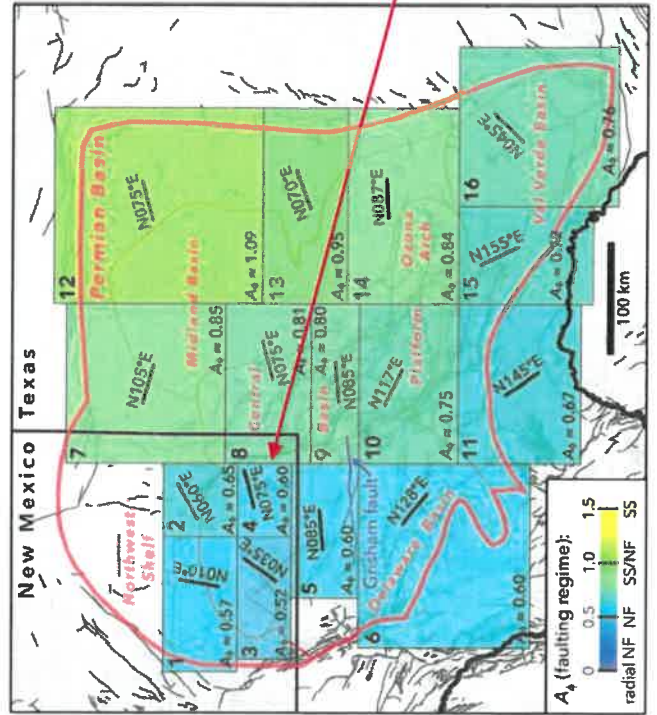
Aquifer Thickness [ft] 833

Porosity [%] 4

Permeability [mD] 20

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 (N72E)



Exh. No. 3

File Data Inputs Export Image Zoom

Fault Slip Potential

Fault Selector.

- All Faults
- Fault #1

Fault #2

Fault #3

Fault #4

Fault #5

Fault #6

Fault #7

Fault #8

Fault #9

Fault #10

Fault #11

Fault #12

Fault #13

Fault #14

Fault #15

Fault #16

Fault #17

Fault #18

Fault #19

Fault #20

Fault #21

Fault #22

Fault #23

Fault #24

Fault #25

Fault #26

Calculate

MODEL INP...

GEOMECHANICS PROB. GEOMECH

HYDROLOGY

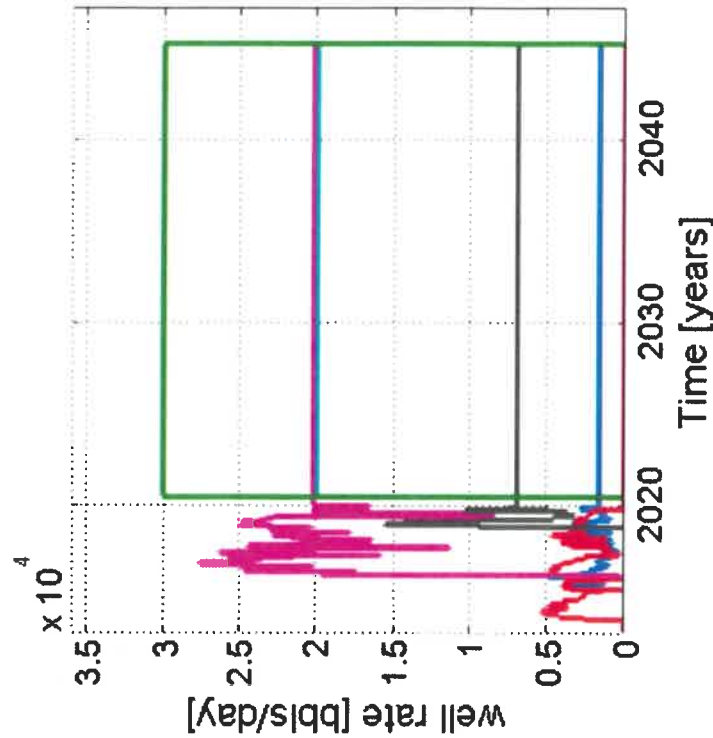
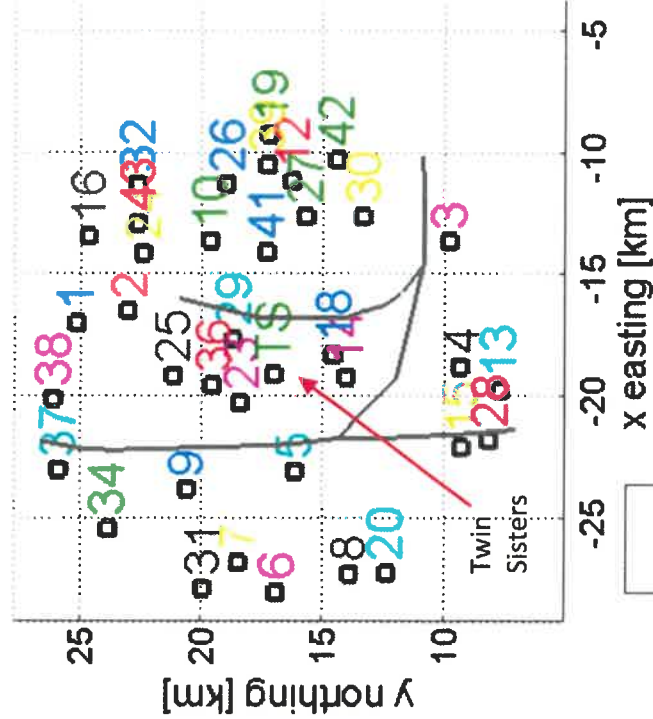
PROB. HYDRO

INTEGRATED

Stress Regime: Normal Faulting

Select Well: All

FSP INPUT Fault and well locations



FSP INPUT Injection history and projected future injection

Area of Review

Low slip potential
based on fault
orientation
(green faults)

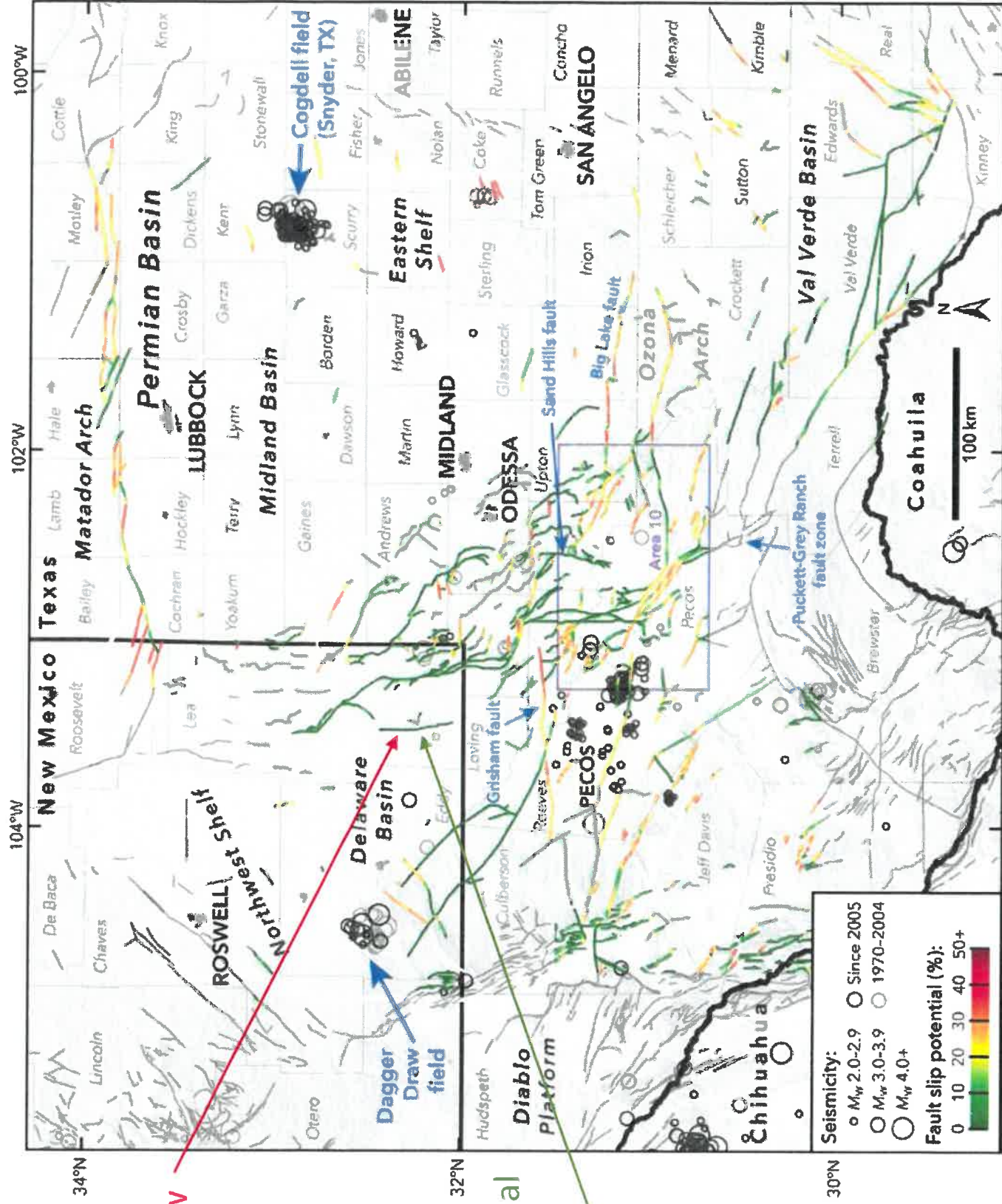


Figure 3. Results of our probabilistic FSP analysis across the Permian Basin. Data sources are as in Figures 1 and 2.

Fault Slip Potential

Fault Selector:

- All Faults
- Fault #1
- Fault #2
- Fault #3
- Fault #4
- Fault #5
- Fault #6
- Fault #7
- Fault #8
- Fault #9
- Fault #10
- Fault #11
- Fault #12
- Fault #13
- Fault #14
- Fault #15
- Fault #16
- Fault #17
- Fault #18
- Fault #19
- Fault #20
- Fault #21
- Fault #22
- Fault #23
- Fault #24
- Fault #25
- Fault #26

Calculate

MODEL INPUTS

GEOMECHANICS

PROB. GEOMECH

HYDROLOGY

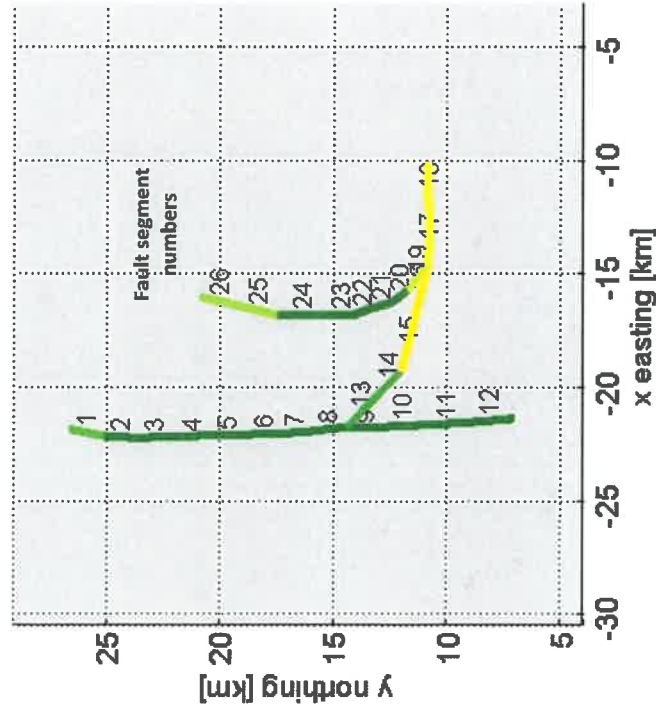
PROB. HYDRO

INTEGRATED

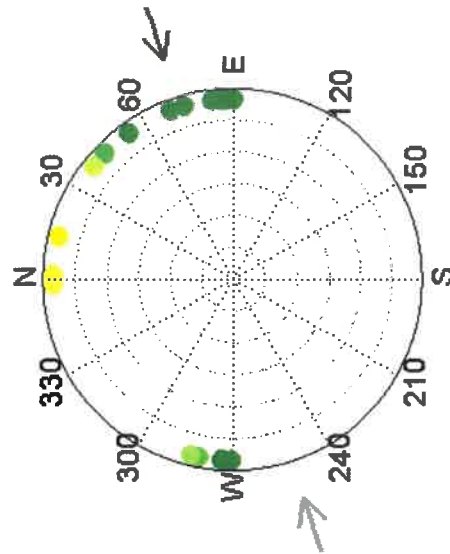
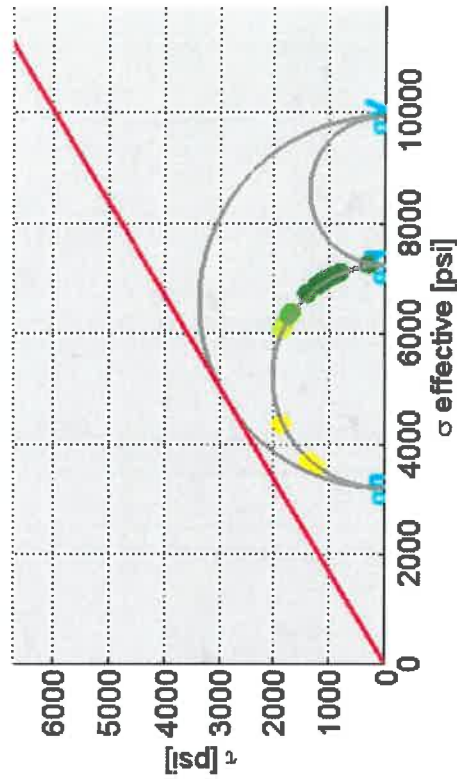
a) Fault Number

>

Help



Stress Regime: Normal Faulting



Stereonet Show:

Fault Normals

Exh. No. 6

Zoom

Fault Slip Potential

Fault Selector:

- All Faults
- Fault #1
- Fault #2
- Fault #3
- Fault #4
- Fault #5
- Fault #6
- Fault #7
- Fault #8
- Fault #9
- Fault #10
- Fault #11
- Fault #12
- Fault #13
- Fault #14
- Fault #15
- Fault #16
- Fault #17
- Fault #18
- Fault #19
- Fault #20
- Fault #21
- Fault #22
- Fault #23
- Fault #24
- Fault #25
- Fault #26

Calculate

MODEL INPUTS

GEOMECHANICS

PROB. GEOME...

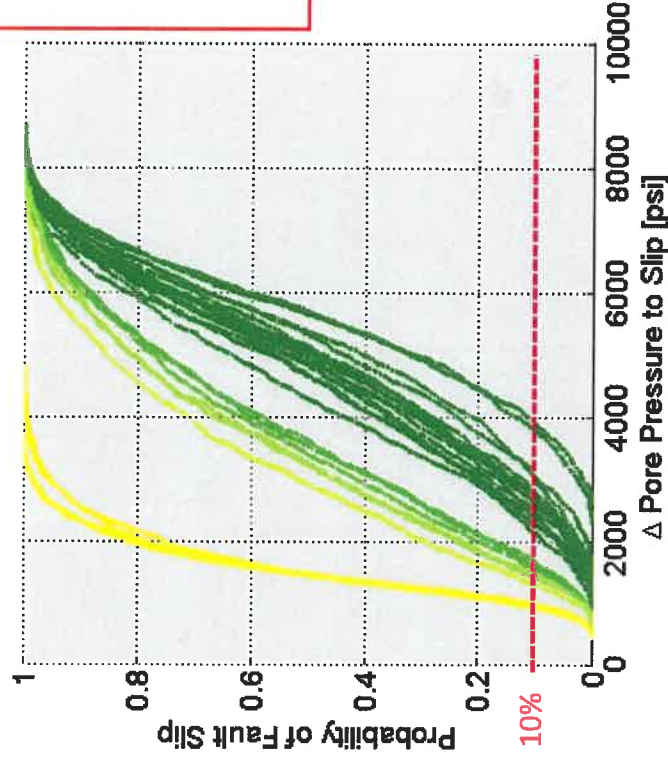
HYDROLOGY

PROB. HYDRO

INTEGRATED

Load Distributions

Run Analysis



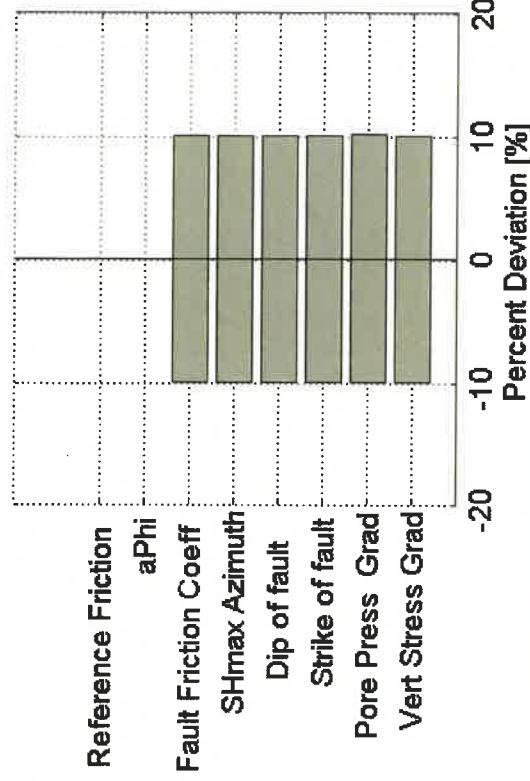
Max Delta PP [psi]:

10000

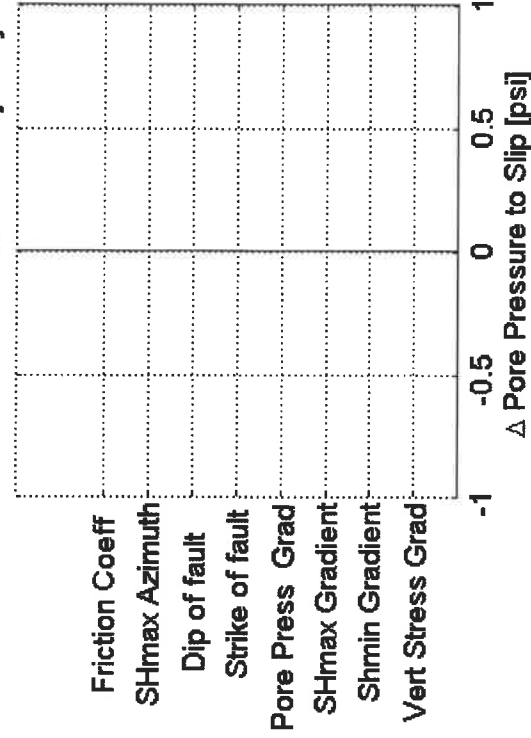
Export CDF data

Show Input Distributions

Variability in Inputs



Choose a fault to see sensitivity analysis



Fault Slip Potential

Fault Selector:

- All Faults
- Fault #1
- Fault #2
- Fault #3
- Fault #4
- Fault #5
- Fault #6
- Fault #7
- Fault #8
- Fault #9
- Fault #10
- Fault #11
- Fault #12
- Fault #13
- Fault #14
- Fault #15**
- Fault #16
- Fault #17
- Fault #18
- Fault #19
- Fault #20
- Fault #21
- Fault #22
- Fault #23
- Fault #24
- Fault #25
- Fault #26

Calculate

MODEL INPUTS

GEOMECHANICS

PROB. GEOME...

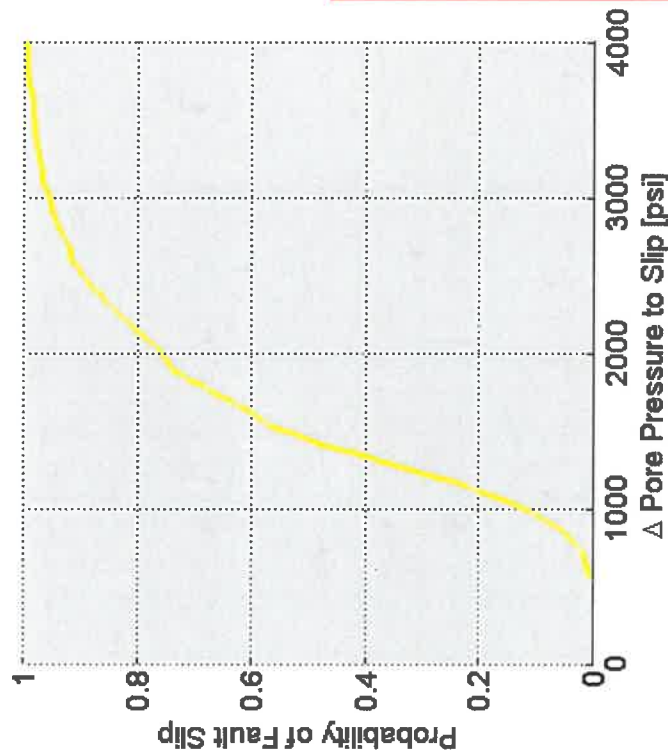
HYDROLOGY

PROB. HYDRO

INTEGRATED

Load Distributions

Run Analysis



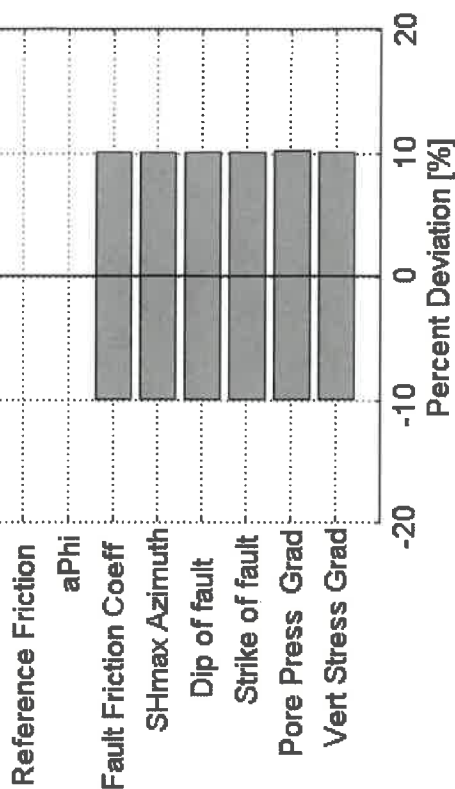
Max Delta PP [psi]:

4000

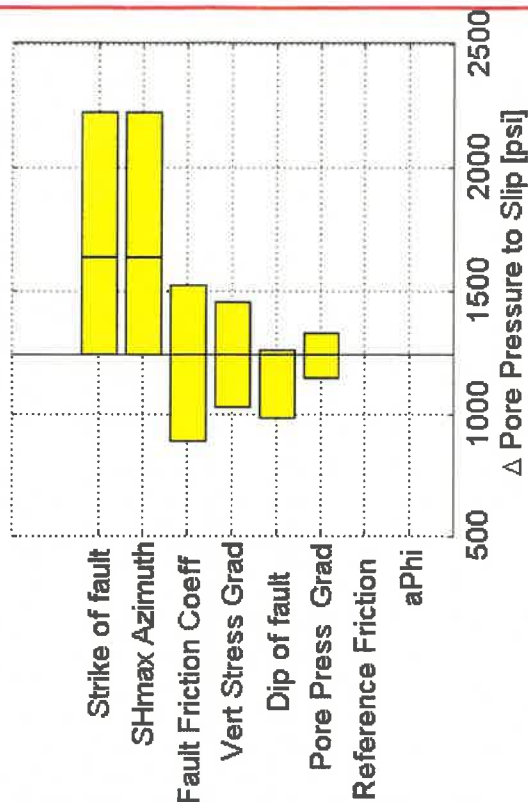
Export CDF data

Show Input Distributions

Variability in Inputs



Sensitivity Analysis for Fault #15



Fault Slip Potential

Fault Selector:

- All Faults
- Fault #1
- Fault #2
- Fault #3
- Fault #4
- Fault #5
- Fault #6
- Fault #7
- Fault #8
- Fault #9
- Fault #10
- Fault #11
- Fault #12
- Fault #13
- Fault #14
- Fault #15
- Fault #16
- Fault #17
- Fault #18
- Fault #19
- Fault #20
- Fault #21
- Fault #22
- Fault #23
- Fault #24
- Fault #25**
- Fault #26

Calculate

MODEL INPUTS

GEOMECHANICS

PROB. GEOME...

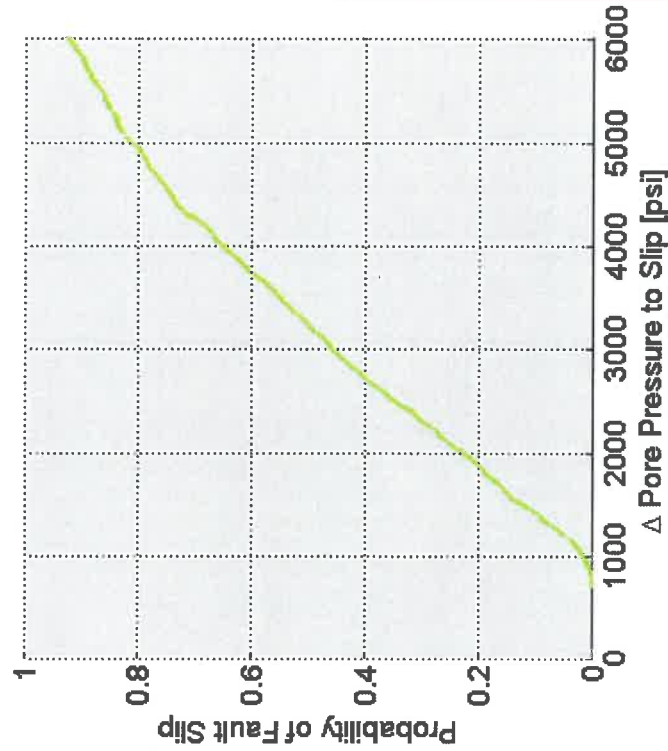
HYDROLOGY

PROB. HYDRO

INTEGRATED

Load Distributions

Run Analysis



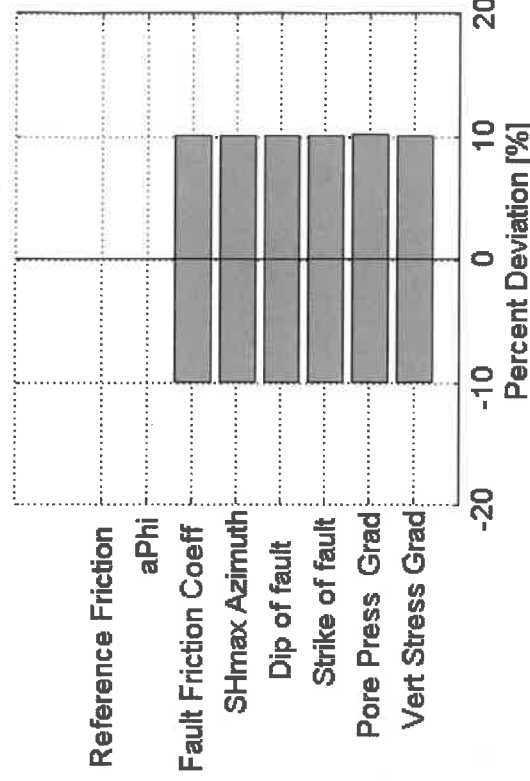
Max Delta PP [psi]:

6000

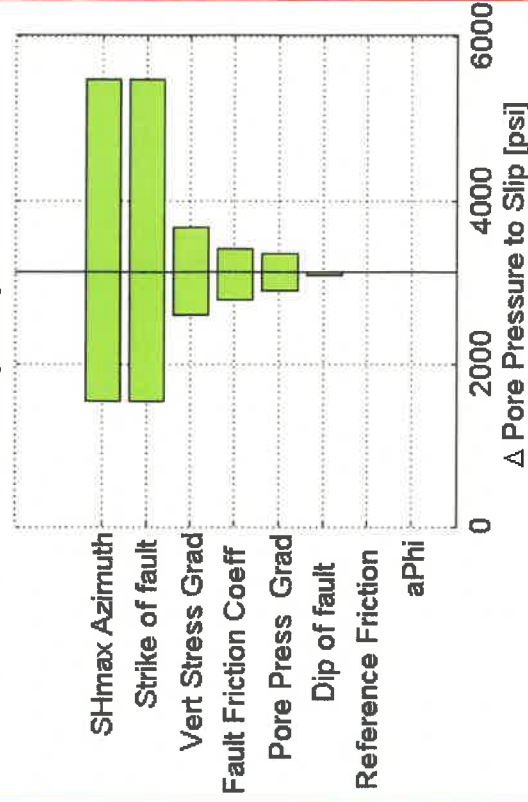
Export CDF data

Show Input Distributions

Variability in Inputs



Sensitivity Analysis for Fault #25



Fault Slip Potential

Fault Selector:

- All Faults
- Fault #1
- Fault #2
- Fault #3
- Fault #4
- Fault #5
- Fault #6
- Fault #7**
- Fault #8
- Fault #9
- Fault #10
- Fault #11
- Fault #12
- Fault #13
- Fault #14
- Fault #15
- Fault #16
- Fault #17
- Fault #18
- Fault #19
- Fault #20
- Fault #21
- Fault #22
- Fault #23
- Fault #24
- Fault #25
- Fault #26

Calculate

MODEL INPUTS

GEOMECHANICS

PROB. GEOME...

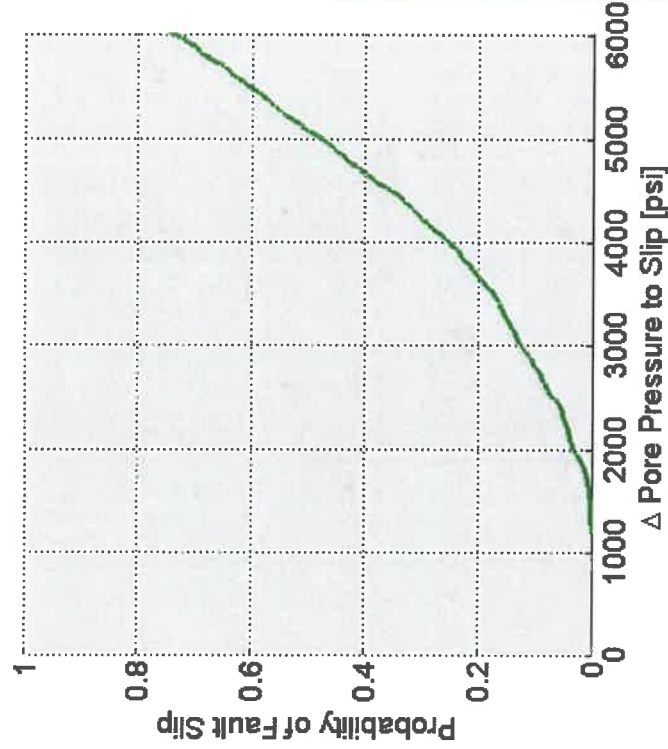
HYDROLOGY

PROB. HYDRO

INTEGRATED

Load Distributions

Run Analysis



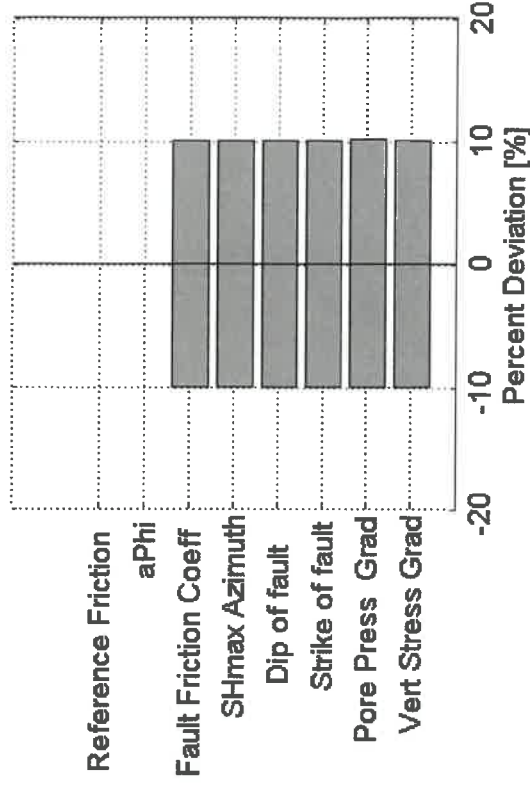
Max Delta PP [psi]:

6000

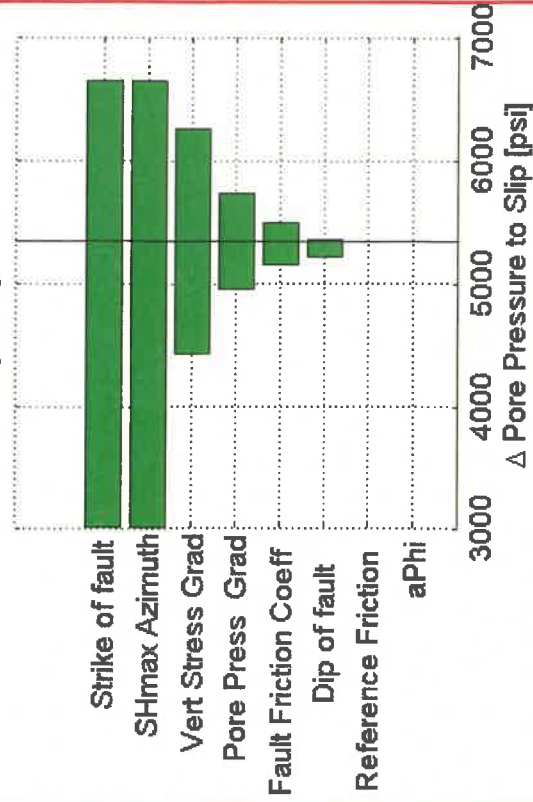
Export CDF data

Show Input Distributions

Variability in Inputs



Sensitivity Analysis for Fault #7



Fault Slip Potential

MODEL INPUTS

GEOMECHANICS

PROB. GEOMECH

HYDROLOGY

PROB. HYDRO

INTEGRATED

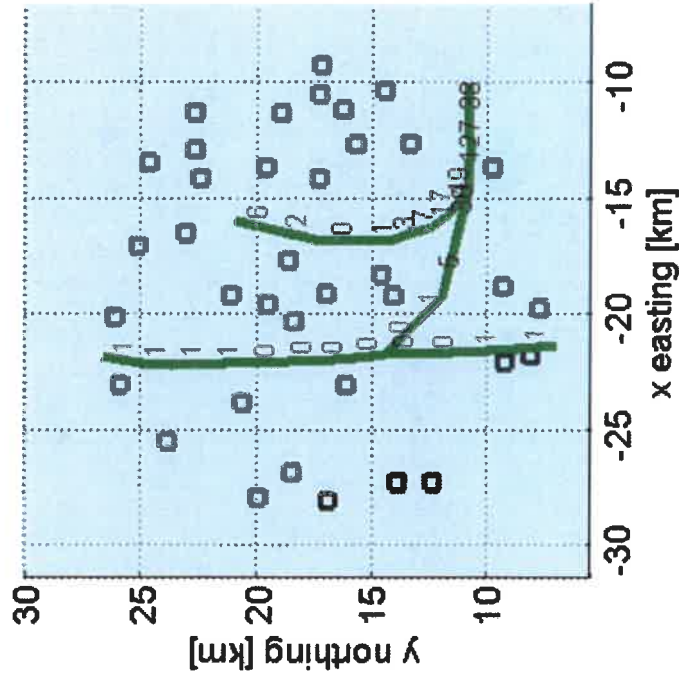
Fault Selector:

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
Fault #7, 0.00 FSP
Fault #8, 0.00 FSP
Fault #9, 0.00 FSP
Fault #10, 0.00 FSP
Fault #11, 0.00 FSP
Fault #12, 0.00 FSP
Fault #13, 0.00 FSP
Fault #14, 0.00 FSP
Fault #15, 0.00 FSP
Fault #16, 0.00 FSP
Fault #17, 0.00 FSP
Fault #18, 0.00 FSP
Fault #19, 0.00 FSP
Fault #20, 0.00 FSP
Fault #21, 0.00 FSP
Fault #22, 0.00 FSP
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Fault #25, 0.00 FSP
Fault #26, 0.00 FSP

Calculate

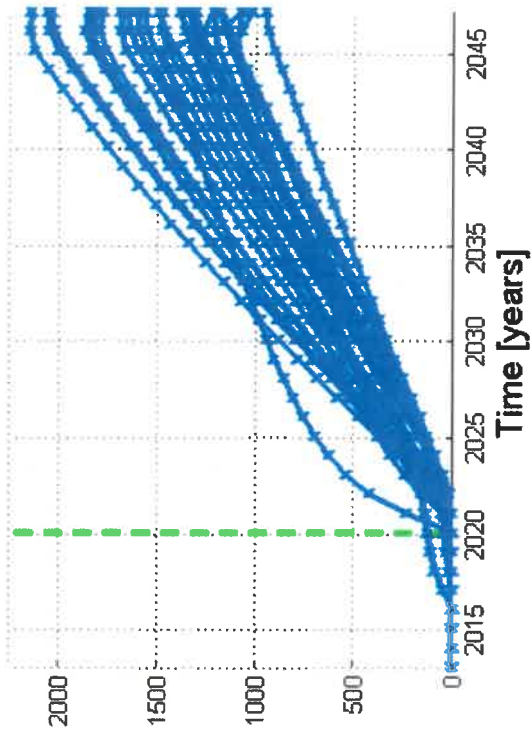
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Summary Plots

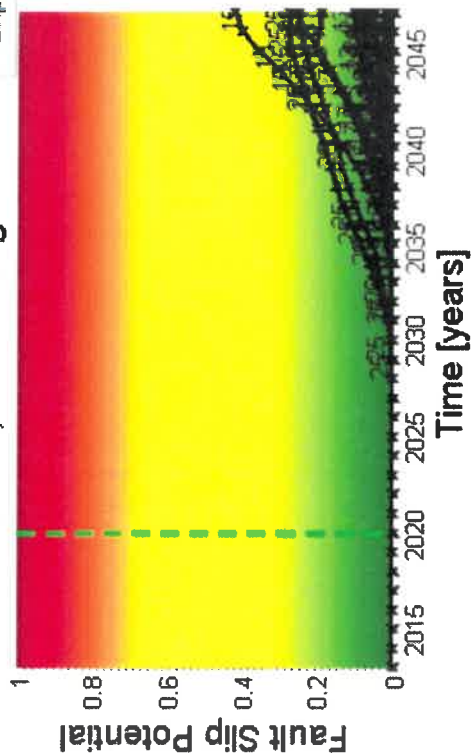


Pressure Change at Fault Midpoint [psi]

Select Fault to Plot Pressures



All Faults, FSP Through Time



Year: 2020

Fault Slip Potential

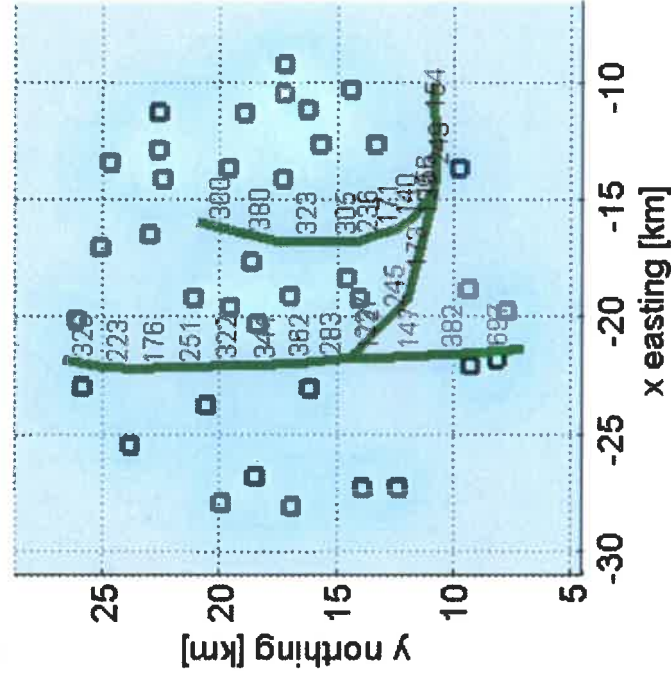
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Fault #8	0.00 FSP
Fault #9	0.00 FSP
Fault #10	0.00 FSP
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Fault #20	0.00 FSP
Fault #21	0.00 FSP
Fault #22	0.00 FSP
Fault #23	0.00 FSP
Fault #24	0.00 FSP
Fault #25	0.00 FSP
Fault #26	0.00 FSP

Calculate

b) PP Change at fault [psi]

Summary Plots



Fault Slip Potential

Year: 2025

MODEL INPUTS

GEOMECHANICS

PROB. GEOMECH

HYDROLOGY

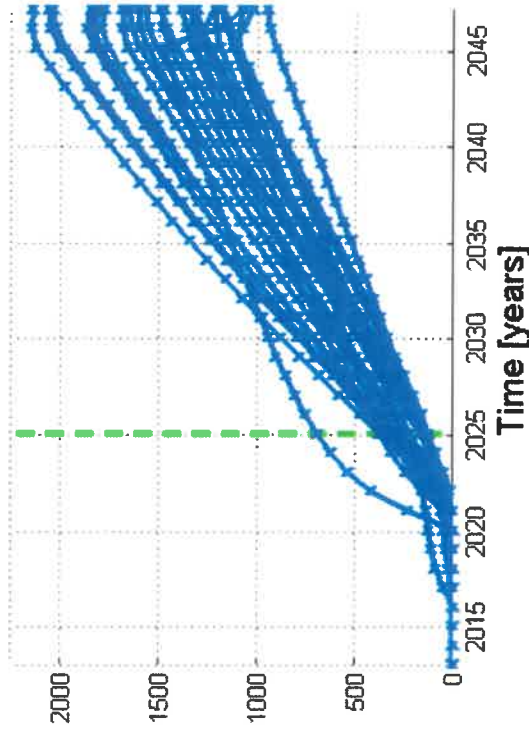
PROB. HYDRO

INTEGRATED

Export

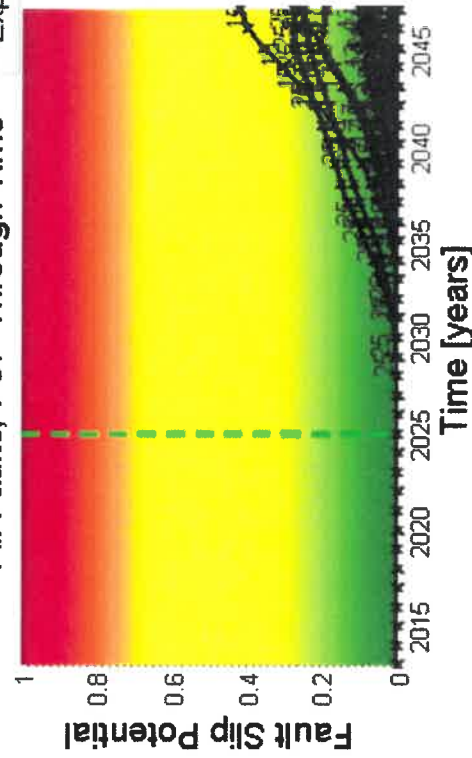
Pressure Change at Fault Midpoint [psi]

Select Fault to Plot Pressures



All Faults, FSP Through Time

Export



Fault Slip Potential

MODEL INPUTS GEOMECHANICS PROB. GEOMECH HYDROLOGY PROB. HYDRO INTEGRATED

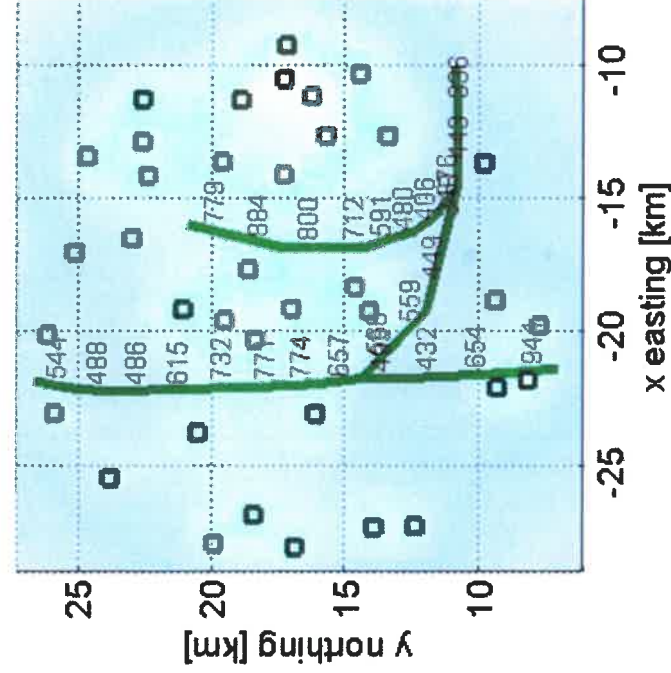
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Fault #23, 0.00 FSP
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Fault #26, 0.01 FSP

Calculate

b) PP Change at fault [psij]

Summary Plots

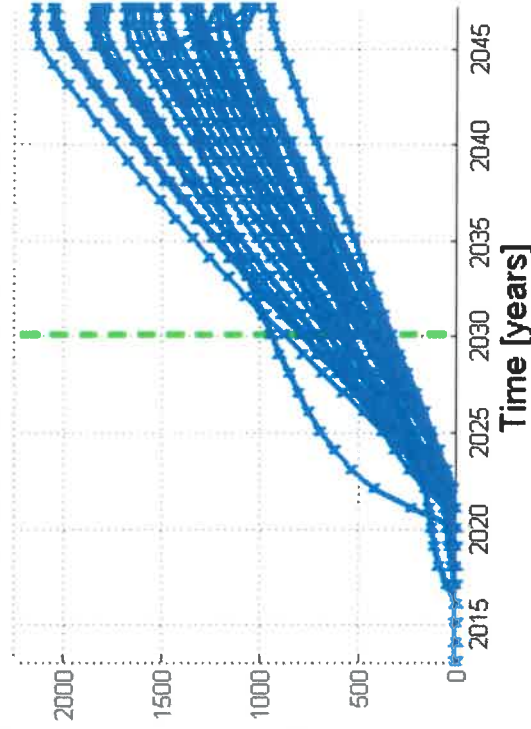


Year: 2030

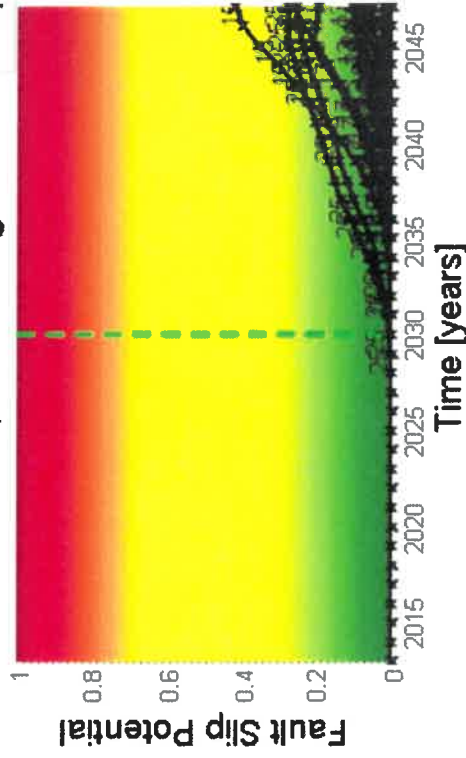
Fault Slip Potential

Pressure Change at Fault Midpoint [psi]

Select Fault to Plot Pressures



All Faults, FSP Through Time



Fault Slip Potential

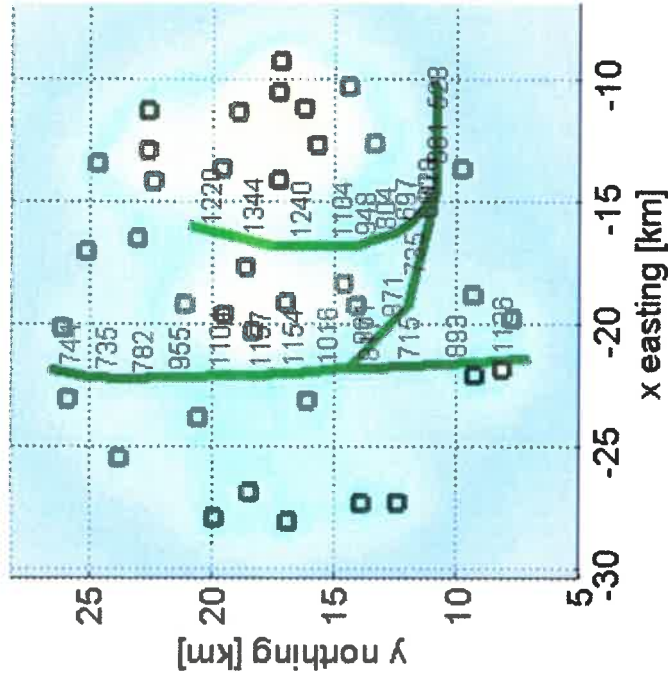
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Fault #19, 0.00 FSP
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Fault #25, 0.09 FSP
Fault #26, 0.06 FSP

Calculate

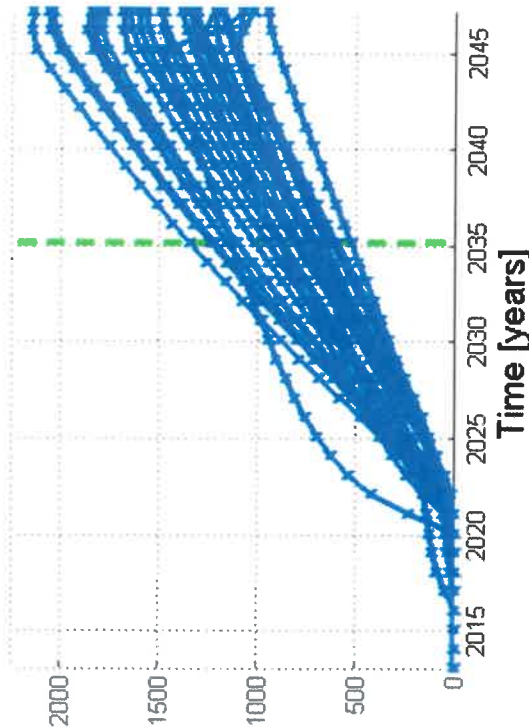
b) PP Change at fault [psi]

Summary Plots

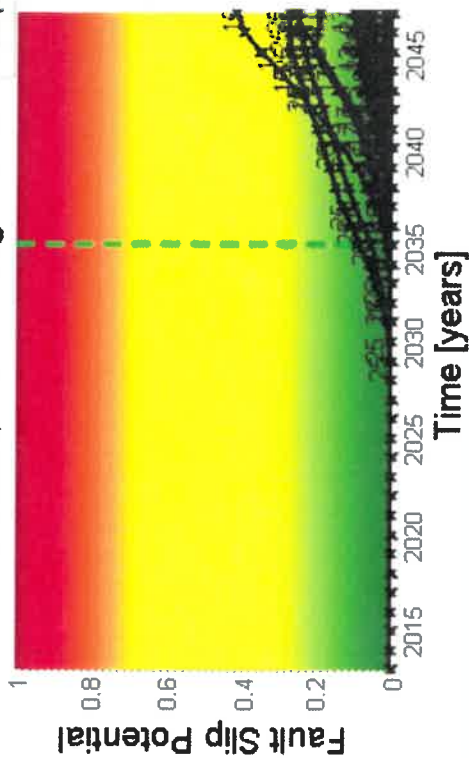


Pressure Change at Fault Midpoint [psi]

Select Fault to Plot Pressures



All Faults, FSP Through Time



Year: 2035

Fault Slip Potential

Fault Slip Potential

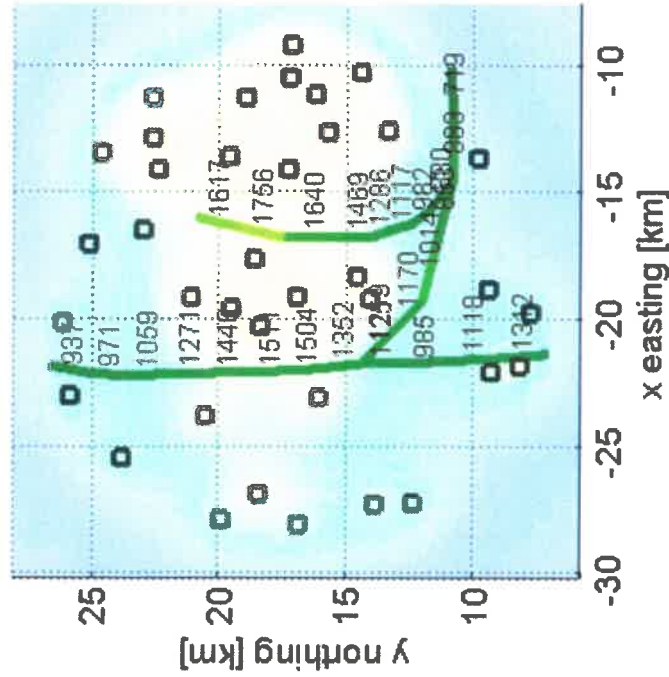
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Fault #11, 0.00 FSP
Fault #12, 0.00 FSP
Fault #13, 0.03 FSP
Fault #14, 0.03 FSP
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Fault #22, 0.00 FSP
Fault #23, 0.01 FSP
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Fault #25, 0.19 FSP
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Calculate

b) PP Change at fault [psi]

Summary Plots



Year: 2040

MODEL INPUTS

GEOMECHANICS

PROB. GEOMECH

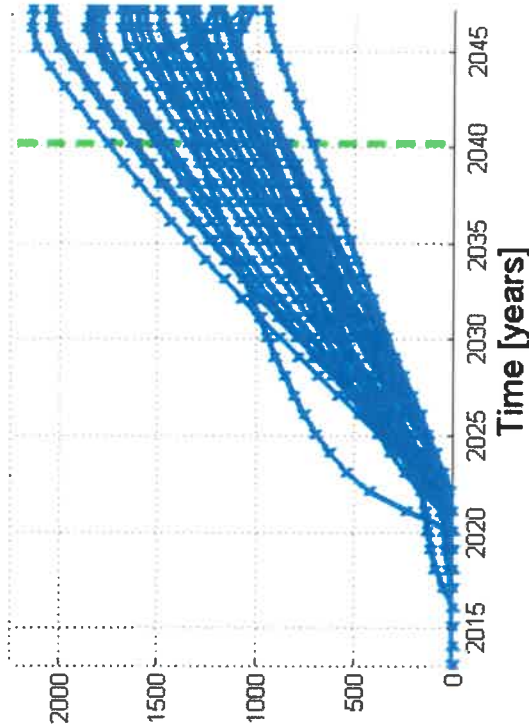
HYDROLOGY

PROB. HYDRO

Export

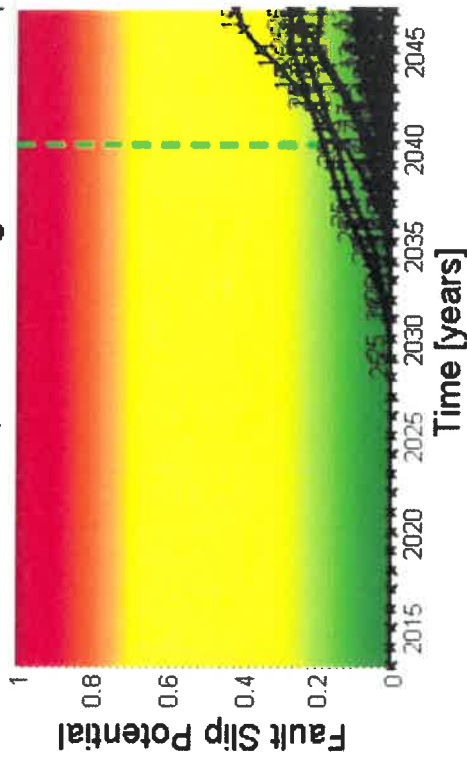
Pressure Change at Fault Midpoint [psi]

Select Fault to Plot Pressures



All Faults, FSP Through Time

Export



Fault Slip Potential

MODEL INPUTS GEOMECHANICS PROB. GEOMECH HYDROLOGY PROB. HYDRO INTEGRATED

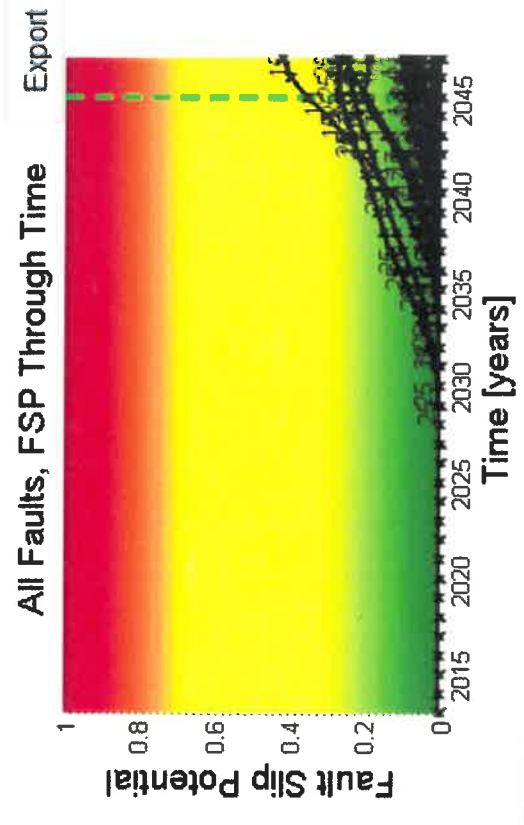
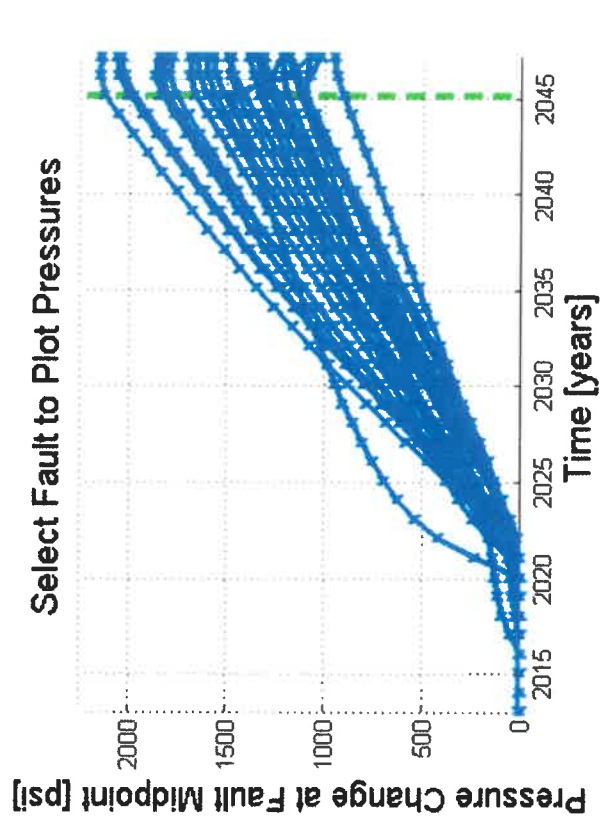
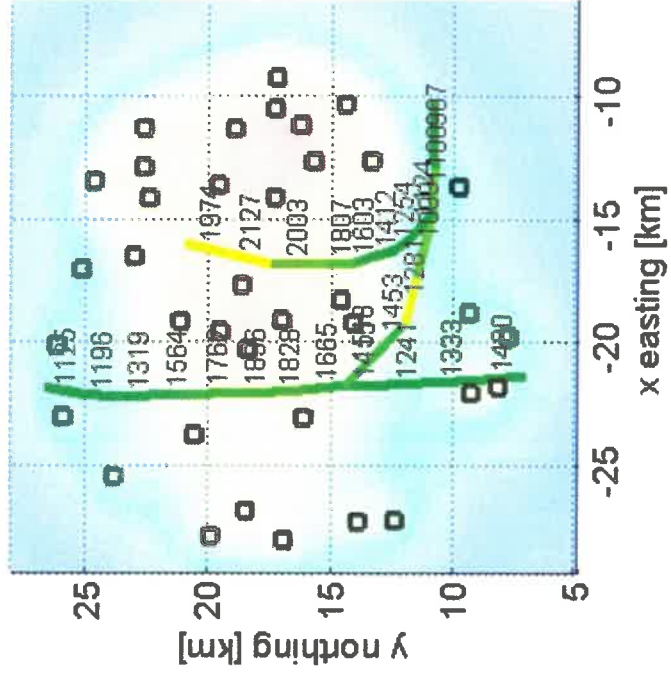
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- Fault #12, 0.01 FSP
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- Fault #14, 0.07 FSP
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- Fault #17, 0.21 FSP
- Fault #18, 0.07 FSP
- Fault #19, 0.05 FSP
- Fault #20, 0.00 FSP
- Fault #21, 0.00 FSP
- Fault #22, 0.00 FSP
- Fault #23, 0.05 FSP
- Fault #24, 0.08 FSP
- Fault #25, 0.27 FSP
- Fault #26, 0.24 FSP

Calculate

b) PP Change at fault [psi]

Summary Plots



Year: 2045

Notice Affidavits

**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. 21090
(TWIN SISTER)**

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 Twin Sister application was prepared by me or under my direction and supervision.

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



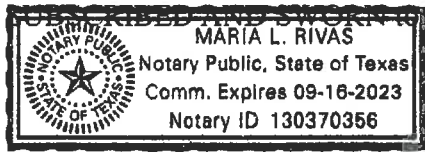
7. As part of preparing the C-108, I compiled a list of all parties entitled to notice within a one-mile area of review. I reviewed County and Division records to determine the parties entitled to notice, including the owner of the surface (Limestone Basin Properties Ranch, LLC) and leasehold operators 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



before me this 3 day of March, 2020 by Chris Weyand.


Notary Public

My commission expires: 9/16/2023

**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.**

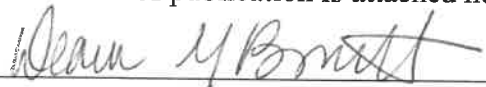
**CASE NO. 21090
(TWIN SISTERS)**

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 March 5, 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 February 20, 2020, which is
more than 10 business days before March 5, 2020. The affidavit of publication is attached hereto.



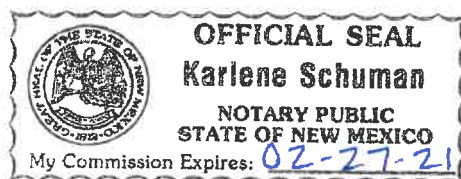
Deana M. Bennett

SUBSCRIBED AND SWORN to before me this 4th day of March, 2020 by Deana M. Bennett.



Notary Public

My commission expires: 02-27-21



87806-0016

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

PS Form 3877
Type of Mailing: CERTIFIED MAIL
02/13/2020

FFB
13
2020

Firm Mailing Book ID: 184566

Line	USPS Article Number	Name, Street, City, State, Zip	Postage	Service Fee	RR Fee	Rest.Del.Fee	Reference Contents
1	9314 8699 0430 0068 7863 77	Oil Conservation Division District IV 1220 South St. Francis Drive Santa Fe NM 87505	\$1.60	\$3.55	\$1.70	\$0.00	87806 Twin Sister Notice
2	9314 8699 0430 0068 7863 91	Oil Conservation Division District IV 1625 N. French Drive Hobbs NM 88240	\$1.60	\$3.55	\$1.70	\$0.00	87806 Twin Sister Notice
3	9314 8699 0430 0068 7864 07	LIMESTONE BASIN PROP RANCH LLC 18 Desta Dr Midland TX 79705	\$1.60	\$3.55	\$1.70	\$0.00	87806 Twin Sister Notice
4	9314 8699 0430 0068 7864 14	NEW MEXICO STATE LAND OFFICE P.O. Box 1148 Santa Fe NM 87504	\$1.60	\$3.55	\$1.70	\$0.00	87806 Twin Sister Notice
5	9314 8699 0430 0068 7864 21	BUREAU OF LAND MGMT 301 Dinosaur Trail Santa Fe NM 87508	\$1.60	\$3.55	\$1.70	\$0.00	87806 Twin Sister Notice
6	9314 8699 0430 0068 7864 38	DEVON ENERGY PRODUCTION COMPANY, LP 333 West Sheridan Ave. Oklahoma City OK 73102	\$1.60	\$3.55	\$1.70	\$0.00	87806 Twin Sister Notice
7	9314 8699 0430 0068 7864 45	COG OPERATING LLC 600 W Illinois Ave Midland TX 79701	\$1.60	\$3.55	\$1.70	\$0.00	87806 Twin Sister Notice
8	9314 8699 0430 0068 7864 52	ENDURANCE RESOURCES LLC 15455 Dallas Parkway Suite 600 Addicks TX 75234	\$1.60	\$3.55	\$1.70	\$0.00	87806 Twin Sister Notice
9	9314 8699 0430 0068 7864 69	GAZA OPERATING, LLC 200 N Loraine St Suite 1550 Midland TX 79701	\$1.60	\$3.55	\$1.70	\$0.00	87806 Twin Sister Notice
10	9314 8699 0430 0068 7864 76	KAISER-FRANCIS OIL CO P.O. Box 21468 Tulsa OK 74121	\$1.60	\$3.55	\$1.70	\$0.00	87806 Twin Sister Notice
11	9314 8699 0430 0068 7864 83	OXY USA INC P.O. Box 4294 Houston TX 77210	\$1.60	\$3.55	\$1.70	\$0.00	87806 Twin Sister Notice
12	9314 8699 0430 0068 7864 90	KAISER-FRANCIS OIL CO 6733 S YALE AVE Tulsa OK 74136	\$1.60	\$3.55	\$1.70	\$0.00	87806 Twin Sister Notice
Totals:			\$19.20	\$42.60	\$20.40	\$0.00	
				Grand Total:		\$82.20	

List Number of Pieces
Listed by Sender

Total Number of Pieces
Received at Post Office

Postmaster:
Name of receiving employee

Dated:

93

Transaction Report Details - CertifiedPro.net
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USPS Article Number	Date Created	Reference Number	Name 1	City	State	Zip	Mailing Status	Service Options	Mail Delivery Date
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MODRALL SPERLING

L A W Y E R S

February 13, 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. 21090

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 Twin Sister SWD #1 well at a surface location 2170 feet from the North line and 183 feet from the West line of Section 29, Township 23 South, Range 34 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 14,652'-16,318'. 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 March 5, 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

95

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. 21090

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 Twin Sisters SWD #1 well at a surface location 2170 feet from the North line and 183 feet from the West line of Section 29, Township 23 South, Range 34 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 14,652 -16,318'.

(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 2,198 psi for this well, and it requests that a maximum pressure of 2,930 psi be approved for the well.

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

97

(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 March 5, 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 M. 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 Twin Sister SWD #1 well at a surface location 2170 feet from the North line and 183 feet from the West line of Section 29, Township 23 South, Range 34 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 14,652'-16,318'. Applicant requests that the Division approve a maximum daily injection rate for the well of 50,000 bbls per day. Said location is approximately 21.2 miles northwest of Jal, 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:** 328805**Well Name:** TWIN SISTERS 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 holdersB. ☐ Royalty, overriding royalty owners, revenue ownersC. ☒ Application requires published noticeD. ☒ Notification and/or concurrent approval by SLOE. ☒ Notification and/or concurrent approval by BLMF. ☒ Surface ownerG. ☐ 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

Date

512-600-1764

Phone Number

CHRIS@LUNQUIS.COM

e-mail Address



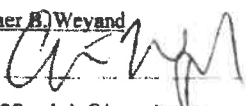
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STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT

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

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

- I. **PURPOSE:** Secondary Recovery Pressure Maintenance X Disposal Storage
Application qualifies for administrative approval? X Yes No
- II. **OPERATOR:** 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 X No
If yes, give the Division order number authorizing the project: _____
- V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.
- VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
- VII. Attach data on the proposed operation, including:
1. Proposed average and maximum daily rate and volume of fluids to be injected;
 2. Whether the system is open or closed;
 3. Proposed average and maximum injection pressure;
 4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
 5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).
- *VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.
- IX. Describe the proposed stimulation program, if any.
- *X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).
- *XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
- XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.
- XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.
- XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.
- NAME: Christopher B. Weyand TITLE: Consulting Engineer
SIGNATURE:  DATE: 1/7/2020
E-MAIL ADDRESS: chris@longquist.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, LLCWELL NAME & NUMBER: TWIN SISTERS SWD #1WELL LOCATION: 2170' FNL & 183' FWL E UNIT LETTER 29 SECTION 23S TOWNSHIP 34E RANGEWELLBORE SCHEMATICWELL CONSTRUCTION DATA
Conductor CasingHole Size: 26.000"Cemented with: 71 sx.Casing Size: 26.000"or _____ ft³Top of Cement: SurfaceMethod Determined: CirculationSurface CasingHole Size: 24.000"Cemented with: 1,525 sx.Casing Size: 20.000"or _____ ft³Top of Cement: SurfaceMethod Determined: Circulation1st Intermediate CasingHole Size: 17.500"Cemented with: 4,044 sx.Casing Size: 13.375"or _____ ft³Top of Cement: SurfaceMethod Determined: Circulation

2nd Intermediate Casing

Hole Size: 12.250"
Cemented with: 3.220 sx.
Top of Cement: Surface
Casing Size: 9.625"
or _____ ft³
Method Determined: Circulation

Production Liner

Hole Size: 8.500"
Cemented with: 273 sx.
Top of Cement: 11.200'
Total Depth: 16.518'
Casing Size: 7.625"
or _____ ft³
Method Determined: Logged

Injection Interval

14.652 feet to 16.518 feet
(Open Hole)

Side 2

INJECTION WELL DATA SHEET

Tubing Size: 7", 26 lb/ft, P-110, TCPC from 0' - 11,100' and 5,500" , 17 lb/ft, P-110 TCPC from 11,100' - 14,602'
 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: 14,602'

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 300')

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:

Lamar: 5,135'

Delaware: 5,235'

Bone Spring: 8,566'

Wolfcamp: 11,424'

Strawn: 12,174'

Atoka: 12,361'

Morrow: 13,004'

125

AWR Disposal, LLC**Twin Sisters SWD No. 1****FORM C-108 Supplemental Information****III. Well Data****A. Wellbore Information**

1.

Well information	
Lease Name	Twin Sisters SWD
Well No.	1
Location	S-29 T-23S R-34E
Footage Location	2170' FNL & 183' FWL

2.

a. Wellbore Description

Casing Information				
Type	Surface	Intermediate 1	Intermediate 2	Liner
OD	20"	13.375"	9.625"	7.625"
WT	0.595"	0.558"	0.550"	0.563"
ID	19.000"	12.415"	8.535"	6.625"
Drift ID	18.810"	12.259"	8.379"	6.500"
COD	21"	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	1,400'	5,150'	11,700'	11,200' – 14,652'

b. Cementing Program

Cement Information				
Casing String	Surface	Intermediate 1	Intermediate 2	Liner
Lead Cement	ExtendaCem	N/A	N/A	N/A
Lead Cement Volume	714 sx	N/A	N/A	N/A
Tail Cement	Halcem	Halcem	Halcem, Halcem, Halcem	Neocem
Tail Cement Volume	811 sx	4,050 sx	Stage 1: 1,193 sx Stage 2: 947 sx Stage 3: 1,080 sx	273 sx
Cement Excess	75%	100% OH	50%, 50%, 10%	50%
TOC	Surface	Surface	Surface	11,200'
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' - 11,100'	11,100' -14,602'

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: 14,652' – 16,318'

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	5,235'
Bone Spring	8,566'
Wolfcamp	11,424'
Strawn	12,174'
Atoka	12,361'
Morrow	13,004'

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: 2,198 PSI (surface pressure)

Maximum Injection Pressure: 2,930 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 Artesia, Atoka, Bone Spring, Delaware, Morrow, Pennsylvanian, Strawn, and Wolfcamp 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	1,247'
Lamar	5,135'
Bell Canyon	5,235'
Cherry Canyon	6,053'
Brushy Canyon	7,365'
Bone Spring Lm	8,566'
1st Bone Spring	9,736'
1st Bone Spring SS	10,022'
2nd Bone Spring	10,397'
3rd Bone Spring	11,227'
Wolfcamp	11,424'
Strawn	12,174'
Atoka	12,361'
Morrow	13,004'
Miss LS	13,977'
Woodford	14,388'
Devonian	14,602'
Fusselman	15,665'
Montoya	16,218'

B. Underground Sources of Drinking Water

No water wells exist within a one-mile radius of the proposed well. Water wells outside a one-mile radius in the surrounding area have an average depth of 503 feet and an average water depth of 270 feet generally producing from the Carlsbad. 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

Because there are no water wells that exist within a one-mile radius of the proposed well, chemical analysis of fresh water wells was not retrieved for the proposed well.

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 Twin Sisters SWD #1) and any underground sources of drinking water.

NAME: Herb Wacker

TITLE: Geologist

SIGNATURE:

Herb Wacker
-713 PC, # 4517

DATE:

Nov 1, 2019

AWR DISPOSAL LLC		Tulsa Section SWD		Location: Section 25, T15N, R10E		Well Name: Rustler Anhydrite - 1247		Well ID: 1247		Well Status: Active		Well Depth: 11100' of 7" P110 268 TDC					
Rustler Anhydrite - 1247		Surface TD - 1400		Surface Drill 24" 0' - 1400' 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 MWK- 9.0		1400' of 20" 106.5# J55 BTC Centralizers - bottom 2 joints and every 3rd ft thereafter		No Logs		Lead: 714 ss 13.7 ppg EXTENDACEM, 1.694 R3/sk (800') 75% excess Tail: 811 ss 14.8 ppg HALCEM, 1.342 R3/sk (600') 75% excess Cement to Surface	
Salt Section		Lamar - 5135		1st Int TD - 5150		1st Intermediate Drill 3750' of 17-1/2" Hole 1400' - 5150' Set and Cement 13-3/8" Casing		17-1/2" PDC 9-5/8" x 8" MM 9 Jts: 8" DC 21 Jts: 5" HWDP 5" DP to surface		Brine Water <1.1ppg		SM A Section Casing Bowl 5150' of 13-3/8" 68# HCL80 BTC. Externally coated 1100' - 5100' Centralizers - bottom 10' every 3rd joint in open hole and 2 ft inside the surface casing		Mudlogger on site by 1400'		4050sa of 13.7ppg Halcem (100% XS in OH) with 5% Microbond. Cement to surface	
9-5/8" ECP DV Tool - 5200		Bell Canyon - 5235		2nd Intermediate Drill 6550' of 12-1/4" Hole 5150 - 11700' 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		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 11700' of 9-5/8" 53.5# P110 BTC Special Drift to 8.535" Externally Coat Between DV Tools DV tool at 8600' ECP DV Tool at 5200'		MWD GR Triple combo + CBL of 13-3/8" Casing		Stage 3: 1080 ss 13.7 ppg Halcem™ C 10% XS 1000psi CSD after 10 hrs Cement to Surface Stage 2: 947 ss of 13.7 ppg Halcem™ C 50% XS 1000psi CSD after 10 hrs Cement to Surface Stage 1: 1199 ss 15.6 ppg Halcem™ C 50% XS 1000psi CSD after 10 hrs Cement to Surface	
3rd Int Liner Top - 11,200		Wolfcamp - 11424		2nd Int TD - 11,700		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		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/MFO using ADA (MOLD)		3452' of 7-5/8" 39# P110 USS Flush It Conn Versaflex Packer Hanger Centralizers on and 1 ft above shoe ft and then every 2nd ft.		MWD GR Triple combo, CBL of 9-5/8" Casing		273sa of 13.2 ppg NeoCem™ PT2 8hr TT Silica Flour 50% Excess 1000psi CSD after 10hrs	
Strawn - 12174		Atoka - 12361		3rd Intermediate Drill 2952' of 8-1/2" Hole 11700' - 14652' Set 7-5/8" Liner and Cement in Single Stage		Chert is possible Loss of Circulation is expected H2S encountered on the Striker 3 well BHT estimated at 280F		5-1/2" 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)	
Morrow - 13004		Miss Let - 13977		3rd Int TD - 14,652		Injection Interval Drill 1866' of 6-1/2" hole 14652 - 16518'		7-5/8" x 5-1/2" TDC		Permanent Packer with High Temp Elastomer and full Inconel 925 trim							
Woodford - 14388		Perm Packer - 14,602															
Devonian - 14,602		Fuselman - 15665															
		Montoya - 16,218'		TD - 16,318'													

District I
1625 N French Dr., Hobbs, NM 88240
Phone: (575) 293-6161 Fax: (575) 293-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number		Pool Code		Pool Name	
Property Code	Property Name TWIN SISTERS SWD				Well Number 1
GRID No. 328805	Operator Name LONQUIST & CO, LLC				Elevation 3565'
10 Surface Location					
UL or lot no. E	Section 29	Township 23-S	Range 34-E	Lot 1st -	Feet from the 2170'
		North/South line NORTH		Feet from the 183'	East/West line WEST
				County LEA	
UL or lot no. -	Section -	Township -	Range -	Lot 1st -	Feet from the -
		North/South line -		Feet from the -	East/West line -
				County -	
Dedicated Acres -		Joint or Leased -		Consolidation Code -	
				Order No. -	

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

X=79876.73 Y=467633.37	X=801316.73 Y=467854.34	X=80865.36 Y=467814.0
<p>17 OPERATOR CERTIFICATION</p> <p>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or undivided mineral interest in the land underlying the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p><i>Chris Longquist</i> 1/27/2020 Signature Date Chris Longquist Printed Name Chris@lonquist.com E-mail Address</p>		
<p>18 SURVEYOR CERTIFICATION</p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true to the best of my belief.</p> <p>XX/XX/XXXX Date of Survey Signature and Seal of Professional Surveyor</p>		
X=798725.42 Y=462258.09	X=801370.07 Y=462375.43	X=804003.61 Y=462395.34
Certificate Number		

S:\SURVEY\LONQUIST_A_CO\LLC\NINETEENTH\PRODUCT\BLO_TWIN SISTERS_SWD_1_REV1.DWG 12/9/2019 3:41 PM lmothy

District I
1635 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
111 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Artesia, NM 87410
Phone: (505) 424-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3450 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 OCM-101
Revised July 15, 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, TX 79705		OCRID Number 328805
Property Code		API Number TBD
Property Name Twin Sisters SWD		Well No 1

7. Surface Location

UT - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
E	29	23S	34E	N/A	2170'	NORTH	183'	WEST	LEA

8. Proposed Bottom Hole Location

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

9. Pool Information

Pool Name SWD, DEVONIAN-SILURIAN	Pool Code 97889
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Additional Well Information

11 Work Type N	12 Well Type SWD	13 Casing/Rotary R	14 Lease Type Private	15 Ground Level Elevation 3,565'
16 Multiple N	17 Proposed Depth 16,318'	18 Formation Devonian-Silurian	19 Contractor TBD	20 Spud Date ASAP
Depth to Ground water 270'		Distance from nearest fresh water well 1.39 miles		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

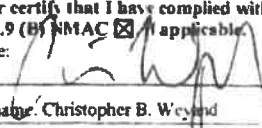
Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surface	24"	20"	106.5 lb/ft	1,400'	1,515	Surface
Intermediate 1	17.5"	13.375"	68 lb/ft	5,150'	4,050	Surface
Production	12.25"	9.625"	53.5 lb/ft	11,700'	3,220	Surface
Prod. Liner	8.5"	7.625"	39 lb/ft	11,200' - 14,652'	273	11,200'

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. Weyand

Title: Consulting Engineer

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Date: 01/02/2020

Phone: (512) 600-1764

OIL CONSERVATION DIVISION

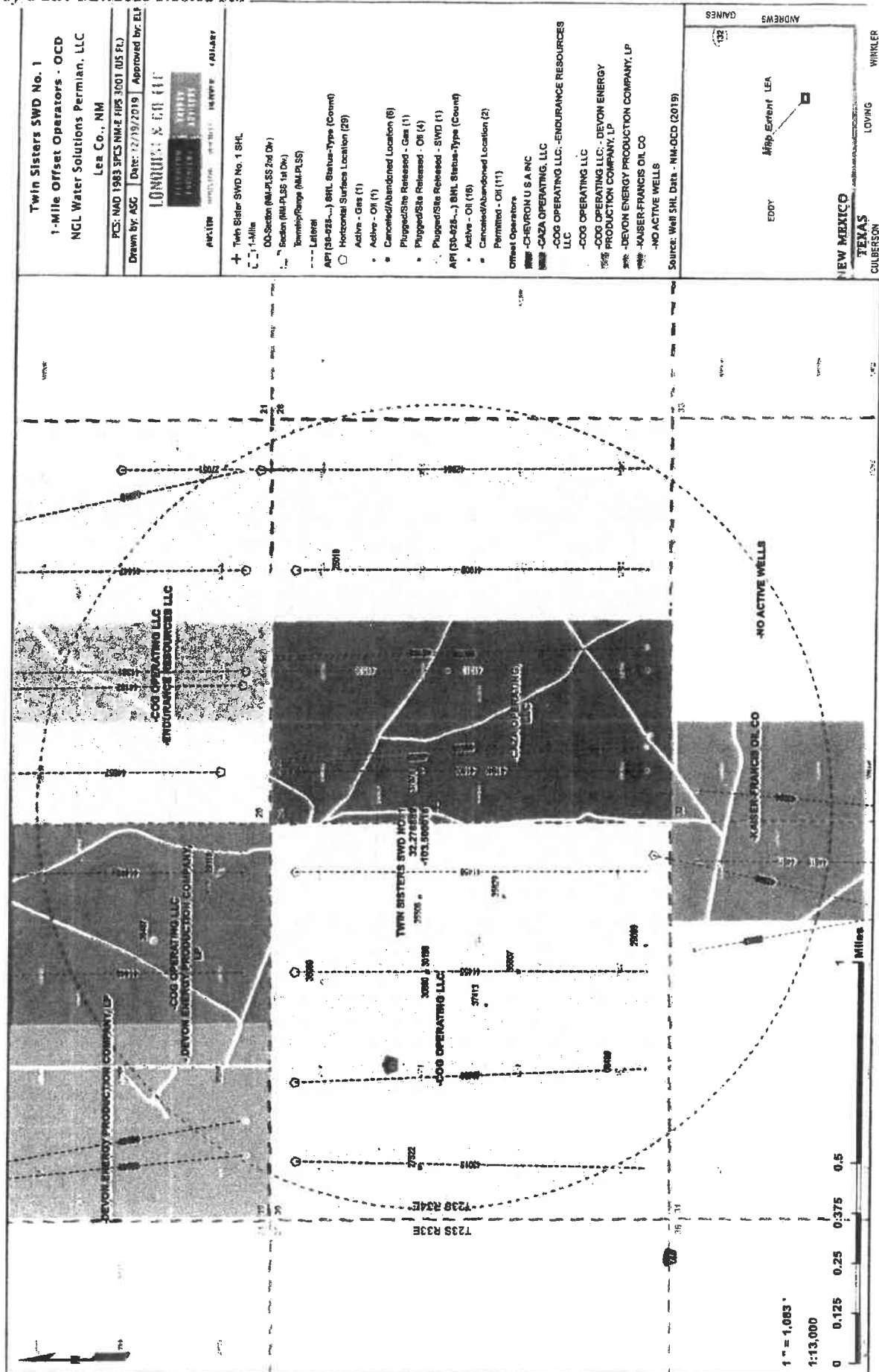
Approved By:

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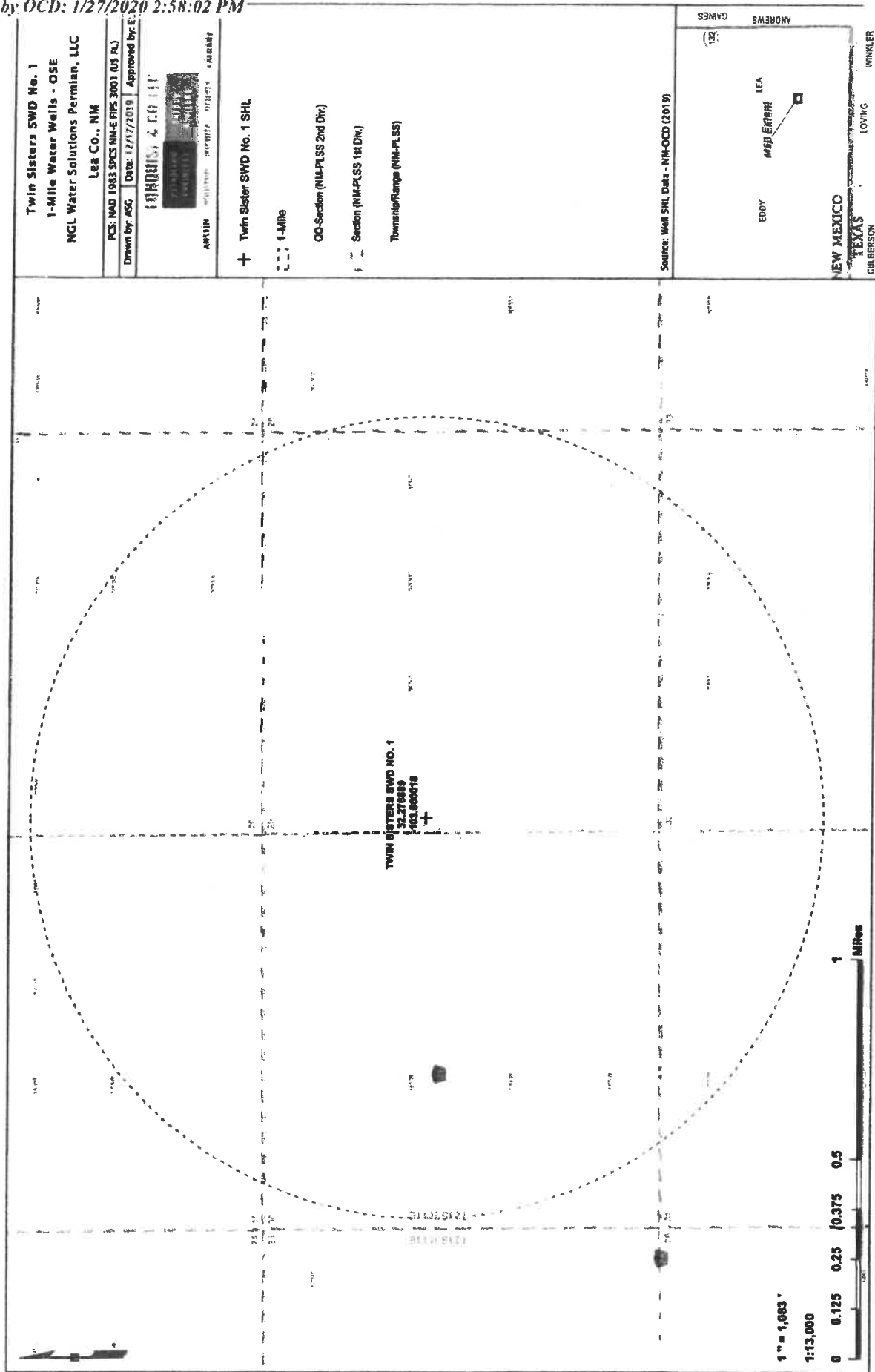
Conditions of Approval Attached





Twin Sisters SWS No. 2
1 Mile Area of Newton (18)

[illegible]Twin Sisters SWD No. 1 - 1 Mile Area of Review List
NNA-000 (2011)



Twin Sisters 39003 No. 1																		
Offshore Produced Water Analysis																		
API	Section	Township	Range	Unit	County	Field	Formation	ph	ids_mpt	medium_mpt	calcium_mpt	iron_mpt	magnesium_mpt	strontium_mpt	chloride_mpt	barium_mpt	radium_mpt	colt_mpt
3002541134	17 12	34E	O	Lea	Lea	BORE SPRING 2ND SAND	BORE SPRING 2ND SAND	7.5	1501.612		48193	3715	30.2	77977.9	0	1000	470	
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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
February 20, 2020
and ending with the issue dated
February 20, 2020.



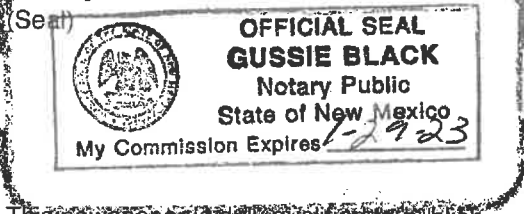
Publisher

Sworn and subscribed to before me this
20th day of February 2020.



Business Manager

My commission expires
January 29, 2023



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

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LEGAL NOTICE FEBRUARY 20, 2020

CASE NO. 21090: Notice to all affected parties, as well as the heirs and devisees of Oil Conservation Division District IV, Limestone Basin Prop Ranch LLC, New Mexico State Land Office, Bureau of Land Management, Devon Energy Production Company LP, COG Operating LLC, Endurance Resources LLC, CAZA Operating LLC, Kaiser-Francis Oil Co., Oxy USA Inc., of AWR Disposal, LLC's application for approval of salt water disposal well in 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 March 5, 2020, to consider this application. Applicant seeks an order approving the Twin Sister SWD #1 well at a surface location 2170 feet from the North line and 183 feet from the West line of Section 29, Township 23 South, Range 34 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 14,652'-16,318'. Applicant requests that the Division approve a maximum daily injection rate for the well of 50,000 bbls per day. Said location is approximately 21.2 miles northwest of Jal, New Mexico.
#35212

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

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